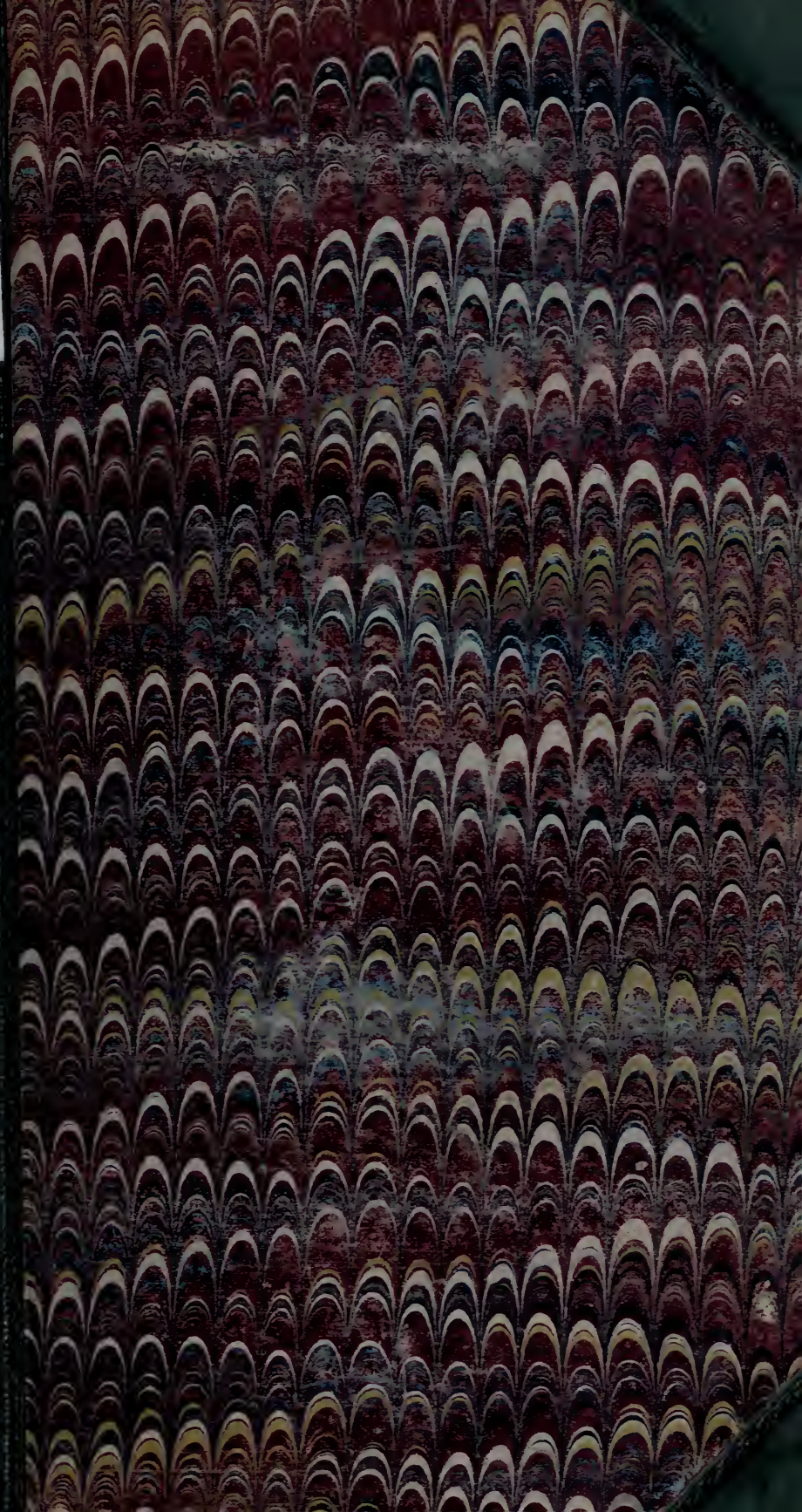




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LASTREA FILIX-MAS, (PSEUDO-MAS OF WOLLASTON.

Var. *Depauperata*. (Page 334, Vol. 1

Pteridoph
L

OUR NATIVE FERNS;

OR A

HISTORY OF THE BRITISH SPECIES AND THEIR VARIETIES.

VOLUME I.

POLYPODIUM.
ALLOSORUS.
GYMNOGRAMMA.
POLYSTICHUM.
LASTREA.

CONTAINING DESCRIPTIONS OF TWENTY-TWO SPECIES AND THREE HUNDRED
AND EIGHTY-FOUR VARIETIES OF BRITISH FERNS.

BY

^{Edward}
¹⁸⁵⁴
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Author of a "Natural History of British and Exotic Ferns," "British Grasses,"
"New and Rare Ferns," "Beautiful Leaved Plants," etc.

WITH THIRTY-SEVEN COLOURED PLATES, AND THREE
HUNDRED AND SEVENTEEN WOOD ENGRAVINGS.

LONDON:

GROOMBRIDGE AND SONS, 5, PATERNOSTER ROW.

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TO

WILLIAM HOPKINS, ESQ., MA, LLD, FRS, ETC.

MY DEAR SIR.

You are aware that during the past few years a more systematic search throughout Great Britain and Ireland has resulted in the discovery of so many varieties of Ferns, (departures from the normal form of the parent from which they have sprung,) that they now count by hundreds instead of units.

“Our Native Ferns,” which, by your kind permission, has been dedicated to you, has been written for the purpose of making these many varieties familiar to the public.

Knowing the interest you take in any endeavour to collect facts that may be useful, and that you will excuse the shortcomings of these volumes, they have been dedicated to you as a slight token of my respect and esteem.

Believe me, My Dear Sir,

Yours very truly,

EDWARD JOSEPH LOWE.

LIST OF COLOURED PLATES AND WOOD-CUT ILLUSTRATIONS.

VOL. I.

[The Roman numerals are Coloured Plates.]

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INTRODUCTION.

THE love of flowers is often gained from some grand floral display that accident has brought under our notice, such as the London and provincial Horticultural Exhibitions; yet the desire to grow similar plants ourselves is but rarely felt under these circumstances, and this results from a conviction that we cannot equal those specimens of horticultural skill that we observe have merited a prize. The desire to cultivate plants, however, is engrafted into us more from seeing plants growing in their native wildness, and as gathered together in the collections of our principal Nurserymen: indeed both these sources help our inclinations forward until we become enthusiastic lovers of Botany. My first love of Ferns was gained by a visit to the Fernery of Messrs. Backhouse, of York. In those days British Ferns were more popular than the exotic species: subsequent visits, however, to Messrs. Veitch and Rollisson, convinced me that foreign Ferns were floral gems, and created a desire to know more about them.

Stove and greenhouse flowers can only be cultivated in hothouses; it is therefore the cultivation of hardy plants that must claim the attention of the million. Who could visit the pansy-beds of Mr. Dean, of Bradford, or of Messrs. Downie, Laird, and Laing, for instance, without wishing to grow these plants at home. In alluding to the flowers of our gardens, now becoming so deservedly cultivated, the want of a popular illustrated work on the subject is to be regretted; a desideratum

that it is hoped will not be of long standing. The field is wide, and as one class of plants occupy the attention of some, and another class of others, it seems desirable for the universal good of such a work that it should be written in independent volumes. Such a series of books might be comprised thus:—"Native Ferns," "Bulbous Plants," "Alpine Plants," "Herbaceous Plants," "Hardy Annuals," and "Florist's Flowers." Every one is interested in the history of what he possesses; and one reason why our "Native Ferns" are so much admired, is that a knowledge of them can be gained from books published on the subject. There is no class of plants more lovely than Ferns, yet there are many tribes equally so, and indeed the combination of both is extremely desirable. Nature mingles them together in the most exquisite manner, and what can we copy equal to nature.

The present work is written more especially to supply a pictorial want, to make the amateur acquainted with his Native Ferns without the labour of botanical study. Some persons have not the time, whilst others have not the inclination, to study botany, and yet they possess the desire to know the plants they cultivate: to these pictures speak volumes. It is true that the British species have been described by numerous authors, yet new species have gradually been discovered; but it is not the species that require publicity so much as the varieties of those species; many of them are distinct in character, and so various in form, that the Fern cultivator must include them amongst his choicest gems. So different are they from the species themselves, that it is in some instances difficult to know the parent from which they have sprung.

There is so much fascination in the study of Ferns, that no one can wonder at the many persons who have either commenced the cultivation of these plants, or have made the subject a study, and, not having the opportunities of growing

the Ferns, have contented themselves with making a collection of fronds.

For elegance of form, and brilliancy and diversity of colour, no plants can vie with the Ferns of the world. In a small island like Great Britain, there is not that difference in climate that will enable any but a limited number to grow in the open air. We are thus deprived of the effect that might be produced by the gold and silver-powdered Ferns, the climbing species, the stately tree Ferns, or the many exquisite parasites, and the tribes of *Hymenophyllum* and *Trichomanes*. If England has not these gems, she can boast of many very beautiful species and varieties, perhaps more sombre in colour, but nevertheless quite as distinct and lovely in form.

English Ferns are all comprised in the order *Polypodiaceæ*, and consist of the following genera:—

- 1.—*Polypodium*, *Linnæus*. Polypody.
- 2.—*Allosorus*, *Bernhardi*. Rock Brakes.
- 3.—*Gymnogramma*, *Desvaux*. *Gymnogramma*.
- 4.—*Polystichum*, *Roth*. Shield Fern.
- 5.—*Lastrea*, *Bory*. Buckler Fern.
- 6.—*Athyrium*, *Roth*. Lady Fern.
- 7.—*Asplenium*, *Linnæus*. Spleenwort.
- 8.—*Scolopendrium*, *Smith*. Hart's-tongue Fern.
- 9.—*Ceterach*, *Willdenow*. Scale Fern.
- 10.—*Blechnum*, *Linnæus*. Hard Fern.
- 11.—*Pteris*, *Linnæus*. Bracken.
- 12.—*Adiantum*, *Linnæus*. Maiden-hair Fern.
- 13.—*Cystopteris*, *Bernhardi*. Bladder Fern.
- 14.—*Woodsia*, *R. Brown*. The Woodsia.
- 15.—*Trichomanes*, *Linnæus*. Bristle Fern.
- 16.—*Hymenophyllum*, *Smith*. Film Fern.
- 17.—*Osmunda*, *Linnæus*. Royal Fern.
- 18.—*Botrychium*, *Swartz*. Moonwort.
- 19.—*Ophioglossum*, *Linnæus*. Adder's Tongue.

OUR NATIVE FERNS.

GENUS I.

POLYPODIUM. LINNÆUS.

SORI without an indusium, their receptacles being medial or terminal on the free veins.

Veins simple or forked, from a central costa. Venules free.

Fronds simple to bitripinnate; the stipes articulated or continuous with the rhizoma.

Rhizoma creeping, brief, or caudiciform.

Five British species.





Adiantum species

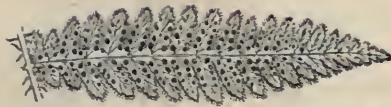


Fig. 1.—Portion of mature Frond—under side.

POLYPODIUM PHEGOPTERIS.

LINNÆUS.

The Beech Fern.

PLATE I.

| | |
|----------------------------------|-----------------------------|
| <i>Polypodium phegopteris,</i> | LINNÆUS. BOLTON. SCHKUHR. |
| “ “ | SMITH. HOOKER AND ARNOTT. |
| “ “ | MOORE. DEAKIN. BABINGTON. |
| “ “ | SOWERBY. PRATT. E. J. LOWE. |
| “ <i>latebrosum,</i> | SALISBURY. |
| “ <i>connectile,</i> | MICHAUX. |
| <i>Phegopteris vulgaris,</i> | METTENIUS. J. SMITH. |
| “ <i>polypodioides,</i> | FEE. |
| <i>Lastrea phegopteris,</i> | BORY. |
| <i>Polystichum phegopteris,</i> | ROTH. |
| <i>Gymnocarpium phegopteris,</i> | NEWMAN. |

Polypodium—From the Greek *polys*—many, and *pous*—a foot, in allusion to the branching of the rhizoma. *Phegopteris*—From the Greek *phegos*—a Beech, and *pterus*—a Fern.

THE Beech Fern, although local, is widely dispersed in Great Britain. It is to be met with in mountainous districts in damp woods and hedge-rows, especially in the neighbourhood

of water: hence its other English name, "Mountain Polypody." *Polypodium phegopteris* is a most beautiful species, and delights to creep with its rhizoma amongst wet moss, rooting into decayed vegetable matter.

In England the Beech Fern is to be found in Cheshire, Cornwall, Cumberland, Derbyshire, Devonshire, Durham, Herefordshire, Lancashire, Northumberland, Shropshire, Staffordshire, Sussex, Westmoreland, and Yorkshire. In Scotland it is much more generally distributed. In Ireland the Beech Fern is uncommon and very local; it has been found in Antrim, Down, Donegal, Kerry, Louth, Londonderry, and Wicklow. In Wales it is common in Brecknockshire, Caermarthenshire, Caernarvonshire, Cardiganshire, Glamorganshire, Merionethshire, and Montgomeryshire. Also a native of the Isle of Man and Shetland Islands.

The Beech Fern is not only found throughout Europe from Italy to Iceland, but it is widely spread in North America. It occurs at Kamtschatka and along the Altai Mountains.

This lovely species is easily cultivated in our Ferneries, if planted in a moist shady situation in rich vegetable mould, and especially when amongst rock-work, and where the moisture in the soil is not stagnant. If water is introduced into the Fernery, this plant should be within reach of the spray of a waterfall, as it is in the highest degree luxuriant when planted under such circumstances.

The form of the frond is ovate-triangular, acuminate, and tapering to a point; pinnate below and pinnatifid above. Pinnæ pinnatifid, the basal pinnæ profoundly pinnatifid; mostly opposite, occasionally alternate; the basal pair of pinnæ lanceolate in form, deflexed, and curving downwards away from the other pinnæ; the next pair nearly straight, and the rest curving upwards more or less. The attachment to the rachis is sessile with the basal pair, the second pair somewhat adnate, the remainder being attached throughout their whole width. The upper pinnæ have their bases decurrent, being continuous on the rachis. Lobes blunt.

Stipes usually more than half the length of the frond, upright, having a few thin scales at the base and minute hairs above. The entire length of the frond, including the stipes, varies from four to twenty inches. Colour pale green.

Veins slender, thin, and flexuous, with alternate unbranched veinlets. Sori naked, circular, and sub-marginal; the spore-cases minute, and pale brownish in colour. Spores ovate.

Rhizoma perennial, dark in colour, thin and creeping; roots black and fibrous.

I believe only one variety has been discovered of this interesting species, *P. phegopteris* keeping very constant to its normal form. The variety mentioned was found by myself in great abundance in 1857, near Stockghyll Force, Ambleside, clothing the bank of a wet shady lane. In this variety the form or general outline of the frond resembles that of the normal *phegopteris*, the distinctive feature being in the irregular multifid lobes; and occasionally in the apices of the pinnæ being also multifid. This variety, under the name of *multifidum*, has been described on page 83 of my "Natural History of New and Rare Ferns."

Should any of my readers visit that lovely portion of the English lake district near Ambleside, a short walk from the principal Inn will bring them to the lovely narrowly-confined waterfall known as Stockghyll Force, and at a brief distance to the right they will be repaid by witnessing the Beech Fern growing in the wildest profusion, clothing the banks in company with the Oak Fern, Lady Fern, and Common Polypody; whilst in the fields beyond, if in early summer, the beauty of the delicate pink *Primula farinosa*, with its silvery-powdered leaves and flower-stalks, intermingled with the purple butterwort, and the wavy snow-white heads of the cotton-grass, adds other charms to the spot.



Fig. 2.—*Polypodium phegopteris*, Variety *Multifidum*, *Lowe*.



POLYCIDIUM ALBERTI.

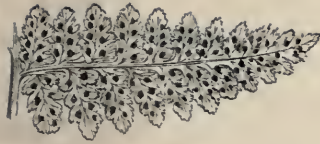


Fig. 3.—Portion of mature Frond—under side.

POLYPODIUM ALPESTRE.

SPRENGEL.

The Alpine Polypody.

PLATES II AND III.

| | |
|--------------------------------|--------------------------------------|
| <i>Polypodium alpestre,</i> | SPRENGEL. MOORE. HENFREY. |
| “ “ | SOWERBY. E. J. LOWE. |
| “ <i>rhaticum,</i> | PALLAS. FRIES. WOODS. |
| “ “ | LEDEBOUR. (<i>Not of LINNÆUS.</i>) |
| “ <i>flexile,</i> | MOORE. |
| <i>Phegopteris alpestris,</i> | METTENIUS. J. SMITH. |
| “ <i>flexilis,</i> | J. SMITH. |
| <i>Pseudathyrium alpestre,</i> | NEWMAN. |
| “ <i>flexile,</i> | NEWMAN. |
| <i>Athyrium alpestre,</i> | NYLANDER. |
| <i>Aspidium alpestre,</i> | HOPPE. SCHKUHR. |
| “ <i>rhaticum,</i> | SWARTZ. |

Polypodium—From the Greek *polys*—many, and *pous*—a foot, in allusion to the branching rhizoma. *Alpestre*—signifying a mountain, on account of its alpine situation.

A COMPARATIVELY recently-discovered species, growing only on the Scotch mountains, where it is abundant at an elevation of

from three to four thousand feet above the sea, and extending downwards to two thousand feet. It has only been found in the Highlands of Scotland, in the counties of Perth, Forfar, Inverness, and Aberdeenshire. Having a very similar appearance to some forms of the Lady Fern, it was confounded with that species, and therefore passed over without sufficient notice until recent botanists detected its true difference.

This Fern is widely spread in Europe, being a native of Germany, Switzerland, Lapland, Russia, Norway, Sweden, and the Caucasus.

Although so recently introduced, there are several distinct varieties already in cultivation.

It is a pretty, delicate-looking, hardy Fern, and grows readily in a well-drained, loamy, porous compost. It is propagated by spores, and also by divisions of the tufted caudex.

As yet it has not been discovered either in England, Wales, or Ireland.

The fronds, which are lanceolate in shape, and herbaceous, attain a length of from twelve to forty inches, the usual length being twenty inches. The habit is upright, and the colour deep green. Bipinnate, sometimes tripinnate. Pinnæ lanceolate-acuminate; pinnules oblong-ovate, profoundly pinnatifid, segments serrate. The frond is broadest in the centre, narrowing to the base and apex. The stipes is short, not one fourth the length of the rachis; on it are scattered pale brown scales.

Veins consisting of a tortuous mid-vein, from which proceed into each segment a pinnate branch; venules simple, extending nearly to the margin, and bearing sori considerably below their apices.

Sori circular and minute. Spore-cases numerous, and of a brown colour.

Caudex perennial, brief, and decumbent. Fronds annual, appearing at the end of April.

The several varieties are:—

Var. *Flexile*.—Occurring only on the Clova Mountains, where it was found in Glen Prosen, by Mr. Backhouse. It is very handsome and distinct, being more slender and flaccid, the pinnæ shorter, and the pinnules much less in number. The



A

COLEOSTRICHUM ALPESINUM
 (L.) Presl.



E

P. ALPESTRIS
 Vitis Ischnocaulis.

stipes is almost wanting, the rachis extending nearly to the base of the frond. The length varies from six to eighteen inches. Pinnæ brief, having only six or eight pairs of pinnules, which are oblong and narrowed below, and distantly dentate. Sori few, chiefly at the base of the frond, the apex being barren.

Var. *Tripinnatum*.—Fronds tripinnate and large, the pinnules attaining a length of an inch and a half; oblong-ovate. Found by Mr. G. Lawson at the Wells of Dee, in Aberdeenshire.

Var. *Lanceum*.—Subtripinnate and large; the pinnules elongate, ovate-lanceolate more or less, and profoundly pinnatifid; the segments bluntly serrated. This variety was found on the Clova Mountains, by Mr. G. Lawson, and at Lochnagar, Aberdeenshire, by Mr. Croall.

Var. *Laciniatum*.—Raised from spores in 1858, in the Fernery of Messrs. Stansfield, of Todmorden. It is distinguished from the variety *Flexile* by its densely set and lacinated pinnæ; the pinnæ are recurved towards the base of the stipes, brief, and rounded at the end; pinnules decurrent, variously dentate or lacinated, and densely set. Veins branched; venules simply furcate. Sori medial.

Plate II is a frond of *Polypodium alpestre*, gathered at Lochnagar, by Mr. G. Lawson. Plate III—A. the variety *Flexile*, from a plant in the possession of Messrs. Stansfield, of Todmorden. Plate III—B. the variety *Laciniatum*, also from the Fernery of Messrs. Stansfield, of Todmorden.

In 1841 Mr. Watson gathered the *P. alpestre* on Ben Alder, in Invernesshire; in 1844 a frond was brought from Canlochen Glen, in Forfarshire; and in 1852, Mr. T. Westcombe, and Mr. Backhouse, of York, procured it in great abundance in Canlochen, Glen Prosen, Glen Fiadh, and in all the Dee-side mountains. Mr. Backhouse remarks, that at an elevation of from two to three thousand feet this Fern was found mingled with the Lady Fern; above this height the Lady Fern ceased, and left the Alpine Polypody in sole possession, flourishing most in the more exposed situations.

Mr. Moore seems to think that the plant known as *Athyrium filix-fœmina*, var. *præmorsum*, and found in some gardens under the name of var. *Aberdeenense*, may prove to be a variety of this species.



PHILOPODIUM BRACHYPTERIS.



Fig. 4.—Pinna of mature Frond—under side.

POLYPODIUM DRYOPTERIS.

LINNÆUS.

The Oak Fern.

PLATE IV.

| | |
|---------------------------------|-----------------------------|
| <i>Polypodium Dryopteris,</i> | LINNÆUS. SCHKUHR. BOLTON. |
| “ “ | SMITH. HOOKER AND ARNOTT. |
| “ “ | MOORÉ. DEAKIN. BABINGTON. |
| “ “ | PRATT. SOWERBY. E. J. LOWE. |
| “ <i>pulchellum,</i> | SALISBURY. |
| <i>Phegopteris Dryopteris,</i> | FEE. |
| <i>Lastrea Dryopteris,</i> | BORY. |
| <i>Polystichum Dryopteris,</i> | ROTH. |
| <i>Gymnocarpium Dryopteris,</i> | NEWMAN. |

Polypodium—From the Greek *polys*—many, and *pous*—a foot, in allusion to the branching of the rhizoma. *Dryopteris*—From the Greek *Drus*—an Oak, and *pteris*—a Fern.

NOTHING can exceed the exquisite beauty of this plant, nor the refreshing colour of its most vivid green fronds. Although they are annual, they spring up early in April, and where well established, there is soon such a dense miniature forest

of fronds, that it must always remain one of the most beautiful species of our cultivated Ferns. In a wild state it is an inhabitant of mountainous rocky places, flourishing in shady woods or beneath hedges, and although growing in damp situations, it selects the driest places. The Oak Fern, or, as it is sometimes called, the "Smooth Three-branched Polypody," is easily cultivated, requiring no care beyond the selection of a proper place and suitable soil. It is very hardy, and readily propagated by dividing the branching rhizoma.

This species is a companion of the Beech Fern, and occurs in the counties of Cheshire, Cumberland, Derbyshire, Durham, Gloucestershire, Herefordshire, Lancashire, Northumberland, Oxford, Shropshire, Somersetshire, Staffordshire, Westmoreland, Worcestershire, and Yorkshire. In Scotland and Wales very generally distributed. In Ireland exceedingly rare.

A widely-spread European species, extending from Gibraltar to the North Cape, and equally wide-spread in America, extending from Columbia and Sitka to Labrador and Greenland. A native also of the United States, Kamtschatka, Siberia, and Africa.

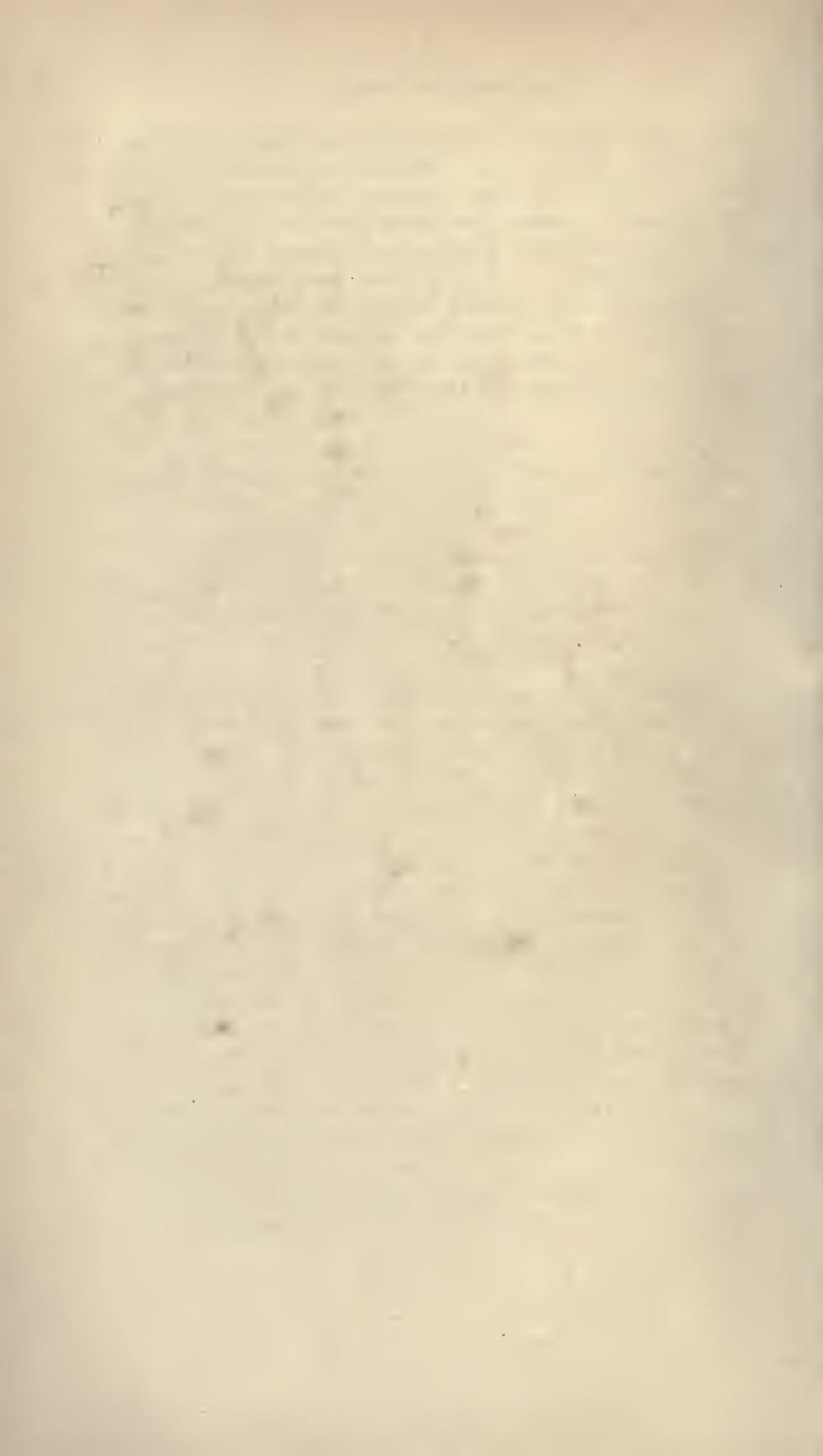
The fronds are pentangular-deltoid in form, three-branched, the branches being stalked and triangular in shape. The two basal branches less than the central branch, and narrower; having also this distinction,—the terminal branch has the pinnae equal in size on either side of the rachis, whilst in the basal pair the branches are placed at an obtuse angle, and the pinnae are much larger on the lower side of the rachis. The fronds vary in size from four to twelve inches, and are smooth, membranaceous, and brilliant green in colour. The branches are pinnatifid above, and pinnate at the base. The pinnae opposite each other, pinnatifid above, and pinnate at the base, the apex being almost entire. Pinnules oblong and crenate. Stipes smooth, frequently two or three times the length of the rachis; erect in growth, slender, dark in colour, and slightly scaly at the base. Rhizoma perennial, creeping, branching, and dark coloured; roots black and fibrous. The undeveloped fronds, when first growing, resemble three small balls placed on slender wires.

There is a flexuous mid-vein, with alternate veins to each lobe, branching, and reaching the margin.

Sori scattered over the whole frond; situated below the apices of the basal venules, circular, abundant, but minute. Spore-cases small, deep brown in colour; spores ovate.

No permanent varieties have been found of this handsome Fern, which is singularly constant to its normal form.

In its wild state the Oak Fern is quite a feature in the landscape, and when travelling amongst the mountains in hot summer days, there is a delicious coolness in the colour of the fronds that is refreshing to the pedestrian, and makes him remember with pleasure the Oak Fern—his mountain friend.







LYGIDIUM ROSEUM L.



Fig. 5.—Portion of mature Frond—under side.

POLYPODIUM ROBERTIANUM.

HOFFMANN.

The Limestone Polypody.

PLATE V.

| | |
|-----------------------------------|----------------------------|
| <i>Polypodium Robertianum</i> , | HOFFMANN. MOORE. |
| “ “ | LINDLEY AND MOORE. |
| “ <i>calcareum</i> , | SMITH. HOOKER AND ARNOTT. |
| “ “ | BABINGTON. DEAKIN. NEWMAN. |
| “ “ | SOWERBY. PRESL. WILLDENOW. |
| “ “ | SPRENGEL. |
| “ <i>dryopteris</i> , var., | A. GRAY. BOLTON. |
| <i>Phegopteris calcarea</i> , | FEE. |
| <i>Gymnocarpium Robertianum</i> , | NEWMAN. |
| <i>Lastrea calcarea</i> , | BORY. NEWMAN. |
| “ <i>Robertiana</i> , | NEWMAN. |
| <i>Nephrodium dryopteris</i> , | MICHAUX. |

Polypodium—From the Greek *polys*—many, and *pous*—a foot, in allusion to the branching rhizoma. *Robertianum*—Named after a botanist.

THE present species bears considerable resemblance to the *Polypodium dryopteris*, but is readily distinguished by its more robust growth, and by the powdery-looking fronds. It is confined to the limestone districts, and very local. A hardy

plant, very readily cultivated; and growing in exposed sunny parts of the Fernery, is a useful species if given suitable soil and good drainage. The soil should be loamy, with a small portion of chalk or limestone.

Polypodium Robertianum, better known as the *Polypodium calcareum*, is found in several parts of Cumberland, in Derbyshire, (at Matlock, Buxton, and Wirksworth, where it grows abundantly,) in Gloucestershire, Lancashire, Oxfordshire, Somersetshire, Westmoreland, Wiltshire, and Yorkshire. In Wales—Caernarvonshire, Denbighshire, and Glamorganshire. I believe it is unknown in Ireland and Scotland. Its most abundant localities are Matlock, Buxton, and Wirksworth, in Derbyshire, (in the latter locality I have seen many plants;) Besbury Common, Gloucestershire; Arnside, Westmoreland; Settle and Anster Rocks, Yorkshire; and Merthyr Tydvil, in Wales.

Abroad it is a native of France, Switzerland, Germany, Hungary, and Norway. On the Himalaya Mountains, and in Canada and the United States.

For some time there was a doubt as to whether this Fern should take rank as a species, or be considered merely as a variety of *Polypodium dryopteris*: our leading cryptogamic botanists have long since settled this question, regarding it as a distinct species.

The fronds, which grow erect, rigid, and elongate at the apex, are pentangular-deltoid and subternate, the lower branches bipinnate at their base, and stalked. Pinnæ obliquely-triangular, opposite, and briefly stalked; the basal pair considerably the largest, and bipinnate; the second pair briefly stalked or sessile, and pinnato-pinnatifid; the remainder sessile, pinnate, and then pinnatifid, becoming less and less divided towards the apex. The pinnules of the basal pair of pinnæ considerably larger on the lower side: all others almost equal. Stipes much longer than the rachis; base scaly, stout, pale green, lateral, and adherent to the rhizoma.

Rhizoma perennial, branched, creeping, and scaly; root-fibres dark.

Length of frond from eight to eighteen inches, sometimes more; herbaceous and heavy greyish green, owing to minute-stalked glands covering both frond and stem.

Vernation circinate.

Veins alternately branched; venules simple or forked, and reaching the margin, and bearing a sorus near the margin.

Sori dispersed over the under side of the fronds, small, circular, and sub-marginal. Spore-cases light-brown coloured; spores nearly ovate in form.

The pubescent covering of the fronds gives the plant the appearance of being dusted over with lime.

It is rather remarkable that it has not been found in Scotland.

One especial distinction of this species was pointed out by Mr. Newman,—the three portions of the young rolled-up frond never assume the appearance of three little balls, as in *P. dryopteris*; and, moreover, unlike that species, it delights to grow in sunshine.

Hoffman's name of *P. Robertianum* has a prior claim to that of *P. calcareum* of Smith: this is to be regretted, as the latter is very appropriate.

Polypodium Robertianum is not subject to variety.

Mr. Moore remarks, that in the West of England this species only descends to two hundred and fifty feet above the sea, and in the north ascends to nine hundred feet. Dr. Hooker found it on the Himalaya Mountains, at an elevation of from five to eight thousand feet.

Bolton was the first to point out the difference between the present species and *P. dryopteris*, and Höffmann to pronounce it a distinct species.

I am indebted to Mr. Joseph Sidebotham, of Manchester, and to the Rev. W. Miller, (late curate of Wirksworth,) for plants of this species from different localities.

Very readily propagated from the extensive creeping rhizomas. It is handsome in a Fernery.

The illustration is from a plant gathered on a limestone wall at Matlock Bath.





POLYTAENIUM VULGARE.



Fig. 6.—Portion of mature Frond—upper side.

POLYPODIUM VULGARE.

LINNÆUS.

The Common Polypody.

PLATES VI, VII, VIII, AND IX.

| | |
|-------------------------------------|---------------------------|
| <i>Polypodium vulgare,</i> | LINNÆUS. SCHKUHR. BOLTON. |
| “ “ | SMITH. HOOKER AND ARNOTT. |
| “ “ | MOORE. BABINGTON. DEAKIN. |
| “ “ | SOWERBY. NEWMAN. HUDSON. |
| “ “ | E. J. LOWE. WITHERING. |
| “ “ | FRANCIS. WILLDENOW. |
| “ “ | SPRENGEL. FEE. |
| “ <i>boreale,</i> | SALISBURY. |
| “ <i>officinale,</i> | GULDENSTADT. |
| “ <i>pinnatifidum,</i> | GILLIBERT. |
| “ <i>viterbiense,</i> | BOCCONE. |
| “ <i>Virginianum,</i> | OF GARDENS. |
| “ <i>Cambricum,</i> | LINNÆUS. |
| “ <i>laciniatum,</i> | LAMARCK. |
| “ <i>vulgare, var. semilacerum,</i> | LINK. MOORE. |
| “ “ <i>var. Hibernicum,</i> | MOORE. SOWERBY. |
| “ “ <i>var. sinuatum,</i> | FRANCIS. |
| “ “ <i>var. serratum,</i> | HEBB. BRIT. MUSEUM. |
| “ “ <i>var. Cambricum,</i> | WILLDENOW. BOLTON. MOORE. |
| “ <i>Cambricum, var. crispum,</i> | DESVAUX. |
| <i>Ctenopteris vulgaris,</i> | NEWMAN. |

Polypodium—From the Greek *polys*—many, and *pous*—a foot, in allusion to the branching rhizoma. *Vulgare*—Common.

It is now, I believe, nearly twenty years since Mr. Newman published his interesting history of the British Ferns. In those days Ferns were imperfectly known, except to a few botanists, and his work was cordially welcomed by the public. Those who are acquainted with the book will recollect a wood-cut illustration of an old tree, on the bole of which are cut the letters E. N., the initials of Mr. Newman. Looking higher up the tree, an epiphyte in the shape of a Fern has taken possession, and is clothing the forks from where the branches spring; and this Fern is the Common Polypody. It is a Fern that delights to run along the ground amongst old wood and moss, keeping its rhizoma above the soil, delighting to grow in our hedge-rows, on rocks, walls, and stumps of trees. It may justly be called a parasite—or rather an epiphytal plant—which seeks to hasten to destruction those trees where decay has made its appearance. It is subject to much variety of form, departing in an extraordinary manner from the normal type, as a reference to the varieties hereinafter mentioned will shew.

One of the commonest and most universally-distributed British species, the localities being too numerous to mention. It is found at every elevation from the sea level to a height of two thousand one hundred feet. In shady places it is evergreen. *Polypodium vulgare* delights in a damp situation, where there is abundance of drainage for its roots.

Abroad it is a native of Scandinavia, Sardinia, Sicily, Italy, Corfu, Madeira, Canary, Algiers, Erzeroum, Kamtschatka, Canada, the United States, Mexico, Guatemala, California, France, Spain, Germany, and Switzerland. It is equally abundant in England, Scotland, Ireland, Wales, and the Channel Islands.

The fronds are somewhat ovate-oblong, approaching linear-oblong in form, profoundly pinnatifid, and acuminate; lateral, narrow, usually subcoriaceous; sometimes erect in habit, at others drooping. The lobes are flat and linear-oblong in form, becoming shorter towards the apex of the frond. Usually indistinctly serrated and blunt-pointed.

Stipes articulated with the caudex; mostly almost equal in length to the rachis.

Rhizoma creeping and branching, copiously clothed when

young with brownish, deciduous, pointed scales, beneath which, green. Perennial.

Roots fibrous, hairy, and branching.

The veins consist of a tortuous conspicuous mid-vein, which branches alternately. The lateral veins branching into from three to five venules or veinlets. In the barren frond the venules are free, ending in club-like heads which form a line near the edge of the lobes. In the fertile lobes they terminate in a sorus.

Fructification usually confined to the upper portion of the under side of the frond.

Sori mostly round, sometimes sub-oblong; eventually crowded and confluent. Destitute of an indusium.

Spore-cases at first straw-coloured, turning to yellow, and then to orange. Spores yellow.

Length of frond from three to twenty inches.

The peasants collect the fronds for their supposed medicinal value.

Readily increased by divisions of the branched rhizoma, and well adapted for artificial rock-work.

Vernation circinate.

From the habit of this plant a character is added to the landscape where it grows. A group of pollard willows clothed with *Polypodium vulgare* are both singular and interesting. The Matlock and Cromford Woods are carpeted over with this species, the rhizomas spreading along the rocks, and amongst the moss in the wildest profusion. In higher, more exposed, and consequently more bleak situations, the form becomes compact, and the size considerably stunted. A very dwarf variety, scarcely differing from the normal form, occurs along the raised banks of the hedges in the salt districts about Northwich, especially near Wincham; and a similar variety I noticed, subsequently, on Helvellyn and Fairfield, in the Lake District.

Some of my readers will doubtless remember on their visit to the English Lakes, a small house by the road-side at Ambleside, covered with rock-work in the front, having only two rooms, and being two stories high, one room down stairs, and another reached by a stone staircase outside the house. Some of them will have recollected this abode from the

profusion of Ferns that luxuriate amongst the rock-work, and completely clothe the house on the road side on the highway from Ambleside to Wordsworth's lovely residence at Rydal. This house is occupied by a poor old man, a Fern collector, from whom can be procured most of the Ferns of the district, if he is still alive. Several years ago, when I visited the spot, the *Polypodium vulgare* was growing most healthfully on the side of this house, associated with varieties of *Scolopendrium vulgare*, *Polystichum angulare*, the Lady Fern, Male Fern, *Osmunda regalis*, etc., interspersed with different species of club moss. The man himself was eccentric, but intelligent, and an excellent pilot to those who, like myself, secured his services as a guide to the different habitats of the Lake Ferns. The visitor to the English Lakes must not overlook this remarkable house, which, I believe, is the oldest in Ambleside.

Polypodium vulgare requires a peculiar treatment under cultivation,—an imitation of nature as closely as possible. The Ferns must be planted where they can take undisturbed possession of the place selected, as it is only when well established that they become really beautiful, and this occupies time to accomplish,—three or four years at least. The locality should be shady, cool, and damp, without having stagnant moisture, for the roots cannot bear to grow in a drenched soil. The soil to be prepared should be composed of leaf-mould, or a vegetable compost, interspersed with a cool, but not too moist clay or garden mould. The soil must be light and porous, not stiff and retentive. The rhizoma should not be buried in the ground, but fastened close down to it, the roots alone being covered. The creeping stems seem to require both air and light. When once established, the growth of the branching rhizoma is rapid.

There are many handsome varieties of *Polypodium vulgare*, amongst which *Acutum-Stansfieldii*, *Cristatum*, *Crenatum*, *Cambricum*, *Compositum*, *Marginatum*, *Omnilacerum*, *Obtusum*, *Pulcherrimum*, *Semilacerum*, *Serrulatum*, and *Truncatum* are the most distinct. Some varieties are more permanent than others, and seedling plants from well-marked fronds will be more permanent in character than divisions of the rhizoma, although by this means other varieties will frequently appear; never-

theless, this is an advantage, inasmuch as there is a great probability of something more remarkable being found amongst the batch of seedlings, whilst, at the same time, there will be many resembling the frond from which the spores have been gathered.

The varieties of *Polypodium vulgare* comprise—



Fig. 7.

ACUTUM, Moore. (Fig. 7.)—Found at Hartley Mandit, near Alton, Hants., by Mr. G. B. Wollaston, in the south of England. Also Bowness, and in Patterdale, English Lakes, by Mr. Joseph Sidebotham, of Manchester. This variety differs from the normal species only in the tips of the lobes tapering into a longish acute point. In the true form the lobes are not even serrulate, and never serrate. A scarce Fern.

ACUTUM-STANSFIELDII, *Lowe*. (Plate IX.)—Found near Settle, by Mr. Clapham, of Scarborough; near Milnthorpe, by Mr. Barnes; and near Cark, by Mr. Stansfield. This Fern has been known as *Acutum*, but as it is perfectly distinct from the true form of that variety, I have taken the liberty of adding *Stansfieldii* to it. Unlike *Acutum* it is a broad-fronded variety, with long, narrow, acute, pointed lobes. Very handsome.



Fig. 8.

AURITO-DENTATUM, *Monkman*. (Fig. 8.)—Found in 1861, by Mr. C. Monkman, of Malton, growing upon a wall in Westmoreland, near Lake Windermere, in the vicinity of Bowness. The fronds are normal in outline, the lobes being strongly eared or aurite, next the rachis, and deeply dentate on the inferior margin; almost lacinate. A very pretty Fern, and, as yet, proves constant. Fertile. The variety *Auratum* grows plentifully in the same locality.



Fig. 9.

AURITUM, Moore. (Fig. 9).—Gathered near Windermere, by Mr. Clowes; near Settle, by Mr. Clapham; at Heldenley, near Malton, Fountain's Abbey, Keswick, and Bowness, by Mr. C. Monkman, of Malton; and in North Wales, by Mr. Stansfield. The distinguishing peculiarity is an ear-like appendage or lobule, attached sometimes to the anterior, and at other times to the posterior base of the lobes; mostly this distinct auricle is on the anterior base of each of the lower lobes. A small variety, occasionally rather bifid. Outline of the frond normal.

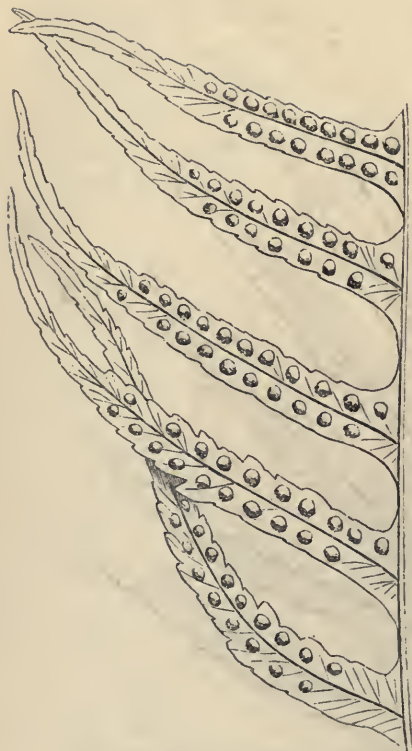


Fig. 10.



Fig. 11.

ATTENUATUM, *Wollaston, MS.* (Fig. 10.)—Fronds large; lobes narrow and very much attenuated; distant and alternate; slender and thin in substance. Sori bold. A distinct and handsome variety, forwarded to me by Mr. Wollaston, of Chisselhurst, a gentleman who has done more than anyone else to bring into notice the varieties of British Ferns, and one who deserves the warmest thanks of all Fern cultivators.

BIFIDO-LOBATUM. (Fig. 11.)—Found in Somerset, by Mr. Elworthy. A small variety, with the general appearance of *Bifidum*, and bearing a rounded lobule or auricle on the anterior base of each of the lower lobes.



Fig. 12.

BIFIDUM, Moore. (Fig. 12.)—A variety discovered some years ago. It has been gathered in various parts of the lake district, in Wales, and on the Yorkshire Hills, by Mr. Monkman; at Arnside, by Mr. Crossfield; near Milnthorpe, by Mr. Barnes; in the Valley of the Conway, by Mr. Stansfield; at Matlock, near Ambleside, and at Chaigeley Manor, near Clitheroe, by myself. A distinct, good variety, characterized by the lobes being bifid, (that is, forked,) occasionally three or four cleft; sometimes almost ramoso, developing into *Ramosum*. The lobes are seldom all alike bifid. Length of frond from twelve to fifteen inches.



Fig. 13.

CAMBRICUM, *Willdenow*. (Fig. 13.)—This splendid Fern was originally found in Wales, and named the Welsh Polypody, and recently in a wood near Macclesfield. Mr. Joseph Sidebotham, of Manchester, has found it at Mill Dingle, Beaumaris, Conway Castle, Troutbeck, near Ambleside, and at Flenarim, Antrim, Ireland. It has long been known as a British gem, and is quite constant and true in its character. *Cambricum* has a much denser growth, is somewhat ovate-oblong in form, and is throughout bipinnatifid. The lobes are narrow near the rachis, become wide in the centre, and narrowing again to a pointed apex; they are crowded together so as to overwrap each other, except at the base and apex (of the lobes.) The margin is deeply cut into narrow, pointed, serrated lobules, with the exception of their base and apex. This beautiful species is always barren. Under pot culture, as an exhibition plant, it can scarcely be surpassed.

COMPOSITUM, *Wollaston*. (Fig. 14.)—Found by Mr. Elworthy, near Nettlecombe, and by Mr. Clowes, near Windermere. It is difficult to describe *Compositum*, as it rarely produces two fronds alike. A very interesting Fern, combining the variations peculiar to *Auratum*, *Bifidum*, *Sinuatum*, *Serratum*, and *Semilacerum*. It is smaller than the normal species. Often on the same frond there will be a combination of several varieties, and always on the same plant; that is, some will be more or less sinuate, and others more or less bifid or serrate. It inclines more to *Sinuatum* than to *Bifidum* or *Serratum*.



Fig. 14.



Fig. 15.

CORIACEO-BIFIDUM, *Monkman*. (Fig. 15.)—Found in the year 1857 or 1858, on a dry wall at Low Hutton, near Malton, by Mr. Monkman. In its wild state it has proved itself quite constant. Mr. Monkman remarks on this variety,—“Under cultivation it is not so permanently bifid as could be wished, *until well established* and left undisturbed at the roots. Rather than turn out to re-pot, plunge pot and all into a larger one. The form is very handsome, dwarfish, and (apart from its bifid lobes) its peculiarities are an extremely leathery texture, (hence the name I propose,) peculiarly loose epidermis, and immense fructification. If a lobe is bent, the epidermis will be found to wrinkle: this is very curious. The form has never been figured, nor, to my knowledge, described; and having stood the test of years, I think it may now rank as an acknowledged variety.”

