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24 FEB 1932

A POPULAR DESCRIPTION

OF THE

Natal Ferns:

DESIGNED FOR THE USE OF AMATEURS.

BY

J. M. WOOD,

INANDA.

DURBAN:

PRINTED AND PUBLISHED BY

T. L. CULLINGWORTH, (EAST END),

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Royal Bot. Soc. Gardens,
Regent's Park.

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P R E F A C E .

THE object the compiler has had in view in writing the following pages, has been simply to render the study of our Natal Ferns easier for those persons who make no pretence to botanical acquirements, and who have not the opportunity of consulting Hooker and Baker's "*Synopsis Filicum*" which contains an enumeration and description of all known ferns, and from which work some of the following descriptions have been taken. The compiler has as far as possible endeavoured to avoid the use of technical terms, and of such as he has been compelled to use he has added a description which he hopes will make their meaning plain. He has also compiled an Analysis or Vidimus of the Genera, which will be found of use in referring a fern to its proper place. For the purpose of classification it is advisable when possible to have more than one specimen of the fern, one frond of which at least, should not be quite mature, as the indusium which is of so much use in classification is often after, on even at, maturity so pushed aside and hidden by the growing capsules, that in a many cases it is difficult to detect, and it is always most conspicuous in the young specimens.

To use the table let us suppose that we have before us a frond of a fern, in fruit, and which is as near perfect as possible, and which should also have a portion of the rhizome attached to it, we turn to the first part of the table and looking to the three methods of fructification there given, we find that the first viz:— "fructification dorsal" corresponds with our specimen, we are then referred to **I** Sori covered or naked, we find the latter to be true, the sori are naked, we then turn to **B.** and reading carefully over the list there given we note the one which best describes the specimen before us, which in this case is the first, viz:— Sori round, distinct, capsules numerous, the fern is therefore a *Polypodium*. Let us suppose another case, we have a frond of a fern before us, and upon referring to the first part of the table, we again find the fruit to be dorsal and pass on to **I.** In this case we find that the fruit is covered with an indusium, which passes us on to **A.** and reading down the lines we find the one which appears nearest to be "Indusium semilunate, marginal," we therefore pass on to **d** and upon holding the frond between the eye and a strong light we see at once that the veins are anastomosing, it is therefore *Lonchitis*. A table is also prefixed to each genus where required, for the purpose of determining the species. We have often been asked by Amateur collectors how they may best distinguish a fern from any other plant, in the majority of cases if the fern is in fruit, this is easy, as the greater number of our ferns bear their capsules or spore cases on the back of the frond, but we have in Natal 4 genera which differ in this respect viz;— *Schizaea* and *Ophioglossum* which bear their capsules on a spike, and *Osmunda* and *Anemia* which bear theirs in a panicle. Another mode of detecting a fern is by the veneration or arrangement of leaves in the bud, which in all our Natal species except *Ophioglossum*, is circinate or coiled like a crozier, in *Ophioglossum* it is straight. A third difference is the venation which in most of our species is forked and free, and in the remainder anastomosing or running together, both, forms which differ considerably from the venation of either exogen or endogen, and which are after a little practice easily recognised. As this List has been intended for Amateurs only, the synonyms have been wholly omitted, but Mr. Buchanan's Revised List published in 1875, gives both the synonyms and also the habitats of the different species very fully.

ANALYSIS OF GENERA OF NATAL FERNS.

Fructification dorsal <i>i.e.</i> on back of frond	I.
„ spicate	II.
„ paniculate	III.

I.

Sori covered with an indusium	A.
„ naked	B.

A.

Indusium eup-shaped	<i>a.</i>
„ tubular	<i>b.</i>
„ continuous, marginal	<i>c.</i>
„ semilunate „	<i>d.</i>
„ kidney-shaped	<i>e.</i>
„ linear, oblong, sometimes curved	<i>Asplenium.</i>
„ round, attached by centre... ..	<i>Aspidium.</i>
„ elliptical, apparently doubled	<i>Didymochlæna.</i>
„ having the capsules attached beneath	<i>Adiantum.</i>
Fertile fronds contracted; pinnate	<i>f.</i>
<i>a.</i> herbaceous	<i>Woodsia.</i>
<i>a.</i> arborescent; cup complete	<i>Cyathea.</i>
<i>a.</i> „ „ incomplete	<i>Hemitelia.</i>
<i>b.</i> indusium two-valved	<i>Hymenophyllum.</i>
<i>b.</i> „ entire or nearly so	<i>Trichomanes.</i>
<i>b.</i> „ attached by base and sides	<i>Davallia.</i>
<i>b.</i> „ „ „ base only	<i>Cystopteris.</i>
<i>c.</i> „ opening outwards	<i>Lindsaya.</i>
<i>c.</i> „ at first globose, not quite continuous	<i>Cheilanthes.</i>
<i>c.</i> receptacle punctiform; fronds coriaceous }	<i>Pellaea,</i>
except <i>P. geraniifolia.</i>	
<i>c.</i> receptacle continuous; fronds herbaceous }	<i>Pteris.</i>
except <i>P. aquilina.</i>	
<i>d.</i> veins netted... ..	<i>Lonchitis.</i>
<i>d.</i> „ free	<i>Hypolepis.</i>
<i>e.</i> pinnae jointed to rachis	<i>Nephrolepis.</i>
<i>e.</i> „ not jointed... ..	<i>Nephrodium.</i>
<i>e.</i> frond simple	<i>Oleandra.</i>
<i>f.</i> sori marginal	<i>Lomaria.</i>
<i>f.</i> „ intramarginal	<i>Blechnum.</i>

B.

Sori round, distinct, capsules numerous	<i>Polypodium.</i>
„ „ confluent and marginal	<i>Nothochlæna.</i>
„ linear or oblong, sometimes forked	<i>Gymnogramma.</i>
„ „ continuous slightly intramarginal	<i>Vittaria.</i>
„ marginal, capsules few, large	<i>Mohria.</i>

Capules irregularly spread over under surface of frond or pinna	} ...	<i>Aerostichum.</i>
„ large, on under surface of lower segments only	... ..	<i>Todea.</i>
„ few, 2 to 10 in each sorus, medial, frond rigid, opaque	...	<i>Gleichenia.</i>
„ few, concrete, intramarginal	...	<i>Marattia.</i>

II.

Barren frond ovate, veneration straight...	... ..	<i>Ophioglossum.</i>
„ „ linear „ circinate	... ..	<i>Schizaea.</i>

III.

Fronds bipinnate, apex fertile	... ..	<i>Osmunda.</i>
„ pinnate, barren and fertile different	... ..	<i>Anemia.</i>

ERRATA.

Page	4	line	40	from top, for plant <i>read</i> plants
"	4	"	4	from bottom, for stem <i>read</i> a stem
"	5	"	1	from top, for it <i>read</i> of
"	5	"	4	" for first <i>read</i> fact
"	5	"	7	" for caudex, <i>read</i> caudex
"	5	"	27	" for apex <i>read</i> apex,
"	5	"	39	" for fronds <i>read</i> fronds,
"	6	"	36	" for the the <i>read</i> the
"	7	"	37	" for racbis, <i>read</i> rachis
"	7	"	11	from bottom, for lobes, <i>read</i> lobes ;
"	7	"	3	" for this fern, <i>read</i> this fern
"	8	"	14	from top, for pinnate <i>read</i> pinnate,
"	10	"	7-8	" for Eu-Hypoleis <i>read</i> Eu-Hypolepis
"	11	"	15	" for which <i>read</i> which
"	11	"	30	" for long <i>read</i> long,
"	21	"	9	" for upper portion <i>read</i> upper portion ;
"	21	"	10	" for pinnæ <i>read</i> pinna,
"	21	"	35	" for fronds <i>read</i> fronds,
"	23	"	3	from bottom, for company, <i>read</i> company
"	25	"	10	" for called, <i>read</i> called
"	25	"	2	" for pinnules, <i>read</i> pinnules
"	30	"	24	" for veins, <i>read</i> veins ;
"	32	"	19	" for trees and and <i>read</i> trees and
"	36	"	25	from top, for simpte <i>read</i> simple
"	39	"	21	" for dregeana <i>read</i> Dregeana
"	39	"	13	from bottom, for caffrorum <i>read</i> Caffrorum

THE FERNS OF NATAL.

1877.

SUB-ORDER 1.

GLEICHENIACEÆ.

Named in honor of *Baron P.F. von Gleichen* a German botanist. This Sub-order contains 2 Genera, and is very distinct in general appearance from all others. Its characteristics are-1st. The ring surrounding the capsule or spore case is more or less strictly horizontal, the spore case bursts irregularly and is not valvate, and the fissure has a vertical instead of the more usual horizontal direction.

2nd. The spore cases are sessile *i. e.* not stalked.

3rd. The sori are oligocarpous and intramarginal.

The *Gleichenias* have rigid opaque fronds and free veins; they are almost confined to the Southern Hemisphere, only two species being found North of the Equator. We have in Natal 3 Species, all belonging to the Genus *Gleichenia*, the other genus *Platyzoma* not being represented here. Of these 3 species one belongs to the group or section *Eu-Gleichenia* distinguished by its small more or less concave segments, and sori containing 3 to 5 capsules, the other two to the Section *Mertensia* or as it is now called *Mecosorus*, with elongated and plane segments, and medial, or axillary sori, containing 5 to 12 capsules.

GLEICHENIA.

Segments small, ovate, Capsules 3 5 in each sorus, *polypodioides*.

„ oblong, a pair of pinnæ at each fork ... *dichotoma*.

„ „ Rachis woolly ... *unbraculifera*.

SECTION EU-GLEICHENIA.

G. polypodioides.

(*Polypodioides* similar to or resembling *polypodium*).

Generally found growing on precipitous rocks and near waterfalls, but sometimes upon damp banks and ditches. At first sight it has not much the appearance of a fern, and is no doubt often passed over by collectors, especially when not in fruit: it grows usually in tangled masses, the youngest and greenest fronds being on the surface and underneath a quantity of decayed and decaying fronds and stipites.

The stipites are naked, wiry and repeatedly forked or branched, the pinnæ are linear, the segments small, and ovate; the sori one in each lobe near its upper margin, sunk in a cavity which is visible as a raised lump on the upper surface; the fronds are bright green on upper surface, and glaucous beneath. It is not like some of the ferns always to be found in fruit, but about December and January we have generally succeeded in getting good specimens. It is found plentifully about Inanda, Noodsberg, and throughout the midland districts.

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SECTION MERTENSIA OR MECOSORUS.

Ultimate segments oblong, much longer than in the preceding Section.

G. umbraculifera, Umbrella Fern.

(*Umbraculum*, a parasol or umbrella; *fero*, I bear).

A fern of the up-country districts, found usually near springs and at the margin of bush, it is rather a coarse looking fern, its pinnæ bend over in all directions like an umbrella, hence the name; its stipes and rachis are woolly or hairy, forked and fan-shaped; the segments narrowly linear with sori near the margin. It is found plentifully on the Great and Little Noodsberg.

G. dichotoma.

Lately found by Rev. J. Buchanan, near Umpumulo. Its fronds have much the appearance of those of *G. Polypodioides*, but are much larger, and it bears a pair of small pinnæ at every place where the branches fork; the segments are linear and elongated and bear the fruit on each side of the midrib, on the surface and not sunk in a cavity as in the first species. It is a common fern in the tropical and subtropical regions of the Southern Hemisphere and is said to yield starch, and is used in some countries as an article of food. Its stems are used by the Brazilian negroes to form tubes for their pipes.

SUB-ORDER 2.

POLYPODIACEÆ.

This suborder is distinguished by the presence of a jointed elastic ring which surrounds the capsule, and by the contraction of which the capsule is torn open at maturity. In this suborder the ring is sometimes more or less oblique, but never horizontal as in the last division. It includes by far the greater part of all known ferns, and is divided into 58 Genera, 27 of which are represented in Natal.

CYATHEA *Dregii*, common Tree Fern.

(*Kyathos*, a cup, from the form of Indusium).

In the up-country districts, from 8 or 10 miles from the sea to the Drakensberg, this fern is found in abundance, with a trunk (caudex) sometimes 15 feet high, and noble head of fronds each 4 to 10 feet long and 2 feet or more broad. Wherever it is found it gives quite a tropical aspect to the scenery. Its fronds are twice or sometimes thrice pinnate; the segments sessile and covered beneath with brown matted hairs, having the appearance of spider's web, and therefore said to be arachnoid. The sori are plentiful, placed on each side of the midrib; and the indusium is cup-shaped with an irregular margin. Our species is named in honor of Drege, a German botanist. The first plant grown in England were sent to Kew by the late Mr. J. Plant, but it is now often found in cultivation as it bears the journey well, provided it is sent at the right season, and sufficient care be taken in the packing.

HEMITELIA *Capensis*.

A splendid Tree Fern, having stem 12-14 feet high and ample tripinnate fronds of thinnish texture. The venation is simple, one vein being carried into each tooth; the receptacle is large and prominent; the sori quite close to the midrib, but what distinguishes it from all other ferns is the

peculiarity it has if bearing threadlike anomalous barren pinnæ, which are sometimes 1 foot or more long and 6 or 8 inches broad, attached to the fertile fronds near the base of the stipes, and which have often been mistaken for a species of *Trichomanes* and which were in first described as *Trichomanes incisum* by one botanist, and as *T. cormophilum* by another. In damp shady places and near streamlets in the bush, in the midland districts it grows luxuriantly, but though the caudex, attains nearly the same length, it has not the thickness or strength of that of *Cyathea*, and is often found stretched along the ground for a great part of its length, a position seldom assumed by *Cyathea*. It is a common fern in the Cape Colony, and plants of it were sent to Kew, by Mr. Chas. Zeyher, in 1845.

WOODSIA *Burgessiana*.

This genus is named in honor of Mr. Joseph Woods, an English botanist and this, our only Natal species, was discovered by Mr. Gerard, in the up-country districts, and the specific name *Burgessiana* was given by him.

The Woodsias are readily distinguished by the peculiar construction of their indusia, which have not the appearance of a cover to the sori, but are attached underneath and when they burst form an irregular fringe which is often not easily detected without a lens. Our species belongs to the section *Physematium* which has the indusium larger than the sorus and not ciliated. The following description is taken from the *Synopsis Filicum*.

'Frond 6 in. long, 2 in. wide, lanceolate, glandulose, pubescent, membranaceous, flaccid, pinnated; pinnæ sessile; from broad truncated base, oblong, pinnatifid; lobes broad, subtruncated, toothed at the apex; sori small, rather sparse, submarginal; involucre thin, membranaceous, depressed, hemispherical, sublobate (apparently from the long capsules within) opening irregularly at the apex persistent, at length breaking down into a very irregular margin.'

HYMENOPHYLLUM, FILMY FERNS.

(*hymen*, a membrane; *phyllon*, a leaf)

A genus of ferns found in the greatest luxuriance in tropical climates, but extending also to the temperate zone, one or two of the species being natives of Great Britain. They are usually small, sometimes very minute, delicate in texture, with free veins and thread-like creeping rhizomes. The sori are marginal, the spore cases being clustered round the projecting end of a vein which thus forms the receptacle, and are enclosed in little cysts or cups which are two-lipped or two-valved, and which form the indusium.

H. *Tunbridgense*. Tunbridge Filmy Fern.

A small mosslike fern with membranaceous fronds growing on rocks and stones in moist places, and, like some species of *Trichomanes* no doubt often mistaken for moss. The fruit is borne at the margin of the frond on a bristle-like receptacle, which is in fact a continuation of a vein, and is enclosed in a cup-shaped two-valved indusium. A close examination of this fern will show there it is little more than a series of winged veins bearing the fruit in their axils. It is found plentifully in the midland and upper districts of the Colony.

H. Wilsoni, which is classed as a variety of this fern, has its indusium entire; pinnæ with fewer lobes, and divided on the upper side only. It is usually found in company with *H. Tunbridgense*, and is stated in the *Synopsis Filicum* to be connected with it by every intermediate stage of gradation.

TRICHOMANES.

(*thrix*, hair; *manos*, soft, in allusion to the hair-like receptacles and delicate nature of the frond.

This genus is separated from the preceding one by the fact, that its indusium is entire or nearly so, but the two genera are often confused even by botanists.

Frond simple, pinnatifid, rhizome creeping...	<i>pusillum</i> .
„ tripinnatifid, „ „ „ „ „	<i>pyxidiferum</i> .
„ „ stipites tufted	<i>rigidum</i> .

T. pusillum.

(*pusillum*, tiny or weak).

A small and delicate fern found upon moist rocks and trunks of trees in damp shady bush; its rhizome is creeping, fronds distant, sessile or nearly so, 1 to 3 inches long by $\frac{1}{2}$ inch broad, broader at the apex than at the base, having some resemblance in its outline to an oak leaf, hence the name of the Natal variety, *quercifolium* or oak-leaved; the sori are clustered round the apex of the frond, with the tube projecting, and its mouth with two large rounded lobes, thus approaching closely to *Hymenophyllum*. It is found chiefly in the up-country districts.

T. pyxidiferum.

(*pyxis*, a box, *fero*, I bear.)

A very similar plant in appearance to *Hymenophyllum Tunbridgense*, being simply a series of winged veins bearing the fruit in the axils, and having the receptacle projecting beyond the mouth of the tube, which is broadly dilated but not two-lipped. Its fronds are stated in the *Synopsis* to be from 1 to 6 inches long, but we have never met with them more than two inches in length; and they often cover the exposed surface of the stone upon which they grow with a dense mat of fronds. It is a very suitable plant for cultivation, as under a bell-glass or in a wardian case it grows luxuriantly with a small amount of care.

T. rigidum, Stiff Bristle Fern.

This fern, which is a real gem, is found growing beside running water or in damp shady places, and near waterfalls, reaching as low as Inanda. It is the largest of the genus we have in the Colony; the frond, with the stipes, being often 12 to 15 inches long. The stipites are tufted, wiry and naked; and the frond 3 or 4 times pinnate; the ultimate segments linear, and deeply toothed at the apex; the sori are small and axillary, the receptacle often projecting considerably beyond the indusium. It is said to blacken in drying, but we have found that with care the natural color, which is a very dark green, may be preserved or nearly so, but the papers between which it is dried must be frequently changed. It is one of the best of ferns for indoor cultivation, under a bell-glass it will grow luxuriantly with little care provided water be judiciously supplied, and the inside of the glass frequently wiped out. Its fronds have very much the general appearance of those of *T. radicans* the Irish Bristle Fern.

DAVALLIA,

(In honor of *Edmund Davall*, a Swiss botanist.)

A fine genus of ferns usually with scaly creeping rhizomes, and elegantly cut fronds, which are sometimes simply pinnate or tripinnate, but more

commonly decompound, and bearing the fruit in little cysts or cups at the termination of the segments; differing from *Trichomanes* or *Hymenophyllum*, by the fact that its receptacle is punctiform and contained within the indusium, and also became of the firmer texture of the fronds. *D. Canariensis* is the fern which is cultivated in greenhouses under the name of the Hare's-foot. We have in Natal 3 species of this genus, the first of which, belongs to *Davallia* proper or *Eu-Davallia*, the second to the Section *Microlepia*, distinguished by its intramarginal sori and semi-orbicular or short, and half cup-shaped indusia; and the third to the Section *Loxoscaphe*, from the oblique and sublateral position of the sori.

Rhiz. creeping,	sori large, marginal,	... ..	<i>nitidula</i> .
" "	" small, intramarginal	... ..	<i>Speluncæ</i> .
St. tufted	" bipinnate	... ..	<i>thecifera</i> .

SECTION EU-DAVALLIA.

(*Eu*, well or good).

Indusium coriaceous, semicylindrical or half cup-shaped, attached at sides and base.

D. nitidula,

(*nitidula*, slightly smooth or shining).

One of the most elegant of our Natal ferns; it is found creeping upon rocks and trees under slight shade, but sometimes in crevices of open and dry rocks, its fronds are 3 or 4 times pinnate, and the sori are large and occupy the whole of the point of the segment. It is very similar in appearance to the Hare's-foot.

It is found in the coast bush, also at Umzinyati falls, and at Umlaas and in one or two other places, but is not common.

SECTION MICROLEPIA,

(*mikros* small, *lepis* a scale).

Indusium membranaceous, shallowly half cup-shaped, attached at sides and base.

D. spelunca,

(*spelunca*, a cave or dense thicket).

A fern we have not been fortunate enough to meet with. It has only been found we believe in two places in the Colony, near head of the Bay and at Umpumulo. St. strong, 12-18 in. long; fr. 3-6 in. lg. 12-24 in. broad, deltoid tri-or quadri-pinnatifid; lower pinnae 6-12 in. long, 3-4 in. broad, ovate lanceolate; pinnules lanceolate, cut down to the rachis, below into oblong deeply toothed lobes, texture herbaceous; rachis and under surface hairy; veins beneath neither prominent nor rigid; sori 2-20 to a segment, placed one or more together at the base of the lobes.

SECTION LOXOSCAPHE,

(*loxos*, oblique; *scaphe*, a boat).

Indusium suborbicular, or cup-shaped, attached at sides and base.

D. thecifera,

(*theca*, a sac; *fero*, I bear).

Upon old trees, from Inanda inland this fern, is found in abundance. It has much the general appearance of the Carrot fern, (*Asplenium rutaefolium*) and is in fact closely connected with the Section *Darea*, but an examina-

tion of the fruit soon shews the difference. It is pinnate or bipinnate with linear or forked segments, each segment having one vein, and one sorus near the extremity; the sori are half cup-shaped and sunk in the dilated apices of the segments.

CYSTOPTERIS,

(*kystos*, a bladder; *pteris*, a fern).

A genus of dwarf tufted ferns, distinguished by the sori being globose medial on the veins and covered with a hooded indusium, which is attached by its broad base at the back of the sorus, in the young state quite covering the capsules, but ultimately becoming reflexed and jagged at the edge.

C. fragilis, Brittle Bladder Fern.

This our only species is indetical with the English Bladder Fern. It is a small tufted fern with fronds 8 to 12 inches or more long, twice or thrice pinnate lanceolate in outline and delicate in texture; the sori are usually numerous and sometimes confluent; the indusium is best seen in the young specimens, as it is rapidly pushed aside by the growing capsules and is then very indistinct: the veins are free. It is found in the up-country districts, from Greytown to Drakensberg.

LINDSAYA.

(In honor of *Dr. Lindsay* of Jamaica, a writer on mosses and ferns.)

A genus of tropical ferns known by the peculiar character of their indusia, which are attached at their inner, and open along their outer margin the reverse of what occurs in *Pteris*, the capsules having the appearance of lying in a slit at the margin of the frond; the inner valve membranaceous, the outer formed of the edge of the frond. We have in Natal, but one species which belongs to the Section *Schizoloma*, which differs from the true *Lindsaya* only in having the veins netted instead of free.

SECTION SCHYZOLOMA,

(*schizo*, I cut; *loma*, a border or margin).

L. ensifolia.

(*ensis*, a sword; *folium*, a leaf).

A simply pinnate fern with linear or lanceolate pinnæ, all stalked, and, the barren ones slightly toothed; the sori and indusium are continuous, along the margin; and the veins copiously anastomosing. It is a coast fern, and is recognized at a glance by the peculiar indusium.

ADIANTUM.

(*adiantos*, dry, when plunged in water it comes out dry).

This genus is remarkably distinct from every other, its peculiarity consisting in the attachment of the capsules to the frond. Usually the receptacles spring from some part of the frond or segment, the capsules being attached to the receptacle and covered by the indusium, but in *Adiantum* the receptacles are placed on the under surface of the indusium itself which is then inverted over the segment, so that the fructification is said to be resupinate or upside down; a mode of fructification which occurs in no other genus of ferns. The species differ much in habit, and texture, and many of them are great favorites for cultivation. We have, but two species in Natal, but in the Transvaal there is one other, which Mr. Buchanan thinks may yet be found in the upper districts of Natal. It is simply pinnate, and not nearly so delicate in texture, as our other species, and it has its specific name, *caudatum* or tailed, from the fact that its fronds

are prolonged into a long thread-like tail. The Genus is divided into two Sections, *Eu-Adiantum*, which has free veins, and which includes both our species, and *Howardia* which has anastomosing veins.

A. Capillus-Veneris, Maidenhair.

The well known Maidenhair, a small and delicate fern with black and polished stipes and rachis; twice or thrice pinnate; the segments or leaflets differ a little in shape, but are usually wedge-shaped at the base, and rounded in general outline at upper edge, but more or less deeply lobed, the extreme point of the lobe turning completely over, and forming the indusium, the line formed by the doubling being usually slightly curved inwards; the barren segments are toothed; the venation is flabellate or fan-shaped, and forked. The plant is said to be somewhat mucilaginous, aromatic, and agreeable to the taste, and an infusion of it is sometimes used in rheumatic affections and slight catarrhs. The syrup of Capillaire, esteemed for its sweet and agreeable aroma, is made by pouring boiling syrup on the fronds. This plant is one of the ingredients used by the natives in preparing the decoction with which they are sprinkled as a preparation for war. Amongst the varieties of this fern, (or perhaps of *A. tenerum* which is a larger plant), produced in England by cultivation, is *A. Farleyense*, said to be one of most beautiful of ferns.

A. Æthiopicum,

The chief difference between this species and the last, appears to be that the leaflets or segments are much smaller and rounder, not so deeply lobed, and the line formed by the bending over of the indusium is quite crescent-shaped; the stipes and rachis are dark chestnut brown. The whole plant is very fragile, the leaflets constantly falling off, even when thoroughly dry, and in the herbarium. It is a native of the upper districts only.

LONCHITIS,

(*lonche*, a lance, from the shape of the pinnæ).

A genus differing from *Pteris* on account of its sori being nearly confined to the sinuses, or hollows of the edge of the frond, instead of being continued along the whole margin of the segments, and also on account of its anastomosing venation.

L. pubescens,

(*pubescens*, downy).

A fine fern, 4 or 5 feet high, with ample fronds densely covered with short soft hairs; the lower pinnæ are large, and similar to the terminal one, in which the pinnules are, at the base, quite separate from each other, and shortly stalked, but about half-way up they become joined to the rachis and to each other, and end in a lobed or pinnatifid apex, the pinnules being again divided into blunt rounded lobes; the sori are placed in the rounded hollows at each side of the segments or pinnules, and are covered by a semilunar indusium formed from the revolute edge of the frond: The primary veins are free, but the venules and veinlets are compoundly anastomosing, and form irregular hexagonal spaces without any free veinlets. It is found near streams in the bush, in the coast and midland districts, and differs so much in the cutting of the frond, that some botanists have been inclined to consider the extreme varieties as different species.

HYPOLEPIS,

(hypo under, lepis a scale).

A genus nearly related to the next in order, *Cheilanthes*, and not easy to distinguish technically from it. It differs in habit and aspect, and also in the position of the sori, which are placed in the sinuses of the frond; and also by the usually creeping character of the rhizome. The Genus contains only 11 species, 10 of which belong to the Section *Eu-Hypolepis*, the remaining one forming the Section *Aspidotis*; our two species are included in the first Section.

Rhizome creeping, stems smooth, *anthriscifolia*.
St. tufted hairy, zigzag, *Bergiana*.

H. anthriscifolia,

(anthriscus, an umbelliferous plant, folium a leaf).

This plant has at first sight much the appearance of the common brake, and is no doubt often mistaken for it. It grows in ravines and under slight shade, and often reaches 8 ft. or more in height, its rhizome is creeping, sending up fronds at intervals, which are tri-or quadri-pinnate; the ultimate segments small, oblong, and deeply toothed, with sori in the lower sinuses; the texture of the frond is very thin, and its under surface slightly hairy. It is a good fern for cultivation, and grows with little attention, but in transplanting care must be taken to preserve the growing point of the rhizome, and this applies to all ferns with creeping rhizome. It is found in the midland districts from Inanda to Maritzburg.

H. Bergiana.

Very different in appearance from the last, the stipes and rachises are densely hairy, the rachis zig-zag, strong, wiry; the frond quadripinnate; the segments oblong; the whole under surface of the frond more or less hairy; the sori are small, and placed in the sides of the segments, generally very copious. It is found in the drier parts of bush from the coast to Maritzburg or a little beyond. This plant and *H. californica* differ from all others of the genus by not having a creeping rhizome, and it should therefore in our opinion be included with *H. californica* in the Section *Aspidotis*.

CHEILANTHES, LIP FERNS.

(cheilos, a lip, anthos, a flower).

A genus not far removed technically from the last, and having also considerable affinity with *Nothochlana*. The distinguishing character of the genus consists in its producing small, punctiform sori at the ends of the veins, and therefore close to the margin of the frond, the margin being reflexed or bent over the capsules, and thus forming the indusium, which is generally roundish and distinct, but sometimes confluent. The genus contains upwards of 50 species, and is divided into 4 Sections, *Eu-Cheilanthes* and *Adiantopsis*, to which our species belong, and *Physopteris* and *Aleuritopteris* which are not represented in Natal. We have three species, two of which are common, while the third *C. Capensis*, though common in the Cape Colony is here more rare, being in fact confined to one locality, and we have not yet met with it. Mr. Buchanan mentions another species, *C. pteroides* which appears to have been collected by Gueinzins only, we therefore take the description of it and *C. Capensis* from the *Synopsis Filicum*.