A short-fronded, remarkably leathery, broad, erect-growing variety. The lobes, particularly the lower pairs, are bifid or trifid; and occasionally the frond. The margins of the frond frequently slightly serrated. The fructification is particularly large, the spore-cases almost joining. In the autumn the conspicuousness of the fructification and the vivid yellow of the spores cause quite a golden appearance, *à la* the Gold Ferns, as Mr. C. Monkman remarks. Mr. Monkman adds that when he first saw it at a distance, he well remembers supposing



Fig. 16.



A



B

Adiantum vulgare

Adiantum vulgare

it to be *Sedum acre* in bloom. The apical lobes are rough, almost papillose on the upper surface, the protuberances being caused by the large spore-cases. The epidermis, where not clad with the fructification, seems quite separated from the upper skin, and, as the discoverer says, readily wrinkles—a peculiar feature. It still grows plentifully at Low Hutton.

CRENATUM, *Moore*. (Fig. 16.)—Gathered near Ruthin, by Mr. Pritchard; Conway Castle, by Dr. Allchin and Mr. Stansfield; Devonshire, by Mr. Hillman; Saltwood, by Mr. Gray; at Mucruss, Ireland, by Dr. Allchin; and on Carberry Island, near Athlone, by Captain A. S. H. Lowe. Much larger than the ordinary form, and much thinner in texture. The fronds are broad and ovate. The margins of the lobes obscurely crenated or crenato-lobate; frequently undulated. A most interesting variety, but inconstant, often running into *Serratum*, and ultimately becoming *Semilacerum*. Sori sometimes oblong. My brother found both *Semilacerum* and *Crenatum* growing together on Carberry Island.

CRISTATUM, *Perry*, *MS.* (Plate VII—A.)—Discovered in Ireland by Mr. Henry S. Perry, of Rock Lodge, Monkstown, County Cork. First figured in my "Natural History of New and Rare Ferns," Plate XXVI—B, and described on page 63 of that work. Mr. R. Sim, of Foot's Cray, having purchased the stock of this very distinct variety; it is therefore now finding its way into collections.

The present plant has multifid or tasseled apices to every pinna, the midvein of each being divided and branching about a quarter of an inch below the apex. The rachis is also divided and bifid about an inch below the apex of the frond. The variety *Cristatum*, from the points of each frond being branched and crested, and all its divisions terminating in crested tufts, so as to form a frilled margin, is both distinct and beautiful. The sori are large and prominent, covering the whole under side of the upper half of the frond quite to the apex. When first discovered, Mr. Perry forwarded me a frond with a small portion of rhizoma attached: this was planted, and grew, and is still quite true to its original character. Length from six to nine inches.

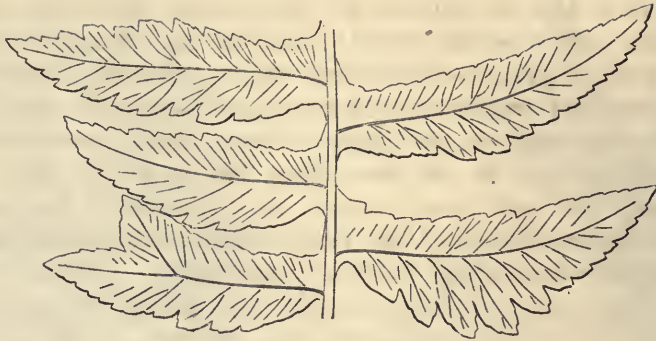


Fig. 17.

DENTATUM, *Monkman, MS.* (Fig. 17.)—Found, I believe in 1859, growing upon a bridge in the grounds of Fountains Abbey, Ripon, Yorkshire, by Mr. C. Monkman, of Malton. A very robust form, resembling *Acutum* in general outline, but when well established has the lobes, especially the lower pairs, very deeply toothed, and sometimes bifid. An extremely handsome large-growing form, the fronds attaining eighteen inches and upwards in length, and eight or nine inches in width. Subpermanent in cultivation, but tolerably characteristic if left undisturbed at the roots. When vigorous, *Dentatum* has a tendency to approach *Semilacerum* in its characters, and one form has grown into the other. A very handsome form of this variety has been found by Mr. Clowes, of Windermere.

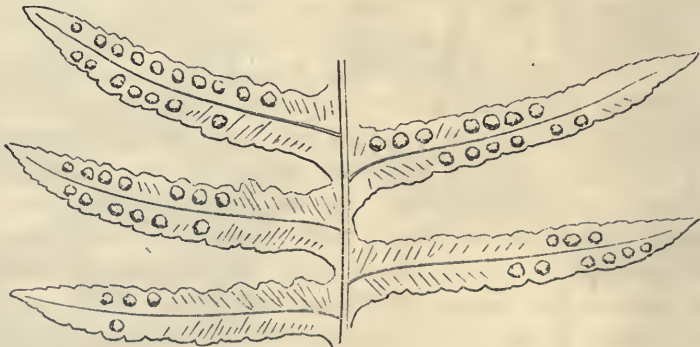


Fig. 18.

DENTICULATUM, *Moore.* (Fig. 18.)—Found near Hereford;

also near Hutton Railway Bridge, in the neighbourhood of Malton, very sparingly, by Mr. C. Monkman. This Fern is of the *Ovatum* type, and when growing, of a crispy appearance, the subsidiary rachides being wavy. The sori are round, not long as in *Serratum*, and large. Rare. Frond broad oblong, abrupt, and caudate at the apices, the margin of the lobes distantly and finely sharp-toothed, or saw-toothed. Less coriaceous. Uppermost lobes not much shorter, and caudate at the apex, the whole of the lobes ascending.



Fig. 19.

INTERRUPTUM, *Moore*. (Fig. 19.)—Rare. This variety has

irregular or interrupted lobes; and here and there altogether absent. Occasionally irregularly bifid, multifid, or curiously lacinated. Fronds linear-lanceolate. Found in 1851 and 1858 at Tunbridge Wells, Kent, by Mr. G. B. Wollaston.

KRASPEDOUMENON, *Lowe*. (Fig. 23.)—See *Marginatum*, Moore, for remarks on this beautiful Fern.

LACINIATUM, *Moore*.—The lobes in *Laciniatum* vary in length on the same frond: they are simply, but irregularly notched and somewhat crisped. This variety approaches *Interruptum*, and is doubtfully distinct. *Laciniatum* puts on so many forms that it is difficult to procure a characteristic frond; under these circumstances I have refrained from giving an illustration.



Fig. 20.

LOBATUM, *Sidebotham, MS.* (Fig. 20.)—Found by Mr. Joseph Sidebotham, about 1843, in Troutbeck Valley, near Ambleside; subsequently near Bowness, and near Beddgelert, in North Wales. Fronds large; lobes broad. Auriculate on the upper edge of the lobes next the rachis, and crenulate; the upper lobes not auriculate nor crenulate. Sori copious, but small. A distinct variety.

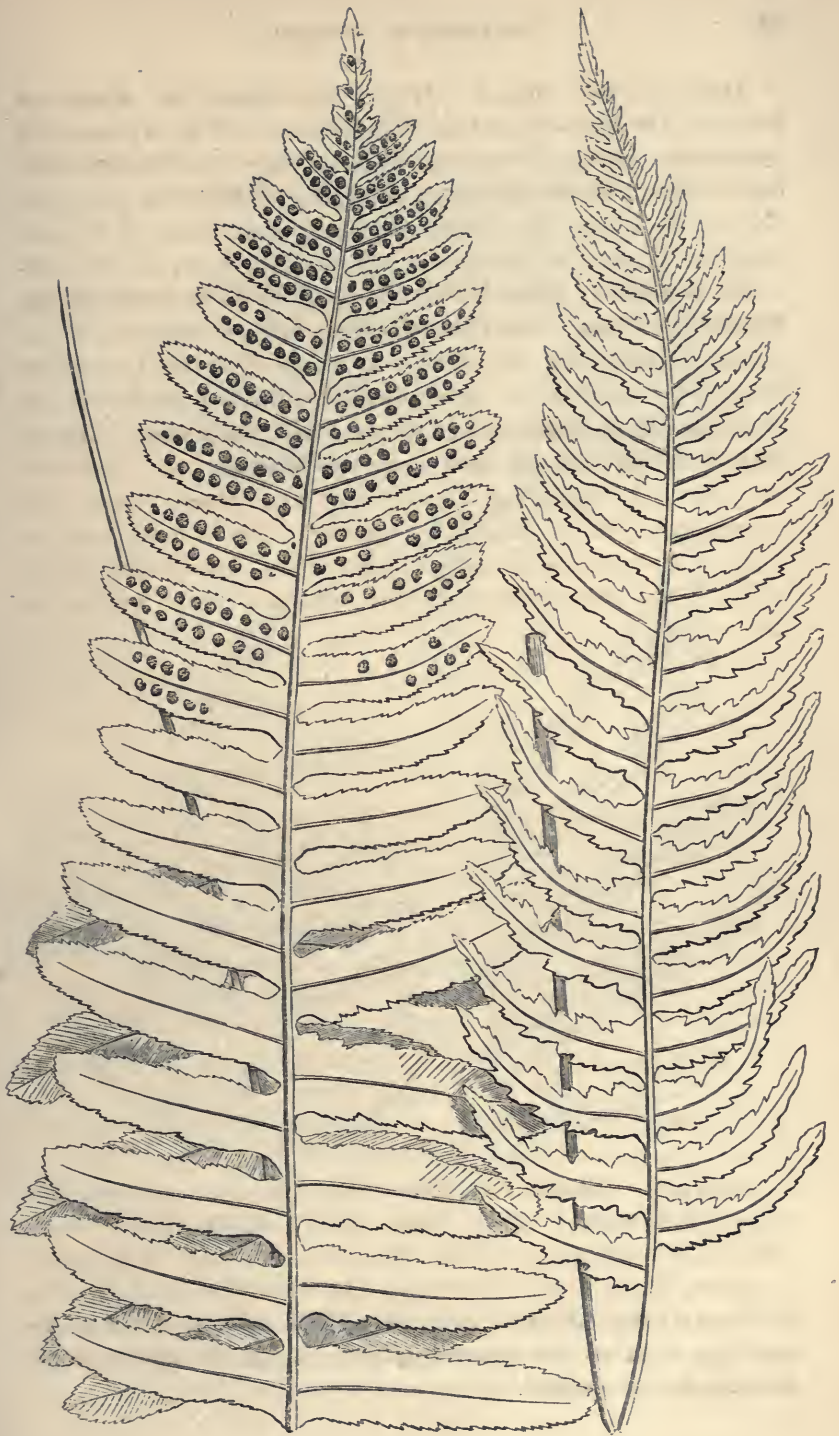


Fig. 21.—VAR. TRUNCATUM.

Fig. 22.—VAR. MARGINATUM.

MARGINATUM, *Moore*. (Fig. 22.)—Found in Kent, by Mr. G. B. Wollaston, and at Windermere, by Mr. Clowes. A remarkable and scarce variety, somewhat larger than the ordinary form. The lobes of the frond blunt, the epidermis on the under side of the lobes, irregularly ruptured, split away as it were from the margin of the lobes, and receding towards the mid-vein. Sometimes eared as in *Auratum*, as is the case in the Windermere form. Mr. Clowes' variety is very different, as the wood-cut illustration will shew. It seems desirable to separate these Ferns, at all events provisionally, and this I propose to do, using the Greek word, instead of the Latin, the name of Clowes' Fern will therefore be variety *Kraspedoumenon*.

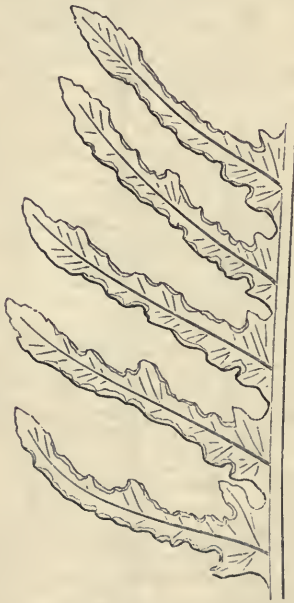


Fig 23.



Fig. 24.

MULTIFIDUM, *Moore*. (Fig. 24.)—This belongs either to the ordinary form or the serrated section; it has the apices of the frond bifid or multifid.



Fig. 25.

MULTIFIDO-CRISTATUM, Moore. (Fig. 25.)—Found by Mr. Tasker, of Weston-super-Mare: the locality has not, I believe, been given. In this very beautiful form, from one to three inches of the frond proper, consists usually of only a few short crested lobes here and there, and connected by a leafy wing, whilst occasionally the latter is alone present. The marked feature in this variety, is its repeatedly short and leafy forkings, each alternate one crispy, the whole forming either a dense, flattish, or circular, extremely handsome crest. A splendid variety.



Fig. 26.

MULTIFORME. (Fig. 26.)—First discovered by Mr. F. Clowes, at Windermere, then by Mr. Henry Perry, in County Cork, Ireland, and in 1859 in Wass Woods, near Coxwold, Yorkshire, by Mr. C. Monkman, of Malton, and still later by Mr. J. Crossfield, of Arnside, in that neighbourhood. A very large-growing remarkable variety, stout in habit, and partaking freely of the characters of *Semilacerum*, *Truncatum*, and *Serratum*, and altogether extremely variable both in size and form. Fronds broad, divided and lobed somewhat like the variety *Semilacerum*, but differing from that variety in being irregular, and in having a horn-like projection of the midrib of many of the abruptly-ending side divisions. Long stalked. Occasionally almost entire. Some of the fronds are very broad, with more or less tapering narrowish lobes; other fronds similar, with lobes here and there shortened abruptly; others having only two or three pairs of divisions, (the lower ones,) and these profoundly crenate or serrate,—such fronds appearing as though the upper part had been suddenly stopped in growth, or broken out. A rare Fern.

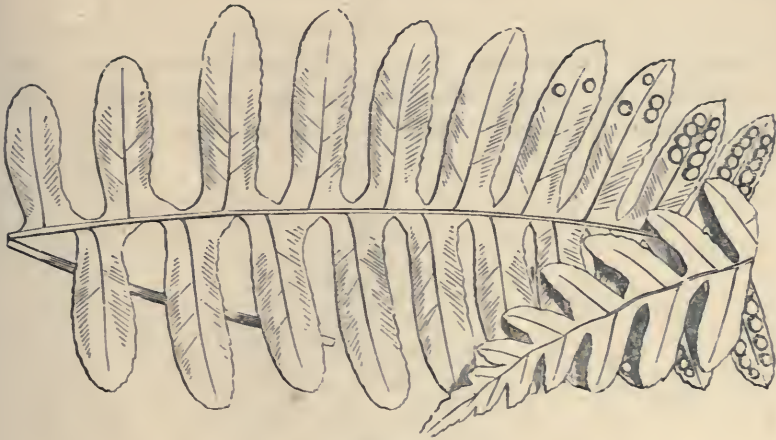


Fig. 27.

OBTUSUM, *Stansfield, MS.* (Fig. 27.)—A pretty, small-froned variety, though rather larger than the normal form, distinguished by the rounded edges of the lobes, which are very obtuse. Gathered in North Wales, by Mr. Stansfield, of Todmorden, and in Devonshire, by Mr. Hillman. Somewhat inconstant.

OMNILACERUM, *Moore.* (Plate VII—B.)—Found by Mr. E. T. Bennett, near Goodrich Castle, Ross, Herefordshire. This exceedingly elegant, and distinct variety is still very rare. Somewhat in the way of *Cambricum*, yet quite distinct from that variety. It has the lobes irregularly pinnatifid, the lobules being narrow and jagged. It differs from *Cambricum* in the narrow and less-crowded lobes, and in being fertile. Length of frond from twelve to eighteen inches. Habit nearly erect. Lobes narrowish next the rachis, widening towards the middle, and tapering beyond. Deeply cut into narrowish, often very attenuated acute lobules, which, towards the centre of the lobe, are often much projected, more particularly from the lower margin. The deeply serrated lobes are sometimes nearly bipinnatifid. Usually the frond is considerably longer than in *Cambricum*, the lobes having their divisions more acute, and more regular, than in that variety. A constant and beautiful Fern. Whilst young, the divisions are sharply and deeply toothed—exceedingly saw-edge-like; when stronger these teeth lengthen very much into very slender lobules, which are again a little torn, or toothed.

OVATUM, *Moore*.—Found at Ballavaughan, in the west of Ireland, by Dr. Allchin. Rare. The frond broad, ovate, and coriaceous, the margin obscurely-dentate or crenulate. The lowest lobes horizontal. Allied to *Denticulatum*.



Fig. 28.

PULCHERRIMUM, *Stansfield, MS.* (Fig. 28.)—This Fern does not belie its name, being most beautiful. It was gathered near Milnthorpe, in the summer of 1861, by Mr. Barnes, and is now in the possession of Messrs. Stansfield, of the Vale Gardens, Todmorden. The fronds are from eight inches to a foot in length, and from four to eight inches in breadth. Ovate-oblong in form, bipinnatifid in the lower and middle portions of the frond, and deeply serrated in the upper portion. Perhaps the most beautiful of all the British *Polypodiums*, differing from *Cambricum*, in being much thicker in texture, in all the lobes and lobules being blunt and rounded, (which gives a peculiar softness and smoothness of outline to the fronds,) and in being abundantly soriferous.



POLYPODIUM VULGARE
J. S. MILLER.

RAMOSUM, *Moore*. (Fig. 29.)—A more developed form of *Bifidum*, frequently branched in the rachis, and again divided. It is furnished with bifid or multifid lobes; varied in its form and manner of branching, the lobes very dissimilar, and the margin of the lobes largely and profoundly dentate below, and minutely so on their upper half. Rare.



Fig. 29.

SEMILACERUM, *Link, Moore*, (*HIBERNICUM, Moore*.) (Plate VIII.)—The Irish Polypody, or (Dargle Fern, as it is sometimes called,) has been found in Ireland, at Killarney, and by the Dargle, Wicklow, where the fronds are well marked. Also in Devonshire, Norfolk, (Postwich,) Kent, Monmouth, and Caernarvonshire; growing in the calcareous districts of England, Wales, and Ireland. It has been gathered at Nettlecombe, by Mr. Elworthy; at Chepstow Castle, by Mr. R. Heward; at Antrim, by Mr. Stansfield; Ulverstone, by Miss E. Hodgson; in the neighbourhood of Arnside and Morecombe Bay, by Mr. C. Monkman; Saltwood Castle, Kent, by Mr. Gray; ruins of Berry Pomroy Castle, Devon, and Tintern Abbey, by Mr.

Heward; Aberglashlyn, Caernarvonshire, by Dr. Allchin; and on a small island (Carberry Island) in Lough Ree, near Athlone, by Captain A. S. H. Lowe, in the spring of 1856.

An exceedingly handsome Fern, not characteristic till of good size and well established, then constant under cultivation. The fronds are from twelve to eighteen inches in length, pinnatifid and fertile above, deeply bipinnatifid below. The lower segments barren, upper ones crenate and fertile, the fructification bold and prominent. Underneath the frond is paler, and of a sub-glaucous green colour. Lobules distinct, linear, acute, and serrate. Fronds broad. The lobes long, and very wide in the middle, and these profoundly cut into lesser and closely-set lobules, the lobules being frequently again lacerated.



Fig. 30.

SERRATUM, Moore. (Fig. 30.)—Gathered in Guernsey, by Mr. Jackson; at Milnthorpe, by Mr. Crossfield; at Conway, by Mr. Stansfield; at Fountains Abbey, Byland Abbey, Bowness, Lancaster, Troutbeck Bridge, (Westmoreland,) and near Rydal, by Mr. Joseph Sidebotham, of Manchester; and on the Ingleboro' Mountains, by Mr. Monkman, of Malton. Not uncommon. Fronds large, more than a foot long, and from four to six inches in breadth; lobes sharply and deeply serrated on the margins. When well grown approaches *Semilacerum* in form, and sometimes, having rounded enlarged teeth or lobules; approaching *Crenatum*.



Fig. 31.

SERRULATO-BIFIDUM; *Monkman*. (Fig. 31.)—Found in 1857 or 1858 in a hedge bank at High Hutton, near Malton, by Mr. C. Monkman. A handsome bifid form, with long narrow fronds, the lower lobes of which are pretty uniformly divided (bifid or trifid,) and all, more especially towards the apex, very prettily and finely serrated. The apices of the fronds are drawn out into a long, tapering, acute, lobe-like termination, also serrated. The apex is occasionally bifid or multifid. A beautiful Fern, but, like most of the bifid forms, somewhat inconstant in cultivation. Mr. Monkman has found a similar but broader form at Byland Abbey, Yorkshire.

SERRULATUM, Moore. (Fig. 32.)—Found in Devonshire, by Mr. Wollaston and Mr. Hillman, and near Malton, by Mr. C. Monkman. A dwarf form. Distinguished by the teeth of the lobes being minutely serrate. Uncommon; generally growing on the trunks of trees. Form normal.



Fig 32.



Fig. 33.

SINUATUM, Moore. (Fig. 33.)—Allied to *Interruptum* and *Laciniatum*. Irregularly lobed, the lobes being sinuous or waved. The lobules sharply serrate; usually only partially sinuous. The fronds very short and broad, and the lobes long; rarely ever divided at the apex. Known to Fern cultivators some years. Found by Mr. B. Wollaston, at Tunbridge Wells.



Fig. 34.

SINUATUM-MONKMANII, *Monkman, MS.* (Fig. 34.)—Found in 1857, at Hest Bank, Morecombe Bay, near Lancaster, growing sparingly on a tree stump, and named, after testing its constancy for several summers. It is a gem in appearance. Dwarf in habit. An extremely curious plant. The fronds vary as widely as possible in general appearance, being depauperated, interrupted, lacinated, multifid, and in other respects very irregular. Lobes frequently much shortened, and often wanting; bifid, trifid, crenated, serrated, lacerated, and not unfrequently united throughout, as in the accompanying wood-cut. Fronds sometimes ramose. Venation and fructification extremely confused, but normal on normal fronds which occasionally are sent up.



Fig. 35.



Fig. 36.

SUPRASORIFERUM, *Wollaston, MS.* (Fig. 35.)—Found in 1861, near Woolbeding, Sussex, by Mr. G. B. Wollaston. The fronds are linear-lanceolate; the lobes denticulate and submarginate. (*Sub* used in the sense of *hardly* or *scarcely*, analogous to *submarginatum* in *Scolopendrium*.) The lower lobes have a tendency to be auricled. Suprasoriferous, as well as on the under side; the name being given by Mr. Wollaston on account of the sori on the upper surface of the frond. The upper sori marginal. A narrow-fronded and distinct variety.

THOMPSONII, *Monkman, MS.* (Fig. 36.)—Found at Mulgrave Woods, near Whitby, in 1859, by Mr. George Thompson, of Darlington. A dwarf, almost imbricate, erect-growing form. Quite constant in cultivation.





ADIANTUM VULGARE.
Van Anden-stam. edh.

TRUNCATUM, *Moore*. (Fig. 21, page 41.)—Found in Ireland, by Dr. Allchin, and at Windermere, by Mr. Clowes. The fronds sometimes truncate, the leafy portions wanting, and the veins projecting, forming irregular points. The lobes profoundly serrated or lobed, and the lobules minutely serrated. Rare. Length twelve inches or more. This is a sub-variety of *Multiforme*.

VARIEGATUM.—Found at Oldstead, Yorkshire, by Mr. C. Monkman, of Malton, and near Cark, Lancashire, by Messrs. Stansfield. The fronds are acute, in fact those of *Acutum*, the distinction being in the variegation. It is pretty distinctly striped with yellowish white stripes, but a very inconstant variety. The plant Mr. Stansfield found is coriaceous, nearly normal in outline, and marbled above with yellow blotches. It does not prove constant under cultivation. It has been considered useless giving an illustration of this variety.

There are no less than thirty-seven varieties of *Polypodium vulgare*, many of which are exceedingly interesting. It is quite true that a portion of these are not constant in cultivation, and are liable to run into several varieties; yet others are perfectly constant, and all are more or less beautiful. These varieties have each been described and figured, therefore a reference to the coloured plates and woodcut illustrations will at once point out how very varied has been the departure from the normal form of *P. vulgare*. What other varieties a few years hence may bring to light it is impossible to say: when Nature puts on these sports there seems to be no limits. A new field is open to the British Fern cultivator, the last few years have added so many varieties that a British Fernery, replete, not only with the species, but also with the varieties of those species, is an imposing addition to the flower-garden. The British Ferns that contain the most varieties are *Polypodium vulgare*, *Polystichum angulare*, *Lastrea filix-mas*, *L. dilatata*, *Athyrium filix-fœmina*, *Scolopendrium vulgare*, and *Blechnum spicant*.

GENUS II.

ALLOSORUS. BERNHARDI.

THIS genus is represented in Great Britain by a solitary species.

The fronds are herbaceous, dimorphous, bi-tripinnate, the fertile fronds contracted and erect in habit; the barren fronds much resembling parsley. In general appearance the *Allosorus* bears some resemblance to the genus *Pteris*, but the fructification is more nearly allied to *Polypodium*, the receptacles are punctiform, and the sori non-indusiate; eventually confluent. The revolute margin of the pinnules covers the sori.

Veins simple, or forked from a central costa.



ALLOSORUS CRISPUS.



Fig. 37.—Portion of fertile Frond—under side.

ALLOSORUS CRISPUS.

BERNHARDI.

The Mountain Parsley Fern or Rock Brakes.

PLATE X.

| | |
|-------------------------------|-----------------------------------|
| <i>Allosorus crispus,</i> | BERNHARDI. BABINGTON. NEWMAN. |
| “ “ | DEAKIN. SOWERBY. MOORE. PRESL. |
| “ “ | SPRENGEL. |
| <i>Struthiopteris crispa,</i> | WALLROTH. |
| <i>Cryptogramma</i> “ | R. BROWN. HOOKER AND ARNOTT. |
| “ “ | MACKAY. |
| <i>Pteris</i> “ | LINNEUS. SCHUHR. SMITH. WILDENOW. |
| <i>Osmunda</i> “ | LINNEUS. BOLTON. |
| “ <i>rupestris,</i> | SALISBURY. |
| <i>Pteris tenuifolia,</i> | LAMARCK. |
| “ <i>stelleri,</i> | GELIN. |
| <i>Onoclea crispa,</i> | HOFFMANN. |
| <i>Stegania</i> “ | R. BROWN. |
| “ <i>onocleoides,</i> | GRAY. |
| <i>Phorolobus crispus,</i> | DESVAUX. FEE. |
| <i>Blechnum crispum,</i> | HARTMANN. |
| <i>Acrostichum</i> “ | VILLARS. |
| <i>Allosorus Stelleri,</i> | RUPPRECHT. |

Allosorus—From the Greek *allos*—various, and *sorus*—a heap.
Crispus—Curled.

THIS is really a charming Fern, and an ornament wherever planted. In its native wilds it is found growing amongst loose stones, or in the crevices of rocks, adding much to the beauty of its home. It is a Fern not readily forgotten when seen in all the luxuriance of wildness, growing amongst the shapeless masses of a profusion of loose stones on the sides of a mountain. The vivid greenness of its fronds contrasts greatly with the sombre hue of its few companions.

A local species, occurring in the counties of Cheshire, Lancashire, Cumberland, Westmorland, Durham, Northumberland, Derbyshire, Shropshire, Somersetshire, Worcestershire, and Yorkshire. In Wales, in Caernarvonshire, Montgomeryshire, Denbighshire, Glamorganshire, (rare,) and Merionethshire. In Ireland it is extremely local, occurring only in the counties of Down, Antrim, and Louth. In Scotland widely spread, being found in almost every county. In England it is exceedingly abundant on the mountains of Northumberland, Cumberland, Durham, and Westmorland, (especially on Cheviot, Helvellyn, Skiddaw, Fairfield, Scawfell Pikes, Keswick, Derwentwater, Ennerdale, Borrowdale, Teesdale, and Lothrigg Fell.) In Lancashire on the moor behind the town of Lancaster, and in Yorkshire on Cronkley Scar, Wensleydale, Fountain's Fell, Ingleborough, and Settle.

Mr. Monkman remarks that it grows in great profusion at the Lancaster station, setting the smoke from the silk mills at defiance. An additional attraction to a tourist to visit this moor is the prospect—one of the finest in our country.

Abroad it is a native of France, Italy, Spain, Germany, Hungary, Sweden, Norway, Denmark, Switzerland, Lapland, and at Sitka, in North-west America.

The *Allosorus crispus* has received a variety of names; Linnæus considered it to belong to the genus *Osmunda*, and afterwards changing his opinion, placed it among the *Pteris* family; Villars declared it to be an *Acrostichum*, Hartmann a *Blechnum*, R. Brown a *Stegania* and a *Cryptogramma*, Hoffmann an *Onoclea*, Wallroth a *Struthiopteris*, Desvaux called it *Phorolobus*, and Bernhardt *Allosorus*. Desvaux, Brown, and Bernhardt

created a new genus for the Rock Brakes. That it is a very distinct Fern there can be no doubt, and Bernhardt did well to make it a new genus.

When the *Allosorus crispus* grows luxuriantly, the mountain sides that are taken possession of by it, resemble at a distance verdant meadows; and it is only on a near approach that this vivid green resolves itself into the many-fronded plants of the Rock Brakes. In the English lakes the mountain sides of Lothrigg Fell and Fairfield are instances of this; and the former being easily reached from Ambleside, will well repay the tourist making its steep but not lengthy ascent. Lothrigg Fell is soon reached from the principal inns of Ambleside, the ascent being made on the Windermere side, not far from the lovely situated church of Brathay. Passing through a steep field of *Allosorus crispus*, the summit is gained, and on the one side there is the Lily Tarn, spoken of by Wordsworth, backed in the distance by Helvellyn, Fairfield, and Langdale Pike; whilst on the other, overlooking the head of the lake, there is a magnificent and never-to-be-forgotten view down Windermere, especially from the stone-piled erection left by the ordnance survey. Here the artist has a vast scope for his pencil, whilst the poet fails in words expressive enough in his endeavour to describe what he sees before him; painting in the language of inspiration, or delineating on canvas such scenes as these, are indeed tasks of no ordinary kind, and each must feel dissatisfied with his labours when he sees they fall short of the reality.

In *Allosorus crispus* the sterile and fertile fronds are different. The sterile ones are bi-tripinnate, the pinnae alternate or sub-opposite, (more especially below,) spreading, and triangular-ovate in form, the lowest pinnae being the largest, and each succeeding pair diminishing rapidly in size towards the apex. The pinnules, which are ovate, are largest on the posterior side; they are pinnate or pinnatifid. The lobes are obovate-cuneate, having bifid lobules with acute incurved teeth, the smaller ones not bifid, but having linear acute teeth. The frond smooth, usually the leafy portion half the length of the frond, frequently more. The fertile fronds contracted, the leafy portion being only half the length of the stipes. Tri-quadripinnate, the pinnae spreading and ovate, pinnules pinnate, ovate, pinnato-pinnatifid, or bi-pinnate, lobes stalked, linear or linear-oblong.

Fronds varying from four to twelve inches in length; colour pale green, delicate, and vivid. Herbaceous.

Rhizoma perennial, brief, tufted, and having pale brown scales; roots wiry, branching, and dark in colour. Stipes slender, smooth, and pale green, either equal in length to the leafy portion of the frond, or longer.

Veins of the fertile frond consisting of a flexuous midvein, with alternate simple or occasionally forked veinlets reaching nearly to the margin of the lobes; whilst in the sterile frond they are repeatedly furcately branched, passing through the centre to the margin of each segment, and being forked with a bifid, and simple with a simple segment.

Sori hid beneath the reflexed margins of the pinnules, which nearly join at the midrib, eventually confluent. Spore cases small, spores smooth and roundish oblong, sometimes somewhat angular.

In Lancashire the "Rock Brakes," or "Mountain Parsley Fern," flourishes at nearly the sea level, whilst in the Highlands of Scotland it is found at an elevation of three thousand four hundred and fifty feet.



Fig. 33.

Fig. 39.

Fig. 40.

Figs. 33, 39, and 40 are not varieties, but different fronds occasionally found on the same plant.

GENUS III.

GYMNOGRAMMA. DESVAUX.

A most interesting genus of plants, more especially hot-house Ferns, some of which are exceedingly beautiful. A single species, namely, *Gymnogramma leptophylla*, is the only plant belonging to this genus found in Great Britain.

Sori forked, linear or elongate, non-indusiate, eventually confluent.

The name derived from the Greek, *gymnos*—naked, and *gramme*—a line, on account of the sori being in lines, and having no indusium or cover to the fructification.



GYMNOGRAMMA LEPTOPHYLLA.



Fig. 41.—Pinna of mature Frond—under side.

GYMNOGRAMMA LEPTOPHYLLA.

DESLAUX.

The Slender-leaved Gymnogram.

PLATE XI.

| | |
|----------------------------------|-----------------------------|
| <i>Gymnogramma leptophylla</i> , | DESLAUX. HOOKER & GREVILLE. |
| “ “ | MOORE. NEWMAN. E. J. LOWE. |
| “ “ | SOWERBY. SPRENGEL. |
| “ <i>Novæ-Zelandiæ</i> , | COLENZO. |
| “ <i>palliserense</i> , | COLENZO. |
| <i>Gymnogramme leptophylla</i> , | J. SMITH. KUNZE. |
| <i>Grammitis leptophylla</i> , | SWARTZ. WILLDENOW. |

| | |
|-----------------------------------|-------------------|
| <i>Hemionitis leptophylla</i> , | LAGASCA. |
| <i>Anogramma leptophylla</i> , | LINK. |
| <i>Osmunda leptophylla</i> , | LAMARCK. |
| <i>Acrostichum leptophyllum</i> , | DE CANDOLLE. |
| <i>Polypodium leptophyllum</i> , | LINNÆUS. SCHKURR. |
| <i>Asplenium leptophyllum</i> , | CAVANILLES. |
| <i>Anogramme leptophylla</i> , | FEE. |

Gymnogramma—Derived from the Greek, *gymnos*—naked, and *gramme*—a line, in allusion to the sori. *Leptophylla*—From the Greek, *leptos*—slender, and *phullon*—a leaf.

A PRETTY diminutive Fern, the only British representative of the lovely genus of *Gymnogramma* so well known and esteemed in hot-houses for their gold and silver fronds. To those who are unacquainted with these hot-house favourites, it may be mentioned that *Gymnogramma chrysophylla*, *G. L' Herminieri*, *G. ochracea*, and *G. sulphurea* have a copious golden powder on the under side of the fronds, and that *G. tartarea*, *G. calomelanos*, *G. pulchella*, *G. Peruviana*, etc., have this powder of a silvery or white hue; hence the popular name of "Gold and Silver Ferns."

As a British plant it is only an inhabitant of the Island of Jersey, where it grows plentifully in several places, more especially near St. Aubin's, St. Haule, and St. Lawrence.

It is a native of France, Switzerland, Germany, Spain, Italy, Sicily, Greece, Portugal, the Canary Isles, Azores, Madeira, Algiers, Morocco, Abyssinia, Cape of Good Hope, Mexico, Vera Cruz, Victoria, Tasmania, New Zealand, India, the Atlantic Isles, and the Islands in the Persian Gulf.

Gymnogramma leptophylla selects moist banks having a south or south-west aspect: in these situations it is found growing amongst mosses (especially *Fissidens bryoides*) and liverwort, (*Marchantia polymorpha*.) It is an annual, springing up in November, developing fronds in January, and being fully grown by the middle of April. Its spores are scattered, and the plant itself dead by the end of July.

G. leptophylla, although in other respects very distinct, nevertheless has the delicate fragile semblance of the *Cystopteris* family, and with the exception of *G. chærophylla*, a West

Indian species of much larger growth, and also an annual, is very different in appearance to other members of this lovely family.

On account of the present Fern being an annual, the cultivator is compelled to raise it year by year from spores. If planted in light loam, using plenty of fine washed sand, and kept moist by means of a bell-glass, it may be grown with success. When cultivated in a greenhouse, *G. leptophylla* bears spores so freely that plants are almost certain to spring up in some of the surrounding pots without further trouble. It is, however, desirable to provide against disappointment by sowing spores, and the following plan answers remarkably well:—A seed saucer is filled within an inch of the top with drainage, upon this is a layer of sphagnum moss, above which is a mixture of loam, leaf-soil, sand, and broken sphagnum. The sphagnum to mix with the soil must be perfectly dry, for it should be broken into small pieces by rubbing between the hands. When the pan is prepared, let it be well watered, and allowed to remain for several hours before the spores are sown. After the spores have been scattered on the surface of the soil, a hand-glass must be placed over the saucer, and the air excluded by tightly packing with wet sphagnum all round the outside of the base of the glass. If managed in this manner the spores will not require watering for a length of time, and this is a great advantage, for watering is not desirable if it can by any possibility be avoided; however the soil must not on any account be allowed to become dry, otherwise the young Ferns will without doubt perish. If the spores have been rubbed from a fresh mature frond, they will be almost certain to grow. Some species are several months before they germinate. If successfully grown under a bell-glass, after the plant has died spores will presently spring up to take possession of the same pot.

As it has been before stated, *G. leptophylla* takes its position amongst British plants from the circumstance that it is a native of one of the Channel Islands. Geographically speaking, the flora of these islands is not that of England, being identical with the flora of France. It is therefore politically, and not geographically, a British plant. Indeed reference to a map will at once shew that these Islands are not only much further

west than any portion of England, but that they are situated within a very few miles of the French coast.

The fronds are glabrous and fragile, few in number, usually only two or three; erect in habit, oblong-ovate in form, and bi-tripinnate; the pinnæ are alternate, and ovate-triangular in shape, the pinnules being also alternate, and cuneate at their base, three-lobed, their apices being bluntly bidentate.

Length of frond from three to eight inches. Colour a pale yellowish green.

Veins dichotomously branched. The fructification covers the whole of the under side of the frond. Sori linear and forked, being situated along the ultimate veinlets, eventually confluent. The spore-cases are abundant.

The stipes usually longer than the fronds, smooth and shining, and of a rich brown colour at the base; terminal and adherent.

Caudex minute and sub-globose, mostly annual, sometimes bi-annual.

Besides the ordinary fronds there are several small somewhat fan-shaped fronds, and others pinnate with fan-shaped pinnæ, the latter fronds only two inches in length; the lobes vary in being larger and more expanded, and in being mostly barren.

There are no varieties of this species.

GENUS IV.

POLYSTICHUM. SCHOTT.

THE Shield Ferns are a charming yet small family, having coriaceous rigid fronds, varying from single pinnate to bi-tripinnate fronds.

Sori circular, and protected by an indusium.

The name is derived from the Greek *polys*—many, and *stichos*—order.

There are three British species and a large number of varieties.



WATERBURY L. SCHOTT



Fig. 42.—Portion of mature Frond—upper side.

POLYSTICHUM LONCHITIS.

ROTH.

The Alpine Shield Fern, or Holly Fern.

PLATE XII.

| | |
|-------------------------------|-------------------------------|
| <i>Polystichum lonchitis,</i> | ROTH. SCHOTT. DEAKIN. |
| “ “ | NEWMAN. BABINGTON. MOORE. |
| <i>Aspidium lonchitis,</i> | SWARTZ. SCHUHR. SMITH. |
| “ “ | HOOKE AND ARNOTT. E. J. LOWE. |
| “ <i>asperum,</i> | GRAY. |
| <i>Polypodium lonchitis,</i> | LINNÆUS. BOLTON. SMITH. |

Polystichum—From the Greek, *polys*—many, and *stichos*—order.
Lonchitis—Spear-like.

THE present species is one but seldom seen growing wild by Fern cultivators, on account of its peculiarly local and mountain habitats, growing at an elevation of from one thousand two hundred to above three thousand feet. It must also rank amongst our rarer British Ferns.

Found only in the fissures of rocks near the summits of the highest and bleakest mountains of England, Scotland, Ireland, and Wales. It is a native of Lapland, Iceland, Sweden, Denmark, and Russia in the north, extending throughout Europe, being found in France, Italy, Spain, Switzerland, Germany, Hungary, and Greece. Found also in North America, Kamtschatka, Asia Minor, Kashmir, and on the Altai Mountains.

The mountain traveller occasionally meets with this plant, often in places difficult of access, and, even where accessible, frequently most difficult to be removed from its native wilds, and still more difficult to cultivate, when obtained under the most advantageous circumstances, as indeed are many other mountain plants. The difference of the pressure of the atmosphere between the sea level and several thousand feet above the sea, is alone an important matter of consideration, and one that cannot be overcome. We may imitate nature very closely in regard to soil, rocky situation, moisture, and temperature, but we cannot remove the extra pressure of the air upon the plant; and this sooner or later, I fear, is sufficient in most instances to destroy its vitality. It is seldom that a specimen is seen flourishing under cultivation.

As a British plant it is found on the mountains at Settle, Attermire Scar, and Ingleborough, Yorkshire; and on the Falcon Clints, Teesdale, in Durham. In Wales on the mountains above Llanberis, at Glyder-vawr, and on Snowdon, (below Crib-y-Destilh. In Scotland it is more spread, being a native of Sutherland, Ross, Inverness, Moray, Aberdeen, Forfar, Perth, Argyle, and Dumbarton, the chief stations being Ben More, in Sutherlandshire, Ben Lawers and Craig Chaliach, in Perthshire, the Clova Mountains, Glen Fiadh, and Craig Maid, in Forfarshire: it has been said also to be an inhabitant of the Orkney Islands. In Ireland this Fern differs considerably in its form: it is found on the Rosses and Thanet Passes, in the county of Donegal, on the Ben Bulben Mountains, in the county of Sligo, and on Brandon Hill, in the county of Kerry.

The bleak, cold, exposed situations in which *Polystichum lonchitis* grows proclaim this Fern to be the most hardy of the British species. Its fronds are exceedingly rigid, and well calculated to resist the blast of those exposed mountains on which it luxuriates. It is an evergreen species.

The fronds, which are linear-lanceolate in shape, are pinnate, the pinnae being numerous and crowded, briefly stalked or sessile, and lanceolate-falcate, acute, on the anterior base auricled, the posterior base being obliquely cuneate, the margins covered with spiny serratures.

The stipes mostly very short, varying from half an inch to three inches in length, and covered with a profusion of large, brown-coloured, chaffy scales, the rachis having numerous narrower scales. The caudex thick, scaly above; roots wiry and dark-coloured.

The length of frond is usually from six to eighteen inches, occasionally as much as twenty-four inches. Colour deep green above, paler beneath.

Veins consisting of a midvein, which extends to the apex of the frond, from which proceeds a vein up each pinna, which is forked and branching two, three, or four times, extending veinlets into each of the marginal teeth.

The fructification is mostly confined to the upper half of the frond; the sori being situated in a line on either side of the midvein, about midway between the midvein and the margin; circular. Indusium membranaceous, orbicular, and attached to the receptacles by a brief central stalk. Spore-cases globose and numerous; spores roundish and small.

Although there are only two varieties of this species described, still the Irish form is so distinct that it seems desirable to distinguish it from the English form, which I propose to do under the name of *Confertum*.

CONFERTUM, *Lowe*. (Fig. 43.)—The Irish form of *Polystichum lonchitis*, smaller in size, the pinnae more numerous, narrower, and more crowded together, overlapping each other. Pinnae usually opposite or sub-opposite below, and alternate above. In this form the auricle of the base is hid by the pinna immediately above overlapping it.

Mr. Wollaston has described two other varieties, namely:—*Multifidum*.—Having the apex divided.

Proliferum.—Producing small bulbils in the axils of the lowermost pinnae.

The variety *Multifidum* is not constant, and the variety *Proliferum* is of the normal form, it is therefore unnecessary to give illustrations of them.

It is useless to plant this Fern in an open or out-door Fernery, as it will only have a miserable existence. In a cool moist frame, if potted firmly in well-drained soil, it may sometimes be kept in health, if it can once be established. It is desirable, in collecting *Polystichum lonchitis*, to select only the smaller plants, and to take especial care not to injure the roots. Large plants it is perhaps impossible to remove successfully.

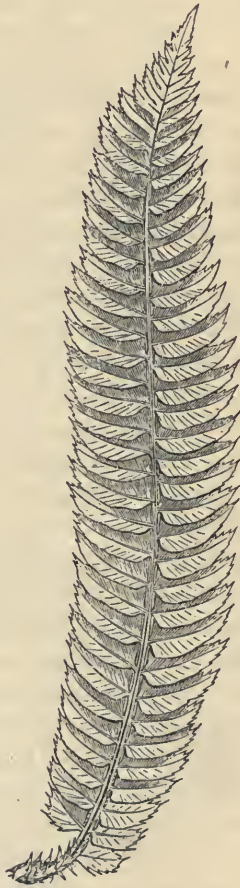


Fig. 43.



COLISTICHUM ANGULARE.



Fig. 41.—Pinna of mature Frond—under side.

POLYSTICHUM ANGULARE.

PRESL.

The Angular Shield Fern.

PLATES XIII, XIV, XV, XVI, XVII, XVIII, AND XIX.

| | |
|----------------------------------|---|
| <i>Polystichum angulare,</i> | PRESL. DEAKIN. SOWERBY. |
| “ “ | BABINGTON. MOORE. |
| “ <i>aculeatum,</i> | GRAY, ETC. |
| “ <i>affine,</i> | WOLLASTON. |
| “ <i>setiferum,</i> | MOORE. |
| <i>Aspidium angulare,</i> | KITAIBEL. SOWERBY. SMITH. |
| “ “ | WILLDENOW. E. J. LOWE. |
| “ “ | HOOKEE AND ARNOTT. |
| “ <i>aculeatum,</i> | KUNZE. |
| “ <i>lobatum, var. angulare,</i> | METENIUS. |
| “ <i>hastulatum,</i> | TENORE. |
| <i>Polypodium angulare,</i> | FRIES. |
| “ <i>aculeatum,</i> | HUDSON. |
| “ <i>setiferum,</i> | FORSKAL. |
| “ <i>appendiculatum,</i> | HOFFMANN. (<i>Not of</i> LINDEN or J. SMITH.) |
| <i>Hypopeltis lobulata,</i> | BORY. |

Polystichum—From the Greek *polys*—many, and *stichos*—order.
Angulare—An angle.

THIS widely distributed British species is a most lovely Fern. Rich dark green in colour, it contrasts well with the pale green of the *Polypodium dryopteris*; and retaining its fronds throughout the winter, it is necessarily a desirable species to be extensively cultivated in our Ferneries. Of late years many remarkable varieties have been found growing wild, or have been raised from spores; so that the forms put on in the fronds of one or other of the varieties are extensive, and many of them exceedingly beautiful. We have them large in size, or very dwarf, we have the broad-fronded, and narrow-fronded. The pinnules large, and more or less circular, and small and almost linear. We have the almost undivided pinnæ and pinnules, and those that are extensively and profoundly divided. There are varieties branching from the base, others from the apex, the apices of the fronds and of the pinnæ are multifid, or crested, others proliferous, in short there is a great departure from the normal form in many of the varieties. Some of the forms of *Polystichum angulare* approach *Polystichum aculeatum*, so as to make it difficult to state where *P. angulare* ends and *P. aculeatum* begins; the latter Fern differs very much from the former in one respect, being almost without variation in form, and singularly constant in its characters.

Mr. Wollaston, of Chisselhurst, has paid a considerable amount of attention to this Fern, and has a very fine collection of its varieties; and Mr. James, of Vauvert, and Mr. Monkman, of Malton, amongst amateurs; and Messrs. Sim, of Foot's Cray, and Messrs. Stansfield, of Todmorden, Nurserymen, have some fine varieties.