Frond hairy *hirta*
" naked; stipes tufted, *multifida*.
" " indusium ciliated, *Capense*.

SECTION EU-CHEILANTHES.

Indusia confluent.

C. hirta.

A very elegant tufted fern, differing much both in size and general appearance according to the situation in which it is found. In favorable situations, we have found the fronds 2 ft. or more long, including the stipes. It is tripinnate, with oblong segments; and the whole plant is densely hairy. In fine specimens the sori, becoming confluent, appear almost continuous round the whole margin of the segment. It is common throughout the Colony.

C. multifida,

(*multus* many, *fissus* cleft).

Totally destitute of the hairs with which the last species is so plentifully clothed, it is easily distinguished from it. The stipes is long, equalling or exceeding the length of the frond, which is usually triangular in general outline, and tripinnate; the stipes, rachis and sometimes the costæ are brown and polished; and the sori are round, distinct, sometimes, but not often confluent. It is found in crevices of bush-clad rocks, and throughout the summer good specimens may be got, but as the dry season approaches the fronds wither, and the plant appears as if dead, but when the spring rains fall it soon puts forth new fronds and grows vigorously.—Since writing the above we have received from Rev. J Buchanan, a specimen of a fern gathered near Newcastle, which he believes to be *C. induta*. It differs from *C. multifida*, apparently only by having a creeping rhizome.

SECTION ADIANTOPSIS.

(*Adiantum*, maiden-hair fern; *opsis* appearance).

Indusia distinct.

C. pteroides.

St. 6-12 in. long, strong, erect, polished, dark chestnut brown, naked; fr. 12-18 in. long 6-9 in. broad, deltoid, tripinnate, upper part simply pinnate, lower with several opposite pairs of wiry, erecto-patent branches, growing gradually larger downwards, the lowest often again branched; segment $\frac{1}{2}$ - $\frac{3}{4}$ in. long, $\frac{1}{4}$ - $\frac{3}{8}$ broad, oblong, entire, bluntly rounded at both ends, sessile; texture subcoriaceous; rachis polished, naked, both surfaces naked; sori small, roundish, distinct but contiguous.

C. Capensis.

St. tufted, erect, 4-6 in. long, naked, dark chestnut brown; frond 4-6 in. long, 3-4 in. broad, ovate, deltoid, tripinnatifid; lower pinnæ much larger than the others, ovate, bluntish, $1\frac{1}{4}$ in. long, $\frac{1}{2}$ in. broad, cut down below to a narrowly winged rachis into oblong, blunt, nearly entire segments 3 to 4 lines long, 2 lines broad; texture herbaceous, rachis polished, chestnut brown; under surface naked, bright green; sori small, placed all round the edge of the segments; involucre ciliated.

PELLÆA,

(*pellos*, dark coloured, in allusion to the dusky color of the fronds).

A genus nearly related to *Pteris* from which it has been separated on account of the difference in their receptacles. In *Pteris* the receptacle is continuous, and connects the veins round the margin of the frond, while in *Pellæa* it is terminal on the veins, each one being distinct from its neighbour, but generally running together and forming a more or less broad band round the margin of the frond. The genus contains upwards

of forty species, which are divided into 4 Sections, each of which is represented in Natal. The first species belongs to the Section *Cheiloplecton*, distinguished by herbaceous texture, conspicuous venation and broad indusium; the next three belong to the Section *Allosorus* distinguished by coriaceous texture, hidden veins, and broad conspicuous indusium, the next two belong to the Section *Platyloma*, with coriaceous texture; usually, but not always hidden venation, and indusium so narrow that it is soon pushed aside and hidden by the growing capsules; and the last to *Holcochlæna* which differs only from *Platyloma*, by its netted veins.

Main rachis winged throughout	...	...	...	...	...	<i>geraniifolia</i> .
Fertile fronds contracted, once pinnate	...	...	...	...	...	<i>pectiniformis</i> .
Indusium intramarginal	...	...	...	...	...	<i>consobrina</i> .
„ marginal, veins conspicuous	...	...	...	...	...	<i>hastata</i> .
„ „ stipes woolly, veins indistinct	...	...	...	...	...	<i>Bojeri</i> .
Frond slaty green; texture thick	„	„	...	...	...	<i>calomelanos</i> .
Veins anastomosing	...	...	...	...	...	<i>Burkeana</i> .

SECTION CHEILOPLECTON,
(*cheilos*, a lip, *plecton*, folded).

Texture, herbaceous, indusium broad.

P. geraniifolia.

A rather remarkable looking fern, found in dry parts of bush from the Coast inland to Maritzburg; in general outline the shape of the frond is like the leaf of a geranium, hence the name; it usually has 3 or 4 pinnæ on each side, the lowest pair much the largest, and again branched; the pinnules on its lower side larger than the others, and again cut like the others into oblong segments; the main rachis is generally winged throughout, sometimes with small segments on each side between the pinnæ; stipes, rachis, and costæ, black and shining; sori broadish and generally confluent. It is a common tropical fern, and is also found in the United States of America.

P. pectiniformis, Comb Fern.

(*pecten*, a comb).

A stiff hard looking fern with tufted stipes which are sealy below, and with numerous (20 to 30) pairs of linear pinnæ on each side, spreading from the main rachis at almost right angles, and when fertile much contracted and appearing almost round. the rachis with whitish, or brown hairs, or scales; the sori are confluent, and clearly within the margin. It is found in dry rocky places, generally exposed to the full blaze of the sun, and is not by any means common: the finest specimens we have yet seen are about 9 or 10 inches long, and were gathered on the face of exposed rocks overhanging the Umhloti. It was, we believe, first found in Natal by Mr. Hill of Verulam.

P. consobrina.

(*consobrina*, a cousin).

A coarse looking fern, found only in the upper districts, and reaching to Noodsberg. The stipes and rachis are dark shining brown. It is 3 or sometimes 4 times pinnate, and the frond is triangular in general outline with the lower pinnæ the largest and again branched, the pinnules on the lower side larger than the others, ultimate segments small, and linear oblong, and the indusium is fastened well within the margin, by which peculiarity it may be readily distinguished from *P. hastata*, some of the forms of which it closely resembles.

P. Bojeri,(In honor of *Bojer* a botanist of Mauritius).

A fern the true position of which appears to be still undecided ; it has been for some time considered a variety of either *P. consobrina* or *P. hastata*. Some time since Mr. Buchanan called our attention to the fact that there were two very similar species often growing together, one with densely hairy stipes, thick, and sometimes decurrent segments, and indistinct or hidden venation; the other with smooth naked stipes and thinner segments in which the venation is clearly visible. The former is evidently *P. Bojeri*, and the latter a small variety of *P. hastata*. The *Synopsis Filicum*, under the head *P. consobrina*, says "*P. Bojeri* appears to be a slender form "with a slightly fibrillose rachis." Our present experience would lead us to regard it as a distinct species, and Mr. Buchanan writes from Newcastle, "I am more than ever convinced that *P. Bojeri* is a distinct species. I find it abundant all along the road, and usually in company with "*P. hastata* but not always." If to be regarded as a variety, it must, we think, be considered as one of *P. hastata* and not of *P. consobrina*.

SECTION PLATYLOMA,

(*platys*, broad ; *loma*, a fringe or border, in allusion to the broad line of capsules surrounding the segment).

P. hastata.(*hasta*, a halbert).

This is one of the most common and widely distributed ferns we have; from the Coast to Drakensberg, in the open fields exposed to the fierce rays of the sun, and in the densest parts of the bush it is found in abundance, and it varies very considerably according to the situation in which it is found. We have observed three varieties of it growing in a garden for the last three years or more, which still remain as distinct as when first planted. The stipes, rachis and costæ are black and shining, the frond varies from simply pinnate and oblong to bi- or tri-pinnate and triangular in outline ; veins forked, and plainly visible on both sides of the segments : which are ovate, or lanceolate, sessile or stalked, and often cordate or hastate ; Sori broad, soon hiding the indusium which is quite marginal, and best seen in the immature specimens.

P. colomelanos.

Like the last species, this is a very common fern, and found from a few miles from the sea to the interior of the continent. It grows between and amongst stones, and usually exposed to the full blaze of the sun. Its stipes is black, wiry, and naked ; its fronds are triangular in general outline, and bi- to tri-pinnate ; the segments stalked, varying much in shape, and so thick that the venation is altogether hidden ; color a light slaty green ; sori in a continuous marginal line, soon pushing back and hiding the narrow indusium.

SECTION HOLCOCHLÆNA,

(*chlænā*, a cloak.)*P. Burkeana*.

Veins netted.

(named in honor of *Mr. Burke*, who found it at Noodsberg).

This fern, though not rare, is not nearly so common as the other Natal species of the genus. It is found in crevices of rocks under slight shade, its stipes and rachis is naked, flexible, and shining ; the fronds are oblong and simply pinnate, some of the lower pairs of pinnæ are usually again branched, but it differs much in this respect ; we have seen a plant in which more than half the pinnæ were compound, but this is not common ; the segments are linear, lanceolate ; the sori quite continuous, broad and soon hiding the indusium.

PTERIS,

(pteryx, a wing or feather).

A widely distributed genus, containing nearly 100 species, which are divided into 6 Sections, 4 of which are represented in Natal. The genus is recognised, 1st, by its linear and marginal fruit, 2nd, by its marginal indusium of the same form, and 3rd, by its continuous receptacle which joins the veins round the margin of the frond. The Section *Eu-Pteris* has free veins. The Section *Campypteris* is distinguished by having the lowermost pairs of veins united so as to form a series of areolæ or spaces near the costa. The Section *Litobrochia* has compoundly anastomosing venation, without any free veinlets, best seen near apex of pinnae, in this respect agreeing with *Lonchitis*, but differing from it by having continuous marginal sori. The Section *Pæsia* is known by its double indusium, thus approaching closely to *Lindsaya*. The Sections *Doryopteris* and *Amphiblestra* are not represented in Natal. The genus is represented in both tropical and temperate regions, though most plentiful in the former.

Simply pinnate, pinnae numerous	...	...	...	...	<i>longifolia</i>
" " 2 to 6 pairs	...	...	...	...	<i>cretica</i> .
Bi- to tri-pinnate, fertile segments entire or nearly so					<i>quadriaurita</i> .
" " "				toothed at apex	<i>flabellata</i> .
" " "				indusium large	<i>tremula</i> .
Quadripinnate, coriaceous	...	...	...	...	<i>aquilina</i> .
Rhizome creeping, barren segments serrate					<i>Buchanani</i> .
" " " " entire					<i>incisa</i> .

SECTION EU-PTERIS.

(Eu, good).

Veins free, fronds tufted, indusium single.

P. longifolia.

A fern which has a wide range of distribution, being common both in the Tropics and North Temperate Zone; it is very hardy and easy to cultivate, and is found growing and flourishing in situations where most ferns would wither and die. In his Revised List lately published Mr. Buchanan says, that "it grows very fine in the fumes of a hot sulphurous" "spring at Iuhlimbiti, "Smith says that" on an island in the Bay of "Naples, it is found luxuriating within the influence of the hot vapours" "rising out of cavities left by extinct volcanoes, growing in soft muddy" "soil at a temperature ranging from 140° to 160°, he also says that it" "has been found "under iron gratings" where it could receive little" "light, and where the temperature is often near the freezing point, and in" "the dry air of the cactus house, it has produced fronds, from 2 to 3 feet" "long." ! It is simply pinnate, with 20 to 30 pairs of short stalked, pinnae, which are linear, entire, pointed at the apex, cordate at the base and 4 to 6 inches long; the veins are forked and plainly visible on both sides, sori broad and continuous. It is found in several places in the Colony, but is not common, the only places where we have gathered it are near Verulam, and at Umlaas.

P. cretica.

A fern found in the up-country districts, usually in dry places. It is simply pinnate, and has usually 2-6 opposite, sessile, pairs of pinnae, the upper one sometimes a little decurrent or running down the stalk, the barren ones much the broadest, and conspicuously toothed; the lower pair

sometimes again divided, veins simple or forked and plainly visible: sori narrow and continuous. There is a variety in the Tropics called *lbo-lineata*, which has a white stripe down the centre of each pinna, and which is common in cultivation.

P. quadriaurita.

A fine fern from 3 to 5 feet high, found beside streams all over the Colony; it is bipinnate, with the lowest pair of pinnæ again compound, having one or two smaller pinnules branching from them on the lower side, hence the name; the segments are linear-oblong, and are not divided quite down to the rachis; all rounded at the end except the terminal ones which are elongated and terminate in a fine point: the sori are narrow and continuous, but do not usually meet, either at the base or apex of the segments; the veins are conspicuous and forked.

P. flabellata.

St. 1 ft. or more long, strong, erect, naked, glossy, straw-coloured; frond 1-3 feet long, 1 ft. or more broad; terminal pinna 6-12 in. long, 2-3 in. broad, made up of numerous, almost contiguous, erecto-patent linear lobes 1-2 in. long, 2-3 lines broad, which reach down nearly to the rachis, and are finely serrated when barren; pinnæ several on each side, similar to the terminal one; the lowest with 1-3 similar small pinnules from the base on the lower side: texture herbaceous, rachis and both surfaces naked; veins $\frac{1}{8}$ in. apart at the base, usually once forked; sori narrow, continuing along nearly the whole length of the segments. It is best distinguished from *P. quadriaurita*, by its more herbaceous texture, and also by the tips of the fertile segments, being always more or less toothed.

P. tremula.

A common fern in New Zealand. A dried specimen was found in the herbarium of Mr. Rawson, at Cape Town, but the locality where gathered was unknown, we first found it in a ravine near the coast. The stipes is naked, 6-8 inches long; frond 12 to 18 inches long, bipinnate, with the larger pinnæ again pinnate or bipinnate, and ending in an attenuated pinnatifid apex; ultimate segments linear, oblong, rounded at the point, decurrent at the base; sori and indusium continuous along the sides of the segments, and sometimes nearly meeting at the point: veins fine and conspicuous, forked.

SECTION PÆSIA.

P. aquilina, Brake or bracken.

Common brake, known to every one, and growing in profusion all over the Colony, it is the most common fern in England. Culpepper says of it "it is the plant that in Sussex is called Brakes, the seed of which some authors hold to be so rare; such a thing there is I know, and may be easily had upon midsummer eve, and for ought I know 2 or 3 days after it, if not more." He also says—"This fern being burned the smoke thereof driveth away serpents, gnats and other noisome creatures, which in fenny countries do in the night time, trouble and molest people lying in their beds with their faces uncovered." It is the badge of the Robertsons.

SECTION CANPTERIA.

P. Buchananii.

A fine large fern growing 6 to 8 feet high, first found by Rev. J. Buchanan at Intshanga. Its rhizome is creeping and subterranean; stipes naked and

straw-coloured, frond tripartite *i.e.* each of the lower pair of pinnæ are equal in size to the whole of the frond above it; the ultimate segments are linear, oblong, sometimes pinnatifid, and serrated where barren; decurrent at the base, pointed and toothed at the apex, the terminal ones alternate; sori copious along the sides of segments; lowermost veins, only, anastomosing, remainder forked and free.

Found by Rev. J. Buchanan, at Intshanga, and in the Zulu Country, and by Mr. W. Todd, near Biggarsberg.

SECTION LITOBROCHIA.

(*lithos*, a stone; *brocha*, spots, areolæ like pavement).

P. incisa,

(*incisus*, a natural indentation).

This fern, like the last, has a subterranean creeping rhizome, its fronds are often 4 to 6 feet long, and bi- or tri-pinnate; the stipes and rachis straw-coloured and naked; the uppermost pinnæ, simply pinnate, with linear oblong pinnules; the lower ones pinnate at the base, pinnatifid towards the centre, and ending in a linear entire apex, the lowest often large and compound; sori continuous, often reaching the point of the segments; veins and venules more or less anastomosing.

It is found in shady places under bush, Krantzklouf, through Inanda to Noodsberg.

L. OMARIA,

(*loma*, a border, in allusion to the indusium).

A genus containing about 40 species, which are almost confined to the Southern Hemisphere. They are known 1st. by their free veins, 2nd: by their fronds which are of two kinds, the fertile ones being much contracted. 3rd. by their linear continuous sori, on a broadish receptacle occupying nearly the whole, under surface of the contracted fertile fronds, 4th. by their nearly marginal indusium, which opens along its inner side. The genus is divided into two Sections, our species all belonging to the Section *Eu-Lomaria*, the other Section, *Plagiogyria* not being represented in Natal.

Pinnæ of barren frond not distinctly separated from each other

Caudex upright *discolor.*

Rhiz. horizontal *attenuata.*

Central pinnæ of barren frond distinctly separate from each other

Pinnæ cordate or auricled, reduced gradually *punctulata.*

„ pointed at apex, veins conspicuous *procera.*

„ rounded „ „ indistinct... .. *Boryana.*

L. discolor.

“Caud. stout; st. 3-6 in. long, black, glossy, densely clothed at the base with long dark scales, frond 1-3 ft. long, barren one 4-6 in. broad, narrowed gradually at the base; pinnæ numerous, spreading, contiguous, linear, 2-3 in. long, $\frac{3}{8}$ in. broad, cut down very nearly to the rachis, narrowed suddenly towards the point, margin wavy; texture coriaceous; veins prominent, close, subparallel: fertile pinnæ narrower and shorter, rachis naked, usually reddish black in the fertile frond.” It is very similar to *L. attenuata*, but usually larger, the fronds forming an elegant crown, red brown below, the pinnules narrower. The *Synopsis Filicum*, from which the above description is taken, states, that the “pinnules of the fertile frond are often leafy at the base,” and we have frequently found this in *L. procera*. It is found at Nottingham and Drakensberg.

L. attenuata.

This, the most common species of the genus we have, is found both in bush and near springs, all over the Colony. The fronds are 3 ft. or more long, in shape a long oval, attenuated at both ends; pinnate, with numerous pinnæ which are 3-4 in. long, and spread from the main rachis at nearly right angles, sessile, dilated at the base, apex ending in a fine point; pinnæ becoming gradually smaller towards apex of frond, and at the base dwindling down to mere rounded auricles, veins forked and plainly visible; fertile pinnæ numerous and very narrow.

L. punctulata.

A species found on rocks in the bush and under shade, all over the Colony. Its stipes is 3 to 6 in. long, frond oblong lanceolate; texture, coriaceous; pinnæ very numerous, oblong, sessile, imbricated, rounded at the point, auricled at the base, and dwindling downwards to small auricles, the lower pinnæ reflexed, fertile pinnæ not usually so numerous, contracted, but slightly dilated at the base; veins once or twice forked; indusium sometimes intramarginal, and therefore Blechnoid, and often difficult to distinguish from *Blechnum* itself.

Scolopendrium Krebsii,

(*Skolopendra*, a centipede, from the appearance of the fructification;
Krebsii, in honor of *Krebs*, a German botanist).

A peculiar variety of the last species, in which the fruit is produced in short diagonal lines at the back of the frond, while the frond is scarcely if at all contracted, the sori are double, and open face to face, as in the English *S. vulgare*, an examination of some of the immature fronds will shew that while the whole of the sori near the base of the frond are at an acute angle with the rachis, at the apex they became almost parallel with it, and are single, and not double as at the base, different forms are found, at last completely merging in the true *punctulata*. The pinnæ are usually more distant than in the last species, and are often crenate or wavy at the edge, and the veins are conspicuously clavate at the apex; the sori are often so copious as to completely cover the whole under-surface of the pinnæ; a bipinnate, or bipinnatifid form is sometimes met with. It is found plentifully on rocks and near streams from Inanda to Patullo's.

L. procera,

(*procerus*, tall).

A rather coarse plant of the Midland districts, growing in open or shady places, and near streamlets. Its caudex is stout, woody, and covered with large scales; stipes scaly: barren frond ovate, 1-3 ft. long; pinnæ linear, the base rounded, sometimes cordate, or auricled, the point acute, sometimes slightly toothed: veins conspicuous, fine, parallel, forked; rachis and midrib scaly: fertile fronds ovate; pinnæ linear, distant, indusium broad, ciliated, sometimes slightly intramarginal.

L. Boryana.

(In honor of *Bory de St. Vincent*, a French botanist).

A plant very similar in general appearance to the last, and not always quite easy to distinguish from it, though it is obviously a different species. In the present species

- 1st. The pinnæ are more numerous in both barren and fertile fronds.
- 2nd. Those of the barren fronds are narrower and more spreading.
- 3rd. They are thicker in texture, so that the veins are not so plainly visible.

- 4th. The rachises and midribs are not so scaly, and are sometimes quite naked and straw-colored. Found plentifully in the Midland district, in open ground, and near springs and streams.

BLECHNUM,

(*Blechnon*, a fern).

This genus differs from the last, only by having its sori and indusium within the margin, but as the fertile fronds are often more or less contracted as in *Lomaria*, and as *L. punctulata* often has its indusium intra-marginal, it is sometimes difficult to distinguish between the two, and the same plant is referred to both genera by different authors, both our species being by some writers referred to *Lomaria*.

Sori continuous *australe*.

„ broken into dots at base of pinnæ *Atherstoni*.

B. Atherstoni.

A singular, coarse looking fern, found at the margin of bush in the Midland districts, it has generally been considered to be a variety of *Lomaria punctulata*, but has lately been again separated under the present name, by which it was known in 1856, when discovered in the Cape Colony by Dr. Atherstone. The rhizome is sometimes creeping, stipes and rachis naked and straw-colored: it is simply pinnate, with numerous narrow pairs of sessile, linear, lanceolate, acuminate pinnæ, cordate or auricled at the base, and the margin slightly wavy; terminal pinna similar to the lateral ones. The sori are close to the midrib, in the centre of the pinna they are quite continuous, but at the base and sometimes at the apex also, they are broken up into a series of opposite, oblong sori, at first quite distinct from each other, and oblique to the midrib, but joining, becoming wavy at the edge, and at length quite confluent and parallel to the midrib. The indusium is broad and conspicuous; the veins forked, clavate and plainly visible, especially on the under side of the frond.

Blechnum australe.

This is our form of the English *Blechnum*, or Hard fern, so called from the texture of its fronds, in comparison with other English ferns. Its stipes is naked and straw-colored, frond 9 to 18 inches long, lanceolate with numerous pairs of oblong, or lanceolate pinnæ, which are cordate or hastate at the base, rounded at the apex, but sometimes terminating in a short and fine point. The fertile fronds are considerably contracted, but not so much so as to appear round as in *Lomaria*, and both barren and fertile fronds dwindle down at the base into auricles: veins plainly visible and forked. This species and *B. hastatum*, an American plant, are the only two of the genus which have a clear space between the sori and the midrib. It is found in dry rocky or shady places from Inanda, inland.

ASPLENIUM,

(*splen*, the spleen from its supposed medicinal properties).

This large genus contains according to the *Synopsis Filicum*, 280 species, to which no doubt others have since been added. It is divided into 7 sections and is known by its linear or linear-oblong sori, which are sometimes curved, and which lie along the veins at the back of the frond, covered by an indusium of the same form: in the Natal species the veins are all free. The greater number of our species belong to the Section *Eu-Asplenium*, some of the remainder to the Section *Athyrium*, distinguished by its sori being

more or less crescent shaped, especially those nearest to the primary veins; the rest to the Section *Darea* distinguished by narrowly linear ultimate segments with usually but one sori to each. The *Asplenium* are well represented in Natal: they are generally tufted, low growing ferns, and they differ in size from *A. Kraussii*, the smallest, to *A. anisophyllum*, which in favourable situations is found 3 or 4 feet high. On and about Noodsberg they are very plentiful, a many species being found within a very limited area.

SECTION EU-ASPENIUM.

A, *once pinnate.*

a, *rachis, brown, polished, veins indistinct.*

Sori numerous, base of pinnae truncate	<i>Trichomanes.</i>
" " " " hastate or cordate... ..	<i>ebeneum.</i>
" few, 1 or 2 to a pinna	<i>monanthemum.</i>

b, *Rachis, brown, polished, veins conspicuous.*

Pinnæ 30 to 40 pairs, acuminate, sharply toothed	<i>harpeodes.</i>
" " " rounded, crenate	<i>lunulatum.</i>
" 15 to 25 " broad, unequally toothed	<i>brachyotus.</i>
" " deeply lobed, lobes toothed... ..	<i>protensum.</i>
Rhizome creeping, sori close to midrib... ..	<i>serra.</i>

c, *Rachis, green or grey.*

Pinnæ oblong lanceolate, conspicuously toothed	<i>anisophyllum.</i>
" ovate, acuminate, entire or nearly so	<i>gemmiferum.</i>
" " " finely serrate, lowest pinnae small, rounded	<i>Prionitis.</i>

d, *small, moss-like plants.*

Upper edge of pinnae, sharply toothed	<i>Kraussii.</i>
" " bluntly lobed	<i>Sandersoni.</i>

B, *Bi- to tri-pinnate.*

Bipinnate, membranaceous	<i>gracile.</i>
Sori in centre of segments, st. and rachis brown	<i>Adiantum-nigrum,</i>
" " " " greenish	<i>varians.</i>
" flabellate, rachis naked	<i>cuneatum.</i>
" " " fibrillose	<i>fureatum.</i>

SECTION DAREA.

Pinnate, segments more numerous on upper side of pinnae	<i>brachypteron.</i>
" " equal on each side or nearly so	<i>Thunbergii.</i>
Bipinnate	<i>rutæfolium.</i>

SECTION ATHYRIUM.

Rhiz. creeping	<i>Schimperi.</i>
St. tufted, pinnules stalked	<i>aspidioides.</i>
" " " decurrent	<i>Filix-femina.</i>

A. *Kraussii.*

A small mosslike plant growing in masses in damp shady places, and about the roots of old trees. It is pinnate, with 10 to 20 pairs of sessile pinnae; which are ovate, and sharply toothed on the outer edge, but the upper and lower ones are entire. Veins flabellate, one being carried into each tooth; sori 1-3, pinnae oblique; indusium opening towards the centre of the pinna. It is a native of the upper districts.

A. Sandersoni.

(In honor of Mr. John Sanderson, of Durban).

A small tufted fern growing on stones and trees in damp shady ravines, in company with mosses and allied plants. The frond with stipes is 6 to 9 inches long, with 12-20 small pinnæ on each side which are crenate on the upper side, the inner side nearly parallel with the rachis, but slightly curved, the lower side also curved and entire, the pinnæ appearing as though nearly the whole of the lower side had been cut away; sori copious, 2 to 6 to a pinna; indusium conspicuously fringed at its free edge; often *gemmiferous*: found in one ravine at Inanda, also at Noodsberg, but rare.

A. Trichomanes.

Maidenhair spleenwort.

St. densely tufted 1-4 in. long, naked, glossy, chestnut brown, polished; frond 6 to 12 in. long, $\frac{1}{2}$ in. or rather more, broad, with 15-30 pairs of sessile horizontal pinnæ which are $\frac{1}{4}$ -- $\frac{3}{8}$ in. broad, $1\frac{1}{2}$ --2 lines deep, the edge slightly crenate, the two sides unequal, the upper one the broadest, and narrowed suddenly at the base; texture subcoriaceous; veins pinnate, inconspicuous, rachis polished like the stem; sori linear-oblong 3-6 on each side of the midrib: Indusium opening towards the midrib. A fern of the up-country districts, common in England, but in Natal rather rare: it is found we believe near Mooi River only.

A. monanthemum,

(monos, one; anthos, flower).

A common up-country fern; stipites tufted, naked, brown; frond linear lanceolate, with numerous (20 to 40) pinnæ on each side, which are oblong, toothed on the upper and outer edges, entire and curved on the lower and inner ones, the sori which are usually 1 or 2 to a pinna, are parallel with, and close to the outer edge of the pinna, indusium opening on the upper edge, veins unequally pinnate sometimes forked. Found plentifully from Maritzburg to the Drakensberg. This fern was imported into and grown in England in 1790.

A. ebenum.

An up-country fern and rather rare. The stipites are tufted, black or brown, and naked; frond lanceolate, with numerous sessile pinnæ on each side, which are ovate, crenate or wavy at the edge, and hastate or cordate at the base; Sori 10-12 or more to each pinna, lying obliquely on each side of the midrib, veins indistinct.

A. lunulatum, A. harpeodes, and A. brachyotus.

These three ferns have been until lately considered as varieties of the same plant, but Rev. J. Buchanan in his Revised List has considered them as distinct species. They are all simply pinnate, fronds from 6-18 in. long, with numerous pinnæ on each side, the stipes nearly or quite naked, but not polished, the chief difference appears to be in the shape of the pinnæ. Those of *A. lunulatum* are oblong, broad at the base, rounded at the point, and crenate or *coarsely toothed* along the upper side, and the outer half of the under side, while the other half is entire and slightly curved, the inner side being also entire, and almost parallel with the rachis; the veins are indistinct and the frond sometimes *gemmiferous*; sori nearer to midrib than the edge. In *A. harpeodes* the pinnæ are very narrow, and subfalcate; the point is acute, and they are *sharply toothed* throughout, except the inner and upright side, and a small portion of the lower one near the base, which is entire and only slightly curved; they are also slightly decurrent

especially at the upper and lower parts of the fronds; and the veins are plainly visible, one being carried into each tooth; sori close to midrib. In *A. brachyotus* the pinnæ are not nearly so numerous, but considerably larger, rounded at point, and bluntly toothed along the upper and half the lower outer edge, while the other half is entire, and very much curved, especially in the lower pinnæ. Veins more distinct than in *A. lunulatum*; sori equidistant from midrib and edge. In all three species the pinnæ are horizontal in the central portion of the frond, deflexed in the lower portion and the points slightly raised in the upper portion sori sometimes 10 to 15 to a pinnæ oblique.