Nearly eighty years ago our Cryptogamic botanists were mindful of the few varieties of British Ferns that had then been discovered. James Bolton, of Halifax, in his "Filices Britannica,"—"An History of the British Proper Ferns," mentions on the title-page, "New Figures of all the Species and Varieties;" and in his "Introduction," written in August, 1785, he says, "For the satisfaction of those who desire further information, I have figured several varieties in Tab. 2," and he goes on to enumerate them, namely, "In *Ophioglossum vulgatum* there is a variety which produces several seed-spikes. In *Asplenium trichomanes* there is a variety having the leaves divided into several lobes, which are crenated on the extremities

in an elegant and beautiful manner. In very moist and rich situations the leaves of *Asplenium viride* sometimes become prolific, throwing out other leaves from their sides. There is a variety of *Asplenium marinum* wherein the lobes are divided and subdivided; this has been named *Adiantum trapeziforme*. The *Polypodium cambricum* is now known to be a variety of *Polypodium vulgare*. There is also another variety of the same plant, lately discovered by my esteemed friend Mr. Alexander, of Halifax, in a wood near Bingley. There is a tall slender variety of *Polypodium fragile* which has been taken notice of, and termed *Polypodium rheticum*. There is a variety of *Trichomanes Tunbrigense* which grows in little caverns under moist rocks, where the sun is excluded, and where the water, dripping from the points of the leaves, enlarges them greatly; in this state the plant has been taken notice of, and called *Trichomanes pyxidiferum*. The varieties of *Asplenium scolopendrium* are many and very well known. *Asplenium adiantum-nigrum*, *Polypodium aculeatum*, and some others are likewise subject to varieties."

Thus so early as 1785 we find botanists describing varieties of British Ferns. We also find Bolton urging the cultivation of British Ferns. He says, "Many of the Ferns might with great propriety be introduced into our botanic gardens; not merely with a view to increase the number of plants in these gardens, but also on account of the agreeable contrast they produce when interspersed amongst plants of all the other classes, of their own beautiful singularity, and of the great ease with which they are procured and preserved. In the hot-house or stove they become evergreens, and their beauty is greatly improved in respect to colour and delicacy. When planted in pots, and placed amongst other plants, their soft, feathery, silken clumps produce an effect which must be pleasing to every one."

Bolton does not recognise the present species, figuring only *P. lonchitis* and *P. aculeatum*, no doubt confusing *P. angulare* with the latter species, which indeed is so nearly allied to it that in some of the varieties there is as much similarity to *P. aculeatum* as to *P. angulare*.

This most interesting Fern has an extended though somewhat local range over England and Wales, being most plentiful in

the south and south-west. It is common in Cornwall, and somewhat abundant at Chaigeley, in Lancashire. Somersetshire, Devonshire, Hants, Surrey, Sussex, and Kent are also favoured counties. In Ireland it is also abundant, whilst in Scotland it is only recorded as occurring in Argyleshire and Berwickshire.

It is a native of Sweden, Norway, France, Spain, Italy, Greece, the Channel Islands, the coast of the Black Sea, India, Georgia, Abyssinia, Natal, Madeira, the Canary Islands, Azores, United States, Sitka, Mexico, Guatemala, Caraccas, Java, New Grenada, and Singapore.

In England this plant prefers lowland shady woods or hedge banks where the soil is moist. In 1860, I found it in Spain growing from two thousand to three thousand feet above the sea, on a mountain known as the Villia Escusa, between Reinosa and Allar. This mountain is one of the spurs of the Pyrenees, and near the summit rocks rise up in lines like streets, so much so that it is difficult to find the way amongst them; in shady parts where the ground sinks below the surrounding level from three to ten feet, and where these well-like holes are narrow and much confined the *Polystichum angulare* is found growing amongst other Ferns, serving as a shelter to the numerous wolves and foxes that have taken possession of these heights.

The "Angular Shield Fern," or, as it is sometimes called, "The Soft Prickly Shield Fern," for distinction from the "Common Prickly Shield Fern," is herbaceous and evergreen. The fronds are usually lax, lanceolate in form, and bipinnate. The pinnules are distinct and various in form, acute or nearly linear to obtuse or broad, having an obtuse-angled base, with a distinct stalk. The pinnules are either serrated or lobed, and having soft bristles at the apices of the serratures. The fronds are numerous, and placed round the caudex, they are spreading and arched, or drooping and bitripinnate. The pinnae numerous and varying in length, sometimes the basal ones are longest, but usually they taper towards the base and apex, being narrow linear-lanceolate in form. The pinnules ovate-falcate, having a bold anterior projecting flat lobe. Usually profoundly serrate, each serrature ending in a slender but rigid bristle. The basal anterior pinnule is frequently much larger than the rest. Profoundly pinnatifid, and occasionally even pinnate.

Veins furcately-branched and alternate, from a flexuous mid-

vein. Fructification on the under side of the frond, usually spread over the upper two thirds. Sori circular and diminutive. Sometimes confluent. Indusium orbicular and membranaceous. Spore cases numerous, and brown in colour.

The fronds from two to four feet in length, and brilliantly green.

There are many varieties of this lovely Fern, now to be described:—



Fig. 45.

ACUTUM, *Wollaston*. (Fig. 45.)—An interesting and distinct variety, in which the pinnules are much auricled, the shape being acute narrowish falcate, distinctly stalked. It has been found growing in Devonshire, Hampshire, and Sussex. My obligations are due to Mr. Wollaston, of Chisselhurst, and Messrs. Stansfield, of Todmorden, for fronds. This Fern approaches the normal form of *Polystichum aculeatum*.

BISERRATUM, *Moore*. (Fig. 46.)—An *Aculeatum*-looking Fern, mostly having an exceedingly lengthy stipes. It is of a lax habit. The outline of the pinnules nearly resemble those of the variety *Intermedium* of Wollaston. The pinnules are large and broad and inciso-serrate; all but the anterior lobe biserrate and aristate. A common form in Jersey. As its name implies,

it is *biserrate*. It has been found in Jersey by Mr. Jackson, and at Brentford by Mr. S. F. Gray. Fronds have been forwarded to me both from Mr. Sim, of Foot's Cray Nursery, Kent, and Mr. Stansfield, of Todmorden.

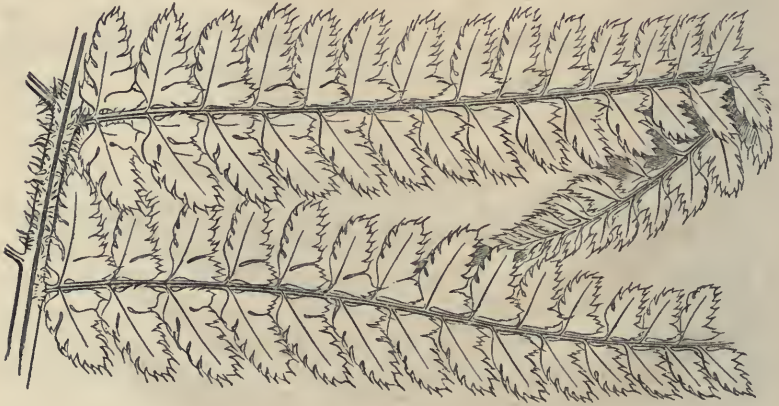


Fig. 46.

TRIPINNATUM, Moore. (Plate XIV.)—A most lovely variety, found accidentally in Cornwall, and brought into notice by myself, having been received as a seedling in a batch of the ordinary form from Mr. R. T. Millett, of Penzance. It is described in Mr. Moore's "Nature Printed Ferns," and figured in Table xiii, B, also in his "Handbook of British Ferns," page 90, and a coloured illustration given in my "Natural History of British and Exotic Ferns," (under the name of *Aspidium angulare*, var. *tripinnatum*,) plate XXIV, vol. vi, page 70. Although grown in my Fernery for the last ten years, it has never increased in size, and this plant I believe is the only one in existence. In a growing state there is one peculiarity, namely, the pinnæ lie nearly horizontally one above another, like so many steps of a ladder; and, being crowded together, when a frond is pressed flat for preservation as a dried specimen, the pinnæ overlap each other. It is exceedingly chaffy beneath, and a most distinct variety.

There is a variety in Messrs. Stansfield's collection bearing the same name, but very distinct from this form, and not nearly so handsome. The true form is stout and rigid, having



POLYSTICHUM ANGULARE.

Var. Tripinnatum.

XIV

crowded imbricated pinnules. Mr. Moore remarks that its chief peculiarity consists in the anterior basal pinnule being very much larger than the others, nearly twice as large as the rest, and in being distinctly pinnate nearly its whole length, the little pinnulets being stalked. It is profuse in the production of sori, and a marked aberration from the normal form. The colour is a vivid green. The rachis and stipes very scaly, and the habit peculiar, the fronds rising perpendicularly. The plant is unfortunately placed, as large fronds of the *Osmunda regalis* weep over it, and somewhat obstruct its growth and conceal it from view. This very beautiful variety has been called *Tripinnatum* in contrast with the *Subtripinnatum*, in consequence of its basal pinnules being much more distinctly pinnate, though the plant is on the whole less divided than the Devon form of the variety *Proliferum*, or the Irish variety *Decompositum*.

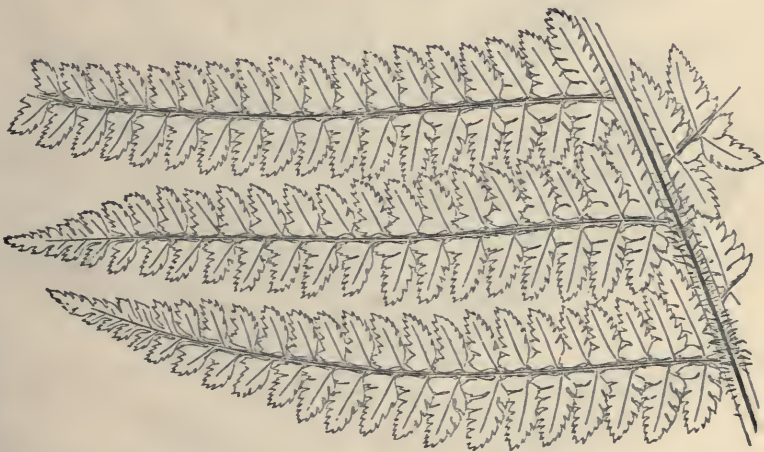


Fig. 47.

DECOMPOSITUM, *Wollaston*. (Fig. 47.)—This is a variety having a most compound or divided form. It is tripinnate, (having distinct pinnæ, pinnules, and pinnulets.) The pinnulets are lobed, and the lobes themselves serrated. The pinnæ resemble those of *Polystichum aculeatum*, but are diminutive in size. It resembles *Subtripinnatum*, but is more divided. It is

to be found in various degrees of development, and was found in Ireland by Mr. D. Moore. Fronds have been forwarded both by Mr. Sim, of Foot's Cray, and Stansfield, of Todmorden.

ARISTATUM, *Wollaston and Moore*. (Plate XV.)—Found in Sussex by Mr. G. B. Wollaston, and subsequently near Burnley, Lancashire, by Mr. Stansfield. A distinct and pretty Fern, of slender habit, and having the pinnæ less crowded than is usual with *Polystichum angulare*. Its chief distinction consists in the bristly points of the serratures being more developed than usual, and turning upwards, the long hair-like points giving the plant a bristly appearance. The stipes is also proliferous. The frond illustrated is from Mr. Wollaston's plant.

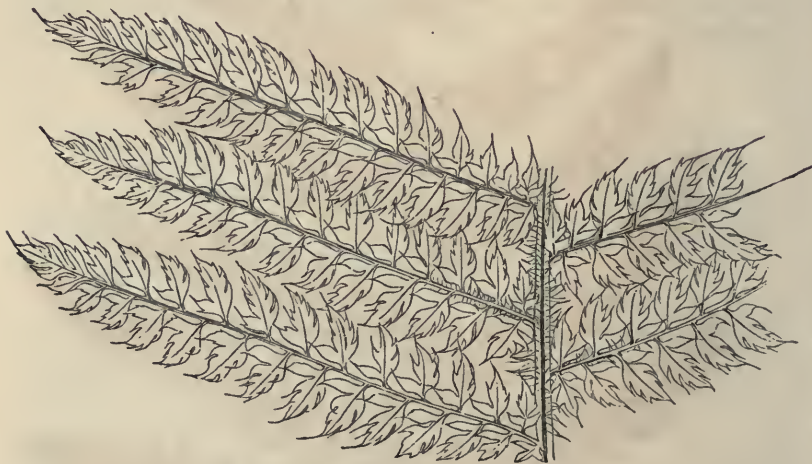


Fig. 48.

PROLIFERUM, *Moore*, (known in some gardens as *Polystichum angulare*, var. *angustatum*.) (Fig. 48.)—There are several forms of this very handsome Fern: one found at Wimbledon, by Mr. Choules; and another, a more elegant variety, near Ottery St. Mary, in Devonshire, by Mr. Wollaston: the latter is a sub-variety, known in gardens as *Polystichum angulare*, var. *Wollastoni*. It is of lax habit, and very graceful in its growth, having narrowed, attenuated, semi-depauperated (but not distorted) tripinnate pinnules, which are distantly lobed, profoundly



POLISTICHUM ANGULA L.

Val. Abstatum.



POLYSTICHUM ANGULARE.

Var. Cristatum.

XVI

divided, and conspicuously stalked; the segments are occasionally perfectly and widely divided, so as to form a tripinnate frond. The former variety is still more singular, having exceedingly narrow, acute pinnules.

Both these varieties are viviparous in the axils of the lower pinnæ, and occasionally in the axils of the pinnules, and from this cause very easily propagated, and become widely spread in collections. Both varieties are more distinctly stalked than in the normal forms of *Polystichum angulare*. I am indebted to Messrs. Veitch, of the Exotic Nurseries, Chelsea, and to Mr. Monkman, of Malton, and Mr. Stansfield, of Todmorden, for plants of this variety.

CRISTATUM, Moore. (Plate XVI.)—An exceedingly beautiful Fern, resembling in its general features the lovely crested varieties of *Lastrea filix-mas* and *Athyrium filix-femina*. It was first discovered near Bristol by Mr. Hillman, a working collector of Ferns, who travels throughout the British Isles in pursuit of Ferns, walking from place to place, with a huge basket slung on his back. Mr. Hillman disposed of his plant to Messrs. Garaway, Mayes, and Co. Subsequently it has been found in Devonshire by the Rev. T. M. Chanter, and by Mr. Wollaston; and again in Somersetshire by Mr. Elworthy. The latter gentleman found two varieties, both well-developed forms, one of which is now in the possession of Mr. Veitch, of Chelsea. It has been found in various degrees of development. In general outline it closely resembles the normal form, but the apex of the frond, and the apices of the pinnæ branch out into multifold curly tufts, those of the pinnæ being much less developed than those of the frond. My thanks are due to Mr. Monkman, of Malton, for plants; and to Messrs. Sim, of Foot's Cray, Stansfield, of Todmorden, and Mr. Wollaston, of Chisselhurst, for fronds.

DISSIMILE, Moore. (Fig. 49.)—A singular Fern, found in Kent by Mrs. Delves. It in some degree resembles the variety *Intermedium* in the more perfect parts of the fronds, it is, however, constantly here and there more or less depauperated, and where depauperated, the pinnæ become irregularly deformed, truncated, suppressed or pinnuloid, whilst the pinnules are also

exceedingly irregular both in size and form. The fronds are proliferous, profusely scaly throughout, and the serratures very conspicuously bristle-pointed. Fronds have been sent to me by Mr. C. Monkman, of Malton, and Mr. Sim, of Foot's Cray.



Fig. 49.

TRUNCATUM, *Lowe*. (Plate XVII.—A.)—A remarkable and distinct variety, originally found in Ireland, but has since been raised from spores in various ferneries. Its distinguishing features are the truncated form of the fronds and pinnæ. The frond terminates abruptly. The pinnæ are short, with from three to four pairs of pinnules, terminating with a fan-shaped pinnule, the remainder of the pinnules being palmately lobed and deeply toothed. Veins ramose; venules simple or furcate. Sori sub-medial, almost marginal. Length of frond from nine to eighteen inches, breadth from two or three inches. Colour deep green



P. ANGULARE,
var. *dissectum*.

P. ANGULARE,
var. *umbrosum*.

above, much paler beneath. Stipes very scaly. The coriaceous texture of the fronds, and their abrupt termination, as well as those of the pinnæ, and the palmately lobed pinnules, render this highly interesting Fern very distinct. The fronds were forwarded by Messrs. Stansfield, of Todmorden.

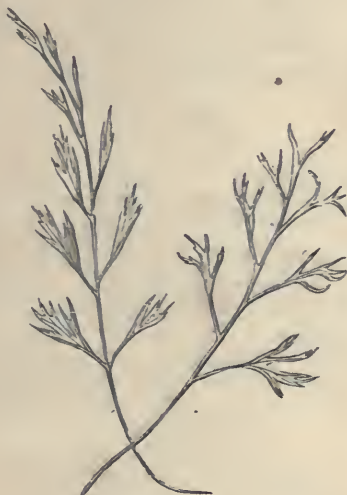


Fig. 50.

DEPAUPERATUM, *Moore*. (Fig. 50.)—A dwarf proliferous Fern, found in Ireland, by Dr. Kinahan. The fronds are depauperated so as frequently to resemble mere skeletons, little else than the ribs remaining, and even these irregularly developed. Some fronds are less affected than others, and in these the pinnules are cuneate at the base, and above are serrated with lengthy subulate teeth. My thanks are due to Mr. Sim, of Foot's Cray, for fronds.

IMBRICATUM, *Moore*. (Plate XVII.—B.)—A most interesting and graceful variety, found in Somersetshire by Mr. Elworthy. In habit resembling *Polystichum aculeatum*, var. *lobatum*. The fronds are narrow, and twenty-four inches in length, and linear-lanceolate in form; the pinnæ being blunt, short, and linear-oblong. The pinnules crowded, blunt, rounded-oblong in shape, imbricated, and not much narrowed at the apex. Spi-

nulose-serrated; the anterior base sub-auricled; the basal anterior pinnule much larger, and all the pinnules united with the rachis by a brief, almost-winged petiole. The stipes and basal portion of the rachis proliferous, a bulbil being found on the larger fronds beneath the soil, so that each large frond is accompanied by a small one. Remarkable for its narrow imbricated fronds. Mr. Wollaston, of Chiselhurst, Mr. Sim, of Foot's Cray, Mr. C. Monkman, of Malton, and Messrs. Stansfield, of Todmorden, have each forwarded excellent fronds.



Fig. 51.

ACULEATOIDES, *Wollaston*. (Fig. 51.)—This variety of *Polystichum angulare* closely resembles the *Polystichum aculeatum* in some respects, and may be regarded as a variety that connects more or less the two species. It was found in Devonshire, in the year 1860, by Mr. G. B. Wollaston, of Chiselhurst. This *aculeatum*-looking Fern has lanceolate and somewhat acuminate fronds. The pinnules decurrent, set on the pinnæ with a broad footstalk, as in the species *Polystichum aculeatum*. The frond illustrated was procured from Mr. Wollaston.



Fig. 52.

GRANDIDENS, *Moore*. (Fig. 52.)—The present very interesting and distinct variety was found in Devonshire by Mr. R. Penwell, and brought under notice by Mr. Hodges, of Cheltenham. This is another of those dwarfish forms of *Polystichum angulare*, having narrow lanceolate fronds. In a species so subject to variety as the present *Polystichum*, there are varieties which run into each other and mingle their several peculiarities, in a manner that makes it difficult to determine to which these varieties should belong: these of course are not distinct enough to warrant being figured and described. Sub-varieties of certain forms are numerous, as, for instance, those of the variety *Cristatum*; and, although there is occasionally a marked difference between them, nevertheless there is not sufficient distinction, and therefore they are passed over with merely a remark. Another class of varieties are also discarded.

I allude to the non-permanent varieties—those that depart from the ordinary normal form, and at length return again to it; these also are very numerous. Some varieties only assume their distinctive character when growing wild, under cultivation returning to the normal form; whilst others, after being removed, return to the normal form until perfectly established in their new situations, and then again shew their true character. There are, therefore, great difficulties to contend with in describing the varieties of any species, difficulties, indeed, that are almost insurmountable. The fronds are from twelve to twenty-four inches in length, and in most instances terminate abruptly. The pinnae are of various lengths, and generally abrupt. The pinnules small, obliquely-cuneate, and conspicuously and deeply inciso-dentate. The terminal pinnule of the lower pinnae is cuneato-flabellate and uniform in size with the rest, those of the upper pinnae are confluent upwards. I have received fronds from Mr. Sim, of Foot's Cray, and Mr. Stansfield, of Todmorden.

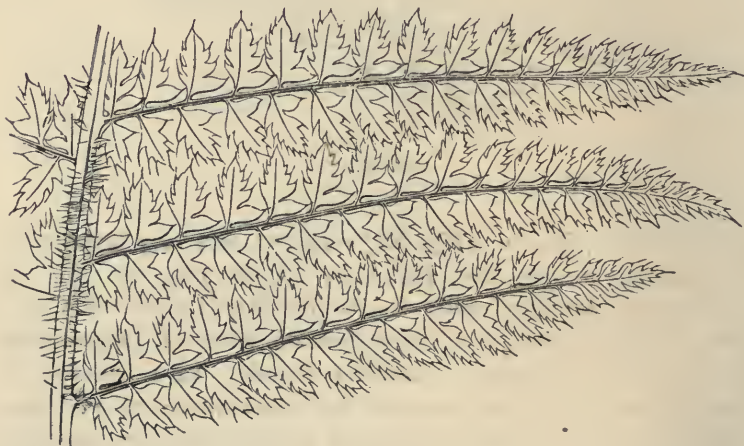


Fig. 53.

DUBIUM, *Wollaston*. (Fig. 53.)—A very large-growing variety, gathered by Mr. J. Stansfield near Preston, Lancashire. The fronds, which exceed three feet in length, are ovate-lanceolate in form, the pinnae closely set; the pinnules stipitate and auricled, except towards the termination of the frond,

where they become ovate and decurrent, as in *Polystichum aculeatum*. The texture is thick and coriaceous, like *P. aculeatum*. This charming Fern would appear to be the intermediate link between the two species, *P. angulare* and *P. aculeatum*. The illustration is from a plant in the possession of Messrs. Stansfield, of Todmorden.



Fig. 54.

OBTUSUM, Moore. (Fig. 54.)—An exceedingly handsome Fern, found in Devonshire, by Mr. Charles Jackson, of Barnstaple. The fronds are linear-ovate and subtripinnate. The pinnæ, which are obtuse, are somewhat imbricate towards the tips. The pinnules subrotund, profoundly serrate or biserrate. Stipes and rachis scaly, the scales narrower, and brown in colour. Sori copious, covering the upper two thirds of the frond. Length of frond twenty inches, width three inches. The frond illustrated was forwarded by Mr. G. B. Wollaston, of Chiselhurst.

HASTULATUM, Moore.—Found near St. Martha's Hill, Surrey, and in Devonshire. It is of the normal form, and scarcely deserving the name of a variety. Its chief features are the

small size of the acute pinnules, and their distinct and slender footstalk; the auricle is distinct, acute, and in the lower pinnules is separated by a deep incision from the rest of the pinnule. Mr. Moore remarks that it is "quite like the Italian *Hastulatum* of Tenore, as figured in the 'Flora Napolitana.'" It is unnecessary to give a woodcut of this variety.

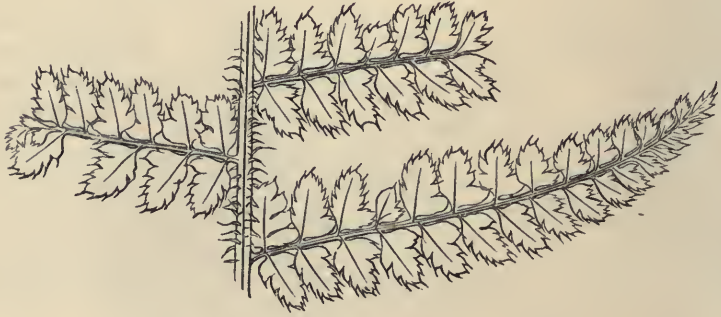


Fig. 55.—Irish form.

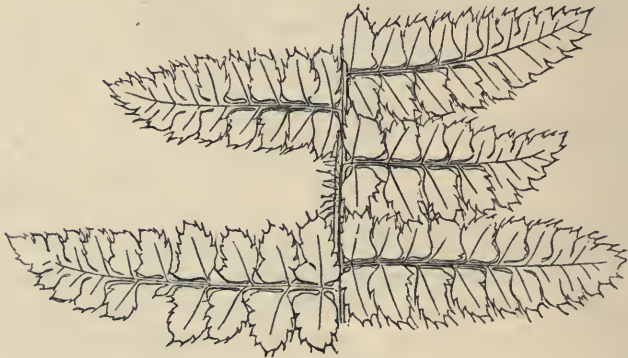


Fig. 56.—Devon form.

PRÆMORSUM, *Allchin*. (Figs. 55, 56.)—Found in Ireland, in 1853, by Dr. Allchin, and subsequently in Devonshire and Hampshire, by Mr. G. B. Wollaston. It is a dwarf-growing form, with irregular lacinate pinnæ; the pinnules truncate, marginate, and verrucose. The Hampshire form of this Fern more closely resembles the Irish form, but is narrower. Length of frond eighteen inches, width four inches and a half. The

Devonshire form is very handsome, more attenuated and narrow, and the pinnæ and pinnules more crowded. Sori apparently confined more to the apex of the frond. Length of frond fourteen inches, breadth three inches and a half. Rachis and stipes scaly.



Fig. 57.—Apex of frond.

MULTIFIDUM, *Wollaston*, (*Claphamii* of Moore.) (Fig. 57.)
This form, having been previously named by Mr. Wollaston,

takes the name of *Multifidum* in preference to that of *Claphamii*. Mr. Wollaston's name is a very appropriate one. Mr. Moore looks upon it as in all probability more as an occasional variation than as a permanent variety. Its distinctive feature is in having the apex of the frond beautifully tufted, and the pinnae sometimes divided. The frond for illustration was forwarded by Mr. G. B. Wollaston.



Fig. 58.—Apex of frond and lower pinnae.

RAMULOSUM, *Stansfield, MS.* (Fig. 58.)—This variety was gathered near Belfast, in the autumn of 1861, by Mr. J. Stansfield. The fronds are ovate-lanceolate, terminating in a

branched crest which generally turns backwards. The pinnæ terminating somewhat bluntly, and the pinnules and their auricles ending in sharp projecting points. Length of frond from two to three feet, breadth of frond about nine inches. The frond illustrated was from the collection of Messrs. Stansfield, Vale Gardens, Todmorden.

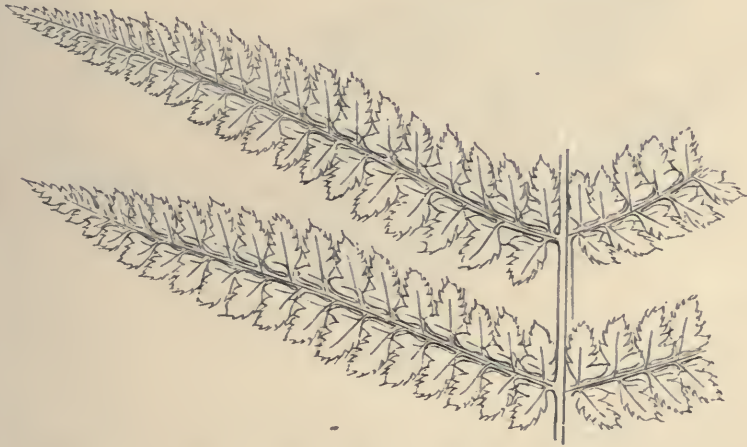


Fig. 59.

INTERMEDIUM, *Wollaston*. (Fig. 59.)—Found near St. Mary's Cray, in Kent, by Mr. R. Sim, of Foot's Cray Nursery. Slightly different forms found in Sussex and Wales. This is a robust, fleshy-looking, and rigid variety, closely resembling *Polystichum aculeatum*, especially in its thick and leathery texture. An upright-growing variety. The fronds, which are from twelve to twenty-four inches in length, and often abrupt at the apex, (in which case they have a tendency to produce bulbils,) are linear-lanceolate in form, the pinnæ narrow, and the pinnules short, crowded together, over-lapping each other, subtrapeziform, stipitate, strongly auricled, and profoundly inciso-serrate, the segments being biserrate, and more aristate than usual, and the basal anterior lobe considerably enlarged. The upper half of the frond fertile, and crowded with spore-cases. In the lower half of the frond the pinnæ are opposite, and in the upper

half alternate. Pinnæ somewhat distant. The illustration is from Messrs. Stansfield, of Todmorden. Not a common variety. The fronds are occasionally multifid.

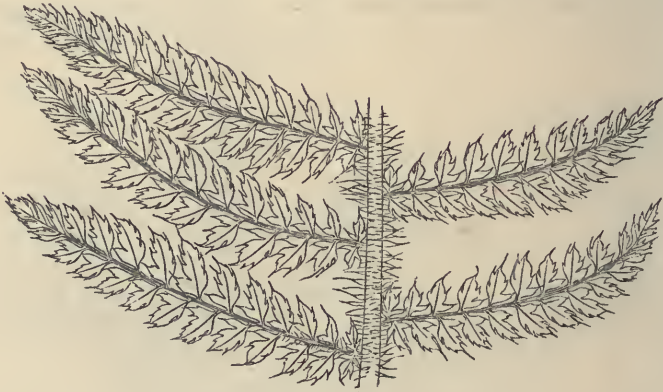


Fig. 60.

TENUÉ, *Clapham*. (Fig. 60.)—This variety I believe was raised from spores by Mr. A. Clapham, of Scarborough. A delightful form; not so abundantly proliferous as *Proliferum*, but being the connecting link between that form and *Proliferum-Wollastonii*, much resembling, when well in character, the latter form. It has a spreading lax habit, and although circulated in bulbils by Mr. Clapham, and by Mr. C. Monkman, it is by no means common in collections. Vivid green slender fronds, about fourteen inches long, and three inches and a quarter wide. Pinnæ equal in length, except close to the apex of the frond. Rachis and stipes exceedingly chaffy; scales very pale, except near the base. Scales also on the rachides. My thanks are due to Mr. C. Monkman, of Malton, for fronds.

CRISTULATUM, *Stansfield, MS.* (Fig. 61.)—Gathered by Mr. Stansfield, near Stainland, in Yorkshire, in the autumn of 1861. The fronds are from two to three feet in length, and from nine to twelve inches in breadth. Generally terminating in tufts or crests. The pinnæ are also occasionally crested.





POLETICUM ANGULARE

Tab. Filice. — Sex of frond.

The texture thin and paper-like. The pinnules rounded and slightly auricled, and margined with short teeth. Like most

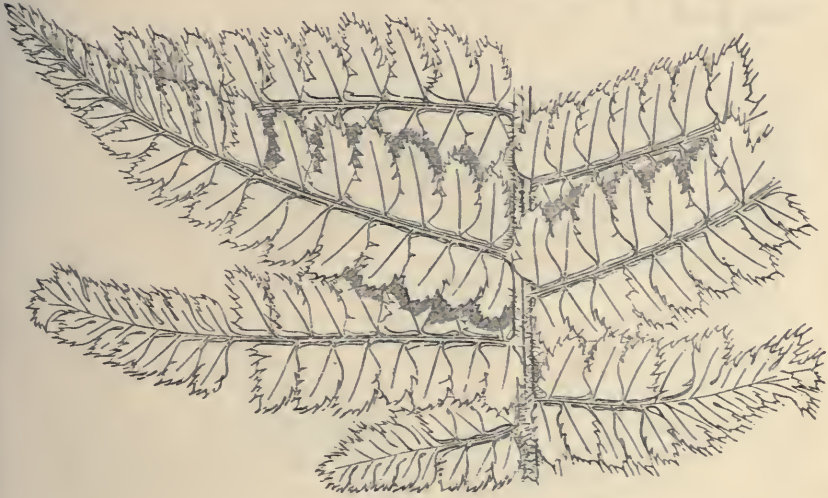


Fig. 61.

of the multifid forms of *Polystichum angulare*, in cultivation this variety generally produces cristulæ. I am indebted to Mr. Stansfield for fronds.

LINEARE, *Moore and Clapham*, (*Confluens*, Moore, and *Supralineatum*, Wollaston.) (Plate XVIII.)—Found in Jersey, by Mr. James, of Vauvert, and in Ireland, by Mr. S. Foot. *Confluens*, the Irish plant, seems to be more dwarf than that found in the Channel Islands. The latter has fronds from two to three feet in length. The form of the frond is ovate-acuminate. The pinnæ narrow, interrupted, and alternate; they are symmetrically changed, the upper ones to a linear-falcate outline, profoundly serrate, and having a very large auricle. The pinnules much depauperated, opposite, or sub-opposite, and entirely confluent; the lower more divided, with irregular, cuneate, sub-auriculate, aristate pinnules.

In the Jersey Fern the pinnules are very much contracted. Rachis and stipes very scaly. The apex of the frond quite

linear. The sori are situated on the edge of the frond, being seen from above, and partly suprasoriferous. Fronds have been forwarded by Mr. James, of Vauvert, and Mr. Sim, of Foot's Cray. The colour of the frond is a beautiful vivid grass green.



Fig 62.

LACINIATUM, *Wollaston*. (Fig. 62.)—Mr. Wollaston looks upon this variety as the same as *Interruptum*, with a different normal form. Some authorities consider it distinct. It is a

very singular Fern, with large fronds that are six inches wide in some parts, and scarcely an inch in others. I am indebted to Mr. Stansfield, of Todmorden, for illustrations.

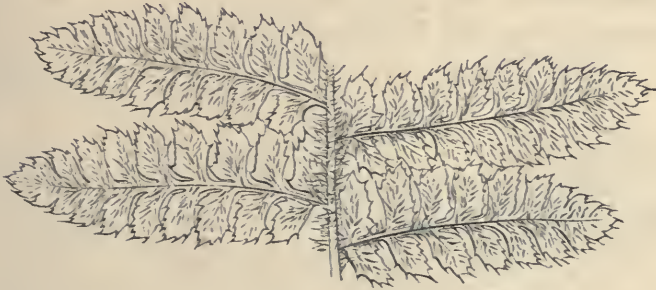


Fig. 63.

BRAUNII. (Fig. 63.)—This is not a British variety, having been found in France. Fronds about a foot or more in length, and of a heavy green colour. Pinnæ close, touching each other, and having their apices blunt. Pinnules broad, and each ending in a sharp tooth. Sori situated near the apex of the frond only. Exceedingly hairy all over the frond, both on the upper and lower surface. My thanks are due to Mr. James, of Vauvert, in Guernsey, for fronds.

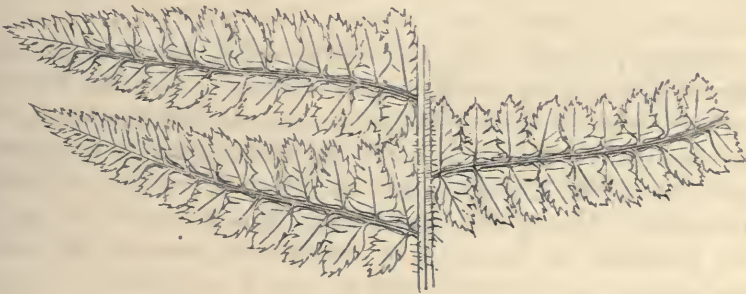


Fig. 64.

VARIEGATO-CRISPATUM, *Wollaston*. (Fig. 64.)—Found in the Isle of Wight, in the year 1859, by Mr. G. B. Wollaston, of

Chiselhurst. The fronds are ovate, the pinnae undulate, and the pinnules crisped. The pinnae are thick and narrow. Sori occupying the upper half of the frond. Length from twelve to eighteen inches. The whole plant is beautifully variegated with cream-colour during the early part of the season. The illustration is from Mr. Wollaston's plant.

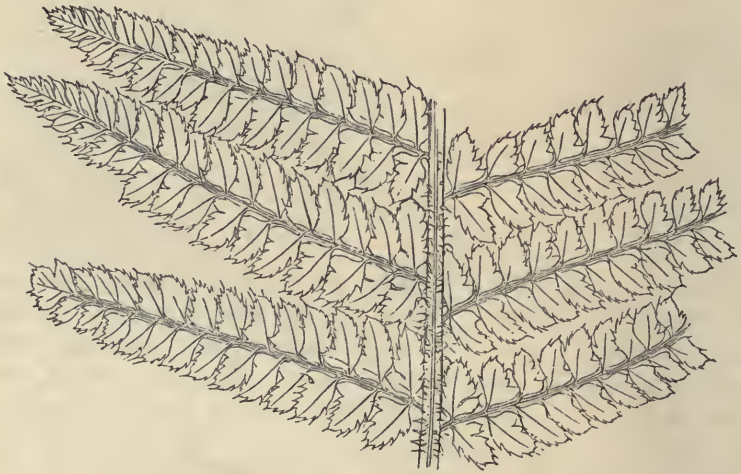


Fig. 65.

DENSUM, Moore. (Fig. 65).—This variety was described by Mr. Moore, from a young plant found at Abbury, in Surrey, by Mr. Morse. It has since been found at Barnstaple, in Devonshire, by Mr. C. Jackson; at Nettlecombe, in Somersetshire, by Mr. C. Elworthy; and at Weston-super-Mare, by Mr. H. Parker. The fronds that I have seen do not come up to the characters as described by Mr. Moore; whether the plant has altered on becoming more mature I am unable to say; however it seems desirable not to pass the variety over. Mr. Moore, in his description, says that it is sub-erect in habit, that the rachides and veins are densely clothed with hair-scales. The fronds bipinnate, oblong-lanceolate in form, the pinnae unequal in length. The pinnules small and crowded, oblique

oblong, having a large, distinctly separated, obovate, auriculi-form lobe, the rest of the margin lobato-serrate, with aristate teeth. For fronds I am indebted to Mr. R. Sim, of Foot's Cray.

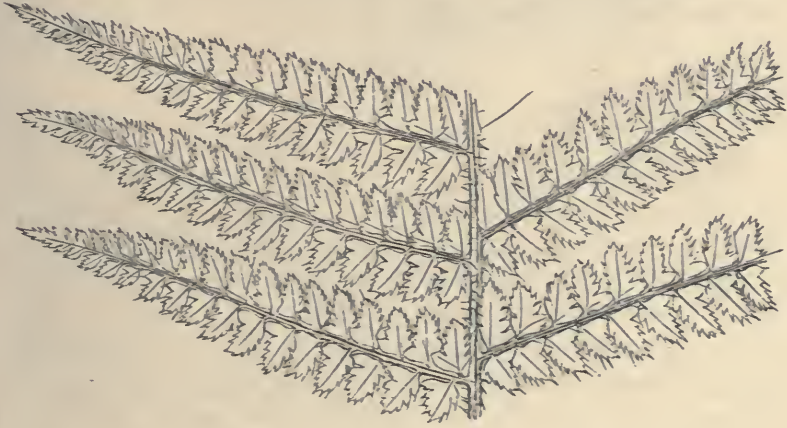


Fig. 66.

QUADRATUM, Moore. (Fig. 66.)—This variety, described by Mr. Moore in his octavo edition of "Nature-printed British Ferns," can scarcely rank as a variety, being of the normal form, simply varying in the outline of the little trapeziform pinnules; but this approach to squareness is more or less seen in many forms. It is a neat-looking Fern, the pinnules small, and sharply yet simply toothed. It has been found in Devonshire by Mr. Wollaston, in Somersetshire by Mr. C. Elworthy; near Uckfield, Sussex, by Mr. J. H. Sclater; at Marwood, Devonshire, by the Rev. F. Mules; also in Yorkshire and Antrim. The fronds are about twelve inches in length.

STENOPHYLLUM, Moore.—Found in Devonshire by Mr. G. B. Wollaston, of Chiselhurst, and near Halifax, by Mr. Stansfield, of Todmorden. A description will suffice for this form. It closely resembles the variety *Angustifrons*, it is somewhat larger in size, and is two inches in width in the widest

part, being attenuated towards the apex. Length of frond from twelve to twenty-four inches. Acuminate in form, pinnæ narrow. Like *Angustifrons* it is bipinnate. Pinnæ sub-opposite below, alternate above. Stipes and midrib very scaly and hairy. The lower pinnules are however distant, and the basal pair alone are stalked and auricled. My thanks are due to Mr. Stansfield, of Todmorden, for examples.



Fig. 67.

DECURRENS, *Moore*. (Fig. 67.)—Found at Nettlecombe, in Somersetshire, by Mr. Elworthy. A distinct and very handsome form, having ovate or lanceolate fronds, occasionally multifid at the apex, and stout in texture. Bipinnate. The upper pinnæ are more or less contracted, altered in shape, and are fertile, the lower ones being sterile, and more normal in form. The pinnules of the upper pinnæ are decurrent, smaller than those of the lower pinnæ, more distinct, usually having the auricle developed, but the rest of the pinnule considerably reduced in size. The pinnules of both the upper and lower pinnæ are distant; those of the latter are oblong-acute, having a large anterior auricle, and being cuneate at the base, and nearly all decurrent with the rachis, yet in a less degree to those of the upper pinnæ. Profoundly, yet somewhat remotely lobato-serrate, with spiny serratures. My thanks are due to Mr. G. B. Wollaston, of Chiselhurst, for fronds.



Fig. 68.

ROTUNDATUM, *Moore*. (Fig. 68.)—A most distinct, small-fronded, and remarkable Fern, found near Nettlecombe, in Somersetshire, by Mr. Elworthy, in the year 1858 or 1859. The fronds, which are narrow-lanceolate, have brief pinnæ that terminate in a blunt confluent lobe. The pinnules approach a circular form, frequently almost round, quite obtuse, the margins being scarcely crenate, and not at all setaceous or spinulose. When more developed the pinnules are somewhat roundish trapeziform, and indistinctly three or four-lobed. I am indebted to the Rev. Charles Padley, of Bulwell Hall, for excellent examples of this variety.

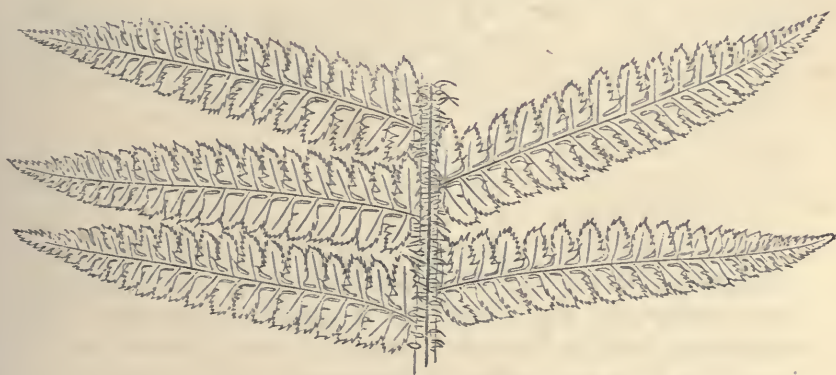


Fig. 69.

PTEROPHORUM, *Moore*. (Fig. 69.)—Found by Mr. G. B. Wollaston, near Ottery St. Mary, in Devonshire. This variety

more nearly approaches *Alatum* than any other form, having the secondary rachides winged, and the pinnules consequently united. It is, however, a less scaly plant, has the pinnules less lobed, the serratures appressed, and the auricle is all but wanting. The fronds, which are narrow and long, become narrow towards both base and apex. The length of frond is about twenty-four inches, and the width in the widest part three and a half. Stem scaly, pinnules crowded. A very handsome Fern, the upper half fertile, fructification most copious. I am indebted to the Rev. C. Padley, of Bulwell Hall, for fronds.

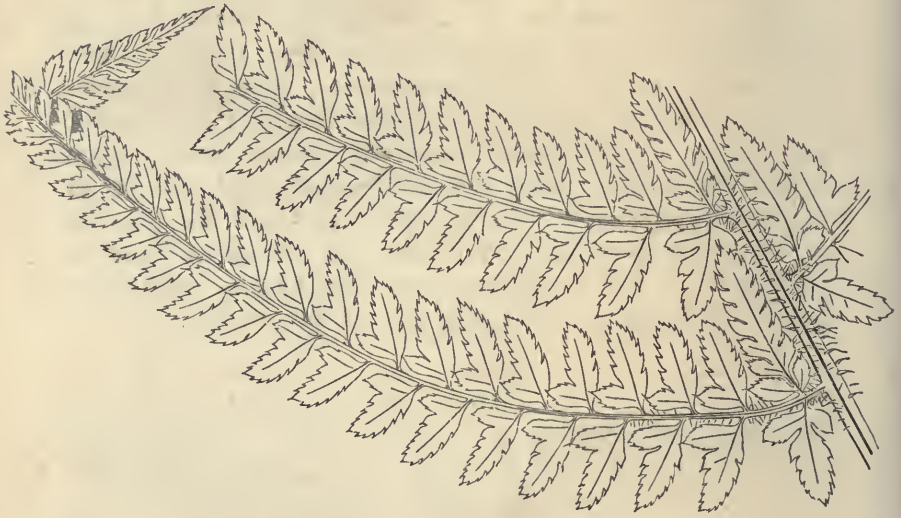


Fig. 70.

LATIPES, *Moore*. (Fig. 70.)—Found at Nettlecombe, in Somersetshire, by Mr. Elworthy. A plant of large size, and exceedingly broad at the base, measuring more than ten inches across. It is nearly allied to *Biserratum*, but differing considerably in the basal pinnæ being exceedingly large. The pinnules are also more elongated and acute, and more profoundly lobed. To Mr. R. Sim, of Foot's Cray, and to the Rev. Charles Padley, of Bulwell Hall, I am indebted for examples.

STIPATUM, *Wollaston*.—A dense-pinnuled form of *Densum*, (Moore.) Found by Mr. A. Tait. Quite lanceolate, tapering both below and above, pinnæ brief and overlapping each other, pinnules ovate, acute, auricled and serrate on their margins, decurrent except the basal one, which is briefly stalked. The pinnules are crowded together so as to overlap each other. Mr. G. B. Wollaston informs me that the plant is nearly dead.



Fig. 71.

GRACILE, *Wollaston*. (Fig. 71.)—Found in Devonshire by Mr. Wollaston. A most graceful, much cut, distinct variety, more nearly resembling *Lineare* than any other form, yet being sufficiently distinct from that variety. The fronds are bipinnate, the form being ovate, attenuate at the apex. The habit lax. Pinnules small, narrow, oblong-acute, and distinct, scarcely auricled, the margin inciso-serrate, irregular in form, many linear with a cuneate base. Those on the upper pinnae are very acute, and bear on each three or four distinct sori. The entire upper pinnae and the apices of the basal ones are confluent and lobate-serrate. The apex of the frond is lengthened and slender, becoming caudate. Base of frond very scaly. My thanks are due to Mr. G. B. Wollaston, of Chiselhurst, for fronds.

A variety of this form under the name of *Gracile*, (No. 2.) has been sent to me by Messrs. Stansfield, of Todmorden.

ATHYRIOIDES, *Wollaston*.—Found at Barnstaple by Mr. C. Jackson. A slender-divided variety, placed provisionally by

Mr. Moore as a form of *Decompositum*. The pinnules are almost linear, profoundly lobed, and having a distinct anterior auricle. The basal pinnæ are the largest, and on these the pinnules on the posterior side are considerably larger and more divided than is the case with those on the anterior side. It is unnecessary to figure this variety.