A. gracile.

A fern which is considered at Kew, to be another variety of *A. lunulatum*, but which appears to be so very different, looking to our species alone, as fairly to entitle it to rank as a species, though puzzling intermediate forms are sometimes met with. Its fronds are 12 to 18 inches long, bipinnate stipes and rachis naked, dull; it has 10 to 25 pairs of stalked lanceolate pinnæ; ultimate segments, wedge shaped, bluntly toothed or crenate at the outer edge, the other two straight and entire; texture thinly herbaceous; veins dichotomously forked; sori 2 to 4 to a pinnule. Found in bush in moist places all over the upper districts.

A. Prionitis.

A common fern in coast bush, the stipites are tufted, and it is simply pinnate with 8 to 12 stalked pinnæ on each side; which are ovate, acuto or acuminate at the apex, and at the base truncate in a curve; sharply toothed all round except in the the curves at each side at the base; sori usually copious, often unequal in length, the short ones alternating with longer ones which reach nearly to the edge of the pinnæ; veins forked, one fork carried into each tooth and reaching quite to the edge; texture herbaceous but differing a little in this respect according to the situation in which it has been grown.

A. anisophyllum.

(*anisos*, unequal; *phyllum*, leaf).

Found in bush under rocky krantzies, and beside streams, from Inanda to beyond Maritzburg; it is one of the largest of its genus, and varies considerably in the shape and size of its fronds it is sometimes gemmiferous but not commonly so, and in some of its forms the contrast between the deep green of its fronds, and the creamy color of its indusium gives it a very attractive appearance. It is simply pinnate with 10-16 oblong, lanceolate pinnæ on each side, which are very unequal in shape, the upper side narrowed suddenly at the base, the lower more gradually; the sori are linear or elliptical and do not reach more than half way to the edge of the pinnæ. The shape of the pinnæ at once distinguishes it from either *A. Prionitis* or *A. gemmiferum*, the only others for which it could be mistaken.

A. gemmiferum.

(*gemma*, a bud; *fero*, I bear).

Differs from *A. Prionitis* in shape of the pinnæ, which in this species are rounded and generally not so sharply toothed: it is more herbaceous in its character and the sori are more equal in length and the veins terminate a little short of the edge of the pinnæ, and have their apices thickened or clubshaped, it is frequently gemmiferous at the apex, which is seldom if ever the case with *A. Prionitis*, it has also a wider range of growth, being found in the upper districts, and as low as Inanda. There is a variety found in

the Seven Mile Bush, Upper Umkomaas, which has its pinnæ divided so much as to be almost or quite bipinnate: we have not met with it though we believe it has also been seen at Inanda; it has been thought to be only a variety, and is called *A. flexuosum*.

A. serra.

A splendid and rare fern, found so far as yet known only in one place in the Colony, a bushy krantz under the point of Gt. Noodsberg, it is also found in Brazil and Fernando Po. It is simply pinnate with 12 to 20 stalked pinnæ on each side, which are attenuated to a fine point which is sharply toothed; lower down the pinnæ become divided nearly halfway down to the rachis, the upper ends of the lobes being sharply toothed, the texture is more or less coriaceous, and the sori are in two parallel rows, close to the midrib, and generally confluent, its rhizome is creeping and subterranean.—Since the above description was written we have found this fern in two ravines on the Little Noodsberg, and also under a krantz near Inanda.

A. protensum.

In appearance much like one of the varieties of a *A. lunulatum*, but much larger. Its stipes and rachis are hairy; its frond is lanceolate having 20 or 30 pairs of stalked pinnæ, which are nearly at right angles from the rachis, lanceolate in outline, and deeply pinnatifid, with the lobes, again deeply toothed at the outer edge, the lobe nearest the rachis much the largest, its inner edge parallel with, and close to the rachis and slightly curved; sori copious, sometimes confluent and usually confined to the undivided part of the pinnæ, indusium opening towards the midrib. It is often *gemmiferous*.

A. Adiantum-nigrum, Black maidenhair spleenwort.

A common English fern, found here in the midland and upper districts, in rocky places and under slight shade. In England in favorable situations it often attains a height of 3 feet or more, but here the specimens we have seen have not been nearly so large. Its stipes are tufted, nearly naked, chestnut brown; the frond is deltoid with numerous pinnæ on each side, the upper ones pinnatifid, the lower ones triangular or ovate, attenuate at the apex, and the lower pair the largest; the pinnæ are again pinnate, the pinnules lobed and sharply toothed; the sori are borne on the venules close to their junction with the midrib, and are therefore close to the centre of each pinnule or lobe: they are at first distinct, but rapidly become confluent, often covering the whole under surface of the pinnules, pushing back and completely hiding the indusium.

A. cuneatum,

(*cuneus*, a wedge, in allusion to shape of segments).

A very common fern in bush from the coast inland, its fronds are tufted and borne upon a naked stipes; the frond with its stipes varies from 1 to 2 feet in length; it has numerous pinnæ on each side and ends in a pinnate acuminate apex; the lower pinnæ are much the largest, and are again pinnate with the lower pinnule divided down to the rachis into quite distinct wedge-shaped segments, which are entire on the two sides, but sharply and unequally toothed on their broad outer edge; the veins are fine and conspicuous, some of them forked, and they diverge in a fan shaped manner from the base of the segment to its apex, and as the sori are medial on the veins, they have therefore a more or less fan-like appearance especially in the large segments: the sori open irregularly, sometimes facing inwards and sometimes outwards, but usually towards the centre of the segments in which they are placed.

A. furcatum.

St. tufted, 4-8 in. long, firm, erect, clothed with deciduous woolly hairs; frond 6-18 in. long, 4-6 in broad, with 12-20 pinnæ on each side, which are lanceolate, deltoid in general outline, 2-3 in. long $\frac{3}{4}$ -1 in. broad, cut down throughout nearly or quite to the rachis into linear cuneate pinnules, which are sharply serrated on the outer edge; texture coriaceous; rachis firm, erect, more or less fibrillose like the stem; veins deep channelled; sori linear, radiant. It is found plentifully in the upper districts and is best distinguished from *A. cuneatum* by its fibrillose rachis, and longer and narrower division. The variety *tripinnatum* which is found about Noodsberg, was once thought to be *A. laserpitiifolium* it is found always on the ground or on stones, and never we believe upon trees.

A. varians.

A small tufted growing fern found under damp rocks and on trees in the upper and midland districts, the fronds are not usually more than 6 to 8 inches long, and are borne upon a naked stipes; they have 8 to 12 pinnæ on each side, which are again divided into wedge shaped segments, which are *very sharpened toothed* at the outer edge; one vein is carried into each tooth; The sori are copious and often confluent, covering whole under surface of pinnules; indusium opening at inner margin.

SECTION DAREA.

A. brachypterum.

(*brachys*, short; *pteron*, a wing).

A small tufted fern of the midland districts found in very damp shady ravines, on rocks and trees: its fronds are sometimes 1 foot or more long, and are borne on a naked stipes with usually a few brown scales at the base; and have 12 to 25 pinnæ on each side, the largest of which are near the middle of the frond, towards the base they are rather smaller while the apex ends in a pinnatifid point; the pinnæ are again divided into linear or forked segments which are more numerous on the upper side; the sori are plentiful, but not more than one to each segment. It is often gemmiferous.

A. rutæfolium,

(*Ruta*, rue; *folium*, a leaf).

Generally called in Natal the Carrot Fern: it is found in bush all over the Colony, and is a fine tufted fern, with fronds sometimes 2 feet or more long, which are borne on a naked green stipes, it has 12 to 20 pinnæ on each side, the lowest of which are deltoid, and the upper ones lanceolate, the largest pinnate with lanceolate pinnules which are again divided into narrow linear segments, the pinnules nearest the main rachis on the upper side are the largest, erect and parallel, forming an upright row of pinnules on each side of the rachis, which are very conspicuous in fine specimens, the lowest pinnules on the under side are wanting; sori not more than one in each segment, oblique and nearly marginal, opening along the outer edge. In very fine specimens the segments are usually so narrow as to give the frond the appearance of a series of winged veins bearing fruit near the extremity,

A. Thunbergii.

(In honor of *Thunberg*, a Swedish botanist).

A Fern as yet found only in Natal, it grows in similar localities, and often or perhaps generally in company, with *A. brachypterum* which it somewhat resembles; it is a tufted fern with naked stipes, and 12 to 25 spreading pinnæ on each side, which are ovate or lanceolate in general

outline, and again divided into linear pinnules which are lobed at the outer edge, those nearest the rachis much the largest and again pinnatifid, the pinnæ in the centre of the frond are the largest, the frond ending at the apex in a pinnatifid point, and the pinnæ at the base being usually less than half the size of those in the centre of the frond; the sori are linear and near the margin, and the indusium opens along the outer edge. It is generally *gemmiferous*.

SECTION ATHYRIUM,

(*athyros*, opened, indusium like an open door).

A. *Felix-fœmina*, Lady Fern.

Stipes tufted, 6—12 in. long, firm, erect, straw-colored or brownish, scaly below; frond 1—3 feet long, 6—12 inches broad, oblong lanceolate with numerous pinnæ, the lower ones spreading, lanceolate, 3-6 inches lg., 1—1½ in. broad, cut down to a compressed winged rachis into lanceolate or ovate rhomboidal pinnules, which are again deeply ineiso-pinnatifid; texture thinly herbaceous; rachis naked, slender; veins pinnate in the lobes; sori linear oblong, the lower ones often curved.

This Fern has just been found by Rev. J. Buehanan in a small ravine on the very top of the Drakensberg, he says of it that it is "very like *A. Schimperi* but cut somewhat more finely, without any pink tint in its rachis, and with a perfectly upright rhizome."

A. *Schimperi*.

This Fern is in the *Synopsis Filicum* classed as a variety of *A. Felix-fœmina*, it has a creeping rhizome, firmer texture, and when fresh the stipes and rachis are delicately tinted with pink, and with care in the drying this color may be in a great measure preserved. It is found in the upper districts of the Colony, and also in Abyssinia. Judging from the specimens we have seen it appears sufficiently distinct from *A. Felix-fœmina* to be considered a separate species, but as we have not seen it growing, we speak with diffidence.

A. *aspidioides*.

This is one of the most elegant of our Natal ferns, its fronds sometimes attain a length of 3 feet or more; they are succulent, and delicate in texture, the stipes is naked, the frond ovate or triangular in outline, and 3 times pinnate, the pinnæ are lanceolate, and like the frond itself end in an attenuated pinnatifid point, the pinnules are numerous, lanceolate, and again divided nearly to the rachis into oblong or ovate segments, which are sharply toothed at the upper and outer edge, texture thinly herbaceous; the sori are small but plentiful, the lower ones generally curved; rachis straw-like, when dry; color of frond dark-green; veins conspicuous, pinnate, forked, and one carried into each tooth: it is found in very wet shady places from Inanda, inland.

DIDYMOCHLÆNA,

(*didymos*, double; *chlæna*, a cloak or covering, the indusium being apparently double).

A genus distinguished, by its free veins, and oblong sori covered with an indusium, which is attached longitudinally along its centre to an elevated receptacle, and is free all round the edge.

L. *lunulata*.

A fine subarborescent fern, it has an erect caudex, with bipinnate fronds; the pinnules which are jointed to the rachis, are oblong in general outline,

entire or very slightly toothed; the veins radiate from the base of the pinnule, and are repeatedly forked, and free; the sori are oblong borne upon an oblong receptacle, and covered with an indusium which is horse-shoe shaped, attached by the centre, and free round the edge; the pinnules are said to be dimidiate, that is the lower half is almost or quite wanting, and in consequence of their being articulated to the rachis, they are very liable to fall off in drying unless care be taken, and the papers frequently changed. It is found in the midland districts from Inanda inland.

ASPIDIUM,

(*aspidos*, a shield or buckler, in allusion to the form of indusium).

This genus formerly included all those ferns with dot-like fruit, covered with a roundish indusium, but it has been of late years considerably subdivided, and it now contains only those species whose sori are round and dorsal, and whose indusium is round, entire and attached by the centre. We have in Natal 5 species, 4 belonging to the Section *Polystichum*, with free veins, the other to the Section *Cyrtomium*, with veins pinnately forked, the lower anterior venules being free, and the rest angularly and irregularly anastomosing. The genus contains nearly 60 species, divided into 4 sections; the Sections *Cyclodium* and *Eu-Aspidium* not being represented in Natal.

Veins anastomosing	<i>falcatum</i> .
Rhizome creeping	<i>pungens</i> .
Lobes without prickles, coriaceous, sori large	<i>Capense</i> .
Bipinnate, stipes tufted, teeth sharp	<i>aculeatum</i> .
Tri- or quadri-pinnate " " scales black	<i>luctuosum</i> .
	<i>aristatum</i> .

SECTION POLYSTICHUM,

(*Polys*, many; *stichos*, order; in allusion to the regular lines of sori, but not specially applicable to the section, as at present defined).

Veins free.

A. *aculeatum*, Prickly Shield Fern.

(*aculeus*, a prickle).

A strong growing fern found only in the up-country districts. Its stipes are tufted, 6—12 inches long, more or less clothed with *pale-brown* scales; frond 1 to 2 ft. long, 8 to 12 inches broad, ovate lanceolate, lower pinnæ close, lanceolate, 4 to 6 in. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad; pinnules ovate, rhomboidal, unequal sided, auricled at the upper side, at the base; teeth sharp; texture subcoriaceous; rachis straw-colored, more or less scaly; under surface slightly fibrillose; sori principally in 2 rows nearer the midrib than the edge. It is a common English plant, and is generally known as the Prickly Shield Fern. We have a variety which has been called, *luctuosum*, also found in the upper districts, whose rachis in the specimen which we have, is densely clothed with large *dark-colored* almost black scales, hence we suppose the name, which signifies "mournful."

A. *pungens*.

(*pungo*, to prick).

Very similar in general appearance to the last, but larger, and at once known by its creeping subterranean rhizome. Its stipes is 1 ft. or more long, sometimes channelled in the upper side, and with the rachis more or less scaly; the lower pinnæ the largest, with numerous stalked pinnules, on each side, which are oblong ovate and sometimes pinnatifid, and eared at

the base, and with a few light-brown scales near point of junction to the rachis; teeth awned; sori small, rather irregular, but nearer the midrib than the edge. It is common in bush, from Inanda to Drakensberg.