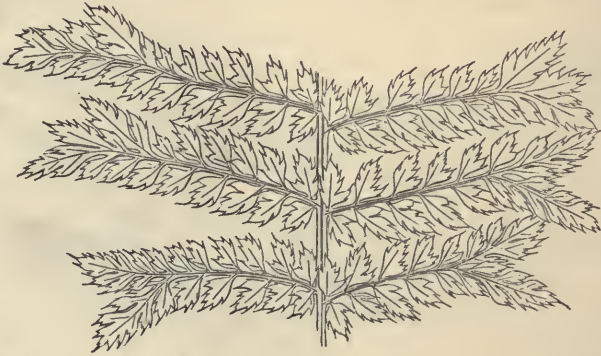


Fig. 72.

CORYMBIFERUM, Moore. (Fig. 72.)—Found at Whitby, in Yorkshire, by Mr. Willison. A handsome and constant variety, less marked in its peculiarities than *Kitsoniæ*, yet having the same general character. It is corymbosely branched at the apices of the fronds, but less compoundly so than in *Kitsoniæ*. The lower portion of the frond is almost normal, the pinnules being small. My thanks are due to Mr. G. B. Wollaston, of Chiselhurst, for illustrations.

FURCATUM, Moore.—Found at Gittisham, near Ottery St. Mary, Devonshire, by Mr. G. B. Wollaston; at Barnstaple, in the same county, by Mr. H. F. Dempster; and at Nettlecombe, in Somersetshire, by Mr. C. Elworthy. A dwarf interesting form. The fronds are nearly normal, the distinction consisting in the apex of the frond, or the apices of the pinnæ, or of both, being forked once or twice beyond the usual acuminate or attenuated portion; the lobes in these portions are brief and short, and are confined to the extreme tip. No illustration is needed, as a description will suffice.



Fig. 73.

ELEGANS, *Wollaston*. (Fig. 73.)—Found near Worthing, in Sussex, by Mr. G. B. Wollaston, of Chiselhurst, and also in Ireland, by Mr. Swynfen Jervis, of Darlaston Hall, Staffordshire. This interesting dwarf variety is remarkable for its distinct acuminate teeth. The basal anterior pinnules are considerably the largest, and almost pinnate. In some fronds the pinnules are more or less cuneate, and their lobes separated by acute open sinuses, giving the frond a biserrated appearance. This, added to the prominent and large spiny teeth, makes the form distinct.



Fig. 74.—Middle pinna.

PALEACEUM, *Stansfield*. (Fig. 74.)—Found in the autumn of 1861, near Belfast, by Mr. T. Stansfield, of Todmorden, and up to the present time has retained its distinctive character. The fronds, which are from twelve to twenty-four inches in

length, and from four to six inches broad, are very handsome. The pinnæ are narrow, the pinnules crowded, short and auricled, and deeply serrate. The stipes, rachis, and secondary rachides are thickly clad with narrow reddish brown scales, intermixed with rufous hairs.

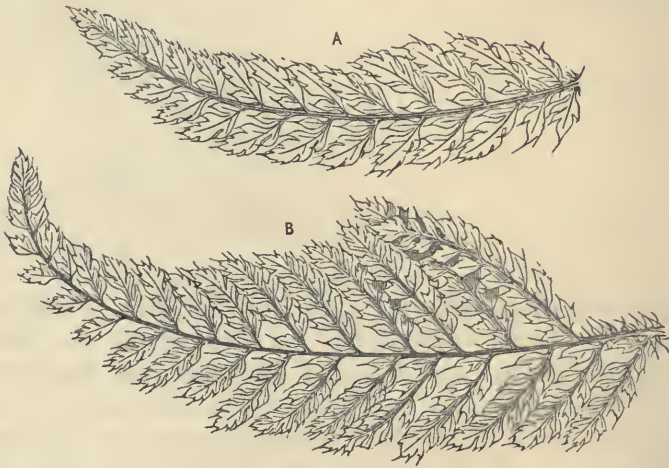


Fig. 75.—A. Middle pinna. B. Basal pinna.

PROLIFERUM FOOTII, Moore. (Fig. 75.)—Discovered in the county of Clare, by Mr. F. J. Foot, and introduced to notice by Dr. Kinahan. This variety, which is closely allied to *Proliferum*, is exceedingly handsome. It differs, however, in having the segments more crowded, and the apices of the pinnules less attenuated. This large form has broad fronds. It is abundantly proliferous on the main rachis. The fronds are from twelve to twenty-four inches in length; deltoid lanceolate. Two or three of the basal pairs of pinnæ are much the largest, and deltoid in shape; the upper pinnæ strap-shaped. Pinnules somewhat distant, narrow falcate. The rachis and secondary rachides thickly covered with brown scales. A very singular-looking Fern. I am indebted to Messrs. Stansfield, of Todmorden, and to Mr. Swynfen Jervis, of Darlaston Hall, for fronds.



Fig. 76.—Small Frond.

VARIANS, *Wollaston*. (Fig. 76.)—Introduced by Mr. G. B. Wollaston, of Chiselhurst. The fronds, which are from twelve to twenty-four inches in length, are pyramidal in outline. The pinnæ approximate, opposite below, alternate above, variously interrupted, mostly short and obtuse, and frequently furcate; sometimes wanting; extremely irregular in its development. Colour a lovely grassy green. Very scaly. Pinnules varying, sometimes ten pairs, and perchance the next pinna with only one pair, or even merely the ultimate pinnule. My thanks are due to Mr. Wollaston for fronds.



Fig. 77.—A. Middle pinna. B. Lowest pinna. C. Apex of frond.

BRACHIATUM, *Moore*. (Fig. 77.)—Found in 1860, in Devonshire, by Mr. C. Hillman, a collector of Ferns. The fronds, which are from twelve to twenty-four inches in length, are pyramidal in form, being much the broadest at the base. The lowest pair of pinnae are sometimes so large as to take the appearance of branches. The sterile pinnules are obtuse, with an obtuse auricle, which is profoundly and acutely serrated. The fertile pinnules vary from ovate to trapeziform. The anterior basal pinnules are double the size of the others, and sometimes doubly auricled. My thanks are due to Messrs. Stansfield, of Todmorden, for fronds.



Fig. 78.

SUBTRIPINNATUM, Moore. (Fig. 78.)—A common form, both in Ireland and England, scarcely deserving the name of a variety, resembling, as it does, the normal form, its only difference being in its highly-developed fronds. The lower pinnules, and the basal ones in particular, are so profoundly pinnatifid that the segments become almost distinct, and indeed sometimes quite distinct. It grows in damp shady situations, and attains a large size. I am indebted to Mr. Stansfield, of Todmorden, for fronds.

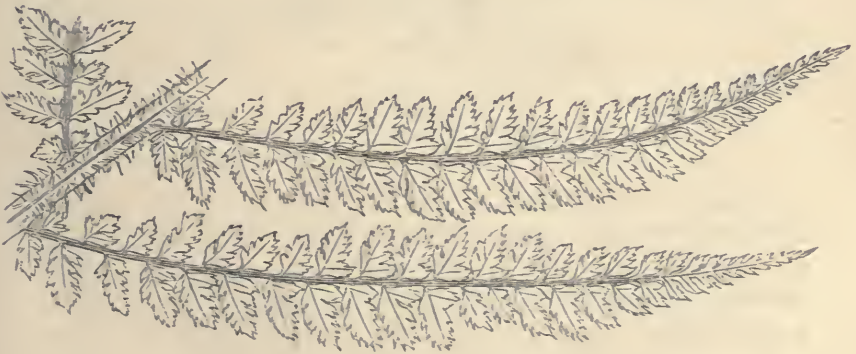


Fig. 79.

INCISUM, Wollaston. (Fig. 79.)—Found at Littlehampton, in Sussex, by Mr. G. B. Wollaston. A large-growing variety. The

pinnules varying in a considerable degree both in form and size; at the basal portion of the frond there are a few divided, as in *Subtripinnatum*, but as they approach the apex they become less and less divided. The pinnules are incised in various ways, and are irregularly lacinated, and occasionally depauperated; the segments are serrated, and the basal anterior ones auricled. A smaller variety has been found in Sussex, by Dr. Allechin: it differs in occasionally having the epidermis on some of the pinnules disrupted. Examples have been furnished by Mr. G. B. Wollaston, of Chiselhurst.



Fig. 80.

INTERRUPTUM, *Wollaston*, (the same as var. *Laciniatum* of *Wollaston*, but of a different *normal* form.) (Fig. 80.)—Found at Oldstead, Yorkshire, by Mr. Charles Monkman, of Malton. A very handsome, constant, and very singular form. The fronds, which are from twelve to eighteen inches in length, are narrow, ovate-lanceolate in shape. The rachis of great length,—almost half the frond. The pinnæ varying in length in an extraordinary degree, being irregularly shortened; some as long as three inches, and others only half an inch. The pinnæ frequently wanting. Pinnules auricled, præmorse, and

variously interrupted, especially near the rachis. When much marked the depauperate pinnules are almost linear, and sometimes quite wanting. A very singular lacinated Fern, and an interesting and permanent variety. The illustration is from a plant in the collection of Messrs. Stansfield, of Todmorden.



Fig. 81.

ANGUSTIFRONS, Moore. (Fig. 81.)—A most interesting and distinct variety, found at Barnstaple, in Devonshire, by Mr. Jackson. It is dwarf in habit, and exceedingly narrow. Mr. Moore says that in the frond he measured, which was eight inches long, exclusive of the stipes, it was barely more than an inch in width. The fronds are narrow linear-lanceolate, being attenuated at their apices; bipinnate. The pinnules are normal in character, small and crowded together, auricled, and

bristly serrate; the three lower pairs on the largest pinnæ are stalked, the others being confluent. Sori confined to the upper third portion of the frond. Mr. Clapham has occasionally seen this variety cornute. My thanks are due to the Rev. Charles Padley, of Bulwell Hall, Nottinghamshire, and to Mr. Swynfen Jervis, of Darlaston Hall, Staffordshire, for fronds of this variety.

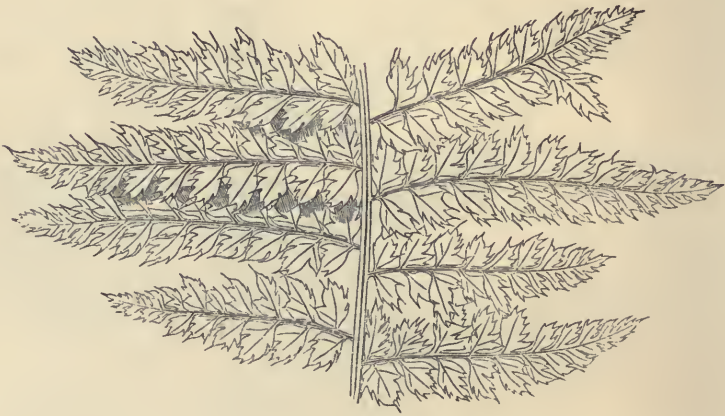


Fig. 82.

INÆQUALE, Moore. (Fig. 82.)—Found in Devonshire, by Mr. G. B. Wollaston. A pretty abnormal Fern. The form of the frond is lance-shaped, the basal pinnæ being short. The pinnules are various in size and form, and in the upper portion more especially they are misshapen, and more or less depauperated. Most of the pinnules are oblong-ovate, being rounded at their apices, having the usual terminal awn and anterior basal auricle. This variety is of an average size, and is fertile towards the apex. The distinctive feature of the variety is the irregularity of the size and form of the pinnules. Examples of *Inæquale* have been furnished by Mr. G. B. Wollaston, of Chiselhurst.

REFLEXUM, Wollaston.—Found at Ottery St. Mary, in Devonshire, by Mr. G. B. Wollaston, of Chiselhurst. In some respects this variety bears resemblance to *Intermedium* and

Trapezoideum, its distinctive feature being in the pinnules, whose upper surface is convex from the edges, being constantly reflexed. An illustration is not needed.



Fig. 83.

IRREGULARE, *Moore*. (Fig 83.)—This variety was found near Nettlecombe, in Somersetshire, in 1854, by Mr. Elworthy, gardener to Sir W. C. Trevelyan, Bart. A most curious form, having on the lower pinnae unequally, inciso-lobate, and varying pinnules, of which the basal anterior lobe (auricle) is considerably increased in size, and widely detached from the others, the remainder forming lacerate serratures, all the larger of which are again serrated. The upper pinnae are fertile, and somewhat depauperated, being very irregular in size, outline, and tothing. For fronds I am indebted to Mr. R. Sim, of Foot's Cray, Kent.

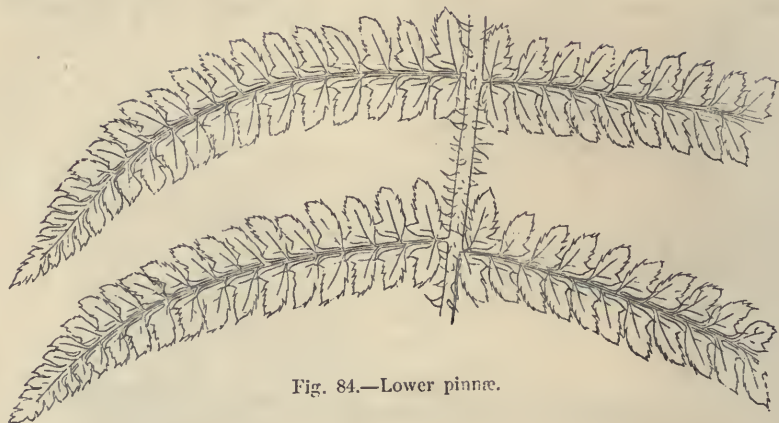


Fig. 84.—Lower pinnae.

AFFINE, Moore, (*Polystichum affine*, Wollaston.) (Fig. 84.)—An exceedingly distinct variety, found at Hartley, in Hampshire, by Mr. G. B. Wollaston, of Chiselhurst, and considered by the discoverer to be a new species. The fronds are dark in colour, firm in substance, and lanceolate in form, having the apex attenuated. Pinnules ovate-falcate, somewhat convex, bluntly auricled, and indistinctly serrated. Stipes long. The form is pretty, and the aspect is that of a slender form of *Polystichum aculeatum*. My thanks are due to Mr. Wollaston, of Chiselhurst, for fronds.

CURTUM, Moore, (*Semitripinnatum*, Moore.)—Found near Nettlecombe, Somersetshire, by Mr. Elworthy. A pretty and curious dwarf *Decompositum*-looking Fern, with short triangular fronds of from six to eight inches in length, and five inches in width at the base. The pinnæ, which are crowded and alternate, are somewhat irregular. The pinnules overlap each other, and when least developed are like *Biserratum*; the more developed ones are more or less pinnatifid, when they somewhat resemble *Plumosum*. The upper half of the frond soriferous. The posterior pinnules of the basal pair of pinnæ are enlarged, being pinnate at the base, and profoundly pinnatifid upwards, giving the plant a character and resemblance of *Lastrea*

dilatata. I am indebted to the Rev. C. Padley, of Bulwell Hall, Nottinghamshire, for fronds. It is unnecessary to give a woodcut illustration of this variety.

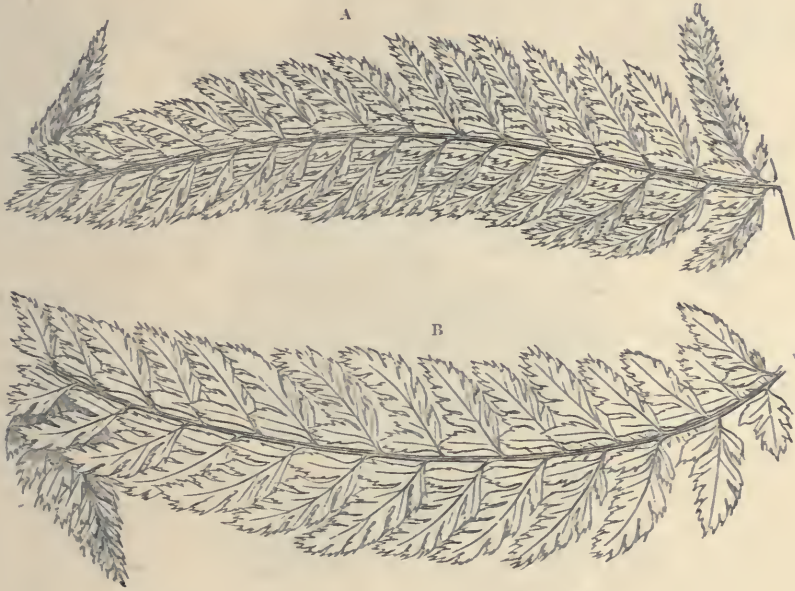


Fig. 85.—A. Middle pinna. B. Lower pinna.

PLUMOSUM, *Wollaston*. (Fig. 85.)—A most lovely Fern, found near Ottery St. Mary, in Devonshire, by Mr. G. B. Wollaston, of Chiselhurst; near Barnstaple, by Mr. C. Jackson; and at Nettlecombe, in Somersetshire, by Mr. C. Elworthy. The fronds, which are very large, and of a pale green colour, are broad, having an ovate-lanceolate outline. Bipinnate, and almost tripinnate in the most divided parts. Texture thin and dry. Pinnæ broad and ample. Pinnules long-stalked, profoundly inciso-lobate, giving an elegant feathery appearance to the graceful arching fronds; hence the name *Plumosum*. The basal anterior lobe of the pinnules is large, having the ordinary auricle lobed on the margin, or biserrate, with sharp teeth. The others are profoundly incised, each lobe pointing forwards, and again cut into sharp-pointed teeth. Rachis of the pinnæ very slender. Length of frond from two to three feet. Texture

thin and papery. Fronds have been received from Mr. G. B. Wollaston, of Chiselhurst, and from Mr. Swynfen Jervis, of Darlaston Hall.

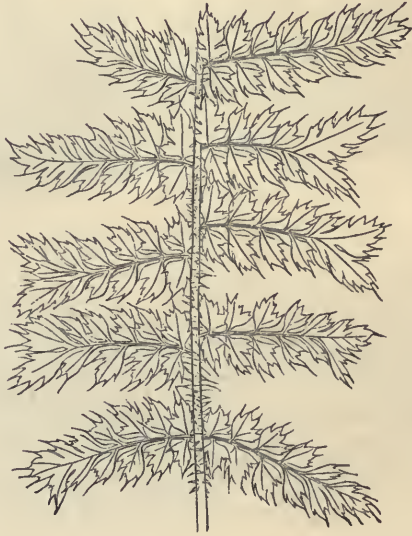


Fig. 86.

POLYDACTYLUM, Moore. (Fig. 86.)—Found in Tipperary in 1857, and introduced into public notice by Mr. R. Sim, of Foot's Cray. An exceedingly elegant and constant variety, having slender narrow lance-shaped fronds. The pinnæ brief and somewhat irregular, and the pinnules here and there abortive or depauperated, yet not to an extent to interfere with the general outline of the frond. The pinnules are small, with a very distinct stalk and auricle. The distinctive feature of this form is the branching of the pinnæ, which become ramose at about half their length, the branches of which are divergent, but plane, and formed of pinnules that are more or less confluent. It is analogous to the many-fingered variety of *Athyrium filix-femina*. Length from eight to twelve inches. My thanks are due to Mr. Sim, of Foot's Cray, for fronds.

POLYDACTYLUM-CORNUTUM, *Lowce*.—This variety was found in North Devonshire, by the Rev. C. Padley, of Bulwell Hall. It is very similar in outline and general appearance to the variety *Polydactylum* of Moore, and is equally large, and as elegant a variety. The distinction consists in the apices of the fronds terminating in a horn. It is not necessary to give an illustration of this variety.



Fig. 87.

PUMILUM, *Moore*. (Fig. 87.)—A variety bearing somewhat the resemblance of *Præmorsum*, having more or less confluent pinnules, yet being more regular than in the variety *Præmorsum*, and standing back so as to appear almost recurved. Occasionally the upper pinnæ are partially depauperated. More dwarf than *Præmorsum*, and narrow, being about nine inches long and two inches broad. The apex of the frond alone fertile, and even there only two or three pairs of sori at the tip of the pinnæ, and a single row at the acuminate apex of the frond. My thanks are due to the Rev. Charles Padley, of Bulwell Hall, for fronds. Found near Nettlecombe, by Mr. Elworthy.

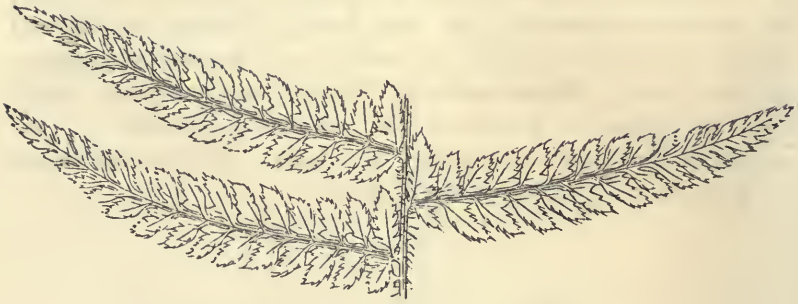


Fig. 88.

ACUMINATUM, Moore. (Fig. 88.)—A very pretty, elegant, dwarf variety, found near Nettlecombe, by Mr. Elworthy, having attenuately pointed fronds and pinnæ, the pinnules being small, narrow, and acute, and very finely serrated. My thanks are due to the Rev. Charles Padley, of Bulwell Hall, Nottinghamshire, for examples.



Fig. 89.

OXYPHYLLUM, Moore. (Fig. 89.)—Found near Nettlecombe, by Mr. Elworthy. An exceedingly fine and elegant variety, having the feathery character of the variety *Plumosum*, together with the narrow acute pinnules resembling the variety *Acutum*. The pinnules are profoundly pinnatifid in a distantly lobed and attenuated manner, in the way of *Proliferum*, to which latter variety it has most affinity. *Multilobum* and *Oxyphyllum* seem to me sufficiently distinct.



Fig. 90.

BILOBATUM, *Wollaston*. (Fig. 90.)—Fronds ovate. Subtripinnate. Pinnæ lanceolate, irregular, sub-depauperate; pinnules variously lacinate, sometimes double, having the large lobe frequently bilobate, from whence its name. This variety was found near Ottery St. Mary, Devonshire, by Mr. G. B. Wollaston, of Chiselhurst, to whom I am indebted for fronds.



Fig. 91.

FOLIOSUM, *Wollaston*. (Fig. 91.)—According to the description of Mr. Wollaston, this will probably be the most beautiful variety of the foliose or leafy group ever found; at present, however, it is of immature growth. Vivid green in colour. The pinnæ are all inclined to be falcate-imbricate; opposite below, alternate above, crowded, and overlapping each other. The posterior pinnules are all longer than the anterior ones,

densely crowded, undulate, and setose. The lobes or teeth of the pinnules are elongate-aristate, running out into a long hair-like point. There is a great probability when the plant becomes quite mature that it will be tripinnate, or even sub-quadrripinnate. Found by Mr. G. B. Wollaston, near Romsey, in Hampshire. My thanks are due to the discoverer for fronds.



Fig. 92.

SUPRALINEATUM, *Wollaston*. (Fig. 92.)—The same as the variety *Lineare* of Moore, except that it has a stipes one third of the frond in length. The analogous form to *Supralineatum* in *Scolopendrium*. Found by Mr. G. B. Wollaston, of Chisclhurst, near Ottery St. Mary, Devonshire. I am indebted to Mr. Wollaston for fronds.

VARIEGATO-CRISTATUM, *Wollaston*.—Found by Mr. G. B. Wollaston, near Southampton, Hampshire. The frond is normal in all its parts, except that the apices both of it and the pinnæ are crisply tasseled. Beautifully variegated with cream-colour in the early part of summer. It is unnecessary to give a figure of this variety.





POLYSTICHUM ANGULARE,
Var. Acuto-pinnale.

P. ANGULARE,
Var. Alatum.

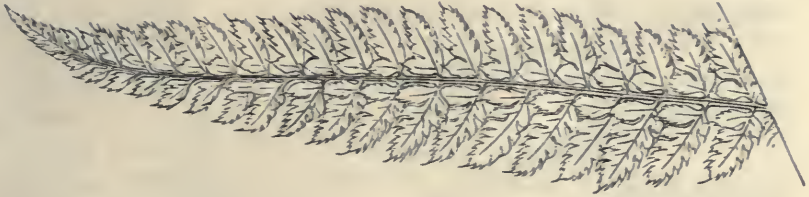
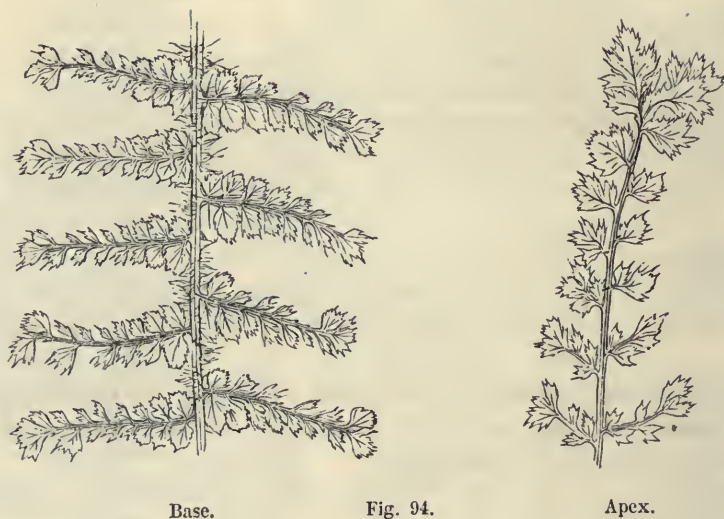


Fig. 93.

LEVIDENSE, *Wollaston*. (Fig. 93.)—This may be considered as *Semitripinnatum*, only of a different normal habit, and therefore the name must drop.

ACUTO-GRACILE, *Wollaston*. (Plate XIX.—A.)—Found near Ottery St. Mary, Devonshire, by Mr. G. B. Wollaston, of Chiselhurst. An interesting dwarf Fern. The plant much resembles the variety *Gracile*, but in which the pinnules are not so linear. The frond and pinnæ normal. Pinnules acute, slender, and having the lobes pointed. Deep grassy green in colour. The coloured illustration is from a frond kindly sent by Mr. Wollaston.

ALATUM, *Moore*. (Plate XIX.—B.) (also *Polystichum aculeatum*, var. *alatum* of Moore, in his Handbook.)—An extraordinary form found in Somersetshire by Mrs. Archer Thompson, and subsequently in Devonshire by Mr. Wollaston. This Fern is remarkable for the pinnules being all joined together by a well-developed wing, on either side the secondary rachides, on which the pinnules are decurrent. The fronds are somewhat dwarf, and lanceolate in form. The pinnules are more pointed and tapering than in the normal form, the anterior side being most developed; the margin of the pinnules cut into rounded teeth, which are bristle-pointed. My thanks are due to Mr. Wollaston, for fronds.



Base.

Fig. 94.

Apex.



Fig. 95.—Cupuliforme.

CONGESTUM, Moore. (Fig. 94.)—Found at Barnstaple, by the late Mr. Jackson. Length of frond nine to twelve inches. Mr. Moore places this conditionally with the variety *Polydactylum*. It is a curious variety, having the pinnules in the upper half of the frond more or less diminished or depauperated along the basal portion of their rachis. Pinnæ sub-opposite below, alternate above, truncate, having the two or three apical pinnules acute, profoundly dentate, and somewhat

enlarged, so as to form on each an abrupt terminal tuft or head. The apex of the frond attenuated, and similarly affected. Stipes and rachis covered with reddish scales. The lower pinnæ normal, and having blunt small pinnules. A handsome form has been found within the last few days, near Lymptone, by Mr. R. J. Gray, of Alphington, near Exeter. Its remarkable character extends through the whole frond; the pinnæ are short, somewhat distant, and opposite; the pinnules distinctly stalked, three or four pairs with an ultimate one; the superior basal pinnules somewhat rotund, the others cup-shaped; the ultimate one very large, dentate, very spiny, somewhat circular, and expanded to such dimension as to be wider than any other portion of the pinna; the cup-shaped pinnules are also spiny. I have preferred retaining this form with *Congestum* at present, giving it the provisional name of *Cupuliforme*, on account of the little cup-like pinnules. I am indebted to the Rev. Charles Padley, of Bulwell Hall, Nottinghamshire, for the original form, and to Mr. R. J. Gray, of Alphington, near Exeter, for *Cupuliforme*, (Fig. 95.) Of the former I have figured the basal portion and apex of the frond, and of the latter the basal portion. A form, differing slightly from *Congestum*, has also been found at Littleham, Devonshire, by the Rev. Charles Padley.



Fig. 96.

MULTILOBUM, *Wollaston*. (Fig. 96.)—A pretty Fern. Length of frond from eighteen inches to twenty-four inches. Pinnæ alternate, long, narrow, but not much drawn out at their apices, towards the centre of the frond the pinnæ much broader. Pinnules deeply divided, the lobes being very conspicuous,

dentate at their apices. The superior basal lobe much the largest, and more or less divided. Rachis and secondary rachides covered with long pale scales. Nearly the whole under surface of the frond soriferous. Some very fine forms have been found in Devonshire, by the Rev. C. Padley, of Bulwell Hall. My thanks are due to Mr. Swynfen Jervis, of Darleston Hall, and to the Rev. C. Padley, for fronds.



Fig. 97.

OBTUSISSIMUM, Moore. (Fig. 97.)—Found at Ottery St. Mary, Devonshire, by Mr. G. B. Wollaston, of Chiselhurst. A most remarkable form, and very rare. Frond ovate-lanceolate, bipinnate, the apex ending suddenly. Pinnæ obtuse, crowded, their apices broad-pointed. Pinnules subrotund, blunt, with short spines, densely imbricate, distinctly stalked, and having no auricle. Mr. Elworthy, of Nettlecombe, has sent me a frond somewhat similar from a plant found by him last spring. It is more elongate and narrow, has smaller and more oval pinnules, and has the sori confined to the extremity of the pinnæ. I have deemed it sufficiently distinct to name, and have called it *Extremum*. My thanks are due to Mr. G. B. Wollaston, of Chiselhurst, and to Mr. Swynfen Jervis, of Darleston Hall, for fronds.



Fig. 98.

RETROFLEXUM, *Wollaston*. (Fig. 98.)—Found by the late Mr. C. Jackson, of Barnstaple, Devonshire, somewhere in that neighbourhood. The plant is erect in habit. The fronds are long, narrow, and bipinnate. The pinnæ normal in outline, distant; many bent backward, so as to clasp the stem behind, as a man would stand with his hands behind him. Pinnules small, distant, and entire. My thanks are due to Mr. Swynfen Jervis, of Darlaston Hall, Staffordshire, for fronds.

VARIEGATO-PRÆMORSUM, *Wollaston*.—Found by Mr. G. B. Wollaston, of Chiselhurst, near Littlehampton, in Sussex. Fronds bipinnate, ovate-lanceolate, and irregular in outline. Pinnæ various, both in length and development, often wanting, truncate, or depauperate. Pinnules coarse, biserrate, spiny toothed, very irregular, and præmorse. Variegated in spring. This is another variety which does not require an illustration for recognition.



Fig. 99.

KITSONIÆ, *Moore*, (*Multicristatum*, Wollaston.) (Fig. 99).—Found at Torquay, in Devonshire, in 1856, by Miss Annie Kitson, of Shiphay, Torquay, and brought under notice by Mr. R. J. Gray, of Exeter. A very distinct, and perhaps the most beautiful variety of *Polystichum angulare*, and quite constant under cultivation. The rachis of the fronds divides towards the apex into four or five branches, the branches themselves being tufted corymbosely, whilst the pinnæ which form them spread out and become crispy at their apices. The basal pinnæ are normal, having numerous pinnules, which are oblong-acute in form, setaceo-serrate on their edges, and not so much auriculate as is usual in this species; the confluent apices of the pinnæ having a disposition to become dilatate. Near the apex of the frond there is an unusually large tuft, formed by the branches, and here both the pinnæ and pinnules are altered in a greater or less degree; usually they are smaller in size and more generally confluent than in the lower pinnæ; there is, however, the same setaceous dentation throughout. The upper pinnæ have their extreme points widened out into crispy tufts. My thanks are due to Mr. R. J. Gray, of Alphington, near Exeter, and to Mr. Swynfen Jervis, of Darlaston Hall, for fronds. Mr. Swynfen Jervis possesses the original specimen of this splendid variety.

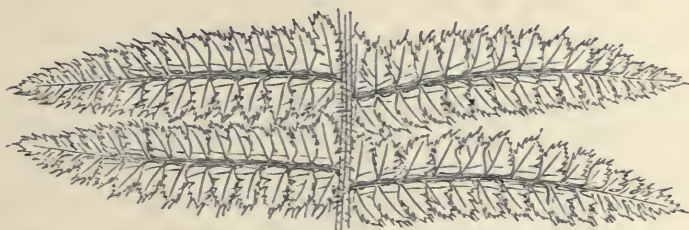


Fig. 100.

CRISPATUM, *Wollaston*. (Fig. 100).—Found by Mr. G. B. Wollaston, near Ottery St. Mary, Devon, and near Beaulieu, Hampshire. Also by the late Mr. C. Jackson, near Barnstaple. Frond normal, ovate-lanceolate; pinnæ slightly imbricate. Pinnules denticulate, imbricate, crowded, wavy, giving to the whole plant an exceedingly pretty crisped appearance. Mrs. Thompson, of South Lawn, Exeter, possesses this plant.



Fig. 101.

CRISTATO-GRACILE, *Moore*. (Fig. 101.)—Found at Ottery St. Mary, in Devonshire, by the late Mr. Charles Jackson, of Barnstaple, and also in the same county by Mr. R. J. Gray, of Exeter. A most lovely and graceful Fern. It is of the same normal form as *Gracile*, another species found in Devonshire, by Mr. G. B. Wollaston, and described at page 101, but differs in being crested. A much-cut variety, with ovate-attenuate bipinnate fronds. Pinnules small, narrow, oblong-acute, and hardly-auricled, variable in form, and some linear; having an inciso-serrate margin. The apices of the fronds, as well as those of the pinnæ and pinnules, are crested. Mr. Gray's form of this variety is a very good one. It is about twelve inches in length, and only two inches and a half wide in the widest part, and the apices of all the pinnules are semi-transparent, owing to the green epidermis not extending to their extreme ends, and being very conspicuous from their unusual breadth. My thanks are due to Mr. R. J. Gray, of Exeter, and to Mr. Swynfen Jervis, of Darlaston Hall, for fronds. The illustration is from near the base of the frond.

ACUTILOBUM, *Wollaston*. (Fig. 102.)—Found near Barnstaple, in Devonshire, by the late Mr. C. Jackson. Normal in length, (that is twenty-four inches.) The fronds deltoid, subtripinnate. The pinnæ are lanceolate, the lower pair being longer than the

rest, the basal pair opposite, the others alternate; sub-bipinnate. The pinnules are acute-lobate, the lower or posterior ones being longer and more developed than the others, more particularly those of the larger pinnae at the base. Pinnules very

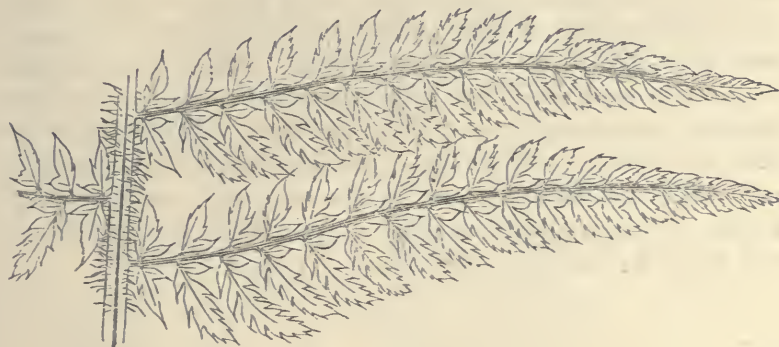


Fig. 102.

spinose, the spines curling round in all directions. Stipes, rachis, and secondary rachis very scaly. My thanks are due to Mr. Swynfen Jervis, of Darlaston Hall, near Stone, Staffordshire, Mr. C. Elworthy, of Nettlecombe, and to Mr. G. B. Wollaston, of Chiselhurst, for fronds.



Fig. 103.

LINEARE-PROLIFERUM, *Lowe*. (Fig. 103.)—Found in North Devonshire, by the Rev. C. Padley, of Bulwell Hall. Length of frond twenty-four inches, width from seven to eight inches.

Fronde ovate-acuminate; as in *Lineare*, the pinnules being narrow, interrupted, and alternate; much depauperated and very various in size and shape. The difference between the present form and *Lineare* consists in it being rigid, proliferous, and in being much more linear near the rachis of the frond. The three or four pairs of pinnules next the rachis on each pinnae are almost or quite wanting, except the midvein, which remains as a spine, the next one or two pairs as a forked spine, beyond which are small pinnules with cuneate bases, the pinnules becoming larger and more perfect the further they are removed from the base of the pinnae. The superior basal pinnule is very long but linear, sometimes however only represented by a spine. Rachis and stipes very scaly. My thanks are due to the Rev. Charles Padley for fronds.

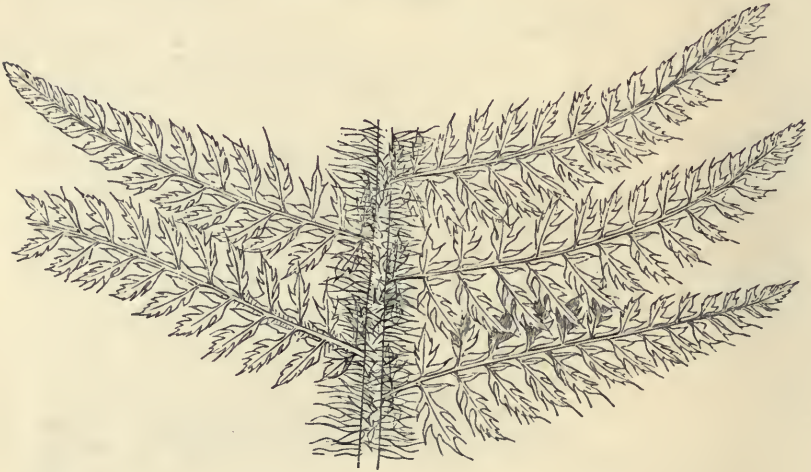


Fig. 104.

PROLIFERUM-WOLLASTONI, Moore. (Fig. 104.)—This very handsome variety has been described at page 80. It is closely allied to *Proliferum*. It was found near Ottery St. Mary, in Devonshire, by Mr. George B. Wollaston, of Chiselhurst, and subsequently at Barnstaple, by Mr. Jackson. Although undoubtedly distinct, it is one of the forms of *Proliferum*, and has been thought to be a variety deserving a figure. I am indebted to Mr. Wollaston for fronds.



Fig. 105.

ACROCLADON, *Moore MSS.* (Fig. 105.)—Gathered recently in Devonshire, by Mr. Mapplebeck, of Birmingham. Mr. Moore says he has previously seen nothing like this variety. He has named it *Acrocladon*, as it is almost the counterpart of *Athyrium filix-fœmina acrocladon*. It is a splendid form, of dwarf growth. My thanks are due to Messrs. Stansfield for fronds.



Fig. 106.—A. Apex. B. Lower pinnae.

EUPREPES, *Lowe*. (Fig. 106.)—Found at Netherton, in Devonshire, the seat of Sir E. Prideaux, by Mrs. Thompson, of South Lawn, Exeter. A most distinct and handsome variety. Length of frond twenty inches; width in widest part (that is, four inches and a half from the base,) five

inches and a half. Stipes and rachis, and secondary rachis densely covered with pale brown scales; stem flexuose. Colour a rich deep green. Pinnæ somewhat distant; the basal ones alternate, the largest opposite, above which sub-opposite, and then alternate. The length of the pinnæ are—basal one inch, second and third two inches, fourth three inches, sixth to twelfth two inches and a half to one inch and a half, thirteenth to twenty-second one inch and a half to half an inch, the remainder varying from nothing to half an inch. In the lower half of the frond the pinnules are, with very few exceptions, all equal in size, all of them distinctly stalked, except the extreme apex; broad, somewhat ovate, crenate, and distinctly spinose, indistinctly auricled, except the basal pinnules. The superior basal pinnule lobed on either side, the lobe occasionally distinctly stalked, and almost circular in form. The apices of the pinnæ end bluntly and abruptly, the apical pinnule frequently larger than the other pinnules. In the upper half of the frond the pinnules are much smaller, laciniated, very dissimilar, occasionally quite linear; many are triangular, and most have a cuneate base. The number of pinnules on each pinna varies from none or one to eight; mostly three, whilst those on the basal portion vary from eight to fifteen. I am indebted to Mrs. Thompson for fronds of this lovely Fern.

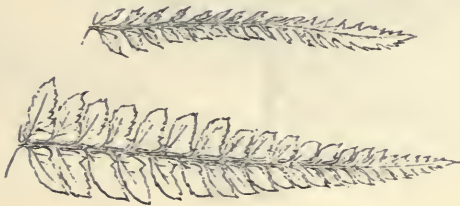


Fig. 107.—Pinna near the apex and basal pinna.

ERASTON, *Lowc.* (Fig. 107.)—Found in Devonshire, by the Rev. Charles Padley, of Bulwell Hall, Nottinghamshire. Length of frond sixteen inches, width in widest part five inches. Lanceolate and bipinnate. Pinnæ alternate, about twenty-three pairs. Pinnules, except near the apex, ovate-falcate or concavo-convex, having a small auricle, which is profoundly divided on

the superior basal pinnule, is conspicuous on the second, and then gradually becomes indistinct and ceases. There is no difference in the size of the basal pinnules in the lower portion of the frond, but they increase in size from the centre of the frond upwards. The edges of the pinnules are minutely serrated; they are devoid of spines, except a solitary one at the rounded apex, and also at the apex of the auricle. The upper third of the frond differs considerably, the pinnules being much smaller and narrower as they approach the apex, at length becoming linear. The apex of the frond is an exact *Lineare*. My thanks are due to the Rev. C. Padley for fronds. Illustration a basal pinna, and an apical pinna.



Fig. 108.

MULTIFORME, *Wollaston*. (Fig. 108.)—This very pretty variety was found in Devonshire, by Mr. G. B. Wollaston, of Chiselhurst. The frond is natural in outline; the pinnæ also natural, but irregularly notched. The pinnules, however, are of every conceivable shape, from a simple vein to a pinnule of an inch and a half in length, pinnate, the pinnulets being distinctly stalked.

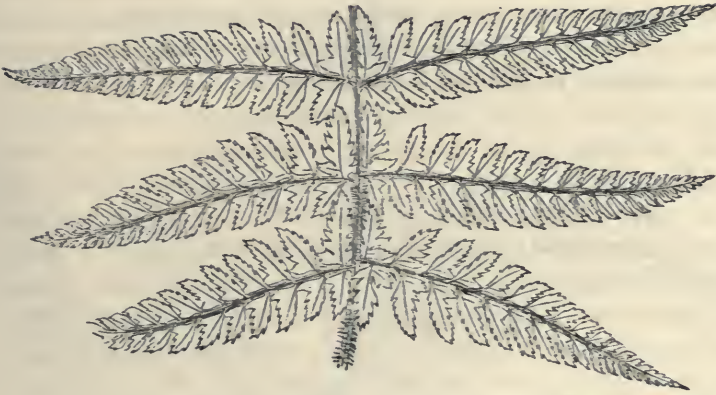


Fig. 109.

ATTENUATUM, *Wollaston*. (Fig. 109.)—Found in Devonshire, by Mr. G. B. Wollaston, of Chisellhurst. The fronds, which are normal in length, are attenuately deltoid, and bipinnate. Pinnæ attenuate; pinnules attenuate but strongly auricled. I am indebted to Mr. G. B. Wollaston for fronds.



Fig. 110.

FLEXUOSUM, *Wollaston*. (Fig. 110.)—Found in Devonshire, by the late Mr. Charles Jackson, of Barnstaple, and now in the possession of Mr. Selater, of Newick Park, Uckfield. The plant is rigid and erect. Fronds ovate, subtripinnate, having

the primary and secondary rachides flexuose. Pinnæ lanceolate, flexuose. Pinnules decomposite, pinnatifid, and aristate. Primary pinnules pinnate. The whole plant is very striking in character. I am indebted to Mr. Selater for fronds.



Fig. 111.—A. Apex. B. Middle pinna.

VESTITUM, *Lowe*. (Fig. 111.)—Found in North Devonshire, by the Rev. Charles Padley, of Bulwell Hall, Nottinghamshire. A decomposed Fern, and very distinct in several particulars. Length of frond twenty-four inches, width seven inches in the widest part, being widest in the centre of the frond, and narrowest at the base, the basal pinnæ not four inches across, whilst the pair immediately below the ultimate pinna at the apex are four inches and a half across. Pinnæ distant below, (being one inch and a half apart,) and approximate above; about equal in width except at the apex; at the base of the ultimate pinna the frond is viviparous on the stem. Pinnules equal in size

both above and below, with larger basal pinnules, the superior basal one distinctly tripinnate, the basal pair of lobes being stalked. Coarsely dentate, and destitute of spines. In the centre of the frond the auricle both above and below is divided to the base and stalked, being parallel to the rachides, simple, entire, and elongate-ovate. Stipes, rachis, and rachides covered with narrow, hair-like, pale brown scales, giving the stems a woolly appearance. The stipes and the basal portion of the rachis scattered over with broad, thick, sharp-pointed scales, *almost black*, and ebeneous, having a narrow red line along each edge. The under side of *every* pinnule, from the extreme basal pinnæ to the apex of the frond, profusely covered with large spore-cases, averaging from seven to eleven on each pinnule, the indusium being circular, pale in colour, with a dark centre. The texture of the pinnæ thick, and the veins invisible from the opaqueness of the pinnules. This Fern has a very foreign look about it, and were it not for the authority I should have been inclined to have considered it from the Cape of Good Hope. The name has been given in reference to the spore-cases covering every pinnule.



Fig. 112.

PROLIFERUM-CRANFORDIANUM, *Phillips MSS.* (Fig. 112).—Discovered by Mr. Phillips, of Belfast, in Cranford Park, in 1861, and was named by him in honour of the Cranford family. The plant grows from one to two feet high. Fronds ovate-lanceolate, pinnæ obtuse, less scaly than in *Proliferum-Footii*; pinnules auricled, slightly mucronate, texture less coriaceous than in that of Mr. Foot's variety. My thanks are due to Messrs. Stansfield, of the Vale Gardens, Todmorden, for fronds.



Fig. 113.

DEFECTUM, *Moore*. (Fig. 113.)—Found in Devonshire, by the late Mr. Charles Jackson, of Barnstaple. The whole plant is remarkably wanting, or defective in its parts. Pinnæ irregular, being depauperate in various parts. Pinnules various, biserrate, and laciniate. I am indebted to Mr. Swynfen Jervis, of Darlaston Hall, near Stone, Staffordshire, for fronds.

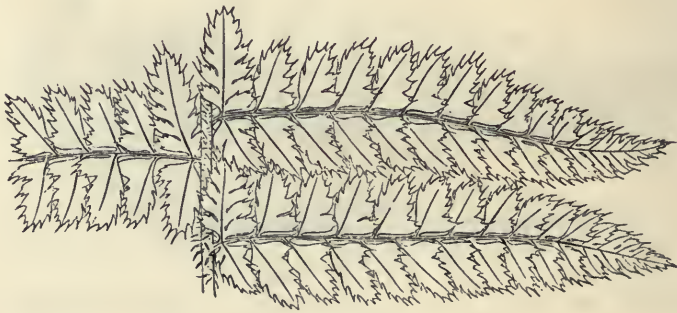


Fig. 114.

CRISPUM, *Moore*. (Fig. 114.)—I believe found in Devonshire, by Mr. Wollaston. Fronds about twelve inches in length, lanceolate, pinnæ short, obtuse, thickly set on the rachis, pinnules toothed, rounded, obscurely auricled, slightly reflected. The densely-set pinnæ, the rounded imbricated pinnules, and their crispy appearance are the distinguishing characteristics of this variety. I am indebted to Messrs. Stansfield, of Todmorden, for fronds.



Fig. 115.

INCISO-ACUTUM, *Stansfield MSS.* (Fig. 115.)—Fronds from three to four feet in length, and one foot in breadth. Bipinnate. Pinnæ distant, acute-lanceolate. Pinnules falcate-lanceolate, deeply incised, narrow, and acute. Gathered in the summer of 1862, near Burnley, in Lancashire, by Mr. A. Stansfield.

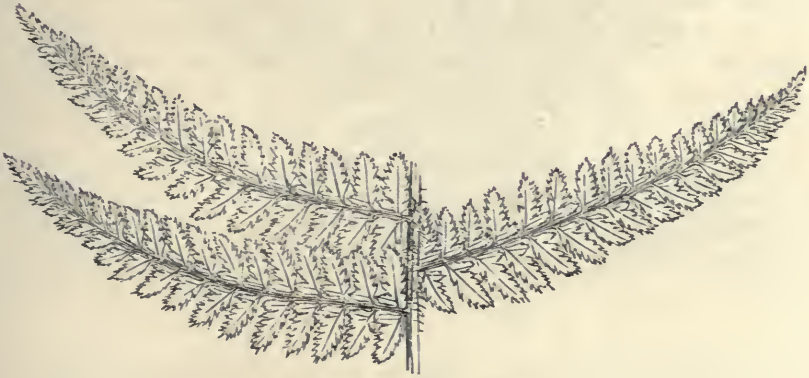


Fig. 116.

PTEROTON, *Lowe.* (Fig. 116.)—Found near Tiverton, in Devonshire, by the Rev. Charles Padley, of Bulwell Hall. Mr. Padley found two plants of this variety growing together. It is an *Acuto-gracile* looking Fern, differing however in having more pinnæ and pinnules. The form of the pinnules also differs, they are deeply incised, alike on both sides, the two edges of the pinnule differing only in having an auricle on the anterior base, the auricle being also incised on both edges. The apices of the pinnules are blunt; the lobes minutely toothed. The pinnæ are sub-opposite below and alternate above. Length of

frond from eighteen inches to twenty-four inches, width in the widest part (that is, in the centre of the frond) four inches. Colour a vivid grassy green. Stem very scaly and hirsute, with rich reddish scales, giving the rachis a dark reddish brown appearance, and contrasting conspicuously with the rich green of the frond. A lovely, slender, most elegant plumose-like variety. I am indebted to the Rev. C. Padley for fronds.



Fig. 117.

RAMO-CORYMBIFERUM, Lowe. (Fig. 117.)—Found near Barnstaple, by Mr. Jackson, and now in the possession of Mrs. Thompson, of Exeter. Length of frond sixteen inches. Pinnæ alternate, diminishing to the base and apex. A leafy-fronded variety, of a vivid green colour. Bipinnate. Pinnules entire, equal in size, slightly auricled, serrate on both edges, with short spines, and a longer one at apex. Stipes and rachis covered with rich brown scales. This Fern does not branch from the bottom of the stem, the distinction being that it is branched only at the apex, and these branches are corymbiferous. I am indebted to Mrs. Thompson for fronds.

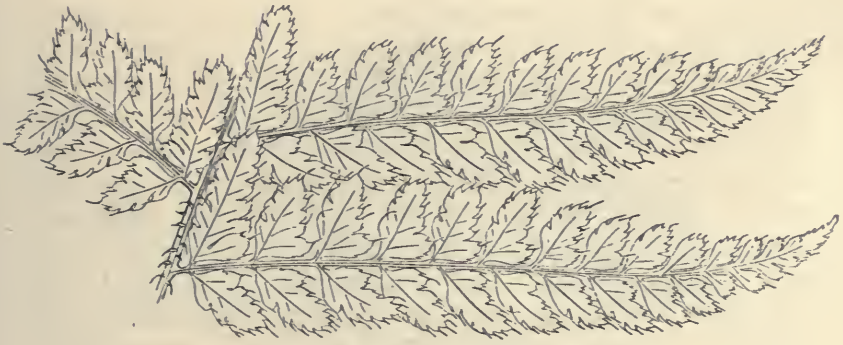


Fig. 118.

PHYLLOIDEUM, *Lowe*. (Fig. 118.)—Found in Devonshire, by Mr. Charles Elworthy, gardener to Sir Charles Trevellyn, of Nettlecombe. A leafy-fronded variety. Length of frond from sixteen to eighteen inches; width six inches; colour a vivid but heavy green. An elegant dwarf variety, almost devoid of scales, except on the main stem. Sori sparingly distributed at the apex of the frond. Pinnæ sub-opposite below, alternate above; length three inches. Pinnules large, entire, with a brief auricle; margin dentate, the lobes having several short spines and one long spine. The superior basal pinnule much larger than the others. This variety is very like *Concinnum*, but is not so dentate.

DEORSO-PINNATUM, *Moore*, (*Subquadripinnatum*, *Wollaston*.)—Found near Barnstaple, in Devonshire, by the late Mr. C. Jackson. Allied to *Plumosum*. Differing in having the lobes on the posterior side of the posterior pinnules separated into distinct linear toothed pinnulets, the pinnules on the lower side of the rachis being deorsely pinnate. A handsome but doubtful variety. At the present time Mr. Wollaston informs me that the plant has run out, yet as there is a possibility of a return of the above character, I have included this variety.

TORTILE, *Wollaston*.—This variety has lost all its characters, and is therefore excluded from this list as one of the non-permanent forms.



Fig. 119.

THOMPSONIÆ, *Lowc.* (Fig. 119.)—Found at Sir William Harris's, Lynmouth, Devonshire, by Mrs. Thompson, of Exeter, and named in honour of that lady. This crested variety is narrow, with a large spreading tassel at the apex. Length of frond from twelve to fourteen inches, width scarcely three inches in the widest part. Pinnæ, the three basal pairs sub-opposite, the next three pairs alternate, and the remainder opposite. Sometimes all alternate. Bipinnate; four or five pairs of pinnules, large, and an ultimate expanded one, which is crested. The superior basal pinnule much the largest, especially in the centre of the frond; it is placed parallel with the rachis, and perpendicular to the secondary rachis, on which it is situated. Stipes and rachis scaly, pinnules spiny, and having a *Polystichum aculeatum* look. Width of frond equal except near the apex, where it is sometimes, but not always, slightly contracted, beyond which expanded out into a branched *Corymbose* head of three inches and a half in width. A very distinct form, approaching *Corymbiferum* of Moore. My thanks are due to the Rev. Charles Padley, of Bulwell Hall, for fronds.

POLUEIDES, *Lowc.* (Fig. 120.)—Found near Exeter, by the Rev. Charles Padley, of Bulwell Hall, Nottinghamshire. This is a handsome large-growing Fern, which sometimes bends round in a remarkable manner. The length of the frond is about thirty-eight inches. About eight inches from the apex it becomes branched, and one of the branches again branched, the latter being much shorter than the others. This may be considered as one of the forms of the variety *Multifidum*, but having characters sufficiently distinct to warrant its being named. The stem is very scaly quite to the apex of the frond. The pinnæ are everywhere alternate from the base to the apex, and they are shorter on one side of the rachis than on the other, as the following measurements will shew:—Taking a frond of thirty-eight inches in length, at about the height of nine inches the pinnæ on the left side are from three inches and a quarter to four inches in length, whilst on the right side none exceed one inch and a half. At eighteen inches in height the pinnæ become more equal in length, but are yet shorter on the right side. The pinnæ are remote, long, narrow, and acuminate at

their apices. There are about twenty-eight pairs of pinnæ to the point of branching, the branches themselves containing about twenty-five additional pairs. The pinnules are sub-opposite below and alternate above, convex behind and concave in front,

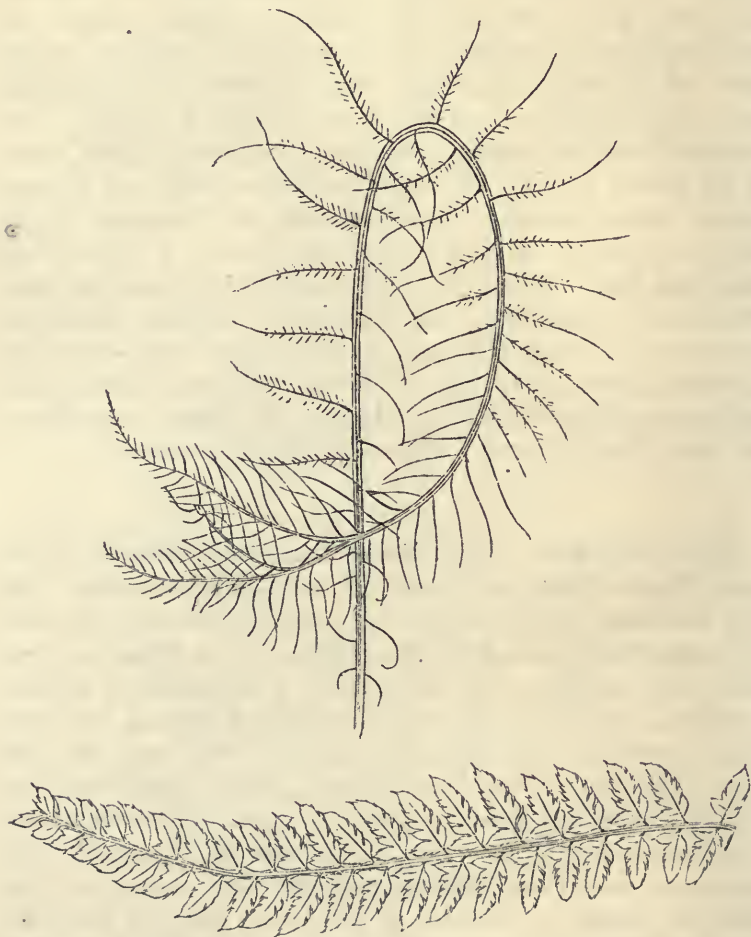


Fig. 120.—Shewing form of Frond and middle pinna.

they are also auricled. In the basal pinnæ the pinnules are broader and closer together, those on the right side even overlapping each other. My thanks are due to Mr. Padley for fronds.



Fig. 121.—Shewing form of Frond and basal pinna.

KALON, *Lowe*. (Fig. 121.)—Found in Devonshire, by Mrs. Thompson, of South Lawn, Exeter. One of the ramose varieties, differing in the curious form of the pinnæ. The basal half of the frond normal, the upper half varying in the length of the pinnæ, and in the formation of the pinnules. Pinnæ on the lower half of the frond opposite or sub-opposite, after which two pinnæ close together on the same side of the rachis; various in length. The apex of the frond much branched, the branching commencing about five inches below the apex. Length of frond from twenty to twenty-two inches;

width eight inches in the widest part, and being six inches in width across the branches. Sori confined to the ramose portion, and about five pairs of pinnae below the branches. My thanks are due to the Rev. C. Padley, of Bulwell Hall, Nottinghamshire, for fronds.



Fig. 122.—Shewing form of Frond and basal pinna.

RAMOSISSIMUM, *Lowe*, (*Variabile-multifidum*, Thompson, MSS.) (Fig. 122.)—Found near Exeter, by Mrs. Thompson. The characteristic peculiarity is in the branches. Like *Kalon*, it is ramose, but differing from that variety in branching near the base of the frond. Length of frond from fifteen to eighteen inches; width, across the ramose portion, from eight to twelve inches. This variety usually branches about four inches above the base, these branches subdividing two inches higher, having a third division two inches and a half beyond the first

subdivision, and frequently more or less branched near the apex. Mrs. Thompson named this variety *Variabile-multifidum*, from the circumstance of the very variable character of its fronds, but as I believe the plant has only been named in MSS., I have deemed *Ramosissimum* a better name. I am indebted to Mrs. Thompson, of South Lawn, Exeter, and the Rev. Charles Padley, of Bulwell Hall, near Nottingham, for fronds.



Fig. 123.—Shewing form of Frond and basal pinna.

POLYCLADOS, *Moore*. (Fig. 123.)—Found by Mr. Elworthy. A handsome and remarkable Fern of dwarf habit. Length of frond twelve to fourteen inches, broad at the base, where it is

seven inches and a half across the basal pair of pinnæ, the next pair only six inches, the next six pairs about five inches, then suddenly reduced to an inch, except a solitary pinna of three inches and a half in length. The apex much branched, spreading to the width of six inches. In the basal portion of the frond the pinnæ are long, and crowded together, their apices more or less linear. In the middle portion of the frond the pinnæ are interrupted, being reduced to a long narrow lobe. The pinnules on the basal pair of pinnæ are much larger than the others, and the inferior and superior pinnules are very similar in size; these pinnules are long and narrow, with almost rounded apices, having a deeply-divided auricle, which is almost wanting on the other pinnæ, except near the apex of the frond. These pinnules are somewhat triangular in form, having a cuneate base, and here the lobe becomes a marked feature, being itself more or less deeply cut and densely spiny; the whole of the pinnules are densely spiny. Stipes and rachis scaly. I am indebted to Mr. Charles Elyworthy, of Nettlecombe, for fronds.



Fig. 124.

KORUMBION, *Lowc.* (Fig. 124.)—A dwarf stout-fronded form, found in a lane leading to Stoke, near Exeter, by the Rev. Charles Padley, of Bulwell Hall. Length of frond ten or twelve inches, width nearly five inches; colour deep green. Pinnæ alternate, approximate, about thirteen pairs, the apex terminating in a small branched and crested head, the pinnæ however are never cristate, occasionally there will be one or two furcate. Pinnules large, subrotund, with a cuneate base, distinctly stalked, not incised, minutely auriculate, conspicuously serrated, the serratures biserrate. The apices of the pinnæ blunt-pointed, as in *Obtusum*, *Elegans*, *Crispatum*, etc. Pinnules equal in size, except the superior basal pinnule, which is larger. I am indebted to the Rev. Charles Padley for fronds.



Fig. 125.

ROTUNDILOBUM, *Sim MSS.* (Fig. 125.)—Found near Nettlecombe, by Mr. Charles Elworthy. Exceedingly pretty fronds, nearly equal in width, except at the base and apex. Length of frond twenty inches, width five inches and a half. Pinnæ approximate and alternate. Pinnules large, stalked, cuneate at the base, slightly auricled, entire, coarsely serrated, or even biserrated. Pinnules equal in size, except the superior basal ones; destitute of spines. Sori large, circular, and very conspicuous. I am indebted to Mr. Charles Elworthy, of Nettlecombe, for fronds.

ASCENDENS, *Lowc.*—A large-growing variety, but narrow on account of the ascending pinnæ, which almost approach the perpendicular, making the frond scarcely more than half the width it otherwise would be; in other respects normal. Found by Mr. C. Elworthy, at Nettlecombe. It is unnecessary to give an illustration.



Fig. 126.

KUMATODES, *Lowe*. (Fig. 126.)—Two plants exactly alike were found in Devonshire, by Mrs. Thompson, of South Lawn, Exeter. It is a curious variety, partaking somewhat of the characters of *Angustifrons*, but is a wider froned form. The length is about twenty inches, and the width in widest part about five inches and a half; the outline is almost equal in width except near the apex, where it rapidly narrows. Its pinnae vary considerably, being occasionally much more undivided, it is however never so divided as in *Angustifrons*. The pinnae are alternate, and in the lower half of the frond much bended. Tripinnate. The pinnules large, auriculate, deeply divided, especially towards the base, and more especially the auricle, which is divided to the veinlet, serrated, and very spiny, the superior basal one is the longest, and its basal lobes are distinctly stalked as in *Tripinnatum*. The chief features in this form are its very fragile texture, its bending pinnae and its large spines, more especially shown in the centre of the frond. Colour a dark bluish green. Stipes, rachis, and rachides very scaly. My thanks are due to the Rev. Charles Padley, of Bulwell Hall, Nottinghamshire, for fronds.

SUB-VARIEGATUM, *Wollaston*.—Perfectly normal in every respect, except that it is beautifully mottled with cream-colour and pale green, a character which, like many of the golden-foliaged trees in our gardens, disappears in autumn, to return again with the new fronds or leaves, as the case may be, next spring. Found by Mr. G. B. Wollaston, of Chiselhurst, near Chichester, Sussex. It is unnecessary to give an illustration of this variety.



Fig. 127.

MULTIFIDO-CRISTATUM, *Moore*. (Fig. 127.)—A dwarf-fronded Fern, with broad, short pinnæ. Length six inches, at about the centre of the frond branching, each branch again branching sometimes into three or four branches, and these again branching, and becoming cristate at their apices. Pinnæ and pinnules unequal in size. I am indebted to the Rev. Charles Padley, of Bulwell Hall, and Mr. R. Sim, of Foot's Cray, for fronds.

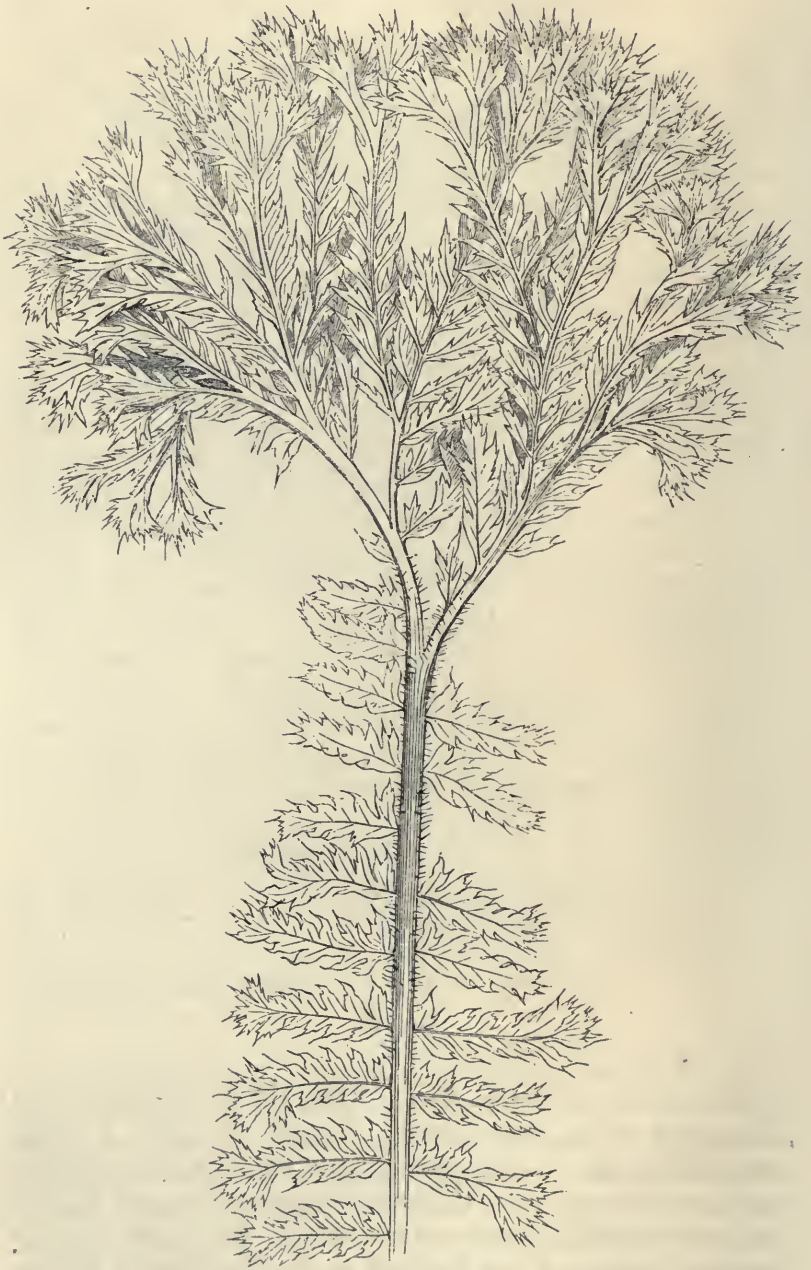


Fig. 128.

GRANDICEPS, *Wollaston*. (Fig. 128.)—The history of this Fern is obscure, and all that is known about *Grandiceps* is that Mr. Swynfen Jervis, of Darlaston Hall, Staffordshire, is in possession of the only plant in existence, and that it is one of the handsomest forms of *Polystichum angulare* yet discovered, bearing a strong resemblance to *Polystichum aculeatum* variety *lobatum-corymbiferum* of Moore, and very like a crested lobate form of *P. aculeatum* in general appearance. Length of frond twelve inches, width (except at the apex) from one and a half to two inches; at the apex the frond branches, and these branches are again divided and subdivided, their extreme apices being cristate and fan-shaped, forming a circular head of about four inches and a half across. My thanks are due to Mr. Swynfen Jervis for a frond of this splendid Fern.

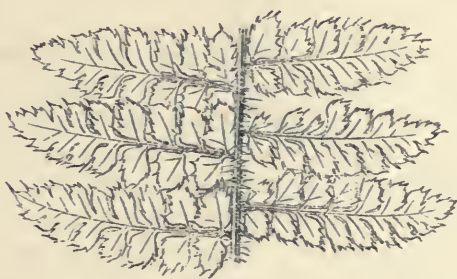


Fig. 129.

TURGIDUM, *Moore*. (Fig. 129.)—A dwarf narrow-fronded variety. Length nine or ten inches, width about two inches in the widest part. Stipes and rachis very scaly. Pinnæ sub-opposite below, alternate above, broad and short, approximate, the lowest pinnæ pointing downwards at an angle of 45° , the others nearly horizontal, apices blunt. Bipinnate. In the lower half of the frond from two to four pairs of pinnules, stalked, one half of the length of each pinna united scarcely cut. Pinnules entire, scarcely cut, and covered along the edges with slender, flexuose, hair-like spines. In the upper half of the frond the pinnæ are undivided, almost entire, and also covered with hair-like scales.

A slender semi-transparent Fern. Found at Littleham, in North Devonshire, by the Rev. C. Padley, of Bulwell Hall, to whom I am indebted for fronds.



Fig. 130.—Shewing form of Frond, and middle pinna.

RAMOSUM, *Willaston*. (Fig. 130.)—The above interesting variety originated from a self-sown seedling in a private collection. The whole plant is normal, except that its fronds are variously and dichotomously divided. My thanks are due to the Rev. F. Mules, of Marwood, for fronds.



Fig. 131.

ELWORTHII, Moore, (*Cruciatum*, Wollaston.) (Fig. 131.)— A remarkably distinct variety, found near Nettlecombe, by Mr. Charles Elworthy, gardener to Sir C. Trevellyn, of Nettlecombe, and subsequently within a few miles of the same place by Mr. George B. Wollaston, of Chiselhurst. This is an exceedingly handsome form, with long and very narrow fronds, being strikingly different from all other varieties. It is at present very rare, indeed I am not aware that it is in the Ferneries of any of our cultivators, except those of the two discoverers, and in that of Mr. Swynfen Jervis, of Darlaston Hall. Being unaware whether Mr. Moore's name or Mr. Wollaston's should take precedence, or whether they are both names in manuscript only, and as the Fern is so remarkable, that it is well worthy of bearing the name of *Elworthii*, after the discoverer Mr. Elworthy, I have adopted Mr. Moore's name. From the well-known fame of this cultivator of the British Ferns, as a most successful discoverer of many distinct varieties of the British species, Mr. Elworthy's name is most deservedly worthy of being handed down to future generations in connection with this plant. I have been somewhat inclined to look upon *Elworthii* and *Cruciatum* as distinct varieties, but from the conflicting evidence that has been received on the subject, I have refrained from

separating them. However Mr. Elworthy says that this plant has all the fronds furcate, giving a very singular appearance; Mr. Wollaston, on the contrary, remarks that he has never seen its fronds shewing tendency to be divided at the apex, or to branch in the rachis; and Mr. Swynfen Jervis, confirming Mr. Wollaston's observations, says that his plant is not furcate, and at the same time a *Simon Pure* from Mr. Elworthy's original specimen. I must therefore conclude that when thoroughly established all the plants will resemble Mr. Elworthy's. Under this present uncertainty I have been additionally induced to adopt *Elworthii*, for if the plants discovered by Mr. Wollaston remain in their present character, the name *Cruciatum* may be applied to them, whilst Mr. Elworthy's will retain that of *Elworthii*. Mr. Wollaston remarks that as Mr. Elworthy's plants were found some miles from where he found his, (both, however, in Somersetshire,) they may vary.

Length of frond about twenty-two inches, of which the lower six inches is occupied by the rachis; frond exceedingly narrow at the base, gradually widening to the apex, where it divides into two branches, which are flexuous, curling round and hanging down; width of frond at base one inch, in the centre three inches, and at the apex four inches and a quarter. The four or five basal pairs of pinnæ opposite, or sub-opposite, the remainder alternate; about seventeen pairs of pinnæ, becoming larger to the apex. Distinctly stalked, and divided at the base close to the rachis into forked pairs of pinnæ, so as to give the appearance of a cruciform arrangement; the upper one ascending at a greater or less angle, and the lower one descending at an equal angle, the angle being greater towards the base, an additional cause of lessening the width of the frond; the basal pinnæ however are only three quarters of an inch in length, whilst the apical pinnæ are three inches and a half in length. Several of the basal pinnæ do not branch at their base into two distinct pinnæ, and these are bifid at their apices. The pinnæ are somewhat distant, but owing to half of them ascending and the other half descending, they cross each other at right angles, and give the frond a crowded appearance. The pinnules are in the lower half of the frond imbricate, and in the upper half approximate. The lower ones entire, with a serrate, spinous edge, and a brief auricle, and briefly stalked; the upper ones

more deeply serrate. Rachis and stipes densely scaly. Sori confined to the upper portion of the frond. The apex has every appearance of being proliferous. Some of the pinnæ are even trifid, the third being much smaller in size. In the plant of Mr. Swynfen Jervis, the fronds are seventeen inches in length, width at base one inch, in centre of frond, in widest part, two inches and a quarter, (that is, at four inches from the apex,) from which gradually tapering to an acuminate apex. The pinnæ in the upper portion of the frond are not bifid, yet the lower portion is so close a copy of Mr. Elworthy's plant, that it must be considered at present, with every prospect of the assumption being correct, that when the plant has had the growth of another year or two, it will assume the more extraordinary characters that constitute the differences between this and the original plant found by Mr. Elworthy. My thanks are due to Mr. Swynfen Jervis and to Mr. Elworthy for the fronds now described. The wood-cut illustration, although quite sufficient as far as recognising the plant is concerned, is too small to do justice to so beautiful a variety.

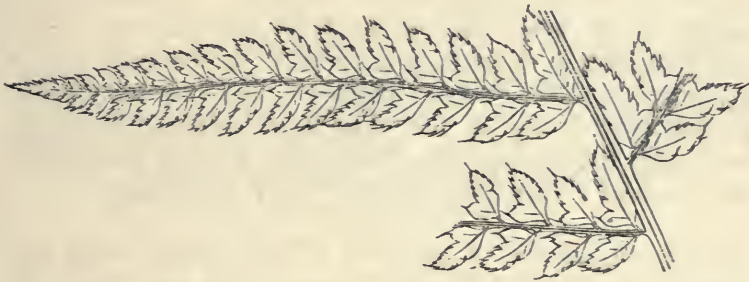


Fig. 132.

LAXUM, *Wollaston*, (*Fulcatum*, Stansfield, MSS.) (Fig. 132.)—Found at Littleham, in Devonshire, by the Rev. C. Padley, of Bulwell Hall, to whom I am indebted for fronds. This variety is normal, but having all its parts more remote than usual. The plant from which the description has been taken, was found near Burnley, in Lancashire. Length seventeen inches. Pinnæ alternate, lax, apex much pointed. Pinnules lax, equal in size, except the superior basal one, which is much larger, undivided, with a serrated edge, and

having a conspicuous auricle; mostly only spinous at the tips of the pinnules and auricles. Stipes, rachis, and rachides scaly. My thanks are due to Messrs. Stansfield, of Todmorden, for fronds. From Mr. Elworthy, of Nettlecombe, I have received a decomposite form of *Laxum*, in which the pinnules are deeply incised, the superior basal pinnule much longer than the others, and subtripinnate. I have also received fronds of a *Decompositum* form of this variety, from the Rev. F. Mules, of Marwood.



Fig. 133

PROLIFERUM PADLEYANUM, *Lowe*. (Fig. 133.)—Found at Monkleigh, North Devon, by the Rev. Charles Padley. Normal in outline. Length eighteen inches. Bipinnate. Pinnæ crowded, opposite on the lower half of the frond, and alternate above, linear-lanceolate, apex acuminate, crowded, in the basal half of the pinnæ linear, and strongly auriculate, the rest much broader. The distinctive feature of this Fern is the abundance of long spines along the margins as well as at the apex of the pinnule. I am indebted to the Rev. Charles Padley, for fronds.

SETIGERUM, *Moore*.—A sub-form of *Biserratum*, found near Barnstaple by the late Mr. C. Jackson. A large Fern, with shorter pinnæ, but equally large pinnules; the end of the lobes terminating in a very long seta, hence its name. Too near *Biserratum* to figure.

TRIPINNATUM, *Moore*.—This is of the same normal form as my *Tripinnatum*, (now changed to *Achurodes*,) but has not that chaffy character, nor the ladder-like horizontal position of the pinnæ. The pinnules are identical. It is unnecessary to give an illustration. Mr. Elworthy has found this variety at Nettlecombe. The pinnules slightly imbricate; the stipes long and very scaly, and the pinnæ elongate-triangular.

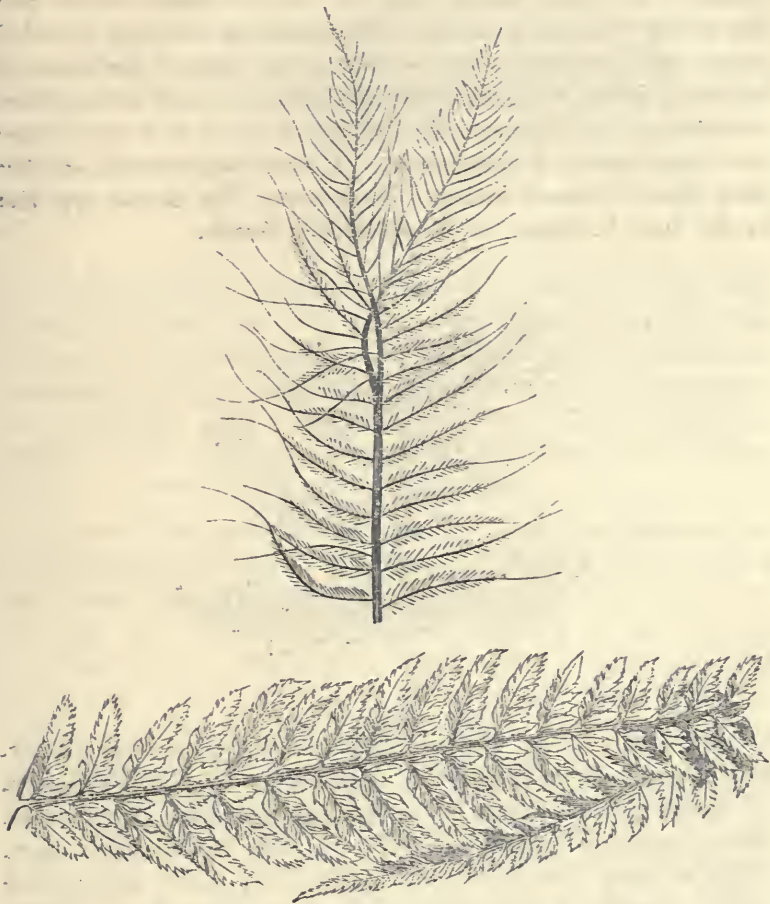


Fig. 134.—Shewing form of Frond and basal pinna.

KLADODESTERON, *Lowe*. (Fig. 134.)—Found near Marwood, by the Rev. F. Mules. A very ramose variety. Length two feet, width equal throughout—ten inches. Stem flexuose; pinnæ ascending and flexuose; length of pinnæ six inches; deep green above, pale beneath. Base very scaly, slightly hirsute, much less so than ordinarily. In the basal pair of pinnæ the lower pinnules longer than the upper row, above an inch long, divided to the costa, and auriculate. In the middle of the frond pinnæ various, some equal above and below, others longer above than the basal ones; pinnæ alternate and irregular. In centre of frond

opposite; at twelve inches from the base the frond divides into two strong flexuose branches, with ascending and very crowded pinnæ and pinnules, some of the pinnæ taking the form of branches, being six inches long and two and a half broad, these branches go on dividing and dividing, forming a head as dense as a forest nearly a foot across. A most magnificent, and the most densely ramose variety I have seen. My thanks are due to the Rev. F. Mules, of Marwood, for fronds.



Fig. 135.

Oxu, Lowe. (Fig. 135.)—Found at Clysthydon, near Exeter, in company with some plants of *Grandidens*, by Miss Thompson, of South Lawn, Exeter. A thin-fronded form, very acute, fifteen inches in length, and only two wide in the widest part. Stipes slender, four inches and a half long; pinnæ sub-opposite below, opposite in the centre of the frond, and alternate above. Pinnæ unequal in size, varying from two or three pairs of pinnules to seven or eight pairs, the apex sometimes acute and sometimes blunt. Pinnules very various in shape and size, mostly somewhat oval, and the superior basal one alone auricled, slightly spinous; always a spine at the apex of the pinnule. The apex of the frond much attenuated. I am indebted to Mrs. Thompson, of Exeter, for fronds of this variety.

MAGNUM, Moore.—A very large form of *Biserratum*, the pinnæ being six inches and a half long, and the pinnules three quarters of an inch. Lobate and biserrate. It is unnecessary to give an illustration.

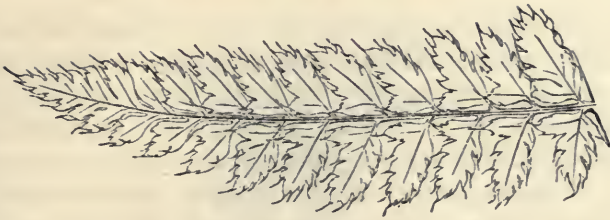


Fig. 136.

TRIANGULARE, *Wollaston*. (Fig. 136.)—Found by Dr. Kinahan, in Ireland, and was first named *Longicaule*, but this character is not distinctive. The fronds are elongate-triangular, subtripinnate, foliose, and coriaceous. The pinnæ are lanceolate and imbricate; the pinnules large, biserrate, and spinous; crowded. My thanks are due to Mr. C. Elworthy, of Nettlecombe, for fronds.

BISERRATUM-INCOMPLETUM, *Moore*.—Found at Nettlecombe, in Somersetshire, by Mr. Elworthy. This is a large form of *Biserratum*, having the pinnules somewhat depauperated: they are also here and there somewhat reduced in size, in an irregular manner, and variously misshapen. Length of frond three feet, width six inches in the widest part; equal in width, except at the base, where reduced to four inches, and at the apex, where attenuated, depauperated, and very variable in both width and shape. The pinnæ descend to within three inches of the base, there being scarcely any stripes. Densely scaly, some of the scales near the base almost three quarters of an inch in length, and approaching half an inch in width; colour pale brown, and almost transparent. Stipes, rachis, and rachides very scaly. Frond long and narrow; pinnæ alternate, ascending, crowded; pinnules biserrate, large, auriculate, crowded inciso-serrate. The superior basal pinnule twice the length of the others; the basal pair of lobes divided quite to the costa, but not stalked, and the next three pairs of lobes almost as deeply divided; colour deep rich green. A fine robust Fern, differing chiefly in the incomplete character of its pinnæ and pinnules near the apex of the frond. It is unnecessary to give an illustration, as it is so closely allied to *Biserratum*. My thanks are due to Mr. Charles Elworthy, of Nettlecombe, for fronds.



Fig. 137.—Apex of Frond and middle pinna.

FORMOSUM, *Lowe*. (Fig. 137.)—Found in Devonshire by the late Mr. Charles Jackson, of Barnstaple, and now in the possession of Mrs. Thompson, of South Lawn, Exeter. Mr. Wollaston, to whom I submitted this Fern, says that it is quite new to him, and suggests *Formosum* for its name, which I have adopted as singularly appropriate. It is an elegant slender-fronded form, with fronds fourteen or fifteen inches in length, and scarcely three inches and a half in width in the widest part; branching at the apex, and the apices of the branches cristate. Colour vivid grassy green. Very leafy and of a plumose character. About twenty pairs of pinnæ below the branching apex, the branching portion having six or seven more pairs, and then branching into crests. Narrow fronded, widest in the centre, gradually narrowing slightly to the base, where two inches and a half wide, and more rapidly to the apex, immediately below the point of branching not an inch wide.

Pinnæ about equal in width, except near the apex, where abruptly pointed; pinnules alternate, except the basal ones, which are sub-opposite. The inferior pinnules rather larger than the superior ones. The superior basal pinnule largest, having an unequal-sized pair of stalked lobes, above which a very deeply-divided lobe or auricle, the remainder of the pinnule cut into biserrated or sub-biserrated lobes, surmounted with spines that are frequently bended and hooked at their apices. The other pinnules strongly auricled, this lobe being divided quite to the base, the other lobes deeply divided. A very distinct and beautiful form. Sori confined to the upper portion of the frond; about seven spore-cases on the superior basal pinnules, and from four to six on the four large pairs of pinnules, and from three to one on the remainder. My thanks are due to Mrs. Thompson for fronds.

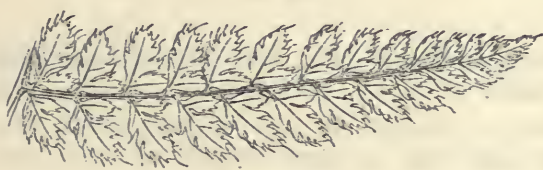


Fig. 138.

PULCHELLUM, *Wollaston*. (Fig. 138.)—Found in Sussex, by Mr. G. B. Wollaston. The present variety has a biserrate form, but is beautifully diminutive in all its divisions. My thanks are due to Mr. C. Elworthy, of Nettlecombe, and the Rev. F. Mules, of Marwood, for fronds.

PROLIFERUM HARDINGII, *Lowe*.—Found in South Devonshire, by Mr. Thomas Wray Harding. Fronds two feet in length; lanceolate. Pinnæ equal in width, except at the apex, crowded, there being from forty-five to fifty pairs of pinnæ. Stipes very brief, very scaly, as well as the rachis and rachides. In general appearance it is not unlike *Proliferum Wollastoni*, but differs in being tripinnate; the inferior pinnules are longer than the superior ones, and the superior basal pinnule is longer than the others; segments alternate, the basal three or four pairs divided to the costa, mostly briefly stalked, and nearly linear; pinnules ascending, except the anterior basal one, which is hori-

zontal, and which towards the apex of the pinnæ becomes the auricle, and not divided to the costa; in the lower two thirds of the frond this is stalked, and again auriculate; the apex of the pinnules is much broader. Spinous. Stipes and rachis a rich reddish brown. My thanks are due to the Rev. F. Mules, for fronds. It is not necessary to give an illustration, as a reference to *Proliferum Wollastoni* will sufficiently describe this Fern, which is in fact a very much divided form of it.



Fig. 139.

MICROMERUM, *Moore*. (Fig. 139.)—Found near Nettlecombe by Mr. Charles Elworthy. Frond twenty inches in length, of which three is occupied by the stipes; width five inches, except the basal pair of pinnæ (which are only three inches across) and at the apex, where it rapidly narrows to an acuminate tip. The pinnæ in the centre of the frond are three inches and a half in length, whilst those near the base are only two inches and a half; in the lower portion of the frond the pinnæ are horizontal, whilst on the upper half they are ascending, and this makes the frond equal in width, although unequal in the length of the pinnæ. Pinnæ opposite below, alternate above, very unequal in length in the upper portion of the frond. Pinnules exceedingly irregular in size and shape, distinctly stalked, approximate, entire, and broad; some large, others small, the larger ones strongly serrate, somewhat ovate, and auriculate, the apex rounded, but having a single spine in the centre; the small ones, which are interspersed irregularly amongst the others, are very various in form, mostly cuneate at the base, fan-shaped, or irregular, the upper half of the frond more irregular. Sori large, and covering the upper two thirds of the frond. Stipes, rachis, and rachides densely scaly, the scales hair-like. Colour a rich dark green. My thanks are due to Mr. C. Elworthy, of Nettlecombe, for fronds.

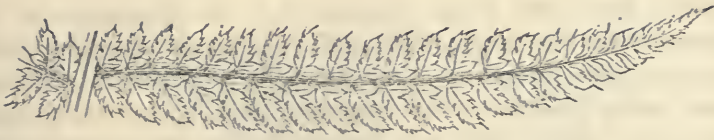


Fig. 140.

CONSPICUILOBUM, *Sim.* (Fig. 140.)—An interesting narrow-fronded variety, found by Mr. C. Elworthy at Nettlecombe. Pinnæ alternate, very narrow, and acuminate. Pinnules small, approximate, conspicuously lobed; serrate. Stipes, rachis, and rachides densely covered with reddish brown hair-like scales. Sori confined to near the apex of the pinnæ. My thanks are due to Mr. Elworthy for fronds.

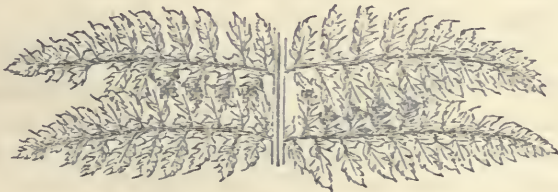


Fig. 141.

MIKRON, *Lowe.* (Fig. 141.)—A very pretty dwarf variety, in the *Gracile* section, found in Braunton by the Rev. F. Mules, of Marwood, Barnstaple, Devonshire, and given by him to Captain Jackson, in whose garden it is now growing. Length of frond eight inches, of which the lower two inches is the stipes. Elongate triangular, being widest at the base, and gradually tapering to the apex; the width at base two inches and a half. The four or five pairs of basal pinnæ curving downwards, the remainder horizontal. Pinnæ opposite on lower half of frond and alternate above; very much crowded, so much so that the pinnules of one pinna overwrap and reach the costa of the next pinna; twenty pairs of pinnæ only occupy a length of five inches. Although very diminutive, and the costa of the pinnæ very thin, they are very stiff and wire-like. Pinnæ broadest at the base, and narrowing to a blunt apex; pinnules stalked, the auricular lobe also stalked

on the basal half of the pinnule, and at right angles to the pinnule; in the upper half of the pinnæ the pinnules much broader, profoundly cut, but attached by a broad decurrent base to the pinnule. The superior basal pinnule more acute than the others, but not larger, whilst the inferior basal pinnule is diminutive and not auricled. I am indebted to the Rev. F. Mules for fronds of this variety.



Fig. 142.

DIVERSUM, *Wollaston*. (Fig. 142.)—A slender-fronded form. Length twenty to twenty-four inches; narrow. Pinnæ distant in lower half of frond. Basal pinnæ descending, the others ascending or flexuose. Pinnules stalked, very diverse. The largest pinnules somewhat triangular, with a bold, rounded, auricled lobe, deeply cut, biserrate, soriferous only near the apex of the pinnules. Sori diminutive, and but few on a pinnule. Sometimes the larger pinnules interrupted by three or four pairs of diminutive almost linear pinnules, or the apex of the pinnæ terminating in these diminutive pinnules; occasionally the superior pinnules will be large, and the inferior ones diminutive or even wanting. Slightly scaly. Colour pale yellowish green. An interesting variety. My thanks are due to Mr. G. B. Wollaston, of Chisellhurst, for fronds.



Fig. 143.

LANCEFOLIUM. (Fig. 143.)—A long, narrow, lance-shaped frond, twelve inches in length, and three inches wide. Pinnæ slightly irregular in length, linear-lanceolate; apex obtuse, distant below. Pinnules briefly stalked, ovate, scarcely auricled, entire, acutely serrated, opposite or sub-opposite, approximate; the superior basal pinnule largest. Soriferous only at the apex of the frond. Scarcely hirsute. My thanks are due to Mr. Swynfen Jervis, of Darlaston Hall, Staffordshire, for fronds.

PLENUM, Wollaston.—Found in Devonshire, in 1860, by Mr. G. B. Wollaston, of Chiselhurst, but not permanent. Another plant has been found near Exeter, by Mrs. Thompson, of South Lawn, Exeter. Dwarf, twelve inches in length, with a long stipes, averaging from three to four inches. Lanceolate in form, bipinnate. Pinnæ opposite below, alternate above, the basal pair of pinnules distant, the next two pairs approximate, the rest crowded, the pinnules overlapping each other. Pinnules somewhat oval, deeply serrate, almost devoid of an auricle, equal in size, except the superior basal pinnule, which is rather larger. About four pairs of pinnules on each pinna divided to the costa, and indistinctly stalked, the remainder of the pinna is not split to the costa. Apex of the pinnæ blunt. In the upper portion of the frond the pinnules are all decurrent, and the apex itself is composed of a series of stalked pinnules. It will be unnecessary to give an illustration. My thanks are due to Mrs. Thompson, for fronds.



Fig. 144.

ACUTUM-DISSECTUM, Moore. (Fig. 144.)—Found at Marwood, Devonshire, by the Rev. F. Mules; at Leith Hill, Surrey, by Mr. H. Lavey; at Whitbarrow, in Westmorland, by Mr. F. Clowes; at Barnstaple, by the late Mr. Charles Jackson; and at Nettlecombe, by Mr. Charles Elworthy. An acute-fronded Fern, much dissected. Length two feet, width six inches; lanceolate, apex attenuated. Stipes brief; stipes and rachis stout, densely scaly on lower half of frond, and rufous above. Pinnæ alternate, approximate, the longest three inches in length, narrow and attenuated. Pinnules stalked, narrow, elongated, and acute, with an acute auricle. The inferior pinnules longer and more spinous than the superior ones, the superior pinnules having two and occasionally three spines, and the inferior ones five or six. It grows to a large size, and is more lobate than the variety *Acutum*. Texture thin. My thanks are due to Mr. C. Elworthy, of Nettlecombe, for fronds.

DIFFUSUM, Lowe.—Found near Littleham, in North Devon, by the Rev. Charles Padley, of Bulwell Hall. This is the best lax form I have yet seen. Very slender, eighteen inches in length, and five inches in breadth. Pinnæ lax, long, and narrow; opposite below and alternate above. Pinnules, in basal half of frond especially, very distant; in a pinna three inches long only three pairs and an ultimate confluent portion; the inferior pinnules somewhat longer than the superior ones, very long oval in form, entire, serrate, spinous at the apex, and a spine where usually the auricular lobe is situated; this spine is not at right angles to the lobe, as is usually the case, but ascending and almost parallel with the edge of the pinnule. Somewhat scaly. My thanks are due to Mr. Padley for fronds.

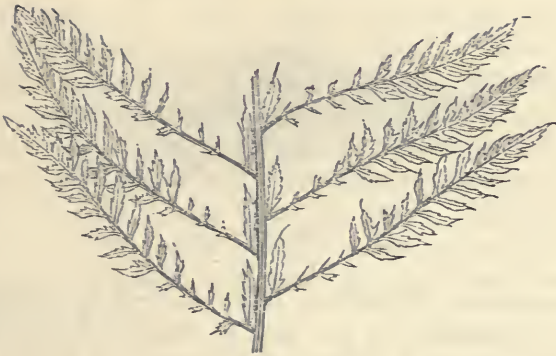


Fig 145.