A. Capense.

A strong coriaceous fern with stout, scaly rhizome; sometimes found upon trees, but more generally on the ground; the stipes is 1 to 2 ft. long, greyish, and densely scaly below; the frond is 1 to 3 ft. long, twice pinnate; the lower pinnæ the largest; the pinnules pinnatifid or lobed; the segments, lanceolate, lobed but not awned like the two preceeding species; rachis and both surfaces naked; secondary rachis margined; veins pinnate, but owing to the thick texture of the frond, not easily seen; the sori are in two rows, one on each side of the midrib; the indusium is large and round. It is found in bush from Inanda inland.

A. aristatum,

(*arista*, the point of an ear of corn).

This is a fern which we have not yet met with, and its habitat is not given either by Mr. McKen or Rev. J. Buchanan, but we believe it has been found near the Intshanga, and also on the Noodsberg and perhaps elsewhere in the Colony. It has a creeping rhizome; with stipes 12 to 18 inches long, clothed especially below with linear scales; the frond is 1 to 2 feet long, ovate-deltoid, 3 or 4 times pinnate; lower pinnæ the largest, subdeltoid; lowest pinnules much the largest, lanceolate-deltoid, 2 to 4 inches long with subdeltoid lower segments; teeth copious, awned; texture subcoriaceous, glossy, naked; sori small; indusium, sometimes reniform, thus approaching to *Nephrodium*.

SECTION CYRTOMIUM,

(derivation uncertain).

Venules and veinlets anastomosing.

A. falcatum,

falx, a sickle.

A rather coarse-looking plant found in the upper districts and near Maritzburg. Its stipes are tufted, 6 to 12 in. long, and densely covered with large, dark colored scales; it is once pinnate, the pinnæ are stalked, ovate, rounded at the base, wavy at the edge, and ending in a long acute point, which is often bent upwards, or falcate; the sori are numerous, large, and scattered irregularly, sometimes quite covering the lower side of the pinnæ; upper side, glossy, naked.

NEPHRODIUM,

(From *nephros*, a kidney, in allusion to the shape of the indusium).

This genus was formerly included with *Aspidium*, but has been separated from it by modern botanists, and is distinguished by its round sori, which are covered with kidney-shaped indusia. We have in Natal 9 species, the first 7 of which belong to the Section *Lastrea*, which has free veins, and the remaining two to *Eu-Nephrodium* with anastomosing veins; the other two Sections *Pleocnemis* and *Sagenia* not being represented in Natal. The genus contains nearly or quite 230 species, distributed all over the world where ferns are found.

SECTION LASTREA.

Rhiz. creeping, edge of fertile frond reflexed	...	<i>thelypteris.</i>
" " " " flat; scented	...	<i>albo-punctatum</i>
Stipes tufted, indusium bristly	... ..	<i>Bergianum.</i>

Stipes tufted, segments serrated and spiny	...	<i>inæquale.</i>
" " pinnæ imbricated,	}	<i>athamantium.</i>
" " not spiny		
" Frond soft with woolly hairs	... ..	<i>catopteron.</i>

SECTION EU-NEPHRODIUM.

Lowest pinnæ as large as the others	... ..	<i>unitum.</i>
" " smallest; soft, hairy...	... ..	<i>molle.</i>

SECTION LASTREA,

(In honor of *Chevalier de Lastre*, a French nobleman).

Veins free.

N. albo-punctatum.

A rather delicate fern with wide creeping rhizome, which is covered with brown fibrillose scales. The frond is oblong-lanceolate, once pinnate, with lanceolate pinnæ, which are again divided nearly but not quite to the rachis into blunt oblong segments; the lower pinnæ smaller than those in the centre of the frond; rachis and both surfaces fibrillose: sori on each side of the midrib, and chiefly confined to the upper portion of the frond; It is strongly scented, the fine odour being very perceptible when the fronds are drying, and even in the bush, its presence may be often detected by its perfume, before the plant itself is visible, especially in autumn when the fronds are withering. It is found at Inanda, and in one or two other places in the Colony, but it is rather rare.

N. Bergianum.

A strong growing plant common from the coast to beyond Maritzburg. Its stipes is 6 to 12 in. long naked or nearly so; frond 1 to 2 feet long, simply pinnate, with linear lanceolate pinnæ, not stalked, ending in a fine point, and cut nearly to the rachis into entire oblong lobes, which are almost falcate; sori small, medial; indusium covered with bristles, and soon falling off; rachis and both surfaces more or less bristly. This plant and *N. molle* are very similar in general appearance, and are often confused with each other.

N. thelypteris,

(*thelys*, a woman; *pterus*, a fern).

Identical with the English "Marsh Buckler Fern," found in marshy places, and on the coast at least, usually in company with *N. unitum*. It has a slender and widely creeping subterranean rhizome, with naked slender stipes, 1 foot or more long; it is simply pinnate, with 10 to 25 linear lanceolate pinnæ on each side, which are divided nearly to the rachis into close entire lobes, those of the barren frond the broadest; the veins are forked, each fork bearing a sorus; sori often confluent; indusium small and soon falling off; edge of segments of fertile frond recurved.

N. athamantium.

'Inkomokomo' of the natives; used by them as a vermifuge. It is found in most parts of the Colony from Inanda inland, almost always in open ground and generally in ant-bear holes, but sometimes at margin of the bush amongst rocks. Stipes stout, covered at the base with linear deciduous scales; The fronds are sometimes 2 feet long, oblong-lanceolate, tripinnate; pinnæ, especially the upper ones imbricated; the pinnules cut down nearly quite to the rachis into blunt lobes, which are entire or nearly so; texture subcoriaceous; color pale green; both surfaces naked; sori close midrib; indusium large, persistent.

N. inaequale.

A common fern all over the Colony from close to the sea to far inland: some of its forms are not easily distinguished from *N. athamanticum*, the chief difference appears to be that its pinnæ are imbricated, and the segments are serrated and spiny. The sori are large, near the midrib, and the indusium is large and persistent.

N. Buchananii,

(In honor of *Rev. J. Buchanan*, late of Durban).

Fronds tufted; stipes densely scaly at the base; scales large, lanceolate, dark brown; rachis hairy; bipinnate; lower pinnæ largest; pinnules lanceolate, cut down to the rachis into oblong rounded segments; edge entire; veins pinnate in the lobes; sori close to the midrib; indusium small. Mr. Buchanan says of this fern that it is, while growing covered with long hairs, strikingly transparent in the sunlight, but quickly disappearing in the process of drying. We have not met with this plant, and have seen but one dried specimen, and from it this description is taken. It is found at Nottingham, Zwartkop and Karkloof.

N. catopteron,

(*kata*, beneath; *pteron*, a wing).

This is by far the largest plant of the family we have in Natal, its fronds with stipes often attaining a length of 6 or 7 feet or even more. It is bipinnate, with oblong lanceolate pinnæ, the lower ones much the largest, with the pinnules on the lower side compound; the segments are oblong, and pinnatifid; the whole frond woolly and soft to the touch, the sori are copious, about half-way between the midrib and the margin; indusium persistent. It is found in shady places and near streams from Inanda inland.

EU-NEPHRODIUM.

In our species, the lower veinlets of each contiguous segment joining together, and forming at their junction a sterile veinlet, which runs in the direction of the margin of the pinna, and terminates between the two segments; sometimes there is but one series of anastomosing veinlets, sometimes more.

N. unitum.

A coarse, coriaceous fern with black, creeping, scaly, subterranean rhizome; stipes naked; frond pinnate; pinnæ stalked, cut down about halfway to the rachis into numerous close, entire, triangular lobes; lower pinnæ as large as the others; veins pinnate; sori copious, in two regular rows, one on each side of the midrib, near to, and following the outline of the margin of the lobes; indusium small, soon falling off. Common in marshes on the coast. In the "Ferns of Natal" by the late Mr. McKen. this species and the next are said to have their capsules naked, *i.e.* without bristles or hairs, some species of the genus found in other countries having their capsules setose or bristly.

N. molle,

(*mollis*, soft.)

A tufted fern with fronds 3 feet or more long. The stipes is slender pinnæ numerous, lanceolate, ending in an acute point, and cut halfway down to the midrib into blunt lobes, the lower pinnæ shorter than the others; sori numerous, distinct from each other, but sometimes almost covering the under surface of the lobes; indusium large, persistent. Found on the coast and in the midland districts, and often confused with *N. Bergianum*, which fern it very closely resembles.

NEPHROLEPIS,

(*nephros*, a kidney ; *lepis*, a scale).

A genus of ferns separated from *Nephrodium* by the fact, that the sori are borne on the apex of the upper branch of a vein, generally near the edge; the pinnæ are articulated to the rachis, and soon fall off in drying. Some of the species produce from their crowns, long slender roots which at intervals form other crowns, and sometimes tubers. It is a small genus, containing only about 7 species, of which we have but one in Natal.

N. acuta.

Our only species is a tropical fern, found in a bush swamp near the head of the Bay of Natal, and sparingly in one or two other places, like all its genus it is simply pinnate, its fronds are 1—2 feet or more long; the pinnæ are lanceolate, and attenuated to an acute point, the edges are more or less wavy or crenate; the sori are in two rows near edges of the pinnæ. The indusium is reniform and persistent, and the veins are free.

OLEANDRA.

A genus of tropical ferns not far removed from *Lastrea*, but differing from that genus both in habit and appearance, the species are not numerous, 6 only being described in the *Synopsis Filicum*, 1 of which is found in Natal: all the species have free veins, a creeping rhizome and simple articulated fronds, which are in shape like the leaf of *Oleander*, hence we suppose the name of the genus.

O. articulata,

(*articulus*, a joint).

A climbing fern found in the midland districts upon rocks, generally in shady places, but sometimes exposed to the full blaze of the sun, but in that case the fronds are usually small, the rhizome is densely scaly, and the stipes is articulated, with generally a slight swelling at the joint; the sori are large and in two regular rows; and the indusium is reniform; veins forked and free, distinctly visible on both sides of the frond. In transplanting care must be taken to procure the growing point of the rhizome or it will not be likely to succeed.

POLYPODIUM,

(*polys*, many ; *pous*, foot).

A large genus of ferns which has by modern botanists been considerably subdivided: it is known by its round and naked sori, the differences in the venation serving to mark the different sections. Our Natal species are all comprised in 6 sections, viz:— 1st. *Phegopteris*, with free veins and fronds which are not jointed to the rachis. 2nd. *Eu-Polypodium*, with free veins and articulated fronds. 3rd. *Goniopteris*, with the venation of *Eu-Nephrodium* i. e. the whole or only the lower pairs of veinlets, meet angularly, and form, from their point of junction, sterile veinlets which run in the direction of the margin of the segment, the areole thus formed, not containing any free veinlets. 4th. *Goniophlebium*, with veins forked or pinnate from a central costa, the lower anterior branches being usually free, and fertile at the apex; the rest angularly anastomosing, and producing from their angles free veinlets which are often fertile, the marginal veinlets, being free; sometimes there is but one series of anastomosing veinlets sometimes more: the free veinlets in the basal areolæ distinguish this section from all others. 5th. *Nipholobolus*, distinguished by the ultimate spaces or areolæ formed by the anastomosing venules containing free, divaricate

veinlets, and also by the fronds being covered with a thick felt of whitish hairs. 6th. *Phymatodes*, with compoundly anastomosing veins and free divaricate veinlets, but differing from the last section by its fronds not being covered with stellate hairs. The Sections *Cyrtomiphlebium*, *Dictyopteris*, *Grammitis*, *Phlebodium*, *Campyloneurum* and *Drynaria* are not represented in Natal. The genus contains nearly 400 species, very widely distributed and differing considerably both in habit and venation. Some of the American *polypodies* are said to possess powerful medicinal properties and are used as antirheumatics, febrifuges, &c. In old times the English *polypodius* were also supposed to be valuable as medicines, Culpepper in the "English Physician," says, in describing the *Polypody* that "it is of "a sad green colour and smooth on the upper side, but on the other "side somewhat rough by reason of some yellowish spots set thereon. "That which groweth upon the oak is accounted the best, and why, I "pray, must *Polypodium* of the oak only be used, gentle College of Physicians? Can you give me but the glimpse of a reason for it? Is it only "because it is dearest? Will you never leave your covetousness till your "lives leave you? The truth is, that which groweth upon the ground is "best ('tis an herb of Saturn, and he seldom climbs trees) to purge "melancholy; if the humour be otherwise, choose you *Polypodium* "accordingly."

Veins free,

Pinnate or pinnatifid, naked...	...	...	...	...	...	<i>vulgare.</i>
" " " densely sealy	...	...	...	...	...	<i>incanum.</i>

Veins simply joining,

Sori small, marginal	...	...	...	...	...	<i>obtusilobum.</i>
" " medial, frond often branching	...	...	...	...	...	<i>proliferum.</i>
" close to main veins, gemmiferous	...	...	...	...	...	<i>unitum.</i>

Veins irregularly anastomosing.

Frond simple, densely woolly	...	...	...	...	...	<i>Africanum.</i>
" " with small scattered scales	...	...	...	...	...	<i>lanceolatum.</i>
" " oblong lanceolate, naked	...	...	...	...	...	<i>Schraderi.</i>
" oval, small, rhizome densely sealy	...	...	...	...	...	<i>lycopodioides.</i>
" oblong. sori large, irregular, but in two rows	...	...	...	...	...	<i>normale.</i>
" strap-shaped, sori small, scattered	...	...	...	...	...	<i>irioides.</i>
" pinnatifid, scented	...	...	...	...	...	<i>phymatodes.</i>

SECTION PHEGOPTERIS,

Veins free, stems not jointed.

P. obtusilobum.

A native of the upper and midland districts reaching as low as Inanda. Its stipites are tufted, fronds from 1 to 2 feet long, with numerous pinnæ on each side, which are divided nearly down to the rachis, into oblong entire lobes rounded at the apex, the pinnæ terminating like the frond in an acute pinnatifid point; veins pinnate, conspicuous; sori small and near margin of segments; rachis and both surfaces more or less hairy. This fern has been considered to be a variety of *Nephrodium conterminum*, but at present stands under the present name as explained by Mr. Buchanan in his Revised List.

SECTION GONIOPTERIS.

(*gonium*, an angle; *pteris*, a fern).

Venules joining, and without any free veinlets.

P. proliferum,

(*proles*, offspring; *fero*, I bear).

A coarse-looking fern having much the appearance of *Nephrodium unitum*, growing in similar places, and often in company with it: it is sometimes erect, and sometimes decumbent and rooting at the point, and is easily recognized by its habit of sending out long branches, which take their rise from an angle between the main rachis and one of the pinnæ, no other Natal *Polypodium* having this peculiarity. The sori are small, oval, medial, sometimes confluent; venation conspicuous, venules anastomosing nearly to the edge of the pinnæ. Found near Umgeni brick fields, and in one or two other places, but not common.