CONFLUENS, Moore. (Fig. 145.)—Found in Ireland by Mr. S. Foot, of the Irish Geological Survey, and near Nettlecombe, in Somersetshire, by Mr. Charles Elworthy. This is much dwarfer than *Lineare*. Some authorities consider the two forms alike. Mr. Moore, in his "Nature-Printed Ferns," takes the opposite view; he says that *Lineare* is more decidedly bipinnate, somewhat lax in habit, the pinnules tolerably perfect in the lower half of the frond, linear, and here and there strongly auricled, the apex being confluent, linear, and lobate-serrate. He says justly that the upper third of the frond is a representation of a whole frond of *Confluens*. *Confluens*, on the contrary, is symmetrical in form, but at the same time semi-depauperated. Ovate-lanceolate in form, apex attenuated, the lower anterior pinnules being alone developed and bipinnate (except an occasional pinnule;) and this row of pinnules on either side, and close to the rachis, gives the plant a singular appearance. The other pinnules more or less linear, seven or eight pairs with a confluent apex. Near the apex of the frond the pinnules are entirely confluent and linear-falcate, with a bold anterior auricle and a serrated margin. A variety connecting this with *Lineare* has been found near Exeter, by Mr. J. R. Gray, and another somewhat similar variety, (*Lineare proliferum*,) by the Rev. C. Padley, near Linton, in North Devon. *Confluens* is twelve inches in length, of which three inches and a half to four inches is the stipes; width two inches and a half. Stipes, rachis, and rachides covered with almost colourless hair-like scales. My thanks are due to Mr. S. Foot, for fronds.



Fig. 146.

SUB-PLUMOSUM, *Wollaston*. (Fig. 143.)—A very pretty form, found in Devonshire by the Rev. C. Padley, of Bulwell Hall, and had previously, I believe, been found by Mr. G. B. Wollaston, of Chiselhurst. Fronds bipinnate, twelve to fifteen inches in length, broadest in the centre; slender, delicate, thin pinnules. Pinnæ opposite below, alternate above, approximate. Pinnules large and wide, stalked, deeply serrated, each tooth ending in a spine. Pinnules equal in size above and below, except the superior basal ones, which are larger and divided to the costa. Stipes and rachis covered with reddish hair-like scales. My thanks are due to the Rev. Charles Padley, of Bulwell Hall, for fronds.

BRACHIATUM-MULTIFIDUM, *Lowe*.—Found near Exmouth, in Devonshire, by Mr. R. J. Gray, of St. Thomas', Exeter. An interesting variety. Like *Brachiatum*, this variety has its lowest pair of pinnæ very much the largest, and giving the appearance of branches; in a frond thirteen inches in length, the basal pinnæ were four inches and a quarter in length, whilst the next pair were only two inches and a half; their width is also much greater, the basal ones being in the widest part an inch across, whilst the next pair are only half an inch. With the exception of the base the width of the frond is only four inches, or only half that of the width across the basal pinnæ. The pinnæ are various in size, scarcely two alike. Distinctly tripinnate, the two or three basal pinnules on the lowest pinna having at their base a pair of lobes, which are distinctly stalked, and of which the lobe next to the rachis is only a fourth of the size of the other, the larger lobe being in fact the auricle, and itself auricled. The pinnules more or less obtuse, (but not so much so as in *Brachiatum*.) except near the apex; various in size; nearly all stalked with the exception of the apices of

the pinnæ, and of the frond. Pinnæ opposite, except near the apex and centre of the frond, where alternate. Near the apex pinnæ minute, sometimes wanting, the apex branching about two inches below the tip, each branch branching again on the superior side into about three branches, and these sub-branches again branching, the basal one dilating into a crest at the apex. As the characters of this Fern are easily describable, it is unnecessary to give an illustration. Rachis and stipes very scaly; pinnules spinose. For fronds my thanks are due to Mr. R. J. Gray, of Exeter.

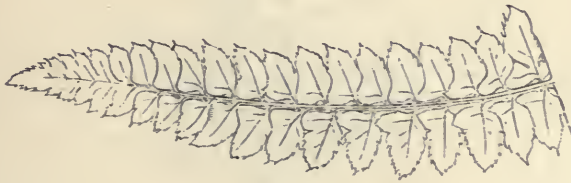


Fig. 147.

INDIVISUM, *Wollaston*. (Fig. 147.)—Found by Mr. Charles Elworthy, in Somersetshire, and originally named in MSS. *Biserratum*, but the plant now will not answer to that cognomen. Frond ovate-lanceolate, with a long stipes. Pinnæ lanceolate, the two or three lowest pair refracted. Pinnules coarse, nearly entire, bluntly toothed, simple, undivided, even in the first anterior and posterior ones. I am indebted to Mr. Charles Elworthy, of Nettlecombe, Cornwall, for fronds of this variety. Mr. Padley has forwarded me specimens of a form of this variety, with pinnules above twice the size, making the frond more crowded and foliaceous. It is a more slender plant. Length twenty-one inches; width seven inches in widest part, (that is, centre of frond,) scarcely narrowed at the base. It is more spiny. The plant appears young, and is likely, in course of time, to be a much finer variety; should this be the case *Indivisum major* would be an appropriate name, it is, however, too near the original plant to do more than name provisionally.

BISERRATUM-DECOMPOSITUM, *Lowe*.—A noble-fronded variety, frequently found by Mr. Wollaston near the sea. Scarcely a variety, although a strong-growing form. The fronds above three feet long, and one foot across. Pinnæ six or seven

inches long, and one inch and three quarters wide at the base. Pinnules exceedingly large; one inch long, and half an inch wide at the base. The basal lobes stalked, the next pair divided to the costa, the others deeply cut and crowded or overlapping; the basal lobes remote from the other, and the superior basal lobe twice the width of the others, and distinctly auricled. Spinous. It will be unnecessary to give an illustration of this form.

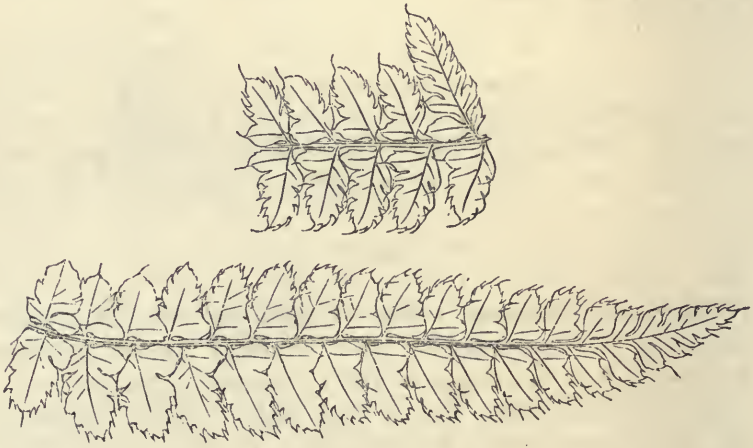


Fig. 148.—Portion of middle pinna. Basal pinna.

OVATUM, *Lowe*. (Fig. 148.)—Found in Devonshire, by Mr. Charles Elworthy, of Nettlecombe. A variety partaking somewhat of the characters of *Obtusum* and *Præmorsum*. Length of frond from thirty to forty inches, width in the widest part eight inches. The pinnæ are opposite below and alternate above, distant below and approximate above; the basal pinnæ are two inches below the next pair, and the second pair are an inch and a half below the third pair. The apices of the pinnæ somewhat broad. The pinnules are very broad, with an ovate auricle, especially near the base. In the lower pinnæ the basal superior pinnules are pinnate, having at their base a pair of oval segments, distinctly stalked, the pinnule not losing its broad blunt character. From the middle of the frond upwards

the superior basal pinnule is much longer than the rest of the pinnules, but their basal lobes are not divided to the base, being decurrent. I am indebted to Mr. Elworthy for fronds.



Fig. 149.—Shewing form of Frond and middle pinna.

DISPAR, *Wollaston*. (Fig. 149.)—Found near Nettlecombe by Mr. Charles Elworthy. Length fifteen to eighteen inches, width five inches and a half in widest part; vivid green above, much paler beneath. Pinnæ unequal in size,—some three inches and a half in length, perchance the next only one inch. Pinnules stalked, except near the apices of the pinnæ, entire, strongly auricular, deeply dentate, and spinous, the longest spines being at the apex and apex of auricle. Superior basal pinnule longest, and more deeply divided, the auricle being divided almost to the costa, but decurrent. My thanks are due to Mr. Elworthy for fronds.

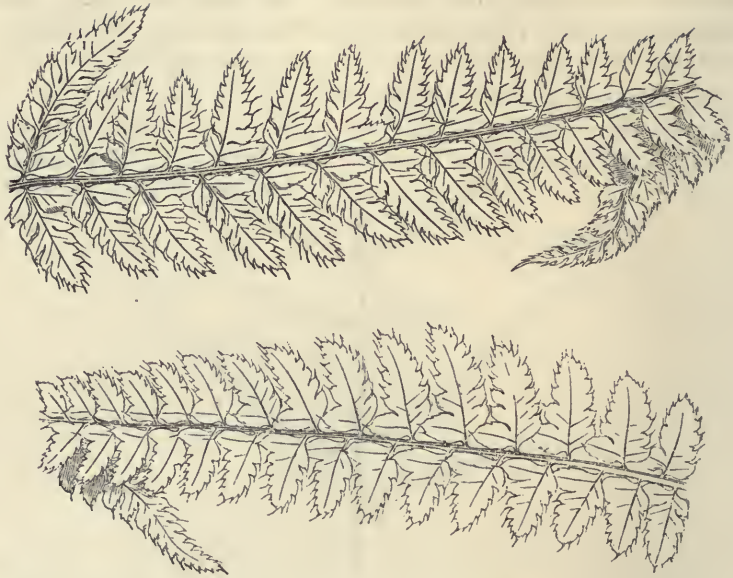


Fig. 150.—Middle pinna, and basal pinna.

TRIPINNATO-DECOMPOSITUM, *Lowe*. (Fig. 150.)—Found near Nettlecombe by Mr. Charles Elworthy, and named by him *Tripinnatum*, from its truly tripinnate character; it is, however, a very distinct form of *Decompositum*. Length above three feet, width nine inches; colour rich green; lanceolate and tripinnate. Pinnæ opposite on lower half of frond, alternate above, lanceolate, distant in the four basal pairs of pinnæ, the next ten pairs approximate, and the remainder crowded. Pinnules in the basal three or four pairs of pinnæ much broader than those higher up the frond, distinctly auriculate; the inferior pinnules longer than the superior ones, but the basal pinnules, both superior and inferior, less than the others, distinctly stalked, except near the apex, and the auricle profoundly divided. In the centre of the frond the pinnules are much more deeply divided, the superior basal pinnule is lanceolate, an inch long, (nearly twice the length of the others,) has a large auriculate stalked lobe, and the half dozen lower pairs of lobes all stalked; the other pinnules in the basal

half of the pinnæ have the two basal lobes (one the auricle) distinctly stalked, and the auricle itself is auriculate and minutely serrated. Copiously soriferous. Stem very scaly. A very strong-growing Fern, received from Mr. Elworthy.



Fig. 151.

CONCINNUM, Moore. (Fig. 151.)—Found near Nettlecombe by Mr. Charles Elworthy. An exceedingly pretty foliose variety, two feet in length, six inches in width in the centre of the frond, gradually narrowing to the apex, being elongate-triangular in form. Pinnæ lanceolate, ascending. Pinnules

equal in size on either side of the costa, largest at the base and gradually smaller towards the apex, stalked, except just at the apex. The superior pinnules erect, the inferior ones inclined at an angle of forty-five degrees. Pinnules much cut, but not deeply; in the superior basal pinnule, in the auriculate lobe, and that immediately above it, every division of the lobes ending in a spine, biserrate and doubly spinous, so that there are from twelve to twenty spines on each pinnule. Pinnæ and pinnules crowded, touching each other. Stipes long. Colour grassy green. My thanks are due to Mr. Elworthy for fronds. Stipes and rachis rufous, with small scales.



Fig. 152.—Pinnæ.

DECOMPOSITUM-SPLENDENS, *Lowe*. (Fig. 152.)—A very broad-fronded exceedingly fine form, found near Nettlecombe by Mr. C. Elworthy. Fronds from twenty-four to thirty inches in length, and nearly twelve inches wide. Scaly. Colouring of the stipes, rachis, and rachides red, as well as the costa of the pinnules; colour of the fronds grassy green. Pinnæ crowded. The inferior pinnules twice the length of the superior pinnules. Distinctly tripinnate. I am indebted to Mr. C. Elworthy for fronds.

THE FOLLOWING REQUIRE NO ILLUSTRATIONS.

INCOMPLETUM.—A subtripinnate form of large size. Pinnæ linear-lanceolate. Pinnules very irregular. The superior basal pinnule longest, the lobes of it divided to the costa, the other pinnules varying much in size and shape, all very strongly lobed and biserrate, frequently flexuose and lacinate. Very scaly. My thanks are due to Mr. Charles Elworthy, of Nettlecombe, for fronds.

DECOMPOSITUM-ELWORTHII, *Low*.—A most lovely form of *Decompositum*, found near Nettlecombe by Mr. C. Elworthy. Length above two feet, width six to seven inches. The pinnæ in lower half of frond opposite, in upper half alternate; they commence quite at the base, leaving no stipes. Colour of fronds vivid green. Pinnæ and pinnules crowded, the latter deeply cut, very hirsute, and the sori on every pinnule, even to the basal pinnæ. My thanks are due to Mr. Elworthy for fronds.

PULCHRUM-IRREGULARE, *Sim*, *MSS.*—A handsome variety found near Nettlecombe by Mr. Charles Elworthy. Length of frond above two feet, width from six to eight inches, the apex ending abruptly and irregularly. Pinnæ opposite on the lower half and alternate on the upper half of the frond. Stipes and rachis very stout and densely scaly, deeply fluted. Pinnæ long, narrow, and acuminate, five inches in length, except the upper six inches, where from two inches to less than an inch, the smaller pinnæ almost as broad as the others. Pinnules stalked almost to the apex of the pinnæ; the lower ones somewhat larger than the superior ones, deeply cut, strongly auricled, the auricle divided to the base, sharply dentate. The upper pinnules not auriculate, and undivided. The fronds I have seen of this variety are not sufficiently irregular to warrant its name; it is, however, a very pretty form. My thanks are due to Mr. Charles Elworthy, of Nettlecombe, for fronds.

PARVULUM, *Lowe*.—This is a very small fronded variety, found in Devonshire by the late Mr. Charles Jackson, of Barnstaple. It is a variety that was very much esteemed by Mr. Jackson, and is now in the possession of the Rev. Charles Padley, of Bulwell Hall. The length of the frond is only eight inches, and the width, (which is almost equal, except towards the rapidly-tapering end) barely two inches and a half. Pinnæ about twenty-three pairs, sub-opposite below and alternate above, crowded except at the base, the basal pair narrower than the others. Pinnules about eight or nine pairs, and an ultimate elongated pinnule; narrow, the basal ones stalked, entire, having a small spiny auricle, and a pointed spiny apex. Stipes and rachis scaly. Colour grassy green. Sori diminutive and costal, confined to the upper two inches of the frond, and only six or eight spore-cases on each pinna. The superior basal pinnule longest. My thanks are due to the Rev. Charles Jackson for fronds.

EXTREMUM, *Lowe*.—Found in Devonshire last spring by Mr. Charles Elworthy, of Nettlecombe. It is a very handsome form, more closely allied to *Obtusissimum* than any other variety; it is however more attenuated and narrower. The pinnæ are crowded so as to touch each other from the centre of the frond upwards, and nearly so on the lower half of the frond, but not to overlap, as is the case with *Obtusissimum*; the pinnules are also smaller in size, and oval in form, and much more serrated, the spines minute, and not so distinctly stalked. Length twelve to fourteen inches, width three inches. Colour a vivid grassy green. The sori are situated only near the apex of the pinnæ, and the basal two thirds of the pinnæ being destitute of spore-cases, the frond seems as if belted with a marginal band, and on this account the name of *Extremum* has been selected to mark the position of the sori. My thanks are due to Mr. Elworthy for fronds.

PROLIFERUM-ANGUSTATUM, *Stansfield MSS.*—Raised at the Vale Gardens, Todmorden, near Manchester, by the Messrs. Stansfield. Fronds from one to two feet long, and only two inches broad. Bipinnate; pinnæ short and obtuse; pinnules

deltoid, slightly auricled, only occasionally proliferous in the lower part of the rachis. This form differs from the old *Proliferum* in the frond being *much narrower* and *much less proliferous*. I am indebted to Messrs. Stansfield, of Todmorden, for fronds.

ARCTATUM, *Moore*.—Found at Barnstaple, by the late Mr. C. Jackson. A handsome and large variety, bearing somewhat the resemblance of *Lineare*, but being, however, less abnormal in its development. The pinnules are tolerably uniform; seldom depauperated. The pinnæ are also not confluent into a lengthy linear lobe, but diminishing in the ordinary manner. The pinnules are almost linear, acute, having a very large acute anterior auricle. Near the base of the frond they are somewhat more oblong, yet even here narrow.

TRAPEZOIDEUM, *Moore*, (*Setosum*, Wollaston, MS.)—Found at Ilfracombe, in Devonshire, by the Rev. J. M. Chanter; at Barnstaple, in Devonshire, by Mr. H. F. Dempster; at Nettlecombe, in Somersetshire, by Mr. C. Elworthy; at Littlehampton, in Sussex, and at Ottery St. Mary, by Mr. G. B. Wollaston; also in Kent and in Lancashire. In Ireland Mr. R. Barrington has found it at Killarney, and Mr. A. Stansfield in Antrim. A dwarf variety, with bipinnate, narrow, ovate, and attenuate fronds. Pinnules brief, broad, nearly trapeziform, and bipinnate; anterior angle much developed. The upper pinnæ have the pinnules smaller, and more or less confluent.

PULCHRUM, *Moore*.—Found at Nettlecombe, in Somersetshire, by Mr. C. Elworthy. An interesting variety, having lanceolate fronds. Pinnules ovate, conspicuously auricled, inciso-lobate, with unequally serrated lobes. In the upper portion of the frond the fertile pinnules are somewhat decurrent, smaller, and more profoundly lobed. A few of the pinnules are depauperated.

ORNATUM, *Moore*.—Found at Barnstaple, in Devonshire, by the late Mr. C. Jackson. A variety having a normal outline, as also normal pinnæ. The pinnules somewhat crowded, ovate, having a very large anterior auricle; profoundly lobed, the lobes

spreading, distinctly biserrate, and the auricle lobate, with the shallow lobules biserrate. A brief-pinnuled, but profoundly lobed form.

VARIABLE, *Moore*.—Found at Barnstaple, Devonshire, by Mr. C. Jackson. A Fern of large size, having ramose pinnæ. The distinctive feature of this variety is the very unequal branching of the pinnæ; some are divided near their base, others only at the apex; then again others are unbranched, and others are abbreviated (whether branched or unbranched.) Some of the pinnules are depauperated, and others normal; the latter are larger, acute, and dentate, as in the variety *Biserratum*.

PYRAMIDALE, *Moore*.—Found several years ago at Nettlecombe, in Somersetshire, by Mr. Elworthy. A well-marked variety, having the base of the frond broadest, and having a pyramidal or clongate-triangular outline. The fronds (exclusive of the stipes) exceed twelve inches in length. The pinnæ, which are dense, are five inches in length in the basal pair, and four inches in length in the second pair. The pinnules are oblique and stalked, the basal ones being profoundly pinnatifid, with ovate-toothed lobes. The upper portion of the pinnules is biserrate, and the teeth acute.

CALCARATUM, *Wollaston*.—Found in Devonshire, by Mr. G. B. Wollaston. This variety is an interrupted form of dwarf habit. The small pinnules, where perfectly formed, have coarse, lengthy, spiny serratures. Towards the apex of the frond the pinnæ are irregularly abbreviated, and their pinnules irregularly depauperated. The main rachis is also arrested, and is in the form of a small horn or spur amongst the misshapen pinnæ.

PRÆMORSO-PULCHRUM, *Moore*.—Found at Nettlecombe, by Mr. Elworthy. A pretty variety, having intermediate characters between *Pulchrum* and *Præmorsum*. It is a dwarf form, with small pinnules. In the lower portion of the frond the pinnules are inciso-lobate, with serrated lobes, whilst towards the apex they are decurrent, and misshapen in a greater or less degree, forming irregular and more or less confluent pinnæ.

ACULEATOIDES-CRISTATUM, *Wollaston*. (*Polystichum aculeatum-cristatum*.)—From the collection of the late Mr. Charles Jackson, of Barnstaple, and now in the possession of the Rev. Charles Padley, of Bulwell Hall. Mr. G. B. Wollaston informs me that this plant has been known for some years, and was found in Devonshire, by Mr. Dempster, and taken to Mr. Jackson. Mr. Moore supposed at the time that it was a variety of *Polystichum aculeatum*, which he named *Cristatum*. It is however, no doubt, a variety of *Polystichum angulare*, therefore Mr. Wollaston has re-named it. A long narrow-fronded form, about eighteen inches in length, with opposite or sub-opposite pinnæ, lanceolate or linear-lanceolate in form, the apex indistinctly cristate. Pinnules entire, small, a lengthened oval, aculeate, scarcely auricled, a strong spine taking the place of the auricle. Stipes and rachis sparingly covered with hair-like scales. I am indebted to the Rev. C. Padley, of Bulwell Hall, for fronds. The variety differs from *Aculeatoides* in having longer and narrower pinnæ, in being somewhat cristate, the pinnules being wider apart, and more aculeate.

DECOMPOSITUM-MULTIFIDUM, *Lowe*.—A multifid form of *Decompositum*, found in Devonshire by the Rev. F. Mules, of Marwood. Fronds large, three feet six inches in length, lanceolate in form, and eight inches wide. Three or four inches below the apex branching into three branches, these again branching; their apices furcate, the furcations being cristate. Stipes thick, twelve to fourteen inches in length; scaly. Rachis scaly; rachides scaly. The three pairs of basal pinnæ remote, the rest approximate, the basal pair shorter than the others; all approximate. The inferior pinnules somewhat larger than the rest, stalked almost to the apices of the pinnæ, long, blunt-pointed, deeply lobed, and strongly auriculate. In the centre of the frond pinnules more deeply cut, the basal lobes divided to the costa, and the superior basal pinnules larger than the others, densely but minutely spinous. My thanks are due to the Rev. F. Mules for fronds.

SEMITRIPINNATUM, *Moore*.—A not uncommon large-growing variety, two feet or more in length, and six or seven inches broad. Almost tripinnate. Pinnæ opposite below, alternate

above, large; the pinnules long, deeply serrated, and minutely spinose. The inferior pinnules, especially of the basal pair of pinnae, longest, and the superior basal pinnule twice the length of the remainder, conspicuously auricled, the auricle of the superior basal pinnule distinctly stalked. My thanks are due to Mr. G. B. Wollaston, of Chiselhurst; Mr. C. Elworthy, of Nettlecombe; Mr. Swynfen Jervis, of Darlaston Hall; the Rev. Charles Padley, of Bulwell Hall; the Rev. F. Mules, of Marwood; Mr. Daniels, of Ruthin Castle, Denbighshire; and Mr. Edwin Cooling, of Derby, for fronds. I can see but little difference between this and *Subtripinnatum*.

ADDITIONS.

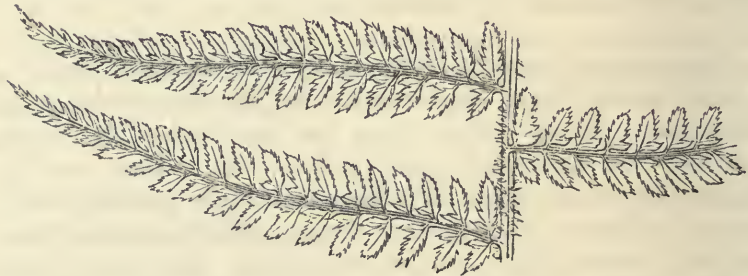


Fig. 153.

ATHYRIOIDES, *Wollaston*. (Fig. 153.)—Subsequently to writing a description of this variety, on page 101, Mr. Wollaston, of Chiselhurst, forwarded me a frond, and although before it was deemed unnecessary to give an illustration, since then I have thought it advisable to refer again to the variety, and to have a wood-cut illustration executed, thinking that without one there would be a great chance of those who are not quite conversant with this species, being misled without this additional aid.

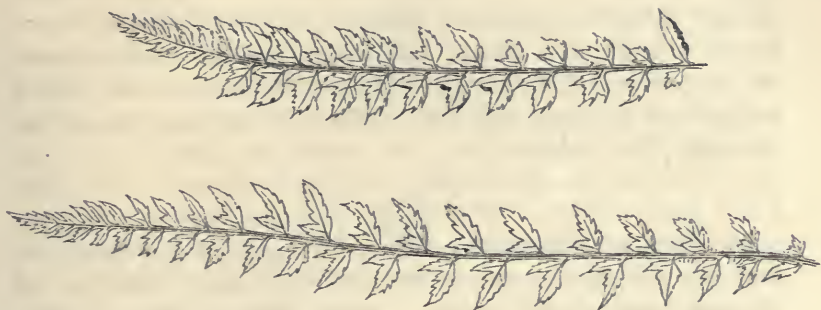


Fig. 154.

LINEATUM, *Stansfield MSS.* (Fig. 154.)—A variety so closely resembling *Lineare*, as to be a connecting link between this and *Confluens*, at least the fronds which have been forwarded by Messrs. Stansfield, of Todmorden, have this half-way character; it cannot, therefore, be considered distinct from *Lineare*, as the wood-cut illustration will shew. My thanks are due to Messrs. Stansfield, for fronds.



Fig. 155.

ABRUPTUM, *Moore.* (Fig. 155.)—Found near Nettlecombe by Mr. Charles Elworthy. A very large-pinnuled variety, but too normal in its characters. Here and there abrupt pinnae and pinnules. A strong-growing Fern, of about two feet in length, and seven inches wide in the centre of the frond.

Pinnæ alternate, more or less acuminate at the apex, sometimes ending abruptly, especially towards the base of the frond. Pinnules large and broad, auriculate, toothed, and spinous; the superior basal pinnule larger, tripinnate, the lower auriculate lobe being stalked. Scaly. I am indebted to Mr. Elworthy, for fronds.

ABRUPTUM, *Stansfield, MSS.*—Mr. Stansfield informs me that this variety has almost lost its distinctive character, and is scarcely worth its name. It has merged into the form *Præmorsum*. The variety has been included here, as it is known in cultivation; the mention of it must therefore be looked upon as pointing out that it no longer deserves to be retained amongst the distinct varieties of *Polystichum angulare*.

SETOSUM, *Wollaston.*—Found by Mr. G. B. Wollaston, of Chiselhurst, near Ottery St. Mary, Devon. This is described by Mr. Thomas Moore, of Chelsea, under the name of *Quadratum*, but the description in his octavo edition of "Nature Printed British Ferns," vol. i, page 144, is not sufficiently characteristic, and as the pinnules cannot be considered as in the least degree quadrate, Mr. Wollaston, taking the remarkably setose feature of the pinnules, has re-named it most appropriately *Setosum*. This variety has lanceolate bipinnate fronds, and linear-lanceolate pinnæ. The pinnules remarkably setose, constricted, and wavy. I have received fronds from Mr. C. Elworthy, of Nettlecombe, twenty-six inches long, by four inches wide in the widest part, with the pinnæ ascending at an angle of forty-five degrees. See page 97, under *Quadratum*, Moore.

BRACHIATUM, *Wollaston.*—Very handsome and distinct, having a light elegant appearance. Colour of frond yellowish green above, rust-coloured beneath, from the sori. Length of frond eighteen inches, width four inches. Pinnæ crowded, narrow, and acuminate, varying in length in different portions of the frond, so as to cause a curiously-shaped frond, narrower

in the centre than at the base, and at a third below the apex, the apex itself ending abruptly. Length of pinnæ—two inches below the apex as much as one inch and a half in length, one inch below the apex only three quarters of an inch, three inches below apex one inch and three quarters long, four inches below apex two inches and a half long, six inches below two inches and a quarter long, seven inches from apex two inches long, ten inches from apex one inch and a half long, eleven inches from apex two inches and a half long, twelve inches from apex three inches long; basal pair of pinnæ one inch and a quarter, next pair only three quarters of an inch, the remainder about half an inch. The upper two thirds of the frond copiously fertile. Since writing the account of this Fern on page 106, I have received additional fronds, and therefore add the above.

ACUTO-GRACILE.—Mr. Padley has sent me a long narrow form with the pinnæ distant and ascending; too near to be otherwise named, but a very nice Fern.

ACUMINATUM, *Moore*.—Since writing the account of this Fern, I have received fronds from Mr. Elworthy. His plant has grown considerably since it has been named by Mr. Moore, and, at the same time, grown even more characteristic of its name. The fronds are nearly three feet long, and six or seven inches broad in the widest part; flexuose near the apex. Pinnæ ascending and flexuose, somewhat distant, towards the apex bundled together, on account of their perpendicular growth; pinnæ from two to three inches in length, being crowded together in a width of from one half to three quarters of an inch. Pinnæ long and narrow. Pinnules remote below, and less so above, narrow, long, ascending, and acutely incised, with an acute auricle, abundantly hirsute. The upper two thirds of frond copiously soriferous.

RECAPITULATION.

1.—*Abruptum*, page 181, 182. 2.—*Achurodes*, p. 78. Previously described as *Tripinnatum*, but the name changed on the recommendation of Mr. Wollaston, as *Tripinnatum* of other authorities have not the same characteristic features.

3.—*Acrocladon*, p. 129. 4.—*Aculeatoides*, p. 84. The Rev. C. Padley, of Bulwell Hall, has a plant found in Devonshire by the late Mr. C. Jackson, which is densely scaly with pellucid almost colourless scales, which not only clothe the stipes, rachis, and costa of pinnæ, but even the under side of the pinnules, extending beyond their edges, and giving them the appearance of being fringed with spines: this is more especially the case in the upper half of the frond. Length ten inches. Pinnæ opposite below, alternate above.

5.—*Aculeatoides-cristatum*, p. 179. 6.—*Acuminatum*, p. 116, 183.

7.—*Acutilobum*, p. 126. 8.—*Acuto-gracile*, p. 119, 183.

9.—*Acutum*, p. 77. Found also at Moorhills Clough, near Bromley, Lancashire, by Mr. A. Stansfield. A very slender form has been found near Exeter by the Rev. Charles Padley. Length eighteen inches, width only three inches. Pinnæ narrow, attenuated, and alternate.

10.—*Acutum-dissectum*, p. 166. 11.—*Affine*, p. 112.

12.—*Alatum*, p. 119. Found at Selworthy, in Somersetshire, by Mrs. Archer Thompson. I have received some good fronds from Mr. Thomas Moore, of the Chelsea Botanic Gardens. Stem very scaly. Superior basal pinnules larger than the rest.

Angustatum. A previous name for *Proliferum*.

13.—*Angustifrons*, p. 109. I have received further fronds from the Rev. F. Mules, of Marwood.

Apiculatum of Wollaston is another name for *Furcatum*.

14.—*Arctatum*, p. 177. 15.—*Aristatum*, p. 80. A very similar form has been found in Shebden Dale, near Halifax, by Mr. A. Stansfield, and near Marwood, Devonshire, by the Rev. F. Mules.

16.—*Ascendens*, p. 147. 17.—*Athyrioides*, p. 101, 180.

18.—*Attenuatum*, p. 133. The Rev. F. Mules has sent me this variety, found near Marwood.

Baileyanum. A form of *Grandidens*.

19.—*Bilobatum*, p. 117. 20.—*Biserratum*, p. 77. Found also in Devonshire, Somersetshire, Sussex, Middlesex, Gloucestershire, Yorkshire, Pembroke, and near Dublin. Mr. Elworthy has sent me an extra good form, two feet six inches long by six inches broad, with ascending crowded pinnæ and approximate pinnules, also more deeply cut and more conspicuously biserrated. Apex furcate. Stipes all but wanting. Stipes and rachis very stout and densely scaly. Mr. Elworthy has also

found a pretty narrow variety, with fronds nearly three feet in length, and under six inches in width, gradually narrowing to the base, and ending abruptly in an attenuated apex. Pinnæ (about forty pairs) much crowded, from the centre of the fronds upwards overlapping each other, about five inches long, and ending in lengthy narrow apices.

21.—*Biserratum-decompositum*, p. 169.

22.—*Biserratum-incompletum*, p. 159.

23.—*Brachiatum*, p. 106, 182. I have received a very large form from Mr. Elworthy.

24.—*Brachiatum-multifidum*, p. 168. 25.—*Braunii*, p. 95.

26.—*Calcaratum*, p. 178. *Claphamii*, Moore, another name for *Multifidum*.

27.—*Concinnum*, p. 173.

28.—*Confluens*, p. 167.

29.—*Congestum*, p. 120.

30.—*Conspicuilobum*, p. 163.

Cornutum. A name for a form of *Grandidens*.

31.—*Corymbiferum*, p. 102. *Cranfordianum*. A form of *Pro-liferum*.

32.—*Crispatum*, p. 125.

33.—*Crispum*, p. 136.

34.—*Cristato-gracile*, p. 126. A somewhat different and larger-growing form has been found in Devonshire by the Rev. Charles Padley, of Bulwell Hall, Nottinghamshire.

35.—*Cristatum*, p. 81. There are several forms of this Fern. Mr. Elworthy has found two, Mr. Wollaston three, and Messrs. Stansfield and Bloxam another. One of Mr. Elworthy's forms is in the possession of Messrs. Veitch, of Exeter: it is much narrower. Mr. Sim's form is very good: it is well crested, and exceeds two feet in length, and is more crested than in Messrs. Veitch's form. The Rev. F. Mules has also found a very fine form. I have received additional fronds from the Rev. C. Padley, of Bulwell Hall, and the Rev. F. Mules, of Marwood.

Cruciatum. Mr. Wollaston's name for *Elworthii*.

36.—*Cristulatum*, p. 92.

37.—*Cupuliforme*, p. 120.

38.—*Curtum*, p. 112.

39.—*Decompositum*, p. 79. Mr. C. Elworthy has sent a remarkably fine form, which is three feet ten inches in length, and ten inches wide in the widest part.

40.—*Decompositum-Elworthii*, p. 175.

41.—*Decompositum-multifidum*, p. 179.

42.—*Decompositum-splendens*, p. 174.

43.—*Decurrens*, p. 98. Mrs. Thompson, of South Lawn, Exeter, has forwarded me a biserrate form found in that neighbourhood.

44.—*Defectum*, p. 136.

45.—*Densum*, p. 96.

46.—*Deorso-pinnatum*, p. 139.

47.—*Depauperatum*, p. 83.

48.—*Difusum*, p. 166.

49.—*Dispar*, Wollaston, p. 171. Found in Devonshire by Mr. G. B. Wollaston, of Chiselhurst. Pinnæ unequal and irregular, opposite, alternate, or sub-opposite, without any order or regularity. Some pinnæ nearly three times the length of even those on the opposite side of the rachis; occasionally an extra pinna on the rachis, no longer, and of the same form

as a single pinnule. Some pinnæ ascending, others horizontal. Pinnules varying considerably in size and form; in some pinnæ they are triangular, with a cuneate base, scarcely auricular, two-spined, and uncut, except the serrated edges; in others strongly auricular and deeply cut, biserrate, and many-spined. Some pinnæ have a lengthy sub-tripinnate superior basal pinnule, whilst in other pinnæ the superior basal pinnule does not differ from the rest. In the upper half of the frond especially the spines all incline in one direction, in consequence of which one half of the spines lie on the leafy portion of the pinnule, giving the appearance of only being spiny on one margin. Length of frond two feet. Colour much paler beneath. Stipes and rachis very hirsute, with reddish hair-like scales. Sori irregular, in some pinnæ very copious, in others very sparingly soriferous. My thanks are due to Mr. Wollaston for fronds.

Discretum. The old Kew name of *Proliferum*.

50.—*Dissimile*, p. 81. The Rev. C. Padley has found a good form in Devonshire, in which some of the pinnæ are wanting. It is thirty inches long, and five inches broad. The stem exceedingly hairy. This variety has also been found near Barnstaple by the late Mr. C. Jackson, and in Guernsey by Mr. J. James, of Vauvert.

51.—*Diversum*, p. 164. 52.—*Dubium*, p. 86. Also found in Sussex by Mr. G. B. Wollaston, at Nettlecombe by Mr. C. Elworthy, in Antrim by Mr. D. Moore, and in Hampshire, Wiltshire, and Wales.

53.—*Elegans*, p. 103. Length of frond twelve inches; colour a rich grassy green. Sori confined to three or four inches of the apex, dark in colour. A leafy variety. I am indebted to Mr. Swynfen Jervis for fronds raised from Irish spores.

54.—*Elworthii*, p. 153.

55.—*Eraston*, p. 131.

56.—*Euprepes*, p. 130.

57.—*Extremum*, p. 176.

Falcatum. Another name for *Laxum*.

58.—*Flexuosum*, p. 133.

59.—*Foliosum*, p. 117.

Footii. A form of *Proliferum*.

60.—*Formosum*, p. 160.

61.—*Furcatum*, p. 102. The Rev. C. Padley has found in Devonshire a decomposite form of *Furcatum*, three feet in length, in which the apex of the frond is ramose, as well as the pinnæ being furcate. This is a very marked variety.

62.—*Gracile*, p. 101.

63.—*Grandiceps*, p. 151.

64.—*Grandidens*, p. 85. Found also at Nettlecombe by Mr. Elworthy; at Lisnaskea, in Ireland, by the Rev. W. R. Bailey; near Whitby by Mr. W. Willison; at Weston-super-Mare by Mr. H. Parker. Mr. Bailey's Fern is known as *Baileyanum*. It has variously inciso-laciniate pinnules, or a few large angular teeth. When the rachis has sometimes been developed into a horn it has been called *Cornutum*. I am indebted to Mr. Swynfen Jervis, of Darlston Hall, for excellent fronds.—A form which I have provisionally called *Grandidens-Greyi* has been found in Devonshire by Mr. R. J. Gray, of Alphington, near Exeter, (formerly of St. Thomas', Exeter.) This is the best form I have seen: it is dwarf in habit, nearly normal in outline, although the pinnæ are somewhat

unequal in length. Unlike the ordinary form of *Grandidens*, the pinnæ are not abrupt, but gradually taper to their apices; and this is also the case with the apex of the frond, giving the frond quite an *Athyrium* look. I am indebted to Mr. R. J. Gray for fronds.—Since writing the account of this Fern I have received several forms of it from the Rev. Charles Padley, of Bulwell Hall. Four plants, differing very much from each other, were found by Mrs. Thompson, of South Lawn, Exeter, at Clist Hydon, and these are the varieties forwarded by Mr. Padley. One of the varieties, which has been provisionally called *Grandidens-angustatum*, differs in being narrower, the pinnules smaller, the upper third of the pinnæ confluent. Length twelve inches, width scarcely three quarters of an inch near the base, and only two inches in the widest part. Basal pinnæ consisting of a pair of stalked, diminutive, cup-shaped pinnules; the rest of the pinnæ undivided; being simply toothed on the edges; apex rounded. The next few pinnæ have two or three pairs of stalked rather larger pinnules and an undivided upper portion. The largest pinnæ have five or six pairs of stalked pinnules and a long undivided apex, conspicuously toothed, mostly bidentate. Pinnules cuneate at the base, from rotund to ovate, occasionally linear or depauperate. Pinnæ approximate and ascending. Pinnules approximate. The frond not narrowing to the apex, ending abruptly in a similar pinna to those on either side the rachis, and equally developed, with equal-sized pinnules. Sori confined to the apex of the frond, situated on the edge of the pinnules, almost suprasoriferous.—The second variety combines the characters of *Grandidens* and *Angustifrons*: it is eighteen inches in length, and two inches and a half wide, and partakes more of the characters of the latter variety.—The third variety is more lax, more slender, has a less number of pinnules, and, though partaking of the characters of both *Grandidens* and *Angustifrons*, partakes more of the characters of the former variety.—The fourth variety is very singular, and might appropriately be called *Grandidens-cornutum*. It is only six inches in length, the stipes occupying two inches; width very various, from less than an inch to three inches and a half. Pinnæ two inches in length, being indiscriminately dispersed amongst others from under half an inch to an inch long. Pinnæ alternate and approximate, the smaller pinnæ consisting of from one to four pinnules, and in place of an ultimate pinnule a cornute termination, the largest pinnæ consisting of from six to eight pairs of stalked pinnules and a long undivided apex. Pinnules very various both in size and form, no two alike. A very slender and singular Fern.

65.—*Grandidens-angustatum*, p. 187. 66.—*Grandidens-cornutum*, p. 187.

67.—*Grandidens-Grayi*, p. 186. *Hardingii*. A form of *Proliferum*.

68.—*Hastulatum*, p. 87. Mr. Elworthy has sent fronds of a small variety which he has found near Nettlecombe.

69.—*Imbricatum*, p. 83. Mr. Elworthy has sent fronds from Nettlecombe.

70.—*Inciso-acutum*, p. 137. 71.—*Incisum*, p. 107. This is the *Plumoso-gracile* of Moore. Pinnæ and pinnules distant. My thanks are due to Mr. Elworthy for fronds.

72.—*Incompletum*, p. 175. Resembles *Biserratum-incompletum*, and is probably identical.

73.—*Indivisum*, p. 169.

74.—*Indivisum-majior*, p. 169.

75.—*Inaequale*, p. 110. Mr. Elworthy has found this Fern near Nettlecombe, and the fronds he has forwarded to me are more beautiful and more characteristic than those from which the engraving was executed. Length twenty-four inches, width five inches. Stipes and rachis stout and very scaly. Sori covering the upper two thirds of the frond, exceedingly copious and large, completely hiding the outline of the pinnules to the extreme tip of the frond. I am indebted to Mr. Elworthy for examples.

76.—*Intermedium*, p. 91. Mrs. Thompson, of South Lawn, Exeter, has sent me large attenuated fronds, three feet long, eight inches wide, and having forty pairs of pinnæ. Found also at Newick Park, Sussex, by Mr. J. H. Selater; at Nettlecombe by Mr. C. Elworthy; on the Island of Anglesea by Mr. T. Pritchard; at Swansea and Castle Malgwyn; at Littlehampton by Mr. G. B. Wollaston; and in Guernsey by the late Mr. C. Jackson.

77.—*Irregulare*, p. 111.

78.—*Interruptum*, p. 108. A large form has been found near Exeter by Mr. G. B. Wollaston. Length from twenty-four to twenty-seven inches, and seven inches wide in the widest part; the upper ten inches contracted into pinnæ of only from one and a half to two inches and a half across. Found also at Fordingbridge, Herts, by Mr. G. B. Wollaston; near Ilfracombe by the Rev. J. M. Chanter; at Killarney by Dr. Kinahan; and in Guernsey by Mr. J. James.

79.—*Kalon*, p. 143.

80.—*Kitsonia*, p. 125.

81.—*Kladodesteron*, p. 157.

82.—*Korumbion*, p. 147.

83.—*Kumatodes*, p. 148.

84.—*Laciniatum*, p. 94. There are several forms of this Fern, differing, and connecting this variety with *Interruptum*. One found by Mr. Willison near Whitby has the pinnæ and pinnules widely expanded. Another found by Mr. Parker is large and more slender. A less-lacinated form has been found at Littleham, in Devonshire, by the Rev. C. Padley. It is fragile, vivid green, and eighteen inches in length. Found also near Dublin by Dr. Kinahan. My thanks are due to Mr. Swynfen Jervis, of Darlaston Hall; Mr. Willison, of Whitby; Mr. G. B. Wollaston, of Chiselhurst; the Rev. C. Padley, of Bulwell Hall; and Mr. Parker, for fronds.

85.—*Lanceifolium*, p. 165.

86.—*Latipes*, p. 100.

Latum, of Moore. A name of *Premorsum*.

87.—*Lawum*, p. 155.

88.—*Levidense*, p. 119.

89.—*Lineare*, p. 93. A variety connecting this with *Confluens* has been found near Exeter by Mr. R. J. Gray.

90.—*Lineare-proliferum*, p. 127.

91.—*Lineatum*, p. 181.

Longicaule, of Wollaston. Another name for *Latipes*.

92.—*Magnum*, p. 158.

93.—*Micromerum*, p. 162.

94.—*Mikron*, p. 163.

95.—*Multifido-cristatum*, p. 149.

- 96.—*Multifidum*, p. 89. *Multicristatum*, of Wollaston, another name for *Kitsonie*.
- 97.—*Multiforme*, p. 132. 98.—*Mutilobum*, p. 121. The Rev. F. Mules, of Marwood, has sent some very fine fronds.
- 99.—*Obtusissimum*, p. 122. Found also at Littleham, in North Devonshire, by the Rev. C. Padley. This, although somewhat narrower, approaches very near to *Obtusissimum*.
- 100.—*Obtusum*, p. 87. One of the *Biserratum* section.
- 101.—*Ornatum*, p. 177. 102.—*Ovatum*, p. 170.
- 103.—*Oxu*, p. 158. 104.—*Oxyphyllum*, p. 116. This Fern to me is quite distinct from *Mutilobum*. The fronds I have received are much more acute in the lobes, the pinnæ and pinnules more sharply pointed, and the inferior pinnules above twice the length of the superior ones, the pinnules resembling branches, with distant and stalked lobes. Pinnæ bending upwards. Densely scaly. Length two feet, width eight inches and a half.
- Padleyense*. A form of *Proliferum*.
- 105.—*Paleaceum*, p. 103. 106.—*Parvulum*, p. 176.
- 107.—*Phylloideum*, p. 139. 108.—*Plenum*, p. 165.
- Plumoso-gracile*, of Moore, another name for *Incisum*.
- 109.—*Plumosum*, p. 113. The late Mr. Jackson's form is closer in pinnæ than that of Mr. Wollaston's. The pinnæ overlapping, sub-opposite below, alternate above, about thirty-five pairs of pinnæ, the basal pair much the largest, and inclined downwards. The pinnules on the lower side of the pinnæ twice the length of those on the upper side. In fronds received from the Rev. C. Padley, of Bulwell Hall, the lowest pinnæ are not larger, and are not inclined downwards.
- 110.—*Polyclados*, p. 145. 111.—*Polydactylum*, p. 114. Messrs. Stansfield, of Todmorden, have sent me a variety that is apparently different; the frond is broader, the pinnæ larger, and the pinnules near the rachis exceedingly small, not so large as the auricles of the larger pinnules, occasionally linear, long, narrow, and strongly auricled, and distinctly stalked. About eleven pairs of pinnæ, besides the apical portion.
- 112.—*Polydactylum-cornutum*, p. 115.
- 113.—*Polueides*, p. 141. 114.—*Præmorsum*, p. 88. The Rev. C. Padley has found in Devonshire a form of this Fern, with fronds from twenty to twenty-two inches long, and five inches and a half wide, except the upper half, which gradually becomes narrower. Pinnæ opposite and sub-opposite below, alternate above. Somewhat similar to the Irish form, except that the frond is not altered or præmorse, except near the apex. Mr. Elworthy has sent me a form found near Nettlecombe, formerly called *Abruptum*, (a variety not sufficiently distinct from *Præmorsum*.) Length fourteen inches, width very narrow, only two inches and a half in the widest part. Pinnæ more or less abrupt; pinnules remote, very various in size and shape, more or less lacinated or depauperated; the two or three basal pairs of pinnules smaller than

those near the apex of the pinna.—Mr. Wollaston considers that *Latum* of Moore can only be looked upon as a variety of *Præmorsum*, and I have adopted this view, although in some respects it is different. In fronds received from Mr. Elworthy of a plant found near Nettlecombe, I find the length is thirty inches, and width in widest part seven inches. There are above twenty pairs of pinnæ, which are five inches in length, narrower and more attenuated, with less-crowded pinnules, which, however, are similar in form to *Præmorsum*. The pinnæ curl upwards at a considerable angle. Found at Barnstaple by the late Mr. C. Jackson; at Ilfracombe by Mr. J. Dodds; and at Nettlecombe by Mr. Charles Elworthy. As there is a marked difference between the Irish and Devon form of *Præmorsum*, it seems desirable to distinguish it by the addition of the name of the discoverer. I have therefore called Fig. 56 *Præmorsum-Wollastoni*.