P. unitum.

A tall coarse-growing plant found only in S. Africa, and Mascarene Islands. The fronds are sometimes 4 feet long and are pinnate; the pinnæ lanceolate and bluntly lobed; apex acuminate; sori small and close to the main veins; venules anastomosing as in *P. proliferum*. It is easily recognized by its gemmiferous habit, producing buds near the apex of frond, and sometimes bearing 6 or 8 small fronds while still upon the parent plant. It abounds in shady ravines from Inanda inland.

SECTION EU-POLYPODIUM,

Free veins and articulated fronds.

P. vulgare

Common Polypody, a fern found only in one or two places up-country, and identical with the English *Polypody*: its rhizome is creeping and scaly; stipes straw-like; frond lanceolate in outline, either divided quite down to the rachis and therefore pinnate, or the pinnæ are joined together at the base, and in that case said to be pinnatifid; the pinnæ are oblong, rounded at the apex, entire or very slightly toothed at the edge, the mid-vein of each pinna is tortuous, and produces from each side forked venules, which terminate a little short of the edge of the segment in club-shaped apices; the sori are confined to the upper portion of the frond, large, sometimes covering the under surface of the pinnæ, but not confluent.

SECTION GONIOPHLEBIUM,

(*gonium*, an angle; *phlebs*, a vein).

Venules anastomosing; with free veinlets in the basal areolæ.

P. incanum.

A small fern with slender, scaly, creeping rhizome; the fronds which are 2—4 inches long, are cut down to the rachis into oblong, blunt pinnæ, which are at nearly right angles to the rachis, dilated at the base, the under side densely scaly; texture coriaceous; veins in all the specimens which we have examined forked and free, but in consequence of the texture of the frond, not to be seen without preparation, by scraping and maceration; sori small, uniserial, usually confined to the upper part of the frond. It is found on trees and is common in the upper and Midland districts. The *Synopsis Filicum* says of the venation of this fern "Veins united or frequently free." We have not seen or heard of any specimen being found in Natal having anastomosing veins, but our plant appears to be so identical both in habit and appearance, with specimens from other parts of the world having united veins, that it does not seem to be safely separable, and it therefore remain under present Section, although it has the venation of *Phegopteris*.

SECTION NIPHOBOLUS,

(*nippos*, of snow; *bolus*, a pill), under surface of fronds covered with white or grey stellate hairs.

P. Africanum.

This fern, our only representative of the Section, is found growing on perpendicular rocks, and on trees, in a few places on the Coast, but it is not common. The rhizome is creeping and thickly covered with large ovate scales; the fronds are simple, ovate, or oblong lanceolate, from 6 to 12 in. long, with a very short stipes, narrowed gradually to both ends; the upper surface naked, dark green, the lower thickly covered with white or greyish stellate hairs; veins not easily seen; sori round, irregularly spread over the under surface of the apex of the frond, and just visible through the tomentum; texture thick, coriaceous.

SECTION PHYMATODES,

(*Phymata*, tubercles, the sori in the typical species having the appearance of tubercles, when looked at from the upper surface).

P. Schraderi,

(In honor of *Schrader* a German botanist).

This fern has a scaly, creeping rhizome, with simple lanceolate fronds, the edges entire, and the fructification confined to the apex of the frond; the sori are large, quite round, and when fresh of a bright orange colour; the veins are hidden in the substance of the frond; but the thickened apices of the free veinlets may be seen with the aid of a small lens, by holding the frond between the eye and a strong light; both surfaces quite naked. It is found on shady rocks and upon trees all over the Colony.

P. lanceolatum.

In general appearance this fern is very similar to the last, but it is easily distinguished by the fact of its being thickly covered, especially the under side; with small roundish scales, which are dark brown in the centre, and thinner and lighter colored near the edge; the sori also are much darker in color, large, and often reaching nearly to the edge. It is found climbing trees and on rocks in shady places from Inanda to Drakensberg, and varies considerably both in size and texture; a pinnate variety has been gathered in the upper districts.

P. lycopodioides.

Rhizome widely creeping, and thickly covered with dark brown scales; the fronds are distant, simple, under 6 inches long, narrowed to both ends, both sides naked; texture coriaceous; the round sori are contained within the largest areolæ formed by the veins, and appear as two regular lines one on each side of the midrib and reaching from the apex to the base of the frond. It is found climbing rocks and trees from the Coast as far inland as Inanda.

P. Mackenii is merely a variety.

P. normale.

A rather rare fern, with creeping rhizome, and simple, entire, oblong, fronds 1 to 2 feet long, 1 to 2 inches broad; the compoundly anastomosing venation is plainly visible on holding the frond between the eye and a strong light, and the club-shaped termination of the veinlets is then a marked feature. The sori are large, and in an irregular row near the midrib. It is a native of the upper districts.

P. irioides.

Named most likely on account of the similarity of the fronds to the leaf of the *Iris*. A large fern with simple elongated fronds, sometimes 3 feet long, and 1 to 3 inches broad, narrowed to both ends, the edges entire; both sides quite naked. The venation is plainly visible on both surfaces of the frond, the main veins, which reach the edge of the frond are connected by large cross venules, interspersed with numerous free veinlets. The sori are very small and copious, scattered irregularly, and chiefly confined to the upper portion of the frond. On account of its peculiar venation, Smith places this fern in a Section alone. It is found on shady rocks and trees, and also on the ground, and is confined to the Coast districts, barely appearing at Inanda.

P. phymatodes.

This the typical species of the Section is found only near the coast, though we once found a solitary plant in a ravine at Inanda. It has a very woody, creeping rhizome, with a few dark brown scales, small specimens have sometimes simple fronds, but the more mature ones are usually cut into oblong acuminate segments; both sides naked. The sori which are sometimes oblong, are sunk in the substance of the frond, and are rather irregularly scattered. During the process of drying this fern gives out an odour something like the scent used by the Kafirs and called by them "Amaka." It is used in the South Sea Islands for scenting Cocoa-nut oil.

NOTHOCHLÆNA,

(*nothos*, spurious; *chlæna*, a covering, in allusion to the very imperfect indusium).

A genus of ferns of which we have in Natal, 3 species; it is closely related to *Polypodium*, but differs on account of its small sori, which have but few capsules and which finally run together in lines near the margin, which is partially reflexed, it has also some affinity with *Cheilanthes*, but the indusium present in that genus is wanting in *Nothochlæna*. It is a small genus containing only about 30 species which are divided into 2 Sections, *Eu-Nothochlæna*, to which our species belong, and *Cincinalis* which is not represented in Natal.

Frond deltoid	...	...	...	...	...	...	...	<i>Buchanani</i> .
Stipes naked, pinnæ distant	...	...	...	...	...	...	...	<i>inæqualis</i> .
„ densely scaly, pinnæ close	...	...	...	...	...	...	...	<i>Eckloniana</i> .

N. inæqualis.

A very rare fern, found only in Natal, Transvaal and Angola; in Natal it has been found only in two or three places, and then but sparingly. The stipites are tufted 3—6 in. long, with a cluster of fibrillose bright brown scales at the base, the main rachis nearly naked; the frond lanceolate 4—6 in. long; thrice pinnate; texture thick; the whole frond densely covered on both surfaces with woolly hairs which in young specimens are a creamy white on the lower surface, but as the frond matures they become a dark brown, each color may be preserved with care in drying; veins free; sori plainly to be seen near the edge of the frond. It is found in fissures of dry precipitous rocks, and in Natal always with a Northern aspect.

N. Eckloniana,

(*Ecklon*, a German botanist).

Not so rare as the last species, and very similar to it in general appear.

ance, but larger, the stipes more densely scaly, but the tuft of scales at the base of the stipes so conspicuous in *N. inæqualis*, is wanting in this species; the upper surface of the frond is nearly free from hairs, the segments are smaller and more numerous. It is found in open rocky places, generally exposed to the full blaze of the sun, is easily transplanted and does well in the garden or fernery.

N. Buchanani.

(Named after the discoverer *Rev. J. Buchanan*, late of Durban).

Stipes, rachis, and both surfaces of the frond more or less covered with whitish or light brown silky hairs, with a small tuft of scales at the base of the stipes. The outline of the frond is triangular, the apex pinnatifid, and below it 2 to 4 pairs of distant pinnæ which are again once or twice divided; color of the frond a much lighter green than the other two species. It is found on damp rocks under shade, and always with a Southerly aspect. It is one of the two species stated in Mr. Buchanan's list to be confined to Natal, the other being *Asplenium Thunbergii*. It is found at Inanda, Noodsberg and Umpumulo, but is not common.

GYMNOGRAMME,

(*Gymnos*, naked; *gramma*, a line).

A genus which contains about 80 to 90 species, and is divided into 7 sections, it is distinguished by its sori, which follow the course of the veins, and are simple or forked and naked, *i. e.* without an indusium. We have in Natal 4 species, each belonging to a different section, the Sections *Syngramme*, *Digrammaria* and *Stagnogramme* are not represented in Natal.

Veins free

Frond not covered with powder, Veins pinnate, herbaceous *Totta*.

" " " " " flabellate, coriaceous *cordata*.
 " covered with white powder *argentea*.
 " " golden " *aurea*.

Veins copiously anastomosing,

Frond simple *lanceolata*.

SECTION LEPTOGRAMME,

(*Leptos*, slender; *gramma*, a line).

Veins free, fronds without any waxy powder, differing from *Phegopteris* only by its elongated sori.

G. *Totta*.

An elegant bipinnate fern with fronds 2 to 3 feet long, the rhizome is creeping but not widely so, the frond oblong with numerous lanceolate pinnæ, which are divided nearly halfway to the rachis into rounded, blunt, entire lobes: lower pinnæ smaller than the central ones, and usually deflexed; both surfaces covered with short hairs; rachis and costæ conspicuously so; sori linear-oblong, medial. Found near streamlets in upland bush; but not reaching the coast.

SECTION EU-GYMNOGRAMME.

Veins free, usually forked.

G. *cordata*

A small fern, pinnate or bipinnatifid with tufted stipes 1—2 in. long, glossy, ebeneous, more or less scaly; frond 3—6 in. long, 1½—2 in. broad, ovate-lanceolate; pinnæ oblong, with a broad centre and sub-orbicular deeply

toothed lobes; texture subcoriaceous, veins flabellate, upper surface naked, lower densely coated with ovate ferruginous scales; sori linear, ultimately sub-confluent. It is found on rocks and in bush throughout the Midland and upper districts.

SECTION CEROPTERIS,

(*keros*, wax; *pterus*, a fern).

Differs from *Eu-Gymnogramme* only by the under surface of the fronds being covered with waxy powder.

G. argenta,

Silver Fern,

A very beautiful plant, at once known by the white waxy powder with which the under surface of its fronds is so plentifully covered, it is a tufted fern with a slender chestnut brown stipes; the frond is triangular in general outline and 3 times pinnate, with the ultimate segments, again deeply lobed, the lower pinnæ are the largest, the upper part of the frond tapering into a long pinnatifid apex; the large pinnæ are usually distant and the whole frond very delicate in texture, the waxy powder is white or sometimes tinged with red; the sori pale brown; veins free. It is found in crevices of rocks in the Midland districts, and is one of those ferns which are very difficult to transplant. There is another variety or perhaps species, with yellow powder which has been called *G. aurea* or Gold fern it is more rare than the Silver fern, being found we believe only on the Little Noodsberg, though a single plant of it was once found by Mr. S. Hill and Mr. McKen near the Mission Station at Indwedwe, but we have not succeeded in finding it in that locality.

SECTION SELLIQUEA.

(In memory of *M. Sellique*, a French Physician).

Veins copiously anastomosing and differing from *Phymatodes* only by its elongated sori.

G. lanceolata,

A plant with wide-creeping rhizome and simple lanceolate fronds, which are 6—12 inches long; both sides naked; veins hidden; sori oblong, oblique, not reaching the edge of the frond. It has much the appearance of *Polypodium lanceolatum* or of *P. Schraderei*, but is easily distinguished from either by the shape of sori. It is confined to the upper and Midland districts.

VITTARIA.

(*vitta*, a ribbon; from the shape of the fronds).

A small genus of tropical ferns, distinguished by having the sori in marginal or slightly intramarginal furrows, and without a distinct indusium. The genus contains only about 10 species, and is divided into two Sections, *Eu-Vittaria*, with sori sunk in a two lipped marginal groove, and *Tæniopsis* to which our only species belongs.

SECTION TÆNIOPSIS,

(*tuina*, a filler; *opsis*, resemblance).

Fructification dorsal, edge of frond often rolled over it.

V. lineata.

Boot Lace Fern.

A fern with simple, narrow, grass-like fronds, which are sometimes 18 in. long; the veins are hidden in the substance of the frond, they are parallel, oblique, and connected by an intramarginal vein which is sunk in a groove,

and becomes the receptacle, the capsules are very small, and have no special covering, differing in this respect from *Pteris* with which genus *Vittaria* has evidently some affinity, as the edge of the frond is often more or less reflexed. It is found hanging from rocks in bush in most parts of the Colony, but is not very plentiful.

ACROSTICHUM,

(*akros*, highest; *stichos*, order, the fructification in the typical species, at the top of the fronds. According to Paxton the word "is supposed to refer to the beginning of a verse, on account of the back surfaces of the leaves being so lined as to resemble in some degree the commencement of lines in poetry."

A large genus of ferns, known by the fact that the capsules are irregularly spread over, and cover the whole surface of the frond or pinna on which they occur, the species have been divided into 12 or 13 different sections, but these divisions have not all been maintained, our first 5 species belong to the Section *Elaphoglossum* with simple fronds, parallel or forked veins which are club-shaped at the apex, the barren and fertile fronds different. The next species belongs to the Section *Stenochlæna* characterized by its simply pinnate barren fronds, and veins forming small costal areolæ, usually best seen near the apex of the pinnæ. The last species belongs to Section *Chrysodium* distinguished by its simply pinnate fronds, and compoundly anastomosing venation without distinct main veins.

Fronds pinnate, barren and fertile different *tenuifolium*.

" " upper pinnæ fertile *aureum*.

Fronds simple, edge not ciliated.

Fertile frond much the narrowest *latifolium*.

" " equalling or exceeding barren one
in breadth *conforme*.

Fronds simple, edge ciliated.

Barren frond ovate, or ovate acuminate *hybridum*.

" " linear or ribbon like *Aubertii*.

Surface of frond densely scaly *spathulatum*.

SECTION ELAPHOGLOSSUM,

(*elaphos*, a stag; *glossa*, a tongue, from the shape of the fronds).

Fronds simple.