115.—*Præmorsum-Wollastoni*, p. 88. The Devon form of *Præmorsum*. See Fig. 56.

116.—*Præmorso-pulchrum*, p. 178. 117.—*Proliferum*, p. 80. A form with narrow pinnules has been discovered at Ide by Mr. R. J. Gray. Another form, which is peculiar from the dense mass of long red scales on the rachis, and which is strikingly effective in the lower half of the frond, was found at Monk Leigh, in North Devonshire, by the Rev. Charles Padley. Found also at Whitby by Mr. W. Willison, and near Brighton by the Rev. H. Rooper. To all these gentlemen I am indebted for fronds. Dr. Kinahan, in August, 1849, found this plant growing on slate rocks by the side of a stream, which, running through Friarstown House demesne, falls into the Dodder, just above Bohernabreena, County Dublin.

118.—*Proliferum-angustatum*, p. 176.

119.—*Proliferum-Cranfordianum*, p. 135.

120.—*Proliferum-Footii*, p. 104. Fronds much more triangular than in the ordinary form. Distinctly tripinnate. Pinnules scarcely auricled. Mr. F. J. Foot, of the Ordnance Survey of Ireland, who discovered this Fern, and who has sent me fronds, says that the original plant is a large stout noble-looking Fern, of a very dark green, the rachis very thick and scaly at the base; and, instead of growing upright the fronds spread out horizontally, or are slanting upwards.

121.—*Proliferum-Hardingii*, p. 161.

122.—*Proliferum-Pudleyanum*, p. 156.

123.—*Proliferum-Wollastoni*, p. 128. Found also in North Devonshire by Mr. Thomas Wray Harding.

124.—*Pterophorum*, p. 99.

125.—*Pteroton*, p. 137.

126.—*Pulchellum*, p. 161.

127.—*Pulchrum*, p. 177.

128.—*Pulchrum-irregulare*, p. 175.

129.—*Pumilum*, p. 115. Found at Nettlecombe by Mr. C. Elworthy, from whom I have received fronds.

130.—*Pyramidale*, p. 178.

131.—*Quadratum*, p. 97. Found also at Whitby, in Yorkshire, by Mr. W. Willison, and in South Devon by Miss Hoscason.

- 132.—*Ramo-corymbiferum*, p. 138. 133.—*Ramosissimum*, p. 144.
 134.—*Ramosum*, p. 152. 135.—*Ramulosum*, p. 90.
 136.—*Reflexum*, p. 110. I am indebted to the Rev. F. Mules, of Marwood, for fronds.
 137.—*Retroflexum*, p. 123. 138.—*Rotundatum*, p. 99. I am indebted to Mr. Swynfen Jervis, of Darlaston Hall, and to Mr. Charles Elworthy, of Nettlecombe, for fronds. The pinnules are without spines; in the illustration the artist has unfortunately added them.
 139.—*Rotundilobum*, p. 147. 140.—*Semitripinnatum*, p. 179.
 141.—*Setigerum*, p. 156. 142.—*Setosum*, p. 182.
Stansfieldii, of Moore, one of the forms of *Cristatum*.
 143.—*Stenophyllum*, p. 97. Fronds have been sent by the Rev. F. Mules.
 144.—*Stipatum*, p. 101. Length from twenty to twenty-two inches. An *Aculeatum*-looking variety. My thanks are due to Mr. A. Tait, of Edinburgh, for additional fronds. Mr. Tait informs me that twelve or fourteen years ago he saw two plants at Dalkeith Palace, and that Mr. Charles Mc Intosh, then gardener there, gave him one. Mr. Tait has never been able to raise any young plants.
 145.—*Sub-plumosum*, p. 168. *Subquadripinnatum*, of Wollaston, another name for *Deorso-pinnatum*.
 146.—*Subtripinnatum*, p. 107. 147.—*Subvariegatum*, p. 148.
 148.—*Supralineatum*, p. 118. 149.—*Tenuë*, p. 92.
 150.—*Thompsoniæ*, p. 141. *Tortile*. This form is non-permanent, and is therefore excluded.
 151.—*Trapezoidium*, p. 177. 152.—*Triangulare*, p. 159.
 153.—*Tripinnato-decompositum*, p. 172.
 154.—*Tripinnatum*, p. 78, 156. The Penzance plant, removed from *Tripinnatum*, and called *Achurodes*.
 155.—*Truncatum*, p. 82. By some authorities considered as a form of *Grandidens*. Found in the Dublin Mountains by Dr. Kinahan.
 156.—*Turgidum*, p. 151. 157.—*Variabile*, p. 178.
 158.—*Variiegato-crispatum*, p. 95. 159.—*Variiegato-cristatum*, p. 118.
 160.—*Variiegato-præmorsum*, p. 123. 161.—*Varians*, p. 105. The Rev. Charles Padley, of Bulwell Hall, has found a dwarf form at Littleham, in Devonshire. Mrs. Thompson, of South Lawn, Exeter, has found a very fine form, the fronds being twenty-four inches in length, no two pinnæ being alike. Mrs. Thompson has also found near Exeter a singular variety, which will apparently be very distinct, but which is as yet too immature to describe. I am indebted to Mrs. Thompson, the Rev. Charles Padley, and to Mr. Swynfen Jervis, of Darlaston Hall, for many fronds.
 162.—*Vestitum*, p. 134. *Viviparum*, Kinahan, is evidently another name for *Proliferum*.
Wollastoni. The same as *Proliferum Wollastoni*.

Polystichum angulare is a species very easily cultivated, growing luxuriantly in our ordinary ferneries in any light loam, and especially delighting to grow in a soil that is enriched by decaying vegetable matter. It prefers a well-drained somewhat shady situation, and requires abundance of space for the expansion of its roots.

There are so many well-marked varieties, that a fine collection of this single species will alone occupy a large space in the British fernery. Indeed, not only are there more than one hundred and fifty named varieties, but there are at least one hundred forms of some of these varieties, combining the characteristic features of one or more other forms in combination with its own particular form. Thus, the section *Tri-pinnatum* embraces a vast number of plants very distinct in character from each other, yet bearing primary features that mark the particular variety from whence it takes its name. The same may be said of the varieties *Biserratum*, *Decompositum*, *Laxum*, *Laciniatum*, *Cristatum*, *Proliferum*, *Semitripinnatum*, *Decurrens*, and *Dissimile*. Were all the varieties to receive name there would be no end to the number of varieties. Some are more, and others less-developed forms, and each variety will frequently change its character on becoming more mature; thus, *Semitripinnatum* may become a fully-developed *Tripinnatum*, or even become *Subquadripinnatum*. It therefore requires great care in distinguishing many of the forms, but at the same time, when special characters are apparent, it seems desirable to distinguish these, although they may in some respects approach one or other of existing forms. In *Tripinnatum*, for instance, the original plant, brought into notice by myself, is quite distinct from the many forms which now bear this name; and I agree with Mr. Wollaston that the two forms cannot belong to the same variety; and although this was the first which received the name, still the subsequent ones are simply tripinnate varieties, and answer exactly to their name, whereas the original form has several marked features that do not of necessity belong to a tripinnate variety, (such as the peculiar chaffy appearance of the under side of the fronds and the horizontal position of the pinnæ, these being peculiar to this plant alone, and not being requisite features

for a simple tripinnate frond. Mr. Wollaston suggested the alteration of the name, and, acting upon this advice, I have changed it to *Achurodes*, on account of its chaffyness. The coloured Plate (XIV,) will therefore represent this variety, of which the description on page 78 will be found to refer to *Achurodes*, and not to the more common form of *Tripinnatum*, which, although answering most of that description, is not chaffy, nor has it horizontal pinnæ.

In speaking of what is called a *normal* form, I cannot do better than quote Mr. Wollaston, whose experience on the subject is very great. He considers that *Subtripinnatum* is a *vigorous perfectly natural development*; beyond it again *Decompositum* is the maximum of normal development. *Biserratum* is also a *vigorous normal growth*, generally found near the sea; and unless these three forms are in excess they are *no varieties*. If they and the intermediate forms ranked as varieties, every one picked up would be so. Of a hundred plants gathered miscellaneously from the hedge no two are alike; some, particularly extremes, are very unlike; but Mr. Wollaston considers them *all normal*, although he says that it requires an intimate knowledge of them to believe they are not different species.





Adiantum species



Fig. 156.—Pinna of mature Frond—under side.

POLYSTICHUM ACULEATUM.

ROTH.

The Common Prickly Shield Fern.

PLATE XX.

| | |
|-----------------------------------|----------------------------|
| <i>Polystichum aculeatum,</i> | ROTH. BABINGTON. DEAKIN. |
| “ “ | NEWMAN. SOWERBY. PRESL. |
| “ “ | FEE. SCHOTT. MOORE. LINK. |
| “ <i>lobatum,</i> | PRESL. LINK. FEE. HOOKER. |
| “ “ | J. SMITH. SOWERBY. |
| “ <i>affine,</i> | PRESL. |
| “ <i>aculeatum, var. lobatum,</i> | DEAKIN. MOORE. |
| “ “ “ | BABINGTON. FEE. |
| “ “ <i>var. lonchitoides,</i> | DEAKIN. |
| “ “ <i>var. argutum,</i> | MOORE. |
| “ <i>Plukenetii,</i> | DE CANDOLLE. STEUDEL. |
| <i>Aspidium aculeatum,</i> | SWARTZ. HOOKER AND ARNOTT. |
| “ “ | SMITH. BENTHAM. SPRENGEL. |
| “ “ | WILLDENOW. KOCH. TENORE. |
| “ “ | LEDEBOUR. STURM. NYMAN. |
| “ “ | SPENNER. SCHKUH. R. |
| “ “ | E. J. LOWE. |
| “ <i>lobatum,</i> | SCHKUHR. KUNZE. SWARTZ. |
| “ “ | SMITH. HOOKER AND ARNOTT. |
| “ “ | MACKAY. WILLDENOW. |
| “ “ | TENORE. |

| | |
|---|-------------------------|
| <i>Aspidium affine</i> , | WALLICH. |
| “ <i>discretum</i> , | DON. |
| “ <i>lobatum</i> , var. <i>lonchitidoides</i> , | HOOKE AND ARNOTT. |
| “ <i>intermedium</i> , | SADLER. |
| “ <i>munitum</i> , | SADLER. (Not KAULFUSS.) |
| <i>Polypodium aculeatum</i> , | LINNÆUS. BOLTON. |
| “ <i>lobatum</i> , | HUDSON. |
| “ <i>Plukenetii</i> , | LOISELEUR. |

Polystichum—From the Greek, *polys*—many, and *stichos*—order.
Aculeatum—Prickly.

THIS very near ally of *Polystichum angulare* was considered by the older botanists as identical with it, and, even at the present day, by some authorities, as doubtfully distinct. On the other hand there are those who would even again divide it into *Polystichum aculeatum* and *Polystichum lobatum*. My experience of this latter Fern leads me to consider it as unworthy of even the rank of a variety, as in the young state the plants are always simply lobate, whilst the more mature plant gradually loses this character. It has only the permanence of youthfulness, and, although found fertile, must be regarded as the young state of *Polystichum aculeatum*, which will eventually assume its normal characters.

An inhabitant of damp shady banks, along hedgerows or in woods. A widely-spread and common Fern, recorded as inhabiting Cornwall, Devonshire, Somersetshire, Gloucestershire, Hampshire, Dorsetshire, Wiltshire, Sussex, Hertfordshire, Kent, Middlesex, Surrey, Buckinghamshire, Berkshire, Oxfordshire, Essex, Suffolk, Norfolk, Cambridgeshire, Bedfordshire, Northamptonshire, Warwickshire, Monmouthshire, Herefordshire, Worcestershire, Staffordshire Shropshire, Leicestershire, Lincolnshire, Nottinghamshire, Derbyshire, Yorkshire, Lancashire, Cheshire, Westmoreland, Cumberland; Durham, Northumberland, Pembrokehire, Glamorganshire, Brecknockshire, Denbighshire, Carnarvonshire, Carmarthenshire, Island of Anglesea, Isle of Wight, Isle of Man, Dumfriesshire, Kirkeudbrightshire, Renfrewshire, Lanarkshire, Edinburghshire, Berwickshire, Fifeshire, Forfarshire, Perthshire, Kincardineshire, Aberdeenshire, Argyleshire, Rosshire, Isle of Islay, Isle of Bute, Isle of Cantyre,

Antrim, Galway, Wicklow, Dublin, Clare, Cork, Londonderry, Sligo, and Channel Islands.

Abroad it is a native of Scandinavia, Switzerland, Germany, Holland, France, Belgium, Spain, Portugal, Italy, Greece, Turkey, Austria, Russia, Africa, Island of Madeira, and United States of America. In 1860, whilst travelling amongst the Spanish Mountains, along the spurs of the Pyrenees, I found *Polystichum aculeatum* repeatedly. On the Villia Escusa, a mountain a few miles south of Reinosa, this Fern was growing luxuriantly amidst the street-like rocks, so much so as to be a shelter to the numerous wolves and foxes that inhabit this mountain. Whilst the asphodel, rock rose, iris, linum, and many other splendid alpine plants, were richly strewn over the open land, this Fern occupied every available space where there was shelter and moisture. It was seen peeping out of the Horodada, in the Congosto Pass, amongst the trees in the Hoz de Barcena, on the Pena Castilla at Fuento del Mar, and where lashed by the waves of the Bay of Biscay at Santander. In the Highlands of Scotland it ascends upwards of two thousand feet above the sea, and in Northern Spain I have seen it most common above the height of three thousand feet.

A very easily-cultivated species in a loamy soil, and a somewhat shady situation. It is an elegant Fern, and, being evergreen, is a desirable plant in a hardy fernery. This species differs from *Polystichum angulare* in being more upright in growth, stouter, and more rigid in texture.

The fronds are from twelve to thirty-six inches in length, and from four to seven inches in width, leathery in texture, deep green on the upper surface, smooth, lanceolate in form, and bipinnate. The pinnae obliquely lanceolate. The pinnules ovate-falcate or elliptic, their apices aristate. Auricular on the anterior side, the auricle being acute and mucronate. The basal anterior pinnule on each pinna is usually much larger than the rest.

Veins branched from a flexuose mid-vein.

Stipes brief, densely covered with broad scales; usual length from three to four inches.

Rachis stout and densely scaly.

Fructification mostly confined to the upper half of the frond.

Sori circular and indusiate, eventually confluent. Indusium membranaceous.

This species is not so proliferous in varieties as *Polystichum angulare*. The following may be described:—

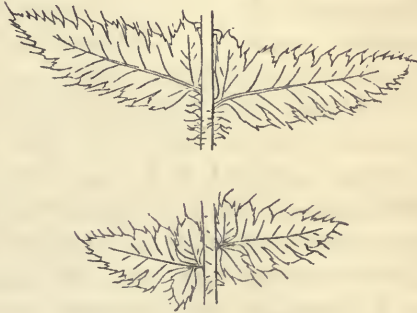


Fig. 157.—Middle pinnæ, and basal pinnæ.

LOBATUM, Deakin. (Fig. 157.)—Having narrow lance-shaped fronds, from twelve to twenty-four inches in length, sub-pinnate, as only a few of the basal pinnæ have pinnules. The anterior basal pinnule is much larger, and the auricle larger; the remainder decurrent or confluent, and not auricled. A common variety, found in many places in Yorkshire, by Mr. A. Clapham, of Scarborough; at Chaigeley Manor, near Clitheroe, Morecombe Bay, and at Preston, Lancashire, by myself; at Matlock, in Derbyshire, and also at Cromford, by myself; at Papplewick, Bulwell, Wollaston, Beeston, and Stanton-on-the-Wolds, by myself; in the lake district near Ambleside, Patterdale, and Coniston, by myself; in Warwickshire, by the Rev. W. Bree; in Gloucestershire, by Mr. H. Buckley; in Shropshire, by the Revs. W. M. Hind and W. A. Leighton; near Yarmouth, in Norfolk, by Miss Wells; at St. Mary's Cray, Kent, by Mr. R. Sim; at Norwood, Middlesex, by Mr. S. F. Gray; at Mayford, in Surrey, by Mr. Thomas Moore, of Chelsea; in Devonshire, by the Rev. F. Mules; at Nettlecombe, by Mr. Charles Elworthy. Other authorities have found it in Somersetshire, Hampshire, Isle of Wight, Sussex, Buckinghamshire, Berkshire, Oxfordshire, Essex, Suffolk,

Northamptonshire, Monmouthshire, Herefordshire, Staffordshire, Leicestershire, Lincolnshire, Cheshire, Northumberland, and Cumberland. It is also common to both North and South Wales, Scotland, and Ireland. Mr. Thomas Moore has found it in Perthshire and Argyleshire, Mr. D. Moore in Londonderry. It is also recorded as inhabiting Forfar, Argyleshire, Rosshire, Dumfries, Edinburgh, Berwick, Lanark, Kirkcudbright, Isle of Cantyre, Isle of Islay, Antrim, Wicklow, Sligo, and Clare. The very common occurrence of this form seems to be a strong argument that it is either a distinct species, or merely a certain growth of the normal form. I feel convinced that the latter is the true view to take of the subject. I have removed many plants to my fernery, every one of which have eventually become *Aculeatum* true. Mr. Moore, however, remarks that it is not the case with his experience, and therefore I have included it as a variety on so good an authority, much against the advice of several well-known Fern-growers. The Rev. Charles Padley, of Bulwell Hall, who has devoted much time to the *Polystichums*, confirms my experience. It is quite possible that a few isolated plants may retain the lobate character, and to these this variety must be confined.

LOBATUM-ACUTUM, *Jervis*.—Found in Staffordshire, by Mr. Swynfen Jervis, of Darlaston Hall, and in Somersetshire, by Mr. Charles Elworthy, of Nettlecombe. A narrow attenuated form, having the apex narrowed out into a long point; the pinnæ almost acuminate, and the segments crowded, small, and very spiny toothed. It is unnecessary to give an illustration.

CRASSUM, *Moore*.—Found near Basingstoke, by Mr. F. Y. Brocas. Distinguished by the very thick, short, broad, overlapping, and biserrate pinnules. An illustration appears unnecessary. I have, however, been unable to get a sight of a frond, although I have made several applications to the discoverer.

MULTIFIDUM, *Wollaston*.—Found in Suffolk by Mr. G. B. Wollaston, of Chisellhurst, and in Somersetshire, by Mr. C.

Elworthy. The distinction consists in the apex of the frond dividing into a spreading tuft of branches. My thanks are due to Mr. Wollaston for fronds. It is unnecessary to give an illustration.



Fig. 158.

MICACEUM, *Mules*, *MSS.* (Fig. 158.)—Found at the foot of Showlesborough, (a lofty hill) near Barnstaple, by the Rev. F. Mules, of Marwood. This plant is said only to grow on a micaceous soil, hence its name. A dwarf form, narrow, pinnae almost as broad as long; in the basal pair of pinnae there is a somewhat circular lobe that is distinctly stalked, in the next pair

this lobe is decurrent, the rest being undivided, and an auricle taking the place of a lobe. Length of frond from four to six inches, width one inch. Stipes and rachis rather scaly. My thanks are due to the Rev. F. Mules for fronds.



Fig. 159.

ACROCLADON, *Lowe*. (Fig. 159.)—Found near Exeter, by Mrs. Thompson, of South Lawn, Exeter. The handsomest form of *Polystichum aculeatum*. Length twelve to eighteen inches,

colour rich green. The pinnæ have pinnules on their lower half, and are confluent towards the apex, which is dilated and crested. Below the branching apex they are undivided, resembling an elongate auricled pinnule with a dilated apex. The apex becomes three-branched, these branches again branching, and their branches also branching, and forming a wide corymbiferous head three times the width of the frond. My thanks are due to Mrs. Thompson, and also to her brother, the Rev. Charles Padley, for fronds.



Fig. 160.—Apex.

FURCATUM, *Lowe*. (Fig. 160.)—Found in Devonshire, by the Rev. F. Mules, of Marwood. A large-growing variety of the normal form, having a forked apex. I am indebted to Mr. Mules for fronds. Length of frond two feet six inches.



Fig. 161.

INTERRUPTUM, *Low*e. (Fig. 161.)—Found in North Devonshire, by the Rev. F. Mules. Length of frond twenty-four inches, width five inches in the widest part. Pinnæ narrowing to the base, alternate, normal at the base for the first four or five pairs of pinnæ, then half a dozen pairs of pinnæ with linear or almost wanting pinnules, above which normal to the apex. Pinnules but slightly auricular, with a much longer superior basal pinnule. In the interrupted portion the pinnules are scarcely more than the footstalks along the rachides. I am indebted to the Rev. F. Mules for fronds.



Fig. 162.—Upper pinna, and lower pinna.

CRISTATUM, *Moore*. (Fig. 162.)—Found at Barnstaple, by Mr. H. F. Dempster. In this variety the pinnæ are pinnate on

their lower half, and pinnatifid in their apical portion, with oblong-acute lobes, the lobes becoming more confluent as they become nearer to the apex, which is somewhat widened and crispy. The apex of the frond is acuminate. The pinnules are acute, oblong, their base cuneate, anterior auricle small. My thanks are due to Mr. G. B. Wollaston, of Chiselhurst, for fronds.

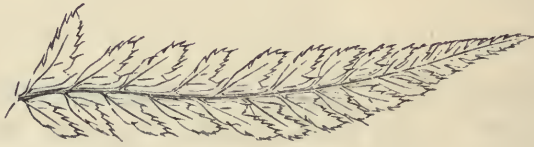


Fig. 163.

ARGUTUM, Moore. (Fig. 163.)—Found in Buckinghamshire, by Mr. J. Lloyd. A very similar variety has been found in South Devonshire, by the Rev. C. Padley, of Bulwell Hall. Frond broad lanceolate; it differs from the normal form in the pinnules being narrowed and elongated, becoming linear, terminating in an acute spine, and having long spines to the marginal teeth and a conspicuous auricle.

PULCHIRUM, Lowe. (Fig. 164.)—Found by the Rev. Charles Padley, of Bulwell Hall, in North Devonshire, and has in cultivation maintained its distinctive character. I have thought this deserving of a name. My thanks are due to Mr. Padley for fronds.

DUBIUM, Wollaston.—This variety approaches *Polystichum angulare* very closely. Normal in size and outline. Pinnæ alternate, linear-lanceolate, and approximate, the apex being



Fig. 164.

attenuate. Pinnules equal in size both above and below, with a larger superior basal pinnule more deeply cut, and especially the auricular lobe; pinnules stalked, except near the apex. Stipes, rachis, and rachides covered with dark brown scales. Vivid green above, paler beneath. Sori very copious, about six pairs of spore-cases on each pinnule. This plant approaches the *Polystichum angulare*, var. *Dubium*, but has narrower pinnules, which are more pointed. There is but little difference, the one however, more nearly resembles *Polystichum angulare*, whilst the other as nearly resembles *Polystichum aculeatum*. It is unnecessary to give an illustration, as on referring to page 86, fig. 53 will give a good idea of the plant, if it is remembered that the difference consists in the pinnules being narrower and more attenuated. My thanks are due to Mr. Daniels, of Ruthin Castle, Denbighshire, for fronds from plants found in his neighbourhood.

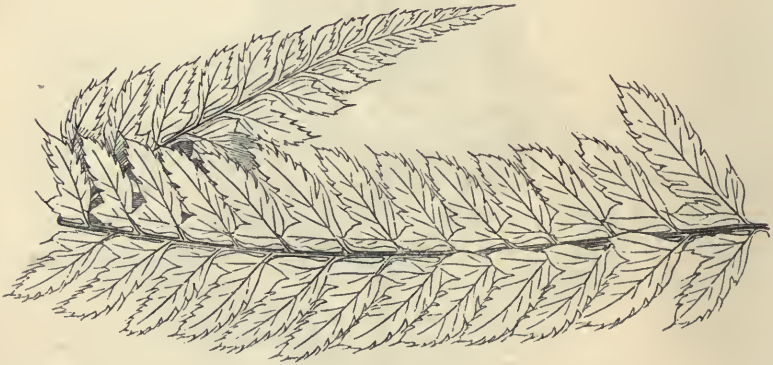


Fig. 165.

PLUMOSUM, *Lowe*. (Fig. 165.)—This feathery-looking form was found near Marwood, by the Rev. F. Mules, to whom I am indebted for fronds. It is normal in outline and size. Differing in the close and elegant plumose character of the fronds.



Fig. 166.

ELEGANS, *Lowe*. (Fig. 166.)—Found near Marwood, by the Rev. F. Mules, and said to be constant. This is named provisionally, and is an interesting variety if it retains its lobate character. Length of frond ten inches.

There are several distinct forms of *Polystichum aculeatum* that have not been deemed sufficiently marked to warrant names being given, and yet differing sufficiently to demand woodcut illustrations, as otherwise confusion might be occasioned. *Polystichum aculeatum*, it must be borne in mind, puts on every intermediate form between *Lobatum* and the fully-developed normal form; there is every gradation (mostly owing to the age of the plant) from the typical *Lobatum* to the typical *Aculeatum*. Some varieties are less, and others more developed than usual. The figures on the next page are three of these forms, and a reference to them will shew that in all essential respects there is no distinctive difference.



Fig. 167.



Fig. 168.

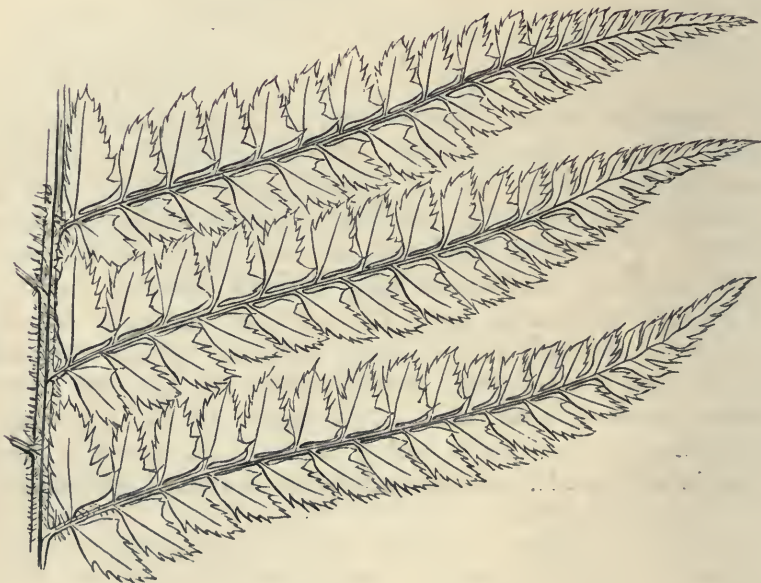


Fig. 169.

GENUS V.

LASTREA. PRESL.

A GENUS having herbaceous or coriaceous fronds.

Caudex creeping, erect, or decumbent, short and stout.

The fertile fronds are sometimes slightly contracted.

Veins simple, forked, or pinnate from a central costa; venules free, the anterior fertile, and occasionally others.

Sori globose, and having an indusium; the receptacles usually medial. The distinction consists in the rounded reniform indusium, and in its position, being attached at the basal sinus.

There are, according to Moore, eight well-marked British species, namely,—*L. thelypteris*, *montana*, *felix-mas*, *remota*, *rigida*, *cristata*, *dilatata*, and *æmula*.

As we proceed I think it will be shewn that more than this number of species exist in our island, and that, as an instance, in what we have considered hitherto as *Lastrea filix-mas*, we have in reality embraced three distinct species, which Mr. Wollaston proposes shall henceforth bear their specific rank under the names of *Lastrea filix-mas*, Presl; *L. pseudo-mas*, Wollaston; and *L. propinqua*, Wollaston.





LASIA REMOTA.—APEX OF FROND.



Fig. 170.—Portion of middle pinna—under side.

LASTREA REMOTA.

MOORE.

The Remote Buckler Fern.

PLATE XXI.

| | |
|--|------------------------|
| <i>Lastrea remota,</i> | MOORE. |
| <i>Aspidium remotum,</i> | BRAUN. KUNZE. FEE. |
| “ “ . | METTENIUS. E. J. LOWE. |
| “ <i>rigidum,</i> var. <i>remotum,</i> | BRAUN. |
| <i>Polystichum remotum,</i> | KOCH. |

Lastrea—Derivation doubtful.

Remota—Distant.

THE *Lastrea remota* is a handsome Fern. It was first discovered in the summer of 1859, in Westmorland, by Mr. F. Clowes, of Windermere, who looked upon it as a form of *Lastrea spinulosa*. To Mr. Thomas Moore, of the Chelsea Botanic Gardens, we are indebted for bringing the present

species before the public. This well-known authority in Ferns received fronds from Mr. Clowes, and recognised in them the *Aspidium remotum* of Braun, announcing the discovery to the Linnæan Society, on the 15th. of December, 1859. Thus another species has recently been added to our British Ferns.

A hardy deciduous species.

Native of Southern Germany, and Windermere, Westmorland.

The fronds, which are erect, are narrow oblong-lanceolate, smooth, and sub-tripinnate; the pinnæ ascending, opposite or sub-opposite, distant below, and ovate-acuminate in form. Pinnules an inch and a quarter in length, briefly stalked, almost pinnate, serrated, and more especially at the apex; ovate below, and linear-oblong at their greatest distance from the main rachis. Veins branched.

Sori medial and conspicuous, consisting of two rows near the costa.

The fructification covering the whole under side of the frond. Indusium kidney-shaped and persistent.

Stipes and rachis stout, and covered with numerous scales; stipes twelve inches in length. Lower pinnæ three to four inches in length, central pinnæ six inches.

Length of frond from three to four feet.

For fronds my thanks are due to Mr. F. Clowes, of Windermere; Mr. Stansfield, of Todmorden; and Mr. Swynfen Jervis, of Darlaston Hall, Staffordshire.

The illustration is from a frond of the original plant, sent by Mr. Stansfield.



ADIANTHUM SPECIOSUM.



Fig. 171.—Portion of mature Frond—upper side.

LASTREA RIGIDA.

PRESL.

The Rigid Buckler Fern.

PLATE XXII.

| | |
|------------------------------|--|
| <i>Lastrea rigida</i> , | PRESL. DEAKIN. MOORE. |
| “ “ | BABINGTON. NEWMAN. SOWERBY. |
| <i>Aspidium rigidum</i> , | SWARTZ. SCHKUEH. BENTHAM. |
| “ “ | HOOKEE AND ARNOTT. SPRENGEL. |
| “ “ | WILLDENOW. FRIES. TENORE. |
| “ “ | STURM. METTENIUS. FEE. |
| “ “ | E. J. LOWE. |
| “ <i>pallidum</i> , | LINK. FEE. |
| “ <i>argutum</i> , | KAULFUSS. |
| “ <i>fragrans</i> , | GRAY. (<i>Not of SWARTZ.</i>) |
| “ <i>nevadense</i> , | BOISSIER. |
| <i>Lophodium rigidum</i> , | NEWMAN. |
| <i>Polystichum rigidum</i> , | DE CANDOLLE. KOCH. LEDRBOUR. |
| “ <i>strigosum</i> , | ROTH. |
| <i>Nephrodium rigidum</i> , | DESVAUX. |
| <i>Polypodium rigidum</i> , | HOFFMAN. |
| “ <i>odoratum</i> , | POIRET. |
| “ <i>fragrans</i> , | VILLARS. (<i>Not of LINNÆUS</i> <i>nor HUDSON.</i>) |
| “ <i>Villarsii</i> , | BELLARDI. |
| “ <i>heliopteris</i> , | BORKHAUSEN. |

Lastrea—.....?*Rigida*—Rigid.

THE Rigid Shield Fern, or, as Mr. Moore has called it, the Rigid Buckler Fern, is a pretty hardy deciduous British species, easily grown both in a Fernery and under pot-culture.

A local species, confined to the limestone mountains of Westmorland, Lancaster, and York, and even in these localities extending over a small area. In Ireland it has been found in the county of Louth. In England Mr. Moore remarks that it ranges between twelve and fifteen hundred feet above the sea-level.

It is a native of France, Switzerland, Sardinia, Sicily, Calabria, Germany, Dalmatia, Croatia, Hungary, Morea, Siberia, Asia Minor, California, and Massachusetts; in the two latter countries it attains a smaller size.

The caudex is thick, tufted, scaly, and decumbent. Stipes short, densely scaly. Rachis scaly. Venation branched. Fronds bipinnate, triangularly elongate. Pinnæ alternate, triangular in form. Pinnules oblong, base truncate, apex obtuse. Length from one to two feet; colour dull green, paler on the under side. Numerous minute glands are scattered over the frond, giving it a somewhat glaucous appearance.

There are no permanent varieties of this species.

The *Lastrea rigida* is readily recognised from *L. filix-mas*, by its more rigid habit, and by the dusty look of its fronds and their smaller size.

For plants of *L. rigida* I am indebted to Mr. Joseph Sidebotham, of Manchester; Mr. Wraight, of Newlands; Mr. Clapham, of Scarbro'; and the late Mr. Clarke, gardener to Mr. Wilkinson Dent, of Flass House, Crosby Ravensworth, Westmorland; to Mr. Clarke my obligations are more particularly due for an extensive series of specimens of this species, gathered in his neighbourhood.

The Rev. G. Pinder found this Fern in great profusion growing in the crevices of rocks along the whole of the great scar limestone district between Arnside and Ingleborough, being most abundant on Hutton Roof Crags and Farlton Knot. It is usually much damaged by wind, and also by sheep. The sheep seem fond of eating its fronds.

There are two forms of growth, one triangular and the other oblong; but the latter form does not seem to be permanent.

Mr. G. B. Wollaston, of Chiselhurst, has found a variety in which the fronds, or the pinnæ, or both, are more or less multifidly divided at the apex.

Messrs. Stansfield and Co., of Todmorden, have also procured a ramose variety from Ingleton Fells.

None of these varieties have proved constant, and cannot therefore be named.

The illustration is from a plant in my own collection.



PLATE I. POLYPTERIS.



Fig. 172.—Portion of mature Frond—under side.

LASTREA THELYPTERIS.

BORY.

The Female Buckler Fern, or Marsh Fern.

PLATE XXIII.

| | |
|----------------------------------|-----------------------------|
| <i>Lastrea thelypteris</i> , | BORY. PRESL. DEAKIN. |
| “ “ | BABINGTON. NEWMAN. MOORE. |
| “ “ | SOWERBY. HOOKER. |
| “ <i>palustris</i> , | J. SMITH. |
| <i>Aspidium thelypteris</i> , | SWARTZ. SMITH. MACKAY. |
| “ “ | HOOKER AND ARNOTT. BENTHAM. |
| “ “ | WILLDENOW. SCHUHR. FEE. |
| “ “ | FRIES. SPRENGEL. GRAY. |
| “ “ | METTENIUS. E. J. LOWE. |
| “ <i>palustre</i> , | GRAY. |
| <i>Athyrium thelypteris</i> , | SPRENGEL. |
| <i>Acrostichum thelypteris</i> , | LINNÆUS. BOLTON. |
| <i>Polystichum thelypteris</i> , | ROTH. KOCH. LEDEBOUR. |
| <i>Nephrodium thelypteris</i> , | STREMPER. |
| <i>Dryopteris thelypteris</i> , | A. GRAY. |
| <i>Hemestheum thelypteris</i> , | NEWMAN. |
| <i>Polypodium thelypteris</i> , | LINNÆUS. HUDSON. STURM. |
| “ <i>pteroides</i> , | LAMARCK. |
| “ <i>palustre</i> , | SALISBURY. |
| <i>Thelypteris palustris</i> , | SCHOTT. |

Lastrea—.....? *Thelypteris*—.....?

THE Marsh or Female Buckler Fern is an interesting bog-growing species.

Found in England in Devonshire, Somersetshire, Hampshire, Sussex, Kent, Surrey, Berkshire, Essex, Suffolk, Norfolk, Cambridgeshire, Bedfordshire, Huntingdonshire, Warwickshire, Herefordshire, Staffordshire, Shropshire, Cheshire, Yorkshire, Nottinghamshire, Northumberland, Cumberland, Westmorland, and Isle of Wight. In Wales in Glamorganshire, Pembrokeshire, Carnarvonshire, and the Island of Anglesea. In Scotland in Forfarshire and Shetland. In Ireland in Antrim, Galway, Mayo, Wicklow, and Kerry.

General throughout Europe, Algiers, Cape of Good Hope, New Zealand, Russian Asia, and North America.

In a fernery a low boggy situation should be formed, where this Fern would flourish luxuriantly with the *Osmunda regalis*, a damp peaty soil being absolutely necessary for the growth of this plant.

Fronde lanceolate, membranaceous, erect; pinnate, pinnae numerous, spreading, linear-lanceolate, and deeply pinnatifid. The fertile fronds have the margins of their segments revolute, are taller, and have a stouter stipes. Veins forked. Fructification extending over the whole under side of the frond.

Sori small, circular, and placed near the base of the venules.

Indusium small and circular.

Stipes as long as the leafy portion of the fertile frond; smooth and round behind, channeled in front, near the base black and polished, above pale green.

Rachis smooth and circular behind, and channeled in front. Caudex creeping.

Length of frond from six to forty-eight inches; colour delicate green.

Easily cultivated in a damp situation with abundance of peaty soil.

This species I have procured wild from Oxtou Bogs, and for other plants I am indebted to Sir Oswald Mosley, Bart., of Rolleston Hall, and for fronds to Mr. Norman, of Hull.

The illustration is from a plant in my own collection.



Adiantum monanum

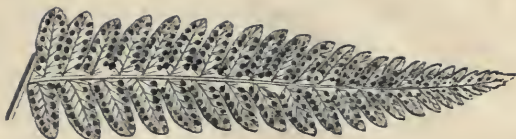


Fig. 173.—Portion of mature Frond—under side.

LASTREA MONTANA.

MOORE.

The Mountain Buckler Fern.

PLATE XXIV.

| | |
|---------------------------------|---------------------------------|
| <i>Lastrea montana</i> , | MOORE. NEWMAN. |
| “ <i>oreopteris</i> , | BORY. PRESL. DEAKIN. MOORE. |
| “ “ | BABINGTON. SOWERBY. NEWMAN. |
| <i>Aspidium odoriferum</i> , | A. GRAY. |
| “ <i>oreopteris</i> , | SWARTZ. SCHKUHE. SMITH. MACKAY. |
| “ “ | BENTHAM. HOOKER AND ARNOTT. |
| “ “ | FRIES. SPRENGEL. WILDENOW. |
| “ “ | METTENIUS. E. J. LOWE. |
| <i>Phegopteris oreopteris</i> , | FEE. |
| <i>Nephrodium</i> “ | DESVAUX. |
| <i>Polypodium</i> “ | EHRHART. SMITH. |
| “ <i>montanum</i> , | VOGLER. |
| <i>Polystichum</i> “ | ROTH. |
| “ <i>oreopteris</i> , | DE CANDOLLE. KOCH. LEDEBOUR. |
| <i>Polypodium thelypteris</i> , | HUDSON. BOLTON. |
| “ <i>fragrans</i> , | HUDSON. (<i>Not</i> LINNÆUS.) |
| “ <i>pteroides</i> , | VILLARS. |
| “ <i>limbospermum</i> , | ALLIONI. |
| <i>Hemestheum montanum</i> , | NEWMAN. |

Lastrea—.....?

Montana—Mountain.

AN interesting species, found chiefly in damp mountainous places, yet also in bogs and marshes along with *Lastrea cristata*. A widely-spread species, being exceedingly common in Scotland and in the north of England. In the west of England I have gathered it sparingly near Bathford, in Somersetshire; Mrs. A. Thompson near Selworthy; Mr. Dempster at Barnstaple and Exmoor. The Rev. T. Rooper has gathered it at Brighton; Mrs. Delves near Tunbridge Wells; Mr. R. Sim at Bexley, in Kent; Dr. Lee at Hartwell, in the Vale of Aylesbury; Mr. W. H. Purchas in the Forest of Dean, Gloucestershire; Mr. T. H. Thomas at Glyn Ponds, in Monmouthshire; Captain A. S. H. Lowe near Malvern, Worcestershire; myself on Oxton Bog and Bulwell Bog, Nottinghamshire, Rudyard, Derbyshire, and at Rainhill and Gateacre, Lancashire; Mr. W. Wilson near Warrington; Mr. H. Buckley at Middleton; Mr. Willison at Whitby; Mr. C. Monkman near Castle Howard, Yorkshire; myself at Ambleside, Rydal, Coniston, Grasmere, and Patterdale; Captain A. S. H. Lowe in Teesdale; myself at Wincham, near Northwich, Cheshire, and at Chaigeley Manor, Lancashire.

Mr. T. Moore also gives Cornwall, Devonshire, Hampshire, Isle of Wight, Dorsetshire, Wiltshire, Hertfordshire, Middlesex, Surrey, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Northamptonshire, Warwickshire, Herefordshire, Staffordshire, Shropshire, Leicestershire, Rutland, Lincolnshire, Northumberland, and Isle of Man. In Wales, Radnorshire, Brecknockshire, Glamorganshire, Carmarthenshire, Cardiganshire, Denbighshire, Anglesea, Flintshire, Merionethshire, and Carnarvonshire. In Scotland, in Dumfriesshire, Lanarkshire, Roxburghshire, Edinburghshire, Berwickshire, Stirlingshire, Kinrosshire, Fifeshire, Forfarshire, Perthshire, Aberdeenshire, Argyleshire, Dumbartonshire, Sutherlandshire, Island of Bute, Island of Cautyre, Island of Islay, Island of Arran, and Shetland Island. In Ireland, Donegal, Londonderry, Galway, Wicklow, Clare, Waterford, and Kerry.

My brother-in-law, Mr. G. H. Allcock, found it abundant about Killarney.

Abroad it is as widely spread, being found in Holland, Denmark, Norway, Belgium, Spain, France, Germany, Switzerland, Italy, Hungary, Croatia, Greece, Transylvania, and Russia. In

Spain, in 1860, I found it near Boo, Lascaldas, Santander, in the Hoz de Barcena, Cartes, and between Reinosá and Allar.

The Mountain Fern has fragrant fronds of from twelve to forty inches in length, and from three to eleven inches in breadth; the colour bright green or yellowish green, of a vivid refreshing appearance. Underneath there are a profusion of small resinous glands, which give out a balsamic odour that is exceedingly agreeable.

Fronds pinnate and lanceolate, tapering considerably both to the base and apex. Pinnæ linear-lanceolate, numerous, profoundly pinnatifid, the basal ones short, triangular, and more distant. Lobes oblong, flat, and mostly entire.

Sori marginal, most abundant on the upper portion of the frond, circular, of moderate size, frequently confluent. Indusium diminutive and very thin, mostly imperfect, often wanting. Caudex perennial and tufted, stout and creeping. The fronds annual, springing up in May, and being destroyed by the first frosts of autumn. Stipes brief, stout, and glandular, covered with pale brown membranaceous scales. Rachis scaly below.

A very readily distinguished species, and although frequently found in low boggy situations, it is much more profusely abundant in mountainous districts. In Great Britain it ranges from the sea level to three thousand feet. Like *Lastrea thelypteris*, this Fern must be grown in a wet peaty situation.

There are several interesting varieties:—



Fig. 174.

CRISTATA, Moore. (Fig. 174.)—Found in Monmouthshire by Mr. T. H. Thomas. A lovely form analogous to the cristate form of *Lastrea propinqua*, (the *Lastrea filix-mas cristata* of authors.) The fronds are somewhat smaller than the normal

form, and are corymbosely-branched towards their apices, the branches being dilated into broad cristate tassels; the apices of the pinnæ are also multifid-criped, although not to that degree as the apex of the frond. My thanks are due to Mr. F. Clowes, of Windermere, and to Messrs. Stansfield, of Todmorden, for fronds.

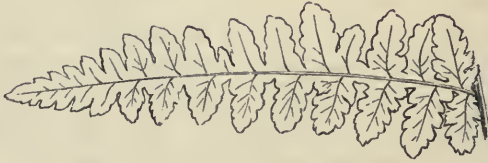


Fig. 175.

CRISPA, Moore. (Fig. 175.)—Found on the Clova Mountains by Dr. Balfour. Normal in outline and size, differing in having the pinnules undulated or wavy, so that the frond has a crispy appearance.



Fig. 176.

TRUNCATA, Wollaston. (Fig. 176.)—A permanent and remarkable variety found near Tunbridge Wells, Kent, by Mr. G. B. Wollaston, and at Llanberis, Carnarvonshire, by the Rev. J. M. Chanter. The peculiarity consists in the extremities of the fronds, and also of nearly all the pinnæ ending abruptly, and the extremity of the rachis projecting frequently a quarter of an inch beyond the pinnules. This peculiarity gives the

plant the appearance of having had the extremities of all the pinnæ eaten off in a uniform manner by some insect or mollusk, and the elegant outline destroyed. In other respects this plant is normal.



Fig. 177.—Apex of Frond.

NOWELLIANA, Moore. (Fig. 177.)—The *Lastrea montana* is one of the least variable of the British Ferns, but this variety is by far the most extraordinary hitherto discovered. It was found by Mr. J. Nowell, and Mr. A. Stansfield, of Todmorden,

near Lake Gyrionedd, in North Wales, September 12th., 1860, and has been tested in the fernery at the Vale Nurseries, Todmorden, and proves perfectly constant. The fronds are pinnate, the pinnae linear, very narrow, and terminating much more abruptly than in the normal species. The rachis or midrib of the frond frequently terminates in a horn-like projection near the apex of the frond. The pinnules are very short, generally only about one third of the length of those in the ordinary form; they are deeply cut and serrated, and in this respect the variety *Nowelliana* differs entirely from the normal type, and indeed has quite as much the appearance of an *Athyrium* as a *Lastrea*. The sori bold and conspicuous. The fronds are from twelve to twenty-four inches in length. My thanks are due to Messrs. Stansfield, of Todmorden, for the illustration. Very characteristic fronds have been received from Mr. F. Clowes, of Windermere; Mr. Swynfen Jervis, of Darlaston Hall; and from Messrs. Stansfield, of Todmorden.

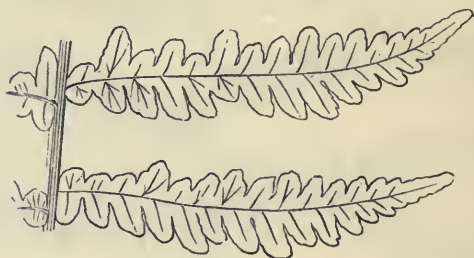


Fig. 178.

INTERRUPTA, *Monkman, MSS.* (Fig. 178.)—At Dalby Warren, near Pickering, Yorkshire, Mr. Monkman has found a depauperated or interrupted variety, which though apparently well marked in the wild state, has not as yet proved constant in cultivation. Mr. Monkman found a similar variety at Bowness, which on removal returned to the normal form. My thanks are due to Mr. Monkman for fronds, and more recently to Mr. Stansfield, of Todmorden.



Fig. 179.

CAUDATA, *Moore*. (Fig. 179.)—Found at Windermere, by Mr. F. Clowes, and under cultivation has remained permanent. Although in some respects more or less normal, still the present variety differs in having an elongated apex, and the pinnæ narrowed and drawn out to a considerable length. The apex of the frond is often divided in a trifid manner. Fronds elongate-lanceolate, pinnæ caudate. Normal in size, very distinct in appearance. Pinnæ six inches wide at the base, rapidly narrowing to the apex, in centre of frond not three inches wide. Pinnules broad, rounded at the apex, various in length, some altogether deficient, except the decurrent portion or rachides. Sori bold.