A. conforme.

Rhizome woody, wide creeping, densely clothed with large lanceolate brownish membranaceous scales, sometimes $\frac{1}{4}$ inch long 1 line broad; stipes 1—12 inches long, firm, erect, stramineous, naked or slightly scaly; frond 2—9 inches long, $\frac{1}{2}$ to 2 inches broad, the point acute or bluntnish, the base cuneate, or spatulate, the edge cartilaginous, entire; texture coriaceous; both sides naked or nearly so; veins subparallel usually once forked; barren frond usually narrower than the fertile one, the edge inflexed. This fern in Mr. Macken's list was inserted under the name of *A. viscosum*, but on the authority of Rev. J. Buchanan has been placed under the above name, we have never gathered it, and the specimens which we have, differ from the description of *A. conforme*, inasmuch as the fertile frond is considerably narrower than the barren one.

A. latifolium.

Rhizome thick, creeping and scaly; stipes 3—4 in. long, passing gradually into the frond, which is 8—12 in. long, quite smooth and rounded at

the apex, edge entire, thickened and cartilaginous; texture coriaceous; both sides naked; fertile fronds much narrower than the barren ones, but barren ones by far the most numerous. It is found hanging from rocks in crowded masses, in the Midland districts.

A. hybridum.

Rhizome woody, the scales dense, $\frac{1}{4}$ to $\frac{1}{2}$ in. long, linear, crisped, dark chestnut brown; stipes subtufed 6–9 in. long, firm, erect, with scattered, squarrose linear dark scales; barren frond 6–12 in. long, $1\frac{1}{2}$ –2 in. broad, the point acuminate, the base rather rounded; texture subcoriaceous; both sides naked except the midrib beneath, the edge ciliated with linear subulate scales; veins immersed, usually once forked; fertile frond much smaller than the others.

Found in the Midland districts at from 3 to 5,000 feet elevation.

A. Aubertii.

Rhizome woody, short creeping, the scales dense, linear, bright brown; stipes of barren frond 1–6 in. long, clothed with squarrose linear brown scales; barren frond 1 ft. or more long, $\frac{1}{2}$ to 1 in. broad, the point acute, lower part narrowed gradually, the edge entire or subrepand; texture thin, midrib and edge slightly ciliated with scales like those of the stem; veins fine, conspicuous, usually simple, 1 line apart; fertile frond $2\frac{1}{2}$ –3 in. long, $\frac{1}{2}$ to $\frac{3}{4}$ broad, narrowed suddenly at the base, the stem 6–9 in. long. On damp rocks and fallen trees in the Midland districts, and on Little Noodsberg.

A. spathulatum.

Stipes densely tufted 1–2 in. long, firm, erect, clothed with soft spreading, brown fibrillose scales, barren frond $\frac{1}{2}$ –4 in. long, $\frac{1}{4}$ – $\frac{1}{2}$ in. broad, obovate-spathulate, the point blunt, the base tapering narrowly or gradually; texture coriaceous; both sides scattered over, and the edge usually densely ciliated with small linear subulate reddish brown scales; veins hidden; fertile fronds smaller than the other, and the stem longer. On moist rocks open to the South with 4 to 5,000 feet elevation. This fern, and the two preceeding we have not met with, and the descriptions have been copied from the "*Synopsis Filicum.*"

STENOCHLÆNA,

(*Stenos*, narrow; *chlæna*, covering, from its rudimentary indusium).

Barren fronds pinnate.

A. tenuifolium.

This fern is the one which is found climbing trees, generally *Waterboom* trees in wet or or marshy places near the coast, the rhizome is woody and wide creeping; the barren frond simply pinnate, and sometimes 6 feet long, and 12 to 18 in. broad, the pinnae 6–12 in. long, $\frac{3}{4}$ – $1\frac{1}{2}$ in. broad, oblong, the point acute, the edge serrate, a gland at the upper side near the base; the fertile fronds are bipinnate, on long stems; pinnae and pinnules contracted, and by these features may be distinguished from all others of the genus. It is confined to the coast, its rhizomes sometimes almost encircling the trees upon which it grows, its fronds are often produced at 20 or 30 feet from the ground, the fertile fronds are only to be found about January or February.

CHRYSONIDIUM,

(*Chrysos*, gold).

Fronds pinnate, veins anastomosing.

A. aureum.

This plant has not at first sight much the appearance of a fern, and is no doubt often passed over by amateur collectors. Its stipes is 1—2 feet long, strong; frond sometimes 6 feet long, and 1 foot or more broad, the upper pinnæ only, fertile; barren pinnæ 3—9 in. long, the edge entire; texture coriaceous; rachis and both surfaces naked; veins copiously anastomosing, without any free veinlets. It is found generally near the sea coast in marshes or estuaries, and has the appearance of a cluster of young woody shrubs, the whole plant is hard and woody in texture, and the pinnæ when fertile are slightly smaller than the barren ones, and have their under surfaces quite covered with the small capsules.

SUB-ORDER 3.

OSMUNDACEÆ.

This suborder is distinguished by spore cases which are two-valved and burst vertically across the apex, and the jointed elastic ring present in all the preceding species is in this Suborder only rudimentary; vernation circinate. It includes 2 Genera, *Osmunda* with *paniculate* and *Todea* with dorsal fructification.

Osmunda regalis.

The Royal Fern, sometimes called the Flowering Fern on account of the cluster of capsules at the apex of the frond, having the appearance of a bunch of minute brown flowers, in Natal, the name Flowering Fern has been transferred to *Anemia* for the same reason. The Royal Fern is common in England, and our variety differs very little from the English plant. It is easily recognized by its bipinnate leafy fronds, and by its fruit being in a panicle at the apex of the frond, while the lower portion is entirely leafy, but it sometimes differs in this respect, a many of the fronds are entirely barren, some entirely fertile, and again fertile pinnæ sometimes occur in the middle of the frond while the apex and base are leafy, a form which in America is permanent and forms a species which is called *O. interrupta*; sometimes instead of the whole of the segment being contracted and fertile, the large capsules are confined to the edge, leaving the central portion leafy; the fronds die down in the winter and produce fertile fronds in the spring and summer. At one time it was much esteemed as a medicine, and is, we believe still used. It was highly spoken of by the late Dr. Coffin the herbalist. Culpepper says of it "*Saturn* owns the plant, this hath all the virtues mentioned in the "former ferns, and is much more effectual than they, both for inward and "outward griefs, and is accounted singular good in wounds, bruises and "the like." It is found in damp open situations all over the Colony.

TODEA barbara,

(In honor of *Henry Julius Tode* of Mecklenberg a writer on mosses).

This our only species of this genus is large subarhoresecent Fern, with ample fronds, often 4 or 5 feet long; it is bipinnate with close linear pinnules, the upper ones connected at the base, the lower ones distinct, edge toothed; both sides naked, the sori are confined to the back of the lower pinnules only, when mature completely filling them, veins free. It is found in marshy places from the coast to Noodsberg.

SUB-ORDER 4.

SCHIZÆACEÆ,

(*Schizo*, I cut), The typical species bearing fruit on the margin of the frond which appears as if cut or cleft.

This Sub-order is distinguished by bearing capsules which have the ring on the apex, the capsule appearing as if crowned by a series of radiating lines, and at maturity opening down the side; vernation circinate; the suborder contains 5 Genera, only 3 of which are represented in Natal, *Schizæa* with spicate, *Anemia* with *paniculate*, and *Mohria* with dorsal fructification.

SCHIZÆA tenella,

(*tenellus*, slender).

Stipes dense, chestnut brown, passing gradually into the frond, which is 6—8 in. long, not very rigid, subcompressed, with a broad distinct midrib and two equal wings, the whole about $\frac{1}{4}$ line broad; fertile segment suberect, $\frac{1}{4}$ — $\frac{3}{8}$ in. long, unilateral with 4—8 rather stout erecto-patent spikes on each side, the lowest $1\frac{1}{2}$ —2 line long. Once gathered by the late Mr. McKen near the Umtwalumi, but has not been met with by any other collector in Natal to our knowledge. Since the above was written it has been collected by Mr. John Sanderson, near Umbilo Falls.

ANEMIA dregeana.

(*Anemon*, naked, from the naked fructification).

Flowering Fern.

A small tufted fern found in the drier parts of the bush, and at once known by its peculiar fructification, the barren and fertile fronds are separate, but both are borne on the same stem, the barren frond is simply pinnate with 10 to 16 pinnae on each side, which are ovate and dark green, unequal at the base, and slightly toothed at the edge, with a few fine scattered hairs; the fertile frond separates from the barren one at a few inches from the ground, and has a stem 4—6 inches long, at the top of which it bears its panicle of capsules, the lower branches of which are longer than the others; it is often found with 2 and sometimes 3 fertile fronds to each barren one, and we have two specimens, one of which, with a large barren frond, bears two small ones which are fertile. at the base, and barren and leafy at the apex, the other one is a barren frond with the lowest pinna on each side again twice pinnate, both are natural sports or deviations from the normal form.

MOHRIA caffrorum,

(In honor of *D. D. Mohr*, a German botanist).

A common fern in damp places and amongst grass all over the Colony. It is the only species of its genus "combining the capsules of the suborder with the habit of *Cheilanthes*," and is confined to Natal and the Mascarene Isles. Its stipes are tufted and slightly scaly, the frond oblong or oblong-lanceolate and twice pinnate, with the pinnules again toothed or lobed; rachises and under surface more or less scaly, veins forked and free; sori marginal; capsules large, few in each sorus, sessile, most plentiful on upper part of the frond; the margin of the frond reflexed over them. When bruised the frond has an odour resembling turpentine; the many rayed, apical ring characteristic of the order may be easily seen with the aid of a pocket lens.

SUB-ORDER 5.

MARATTIACEÆ.

(In honor of *J. F. Maratti* of Tuscany, a writer on Ferns).

This Suborder is known. 1st. by its ringless capsules. 2nd. by its dorsal fructification on leafy fronds. 3rd. by its circinate vernation. It contains 4 Genera, only one of which is represented in Natal.

Marattia fraxinea,

(*Fraxinus*, the Ash).

A tall-growing, coarse fern with large bipinnate fronds and scaly stalks, which are usually swollen in the lower part, the rachis of the pinnæ usually winged; edge of the segments spinoso-serrulate; the fructification is close to the margin of the segments, and consists of 6—12 capsules on each side, which are consolidated together in two opposite rows, and open by slits on their inner faces; veins free, with club-shaped apices. It is found in ravines and under slight shade from the Coast to Maritzburg.

SUB-ORDER 6.

OPHIOGLOSSACEÆ.

A Suborder known 1st. by its ringless capsules. 2nd. by its straight vernation, differing in this respect from all other Natal Ferns. It contains 3 Genera, only one of which is represented in Natal.

Ophioglossum Capense,

(*Ophios*, of a serpent; *glossa*, tongue).

Rootstock not tuberous: frond 6—9 in. long, the sterile division generally placed about the middle, 2—4 in. long, $\frac{3}{4}$ —2 in. broad, ovate or ovate-oblong, without a distinct haft; texture stout, the midrib usually indistinct fertile spike 1 in. or more long, on a peduncle 2—4 in. long, and considerably overtopping the sterile division when plant is fully mature. Distinguished from the next species by the shape of barren frond, and also by the slightly pink tint of its rachis. Sandy banks near Durban.

O. reticulatum.

A plant not much like a fern in general appearance, and no doubt often passed over on that account, its fronds spring from the ground singly, not tufted or in clumps, with a round succulent stipes, which in those fronds which are fertile becomes divided about half way up into the barren and fertile divisions, the barren division is ovate or cordate, the edge entire and the veins copiously anastomosing; the fertile division is generally much longer than the barren one, linear, contracted, the capsules occupy about one-third of its length, in two rows, imbedded on the spike, and at maturity open across the centre. It is found amongst grass both in the open and under slight shade all over the Colony.

GLOSSARY.

ANASTOMOSING, uniting of veins or their branches.

ARACHNOID, like a spiders web.

AREOLÆ, small spaces formed by the joining of veins or their branches.

ARTICULATED, jointed.

AXIL, the angle formed between the axis and any organ that springs from it.

CAPSULE, the vessel which contains the spores.

CAUDEX, an upright stem bearing fronds.

CILIATED, having marginal hairs.

CIRCUINATE, coiled like a crozier.

CONFLUENT, running together.

CORDATE, heart shaped.

COSTA, the midvein, or the rachis continued into the frond or segment.

CRENATE, having rounded notches.

DECURRENT, running downwards.

DEFLEXED, bent downwards.

DICHOTOMOUS, dividing in pairs.

DIVARIEATE, spreading abruptly.

EXTORSE, turning outwards.

FALCATE, bent like a sickle.

FLABELLATE, fan-shaped.

FROND, The whole of the leafy portion of a fern from the point where it either branches or becomes leafy, is called the frond; the lower part of the stem to where it issues from the rhizome or caudex, is called the Stipes.

GEMMIFEROUS, bearing buds.

GLAUCOUS, covered with with a fine whitish bloom.

IMBRICATE, overlapping like tiles.

INDUSIUM or INVOLUCRE, the membrane that covers or encloses the capsules, and which is of various forms.

INTRAMARGINAL, within the margin.

INVOLUCRE, indusium.

LOBE, an ultimate division of the frond.

OBOVATE, egg-shaped with the broad end uppermost.

OLIGOCARPOUS, with only few capsules in each sorus.

PANICULATE, in the form of a panicle *i. e.* a loose arrangement of flowers or fruit like a head of oats.

PINNA, the first division of the frond.

PINNULE, the second division of the frond.

PINNATIFID, divided into lobes or segments from the margin towards the centre.

RACHIS, the divisions of the stipes

RECEPTACLE, that which bears the capsules.

REFLEXED, curved backwards.

RHIZOME, a prostrate rooting stem from which the fronds arise, sometimes above the ground or on rocks on trees; and then usually scaly, sometimes beneath the ground and then naked or nearly so.

- SEGMENT, the ultimate division of a frond, usually longer or deeper than a lobe.
- SESSILE, sitting *i. e.* not stalked.
- SORI, the clusters of capsules.
- SPATHULATE, oblong, with the lower end attenuated like a spathula.
- SPICATE, in the form of a spike *i. e.* a long stalk with sessile flowers or fruit.
- SQUARROSE, covered with bodies which spread at a right or obtuse angle.
- STIPES, the stem, or stalk which supports the frond.
- SUBULATE, awl-shaped, tapering to a fine point from a broad base.
- TOMENTOSE, downy or woolly.
- TUFTED, fronds growing in tufts from an upright rhizome.
- VENULES, the first, and
- VEINLETS, the second divisions or branches of the veins.
- VENATION, mode of arrangement of the veins.
- VERNATION, the manner in which leaves are arranged in the bud, circinate in all the Natal genera except *Ophioglossum* in which it is straight.

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