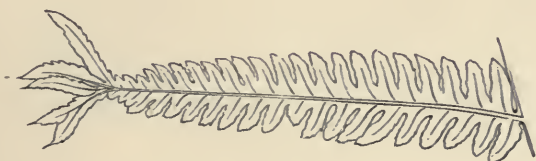


Fig. 180.

FURCANS, *Monkman, MSS.* (Fig. 180.)—Mr. Monkman found near Bowness a plant having the apices of the fronds and pinnæ once cleft, corresponding with the variety *Furcata* of the "Male Fern." In other respects the plant was normal. My thanks are due to Mr. Monkman, for fronds.

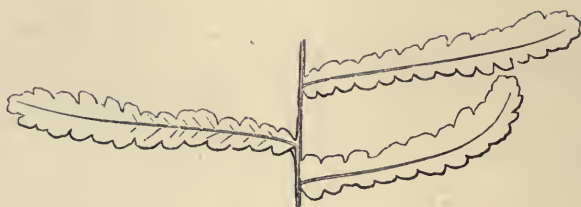


Fig. 181.

ABRUPTA, *Moore*. (Fig. 181.)—Found by the late Mr. C. Jackson near Barnstable. Fronds narrow, pinnae brief, somewhat blunt, frequently bifid, and broadly expanded at the apex. Pinnules irregular in size, and interrupted.



LASIEDA CRISIATA.

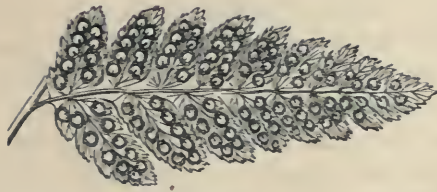


Fig. 182.—Portion of mature Frond—under side.

LASTREA CRISTATA.

PRESL.

The Crested Buckler Fern.

PLATE XXV.

| | |
|----------------------------------|---|
| <i>Lastrea cristata</i> , | PRESL. HOOKER. MOORE. DEAKIN. |
| “ “ | NEWMAN. BABINGTON. SOWERBY. |
| “ <i>callipteris</i> , | NEWMAN. |
| <i>Aspidium cristatum</i> , | SWARTZ. SMITH. BENTHAM. SCHKUHR. |
| “ “ | HOOKER AND ARNOTT. FRIES. |
| “ “ | SPRENGEL. WILLDENOW. SVENSK. |
| “ “ | A. GRAY. FEE. E. J. LOWE. |
| “ <i>Goldianum</i> , | (A garden name, <i>not of</i> HOOKER AND GREVILLE.) |
| “ <i>Lancastriense</i> , | SPRENGEL. SCHKUHR. WILLDENOW. |
| <i>Polypodium cristatum</i> , | LINNÆUS. |
| “ <i>callipteris</i> , | EHRHART. |
| <i>Polystichum callipteris</i> , | DE CANDOLLE. |
| “ <i>cristatum</i> , | ROTH. KOCH. LEDEBOUR. |
| <i>Nephrodium cristatum</i> , | MICHAUX. |
| <i>Acrostichum callipteris</i> , | EHRHART. |
| <i>Dryopteris cristata</i> , | A. GRAY. |
| <i>Lophodium callipteris</i> , | NEWMAN. |

Lastrea—.....?

Cristata—Crested.

THE varieties *Uliginosa* and *Spinulosa* of Moore have been separated from *Lastrea cristata*, on account of a conviction that they are distinct from this species. The former has been described as a species by Newman, both as *Lastrea uliginosum* and *Lophodium uliginosum*; and the latter by Presl, Babington, Sowerby, and Moore as *Lastrea spinulosa*, by Newman as *Lastrea spinosa*, by Müller as *Polypodium spinulosum*, by Hoffman as *Polypodium cristatum*, by Swartz, Schkuhr, Sprengel, Fee, Mettenius, and myself as *Aspidium spinulosum*, by Stempel as *Nephrodium spinulosum*, by Roth as *Polystichum spinosum*, and by Newman as *Lophodium spinosum*. There is something to me so very distinct in the above two Ferns from *Lastrea cristata*, that I have hesitated in placing them with the present Fern.

Found in Norfolk, Suffolk, Staffordshire, Nottinghamshire, Cheshire, and Yorkshire. In Nottinghamshire it is now confined to Oxton Bogs, where it was originally seen by Dr. Howitt. The other habitat, Bulwell Marshes, has now ceased to be a locality: ten years ago I observed it, though rare, in this place. In Suffolk it is recorded as occurring near Ipswich, and at Westleton; in Norfolk in the neighbourhood of Lynn, Yarmouth, Norwich, and Holt; in Staffordshire it is recorded from near Newcastle-under-Lyne and Madeley; in Cheshire, the Rev. G. Pinder found it on Wybunbury Bog; and from Yorkshire Mr. Monkman sends fronds from the neighbourhood of Malton. A new station near Malton was discovered by Mr. John Mackle in 1857. It does not appear to be found more than three hundred feet above the sea level.

From the foregoing it will be seen that *Lastrea cristata* is a very local Fern, growing only near bogs. All the plants I have seen are growing amongst grass in lumps of soil that are elevated a foot or so above the bog, especially on the sides of large tufts of *Aira cæspitosa*.

Abroad it is generally spread throughout Europe, being as far north as Moscow, Scandinavia, and Siberia. It is a native of France, Italy, Switzerland, Holland, Germany, Belgium, Hungary, Transylvania, Croatia, and Bœotia. Also found in Canada and the United States.

This Fern requires to be grown in peaty soil, with plenty

of moisture. The habit is upright, and distinct from all other British species.

Unless under cultivation it is grown in a peaty soil, and in a damp situation, this Fern becomes sickly, and will merely drag on a miserable existence for two or three years, and then die; whilst if nature is copied in its growth, the plant will flourish, and when established in its proper situation, a handsome plant may be obtained. The rhizoma creeps on the surface, sending roots through the moss to the bog below. Owing to the drainage of boggy situations, the *Lastrea cristata* is becoming more scarce. In the Nottingham locality, (Oxton Bogs,) much drainage has been carried on, and its habitation has been somewhat contracted; but I believe that the proprietor, Mr. Henry Sherbrook, will respect its present home, and that there is no likelihood of this Fern being exterminated in our county. The locality is an interesting one, narrow and wild, with a trout-stream running through it, on the banks of which are many interesting plants, uncommon mosses, and rare insects.

Fronde erect, narrow, linear-oblong, sub-bipinnate, or bipinnate, tapering at the apex; pinnæ brief and triangular; pinnules oblong, connected at the base, crenato-serrate on the margin.

Veins forked. Fruetification copious, usually occupying the upper half of the frond. Sori circular, numerous, indusiate, and medial. Indusium reniform, flat, and membranous.

Length of frond from twelve to thirty-six inches; colour heavy green.

INTERRUPTA, *Monkman*.—This form, which corresponds with the varieties of *Polystichum angulare* and *Lastrea filix-mas*, so named, was found by Mr. C. Monkman, in the Malton station, in 1860. Both barren and fertile fronds were well marked. Some years ago I had found similar plants on Oxton Bogs, but they did not prove permanent. My thanks are due to Mr. Monkman for fronds.

FURCANS, *Monkman*.—From the Malton station. Not uniformly cleft, and sub-permanent. An interesting furcate variety, equal in size to the normal or type form, but doubtfully permanent. My thanks are due to Mr. Monkman for fronds.



LASTREA FILIX-MAS.





ADANTUM FILIX-MAS.

Var. Abbreviatum.

XXIX



Fig. 183.—Pinna of mature Frond—under side.

LASTREA FILIX-MAS.

PRESL.

The Male Fern.

PLATES XXVI, XXVII, XXVIII, XXIX, XXX, XXXI.

| | |
|-------------------------------|--|
| <i>Aspidium filix-mas,</i> | SWARTZ. SMITH. SCHEUCH. BENTHAM. |
| “ “ | MACKAY. HOOKER AND ARNOTT. FER. |
| “ “ | FRIES. WILLDENOW. SPRENGEL. |
| “ “ | METTENIUS. E. J. LOWE. |
| “ “ | HOHENACKER. TENORE. |
| “ <i>nemorale,</i> | GRAY. |
| “ <i>Blackwellianum,</i> | TENORE. |
| <i>Polypodium filix-mas,</i> | LINNÆUS. BOLTON. HUDSON. |
| “ <i>nemorale,</i> | SALISBURY. |
| <i>Polystichum filix-mas,</i> | ROTH. DE CANDOLLE. KOCH. LEDERBOUR. |
| <i>Nephrodium filix-mas,</i> | RICHARD. HOOKER. R. T. LOWE. |
| <i>Lophodium filix-mas,</i> | NEWMAN. |
| <i>Dryopteris filix-mas,</i> | SCHOTT. NEWMAN. |
| <i>Tectaria filix-mas,</i> | CAVANILLES. |
| <i>Lastrea filix-mas,</i> | PRESL. DEAKIN. MOORE. SOWERBY. |
| “ “ | BABINGTON. NEWMAN. |
| “ <i>erosa,</i> | DEAKIN. (Var. <i>Incisa</i> of MOORE.) |
| “ <i>affinis,</i> | MOORE. (Var. <i>Incisu</i> of MOORE.) |

| | |
|----------------------------------|--|
| <i>Aspidium depostum</i> , | SCHKUHR. (Var. <i>Incisa</i> of MOORE.) |
| “ <i>affine</i> , | FISCHER AND MEYER. FEE. RUPRECHT. |
| “ “ | (Var. <i>Incisa</i> .) (Not of BRAUN, which is <i>Paleacea</i> .) |
| “ <i>Caucasicum</i> , | BRAUN. (Var. <i>Incisa</i> of MOORE.) |
| “ <i>pseudo-felix-mas</i> , | FEE. (Var. <i>Incisa</i> of MOORE.) |
| “ <i>Mildeanum</i> , | GOEPPERT. (Var. <i>Incisa</i> of MOORE.) |
| “ <i>paleaceum</i> , | DON. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>patentissimum</i> , | WALLICH. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>Donianum</i> , | SPRENGEL. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>Wallichianum</i> , | SPRENGEL. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>parallelogrammum</i> , | KUNZE. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>crinitum</i> , | MARTENS AND GALLEOTTI. FEE. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>nidus</i> , | GRIFFITH. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>uliginosum</i> , | BLUME. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>adnatum</i> , | BLUME. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>abbreviatum</i> , | POIRET. (Var. <i>Abbreviata</i> of BABINGTON.) |
| “ <i>pumilum</i> , | E. J. LOWE. (Var. <i>Pumila</i> of MOORE.) |
| <i>Lastrea pseudo-mus</i> , | WOLLASTON. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>paleacea</i> , | MOORE. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>patentissima</i> , | PRESL. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>parallelogramma</i> , | LEIBMANN. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>truncata</i> , | BRACKENRIDGE. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>abbreviata</i> , | MOORE. (Not WOLLASTON.) (Var. <i>Abbreviata</i> of BABINGTON.) |
| “ <i>abbreviata</i> , | WOLLASTON. (Not MOORE.) (Var. <i>Pumila</i> of MOORE.) |
| <i>Polypodium heleopteris</i> , | BORKHAUSEN. (Var. <i>Incisa</i> of MOORE.) |
| <i>Polystichum affine</i> , | LEDEBOUR. (Var. <i>Incisa</i> of MOORE.) |
| “ <i>abbreviatum</i> , | DE CANDOLLE. (Var. <i>Abbreviata</i> of BABINGTON.) |
| <i>Lophodium erosum</i> , | NEWMAN. (Var. <i>Incisa</i> of MOORE.) |
| <i>Dryopteris affinis</i> , | NEWMAN. (Var. <i>Incisa</i> of MOORE.) |
| “ <i>Borreri</i> , | NEWMAN. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>abbreviata</i> , | NEWMAN. (Var. <i>Abbreviata</i> of BABINGTON.) |
| <i>Nephrodium affine</i> , | R. T. LOWE. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>patentissimum</i> , | STRACHEY AND WINTERBOTTOM. (Var. <i>Paleacea</i> of MOORE.) |
| <i>Dichasium patentissimum</i> , | BRAUN. (Var. <i>Paleacea</i> of MOORE.) |
| “ <i>parallelogrammum</i> , | BRAUN. FEE. (Var. <i>Paleacea</i> of MOORE.) |

Lastrea—.....?

Felix-mas—Male Fern.

THE Male Fern, or Common Buckler Fern, as it is sometimes called, is one of our most common and most widely distributed British species. Equally common in all the counties of England, Scotland, Wales, and Ireland, the Channel Islands, the Northern Islands, and Western Islands, ascending the hills in Scotland to the elevation of fifteen hundred feet.

Mr. G. B. Wollaston, of Chiselhurst, who has bestowed great care and attention in the examination of this Fern, is convinced that it consists of three distinct species, namely, *Lastrea filix-mas*, *Lastrea pseudo-mas*, and *Lastrea propinqua*, three species unmistakably distinct, an account of which he has communicated to the "Phytologist," and which the Editor of that periodical, printed in January of the present year. (See page 415.)

It is true that the three species connect one another by their various forms and varieties, but at the same time it is equally true that the distinctive differences are also recognisable. The lover of Ferns, and more especially of British Ferns, is much indebted to Mr. G. B. Wollaston, for all his valuable researches in this difficult field of investigation, and I think they must feel bound to adopt Mr. G. B. Wollaston's views, and separate this ancient family into three distinct species. With Mr. Wollaston's views I entirely agree, indeed in describing *Lastrea filix-mas* in my "History of British and Exotic Ferns," Vol. VI, I was then convinced that all the so-called varieties could not be traced to the same parents, and on page 42 I described one of the varieties as belonging to a distinct species.

It requires some considerable amount of courage to make so serious an alteration with regard to the British species, especially when such well-known authorities as Hooker, Moore, and Babington have not seen sufficient reason to make such alteration, nevertheless there are many well-known authorities of the present day who will hail with satisfaction an alteration that has seemed desirable, especially when so careful an observer of this branch of Botany as Mr. Wollaston has adopted this course, and I therefore feel less diffidence in following his views.

The following brief descriptive difference of the three species, as described by Mr. Wollaston, will shew how different the three forms are:—

LASTREA FILIX-MAS, *Presl.*—Partially deciduous, lying prostrate in winter; fronds lanceolate, bipinnate, attaining about five feet in length; pinnæ elongate-deltoid, pinnate; pinnules oval, serrate, very slightly auricled, the lowest pair being rather longer than the rest; indusium, when young, sub-peltate, (or like an inverted soup-plate,) not embracing the spore-cases, partially evanescent.

LASTREA PSEUDO-MAS, *Wollaston.*—Sub-evergreen, not prostrate in winter, coriaceous; fronds lanceolate, bipinnate, attaining full five feet in length; pinnæ elongate-deltoid, or pyramidal, pinnate; pinnules paralleloid, or linear-obtuse, not auricled, serratulate, the first anterior and posterior pair scarcely longer than the rest; indusium, when young, embracing the spore-cases, persistent, sub-rotund, depressed.

LASTREA PROPINQUA, *Wollaston.*—Deciduous, entirely sub-alpine; fronds ovate-lanceolate, bipinnate, attaining but rarely four feet in length; pinnæ pinnate, pyramidal, inciso-lobate; pinnules biserrulate, crisped, strongly auricled, basal pair stipitate, much longer than the rest; indusium embracing the spore-cases.

There are several varieties belonging to these three species, that it is doubtful at the present moment as to which species to refer them; it has therefore been deemed the wisest course to retain the whole under one head, namely, the original name, *Lastrea filix-mas*, special reference being made to such as have been well determined as to the species to which they belong.

Lastrea filix-mas, in the widest acceptation, embracing *L. pseudo-mas* and *L. propinqua*, is found in almost every part of Great Britain and Ireland: in some places the true *L. filix-mas* is the common form, whilst in others the *L. propinqua* is more abundant. Each species has a number of varieties. The well-known and beautiful multifid Fern known as *L. filix-mas*, *var. cristata*, does not belong to this species, but to the *L. propinqua* of Wollaston. The *L. filix-mas abbreviata-cristata* of authors, is in reality *L. pseudo-mas*, *var. cristata*, whilst *L. filix-mas*, *var. Jervisii*, belongs to the true *L. filix-*

mas. *L. filix-mas* is a large coarse Fern, *L. propinqua* being much more compact, and more beautiful in its outline. The *L. pseudo-mas* is usually less in size, although there are some varieties that are anything but dwarf.

These three species, in their normal form, appear to grow well in almost every conceivable situation. In dry woods or wet woods, in shady lanes, by the side of running water, or amongst rocks, almost immaterial what the nature of the soil, or the peculiar circumstances under which they have to grow.

The Male Fern is abundant throughout Europe. Also found in Africa, Madeira, Newfoundland, California, Guatemala, Mexico, Equador, New Grenada, Peru, Brazil, and the Caraccas.

It has long been esteemed as a medical plant: Theophrastus, Dioscorides, Pliny, and Galen, each speak of its medicinal virtues. Madame Nouffer sold to Louis the Sixteenth, for eighteen thousand francs, her secret for the treatment of tapeworm, (*Tænia solium*,) and this proved to be the *L. filix-mas*. It has also been put to other economic uses, namely, the tanning of leather, the manufacture of glass, the bleaching of linen, the young stems eaten like asparagus, the bases of the young stalks brewed into beer by the Norwegians, and the fronds cut and dried as fodder and litter for cattle.

Lastrea filix-mas is an effective plant in a fernery, and some of the varieties are exceedingly beautiful.

A deciduous Fern, varying from four or five inches in the dwarf varieties, to four or five feet in those with more robust habits.

The rhizoma large, firm, and woody, covered with thick brown imbricated scales, and having numerous long black tough roots.

The fronds are broadest in the middle, narrowing towards the base, and to an acute point at the apex.

Pinnæ from ten to fifty, mostly remote near the base, becoming more approximate upwards, and running together at the apex.

Pinnules largest at the base, decreasing upwards till they run together, losing themselves in the point or apex of the pinnæ.

Sori abundant and large, and covered with an indusium.



Fig. 184 — Apex.

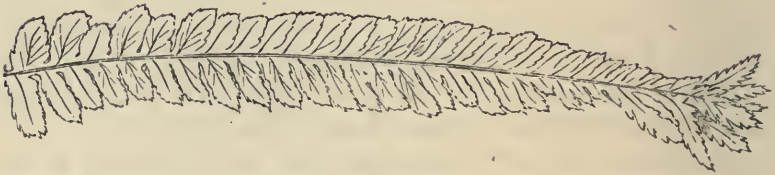


Fig. 185.

JERVISII, Moore. (Figs. 184 and 185.)—A variety of the original *Lastrea filix-mas*. Found near Darlaston Hall, Staffordshire, by Mr. Swynfen Jervis. A large-growing tasseled Fern, having wide lanceolate fronds, four feet in length, with acuminate apices. Pinnæ elongated, and the margin somewhat irregular, the basal portion divided into acute pinnules with serrated edges, the upper portion cut into shallow acute lobes, which point forwards, and extend to the base of the tassel. Tassel spread out and subcristate, yet not so much tufted as in other crested forms. In many respects this Fern is almost typical. Being a coarse-growing variety, it has a fine appearance

in a fernery, with its many broad tasseled fronds. Mr. Swynfen Jervis (the discoverer) has a beautiful plant in his charming fernery at Darlaston Hall, and to him my thanks are due for plants and fronds.

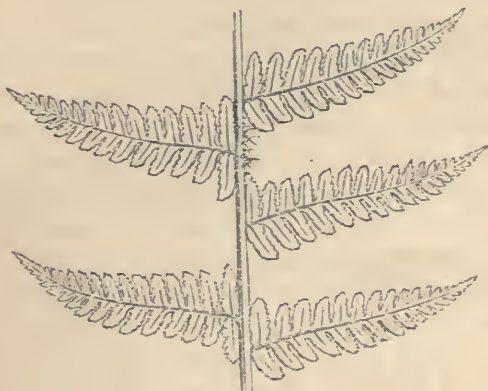


Fig. 186.

ABBREVIATA, *Babington and Moore*, (*Lastrea pseudo-mas*, Wollaston.) (Fig. 186.)—This interesting variety is peculiarly distinct from *Lastrea filix-mas*, and Mr. Wollaston proposes to place it as a distinct species under the name of *Lastrea pseudo-mas*. The pinnules have a curled character strikingly different to the flat pinnules of *Lastrea filix-mas*, whilst the usual solitary spore-case on each pinnule of *Lastrea pseudo-mas* is equally a marked contrast to the six or eight spore-cases on each pinnule of *Lastrea filix-mas*. I have always been struck with the distinct character of this Fern, but never more so than when on a botanical tour in the county of Durham last autumn. This Fern is common along the banks of the Tees, above High Force (a stupendous waterfall about four miles above Middleton,) where the whole of the river Tees falls through a crevice in the rocks perpendicularly down seventy feet, with a roar that can be heard at a great distance; and occasional plants occur here and there along Widdicomb Moor and Cronkley Fell, becoming more abundant as we approached Cauldron Snout from the Clints, being in great abundance amongst the rocks and heather from the upper portion of this very lengthy and

beautiful waterfall to below its base, where the three counties of Durham, Westmorland, and Yorkshire approach so near together that a stone can be thrown into all three counties from the same spot, a feat of no difficulty, but one which the guides are always anxious that each person should accomplish. In this locality the variety *abbreviata* grows on a damp, peaty soil amongst rocks, mostly large sized specimens which would readily have divided into no less than twenty distinct plants, and this seemed to be quite the character of the variety, for the few plants of the normal form of *Lastrea filix-mas* had not this disposition, being mostly composed of single crowns. With this Fern were found growing *Cystopteris fragilis*, *Lomaria spicant*, *Allosorus crispus*, *Asplenium trichomanes*, *Asplenium viride*, *Pteris aquilina*, *Lycopodium selago*, *Lycopodium clavatum*, *Primula farinosa*, *Nardus stricta*, *Caluna vulgaris*, the butterwort, saffron, *Caltha palustris* and several other interesting plants. Near High Force this variety was growing amongst a vast quantity of the lovely British wild flower *Gentiana verna*, a plant that must, in spring, when in bloom, make the spot exceedingly beautiful.

Abbreviata is also found on Snowdon and Ingleborough; in Lancashire, Westmorland, Cumberland, Gloucestershire, Forfarshire, and at Killarney.

A small Fern, usually not more than twelve or fourteen inches in length, and in some degree resembling another form (*pumila*,) but larger and broader, having more coarse pinnules which are not recurved to the same degree as in *pumila*.

Fronds pinnate, the pinnæ scarcely pinnate, the basal pinnules alone being separated to the costa, the rest decurrent. Owing to the recurved character of the pinnules the upper surface of the pinnæ is concave. Pinnules comparatively large, broad, and rounded, the lobes crenate-lobate. A rare Fern, but abundant in Teesdale. Under cultivation it is not of so dwarf a character usually. Occasionally plants will be seen in a fernery, where the soil is better suited for its growth, to attain a size double that of its ordinary wild character; this was very marked in some plants shewn to me by Mr. Swynfen Jervis, of Darlaston Hall, and, I understood Mr. Padley to say that the same larger growth had been noticed by himself with his plants at Bulwell Hall. My thanks are due to Mr. Pearson, of Chilwell, for plants and fronds.



Fig. 187.—Apex, middle pinna, and basal pinna.

CLOWESII, Moore. (Fig. 187.)—A variety of the original *Lastrea filix-mas*. This is a tasseled form, differing from *jervisii* in the tassels being more crispy, and in the attenuated pinnae being more profoundly pinnatifid. The pinnae are elongated, broadest at the base, and gradually becoming narrower and narrower to the base of the tassel. The pinnules

are spreading at their tips, and incised. Apex more or less tufted. Found at Bromsgrove, in Worcestershire, and made known to the public by Mr. B. Maund. The fronds are liable to vary considerably, sometimes being more tasseled, occasionally corymbosely-tasseled; sometimes the pinnæ scarcely divided, at others the pinnæ and pinnules much lacerated. Length of frond upwards of two feet. My thanks are due to Messrs. Stansfield, Vale Nursery, Todmorden, for fronds.



Fig. 188.

BOLLANDIÆ, Moore. (Fig. 188.)—Found in a hedgerow at Ashhurst Park, Tunbridge Wells, in 1857, by Mrs. Bolland. Very distinct, from the great breadth of the fronds, the winged rachides, and large wavy pinnules. Length of frond eighteen inches, ovate-lanceolate, bipinnate to the base of the pinnæ, all the other pinnules connected by the wings of the rachides, membranaceous. Pinnæ broad, oblong, and stalked, not acuminate, but suddenly narrowed at the apex. Pinnules large, elongate-oblong, wavy, blunt, profoundly lobed, which are sparingly serrate, pointing forwards, the base narrowing and becoming decurrent with the membrane which borders the secondary rachides. This variety has, when freshly gathered, the strong mignonette-like scent of the varieties *abbreviata* and *pumila*. Mr. Moore remarks that this is probably owing to the numerous minute glands, the fronds appearing to be glandular-punctate. To Mrs. Bolland I am indebted for fronds.

ABBREVIATA-CRISTATA, Clowes. (Plate XXX.)—This new multifid variety of the Male Fern, although not so dwarf as the *Aspidium pumilum*, (figure 15, vol. vi. of my "Natural History of British and Exotic Ferns,") is nevertheless of dwarf compact habit, and an interesting addition to our hardy



LASTREA FILIX-MAS,
Var. abbreviatum-cristatum.

Ferns. It was found in Borrodale, Cumberland, by Mr. R. D. Harrison. The pinnæ are opposite below and sub-opposite above, distant, and from an inch and a half to two inches in length, their apices being branched and tasseled. The pinnules are opposite. The midrib very scaly. Sori usually one on each pinnule, and in the larger and broader pinnules two, the whole forming a single line close to the midvein. Length of frond from twelve to eighteen inches. The point of each frond, and of each of the pinnæ being twice or thrice forked, forming a small spreading crest, renders this variety very interesting. For a frond of this beautiful and rare Fern I am indebted to Mr. Clowes, of Windermere.



Fig. 189.—Middle pinna and basal pinna.

PINDERI, Moore. (Fig. 189.)—Found near Elter Water, in the Lake district, by the Rev. G. Pinder, in 1855. A very handsome and distinct form, with very long narrow fronds and remarkable outline. Fronds three feet long, and not six inches wide in the broadest part, very much tapered upwards to a long slender point, and also tapering in the same manner below. A form of *Lastrea propinqua*. Elongate lance-shaped. Stipes brief. Basal scales subulate and very long. My thanks are due to the Rev. G. Pinder for fronds, and also to Miss Beevor, of Coniston, for others. In 1862 Mr. C. Monkman and Mr. Thomas Stansfield found this variety also at Coneysthorpe, near Malton.

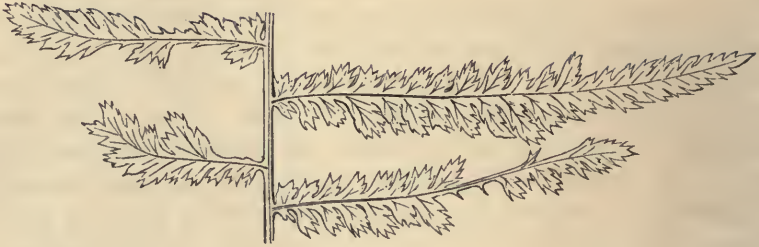


Fig. 190.

INTERRUPTA, *Moore*. (Fig. 190.)—Found at Windermere, by Mr. Clowes, and in the neighbourhood of Grange in Furness, and Arnside, Morecambe Bay, by Mr. Monkman and Mr. Crossfield. A constant variety. Very irregular in character, and abnormal-looking. Most of the pinnules very much narrowed, and are changed from the normal character, either forming brief inciso-serrate lobes along the rachis, or are larger and lacinate. The fronds have a tendency to divide at the apex. My thanks are due to Mr. Clowes, of Windermere, and to Messrs. Stansfield, of Todmorden, for fronds.

CRISTATA-ANGUSTATA, *Moore*. (Plate XXXI—A.)—A very handsome and distinct form, differing from *cristata*, in the narrowness of the fronds, in being only pinnate, and the pinnules all confluent, so that the margins of the pinnæ are merely shallowly lobed. A form of *Lastrea propinqua*. The present variety is exceedingly distinct from the beautiful multifid variety known as *cristata*. The frond is remarkably narrow, nearly linear, being only from an inch to an inch and a half in width. The pinnæ are crested except the upper portion of the frond, whilst the extreme point is tasseled. The stem is covered with reddish brown scales. Length of frond from twelve to eighteen inches. This variety was raised from spores by Mr. R. Sim, of Foot's Cray, and has proved quite constant. Colour a rich deep green. My thanks are due to Mr. Edwin Cooling, of Mileash Nursery, Derby, for plants of this fern, and to Mr. R. Sim, of Foot's Cray, and to Messrs. Stansfield, of Todmorden, for fronds. Only pinnate, the pinnules being all



A

LASTREA FILIX-MAS,
var. *Cristatum-angustatum.*



I

LASTREA FILIX-MAS,
Var. *Willdenowii.*

confluent and very narrow, so that the edges of the pinnæ are merely slightly lobed, the frond seeming (as Mr. Moore justly remarks) "to consist only of a frill on each side of the rachis." The fronds arch gracefully, owing to the weight of the densely tufted and crispy terminal crest. The pinnæ are at the base semicordate and enlarged, above this they are contracted with a lobate-serrate margin, and terminate in crisping rounded tufts. The apex of the frond elongated, and terminating in a very large multifid crispy tuft.

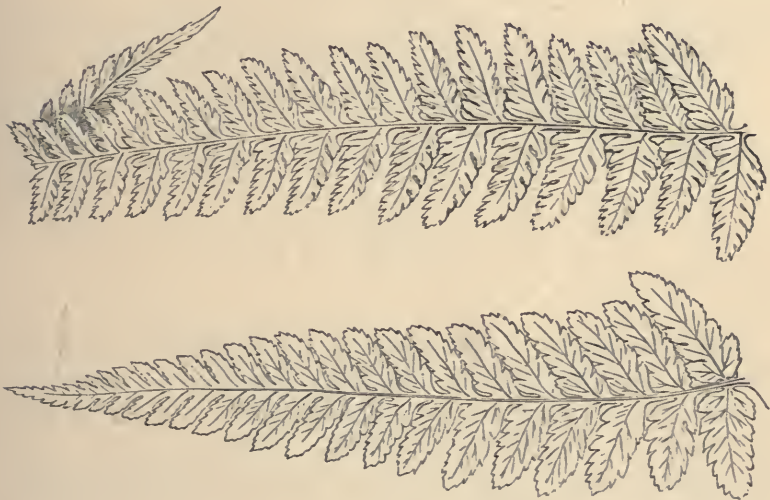


Fig. 191.—Middle pinna and basal pinna.

PRODUCTA, Moore. (Fig. 191.)—Found at Barnstaple, Devonshire, by the late Mr. C. Jackson; at Pitt's Wood, Chischurst, Kent, by Mr. G. B. Wollaston; at Varnes, by Dr. Allchin; at Black Park, Buckinghamshire, by Dr. Allchin; Portnell Park, Virginia Water, Surrey, by Mr. Thomas Moore; and in Shropshire on the Wrekin, by the Rev. W. A. Leighton. This form is somewhat similar to *incisa*, being finely developed, and having elongated pyramidal pinnules with conspicuous lobes. Fronds three feet long, and ten inches broad. Frond lanceolate. The basal pair of pinnules triangular-acuminate, two

and a half inches long, the next pair triangular-elongate, four and a half inches long, and two inches across the base, near the apex of the frond still triangular-elongate, but narrower, the base being broadest. Pinnules elongated, but more deeply divided than in *incisa*, and their attachment to the rachides very narrow. Sori usually occupying the central portion of the pinnules. I am indebted to Messrs. Stansfield, of Todmorden, for fronds.

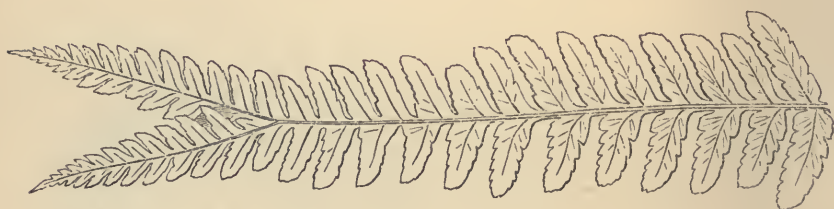


Fig. 192.

FURCANS, Moore. (Fig. 192.)—A strong-growing, handsome form of the *propinqua* group, with the pinnæ, rarely the fronds, two to three or four-cleft, constant. Found by Mr. Monkman at Windermere, growing about one mile from Bowness, on the side of the road leading to Newby Bridge. The type form itself also (*propinqua*) beautifully golden in colour, is there plentifully distributed, with the var. *furcans* of the Lady fern. The form has been found elsewhere, as Messrs. Stansfield (under the name *polydactyla*) sent Mr. Monkman a plant of the variety some six or seven years ago. For fronds I am indebted to Mr. Monkman. This variety, which has also been found near Huddersfield by Mr. T. Stansfield, and on Bookham Common, Surrey, by Mr. Stedman, has normal fronds, except as far as the ends of the pinnæ are concerned, the difference consisting in the forked character—mostly once, but occasionally twice and even thrice forked, the divisions being brief, tapering, and divergent, somewhat resembling a fish's tail. Profoundly toothed. The fish-tail like terminations margin the fronds in a handsome manner.



Fig. 193.—Apex of frond and pinnae.

VARIABLE, *Monkman*. (Fig. 193.)—This is *Monstrosa monkmanii* of Monkman, but the name changed on finding it pre-occupied by the crested deformity of Mr. M'Nab's, (Moore's Handbook, p. 112.) In 1858 or 1859 Mr. Monkman sent Mr. Moore fronds of this curious variety from Castle Howard. He, at that period, doubted the permanency of it; but it seems, however, to be moderately constant to the

monstrous development, having every season shown more or less divergence from the normal form (*paleacea*.) The form sent was found at Castle Howard, and is a combination of *ramosa*, *interrupta*, *depauperata*, and *furcans*, and has no two fronds alike. Occasionally the most inconceivably odd fronds are developed. In the Lake district, and especially in the lanes about Morecambe and Lancaster, great numbers of *Lastrea filix-mas* similarly affected have been found; but, although scores have been gathered of the best marked plants (apparently,) I have never found any except the Castle Howard form to remain permanent. There is this to notice—the Castle Howard group was of the *paleacea* type: the Lancashire and Lake plants were not.



Fig. 194.—Pinna.

INCISA, *Moore*. (Fig. 194.)—A common form, found in Somersetshire, Devonshire, Dorsetshire, Wiltshire, Sussex, Surrey, Hertfordshire, Bedfordshire, Northamptonshire, Norfolk, Herefordshire, Worcestershire, Nottinghamshire, Derbyshire, Lancashire, Cumberland, Durham, Northumberland; the Channel Islands, and in Ireland and Scotland, but not commonly met with in these countries. I have found this form abundant at Chaigeley Manor, near Clitheroe; Browsholme Hall, Lancashire; at Barnard Castle, in Durham; at Tynemouth and Whitley, Northumberland; at Ashton-on-Mersey; Matlock, Wollaton, and at Stanton-on-the-Wolds, Nottinghamshire. Length of frond from three to six feet. A most robust and highly-developed form of stately habit. Lanceolate, bipinnate, and not abruptly contracting near the apex. Pinnae elongate

and gradually narrowing to the apex. Pinnules somewhat distant, basal pinnules profoundly notched on either side of their base, and being rounded at their apices. Margins inciso-lobate, the lobes having from three to five teeth. Veins more highly developed. Sori normal.



Fig. 195.—Apex of frond.

DEPAUPERATA-MONKMANII, *Monkman*. (Fig. 195.)—An accidental seedling from *cristata*, but exhibiting no disposition whatever to crest. There are two or three slightly differing forms in Mr. Monkman's collection, all as peculiar as the specimens illustrated. The fronds are all different, but depauperated so greatly in some cases as to be hardly bipinnate, the pinnæ resembling irregularly-toothed lobes. Quite constant, dwarfish, and very handsome. For fronds my thanks are due to Mr. Monkman.

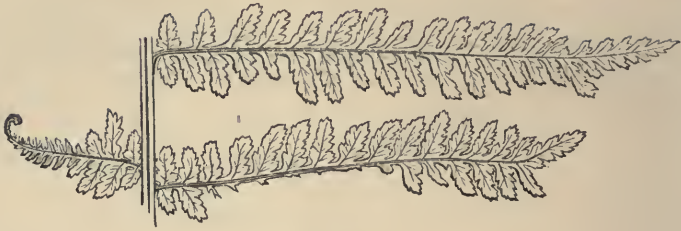


Fig. 196.

EROSA, *Clowes*. (Fig. 196.)—Found at Lodore, near Keswick, by Miss Wright, and at Windermere, by Mr. Clowes. A sub-permanent variety. The fertile portions of the frond are variously erose (abbreviated,) being irregularly contracted. Pinnules biserrated, oblong-obtuse. The basal sterile pinnules rigid and not erose. Occasionally the whole fronds are abbreviated, the fronds more lax, and the pinnæ and pinnules distant and irregular in size and semi-depauperated. My thanks are due to Mr. Clowes, for good examples.



Fig. 197.

CRISPA, *Sim*. (Fig. 197.)—A form of *Lastrea propinqua*. A densely leafy distinct fern, dwarf, crispy, and compressed-fronded. Length from eight to twelve inches; colour dark green. Almost erect in habit, briefly stalked, oval-lance-shaped fronds of from four to six inches wide. Pinnæ and pinnules overlapping each other, those next the rachis so much overlay as frequently to quite conceal it. Pinnules slightly twisted. I am indebted to Mr. Sim, of Foot's Cray, for fronds.

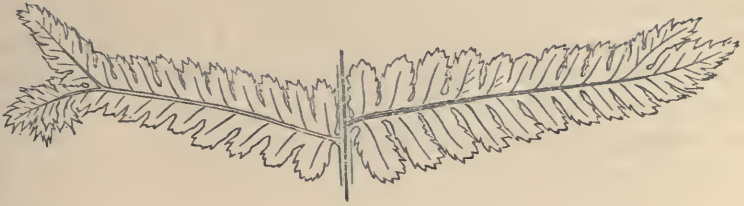


Fig. 198.

SERRATO-MULTIFIDA, *Monkman*. (Fig. 198.)—A remarkable plant of the *propinqua* type, having rarely two fronds at all alike. The most developed fronds point to *cristata* as the parent plant, which condition they closely approach; but the majority of fronds are simply cleft, or partially cleft and crested, and some normal but scarcely bipinnate. Every portion serrated on the margin. A robust-growing form, presenting a curious appearance. Found by Mr. Monkman near Malton.



Fig. 199.

PALEACEA-TRAPEZIFORME, *Monkman*. (Fig. 199.)—This form has very crowded, shortened, trapeziform pinnules, and is very golden in colour. Erect growing, and dwarfish. Found at Bowness, 1860. Quite constant. Appearance peculiarly distinct.

IMBRICATA, *Monkman*.—Mr. Monkman has a curious seedling form of this variety, which he has called *imbricata*, but which is hardly distinguishable from good forms of *crispa*. The two

ought to go together, but Mr. Monkman's name "*imbricata*" is the most applicable. Grows quite erect, the fronds, pinnæ, and pinnules, being densely crowded. A strikingly distinct very dwarf variety. This belongs to *Lastrea propinqua*. Varying so little from the var. *crispa*, it has been thought unnecessary to give an illustration.

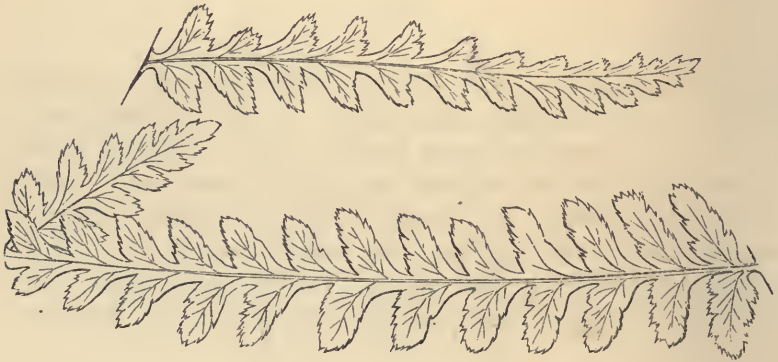


Fig. 200.

MARSDENIE, *Lowe*. (Fig. 200.)—A most remarkable and distinct variety found in Yorkshire by Miss Beavor, of Coniston. The pinnæ are opposite below, subopposite above, and alternate near the apex of the frond; elongate and curving upwards. Pinnules opposite, decurrent, the opposite pairs forming a series of cuneate based wide-spreading cups or vases threaded one within the other. Minutely tridentate. The basal pinnules deeper cut and not decurrent to the same extent as the others, and although opposite the united pair do not form a cuneate base. Rarely the pinnæ and pinnules are depauperate. The two basal pairs of pinnæ are more distant than the others. This is a strikingly distinct form of the true *Lastrea filix-mas*, for the illustration of which I am indebted to Miss Beavor. Length of frond thirty inches. Stipes rich brown, and almost devoid of scales.

WILLISONII, Moore. (Plate XXXI.—B.)—An interesting variety found near Whitby by Mr. W. Willison, having elegant depauperated fronds. Pinnæ remote, pinnules remote and irregular, the intervals being occasionally as much as half an inch, unequal in size, irregularly dentate, decurrent in a marked degree behind. Occasionally laciniately depauperated. For fronds of this singular Fern, I am indebted to Mr. W. Willison, of Whitby.

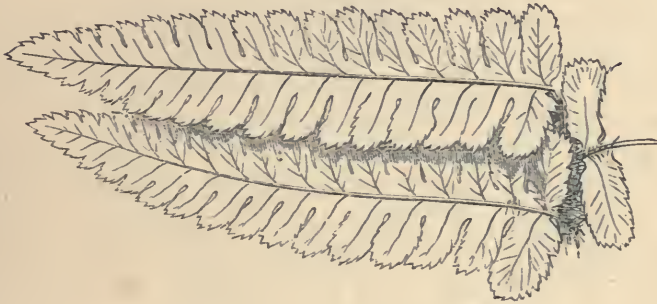


Fig. 201.

BEEVORIE, Lowe. (Fig. 201.)—A very handsome Fern found by Miss Bevor near Coniston in the Lakes. This variety is perhaps the nearest approach to *Pinderii*, yet differs in having the pinnæ so close together, and the pinnules so large and leafy as to touch each other, except the basal pair of pinnæ, which are a quarter of an inch below the next pair. The basal pinnules of each pinna overlap the costa and half conceal it. The pinnæ bear a close resemblance to *Pinderii*, yet are blunter and more rounded at their apices, and they do not become shorter and smaller, as in that variety. The stipes and rachis is densely clothed with scales of a rich golden brown. The sori consist of a single row of spore-cases along the midrib of the pinnæ, and are confined to the apex of the frond. With the exception of the upper four or five inches, the frond is barren. Length of frond thirty inches, the apex acuminate. My thanks are due to Miss Bevor, of Coniston, for fronds.



Fig. 202.—Apex, middle pinna, and basal pinna.

EULOPHE, *Lowe*. (Fig. 202.)—An exceedingly handsome variety, raised from spores accidentally in Miss Blackmur's

wardian case, and now in the possession of the Rev. Charles Padley, of Bulwell Hall. It is evidently a seedling variety from *cristata*, and therefore a form of *Lastrea propinqua*; it however differs considerably from that variety. In the form *cristata* the pinnæ and pinnules are more or less normal, except as regards the crested tips, whilst in *eulophe* the whole character of the frond is changed, the pinnæ are closer together, the pinnules irregularly enlarged and deeply lacinated, giving the frond a very leafy character, whilst not only are the apices of the pinnæ crested, but many of the pinnæ are branched, some near their base and others in the centre. Stipes and rachis covered with rich reddish brown scales. Length of frond about two feet. Pinnæ opposite below, the next three pair sub-opposite, the remainder being alternate, about twenty-two pairs; pinnules from five to nine pairs below the forked apices, various in form and size, sometimes lacinated, erose, or depauperated, mostly enlarged at their apices, more or less rounded, and much dentate, often bidentate. For fronds of this extremely beautiful Fern my thanks are due to the Rev. Charles Padley. This variety has been named *eulophe* from the Greek, on account of the crested character of all the pinnæ.

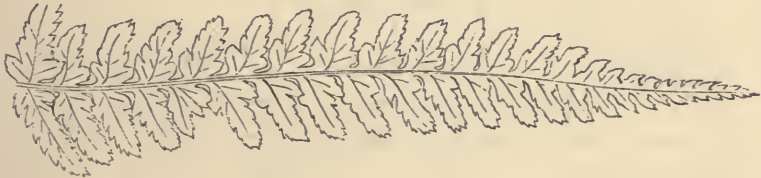


Fig. 203.—Middle pinna.

PROPINQUA, *Wollaston*. (Fig. 203.)—This variety, now considered as a distinct species, is described on page 234. It is not so coarse-growing as the ordinary type of *Lastrea filix-mas*, and although growing to a large size, there is a smoothness in the fronds which renders it distinct and easily recognised. From this fern most of the finest varieties have sprung. Length of frond from three to five feet. Found in the counties of Westmoreland, Cumberland, Durham, Yorkshire, Worcestershire,

Shropshire, Surrey, Kent, Sussex, Wiltshire, Derbyshire, Lancashire, Cornwall, Devonshire, Somersetshire, Cardiganshire, Pembrokeshire, Denbighshire, Merionethshire, Montgomeryshire, Argyleshire, Dumbartonshire, Forfarshire, Perthshire, Sterlingshire, Isle of Arran, Sligo, Galway, Wicklow, Mayo, Kerry, and probably in other counties, also in the Channel Islands. Where found it is frequently very abundant.



Fig. 204.—Middle pinna.

DENTATA, *Lowe*. (Fig. 204.)—A large-growing variety, found near Nettlecombe by Mr. Elworthy. Not unlike the coarser and more lax forms of *Polystichum angulare*. Length of frond four feet. Pinnæ above forty pairs, longest in the centre of the frond, where there are above thirty pairs of pinnules. Pinnæ acuminate. Pinnules very coarsely, profoundly, and strongly dentate, the basal pair much the longest, containing seven pairs of spore-cases; the apices of the pinnules rounded and dentate. Copiously soriferous. Colour vivid green.

DISSIMILE, *Monkman*.—Found at Castle Howard, by Mr. C. Monkman, of Malton. This variety is exactly analagous to the form *dissimile* in *Polystichum angulare*, and will need no further description.



Fig. 205.

RAMOSA, Moore. (Fig. 205.)—A dwarf Fern, branched, as its name implies, and having an irregular outline. This variety was found in the Clova Mountains, in Scotland, by Messrs. Stansfield, of the Vale Nursery, Todmorden. At the base the fronds have several bipinnate branches, and the apex is ramosely multifid. The pinnules, which are small, are blunt, oblong, and dentate.



Fig. 206.—Middle and basal pinnæ.

DEORSO-LOBATA, *Moore*. (Fig. 206.)—A not uncommon variety, being first found by the Rev. W. A. Leighton in Shropshire and in the Island of Anglesea more than twenty years ago. Mr. Moore mentions that it is also found in Westmoreland at Ambleside, in Yorkshire at Bedale, in Derbyshire at Matlock, in Worcestershire at Daylesford, in Wiltshire at Salisbury, in Buckinghamshire at Black Park, in Norfolk at Lynn, in Essex at Epping, in Surrey at Mayford, Bagshot, Sutton Park and St. Martha's Hill, in Kent at Maidstone and Cobham Park, in Cornwall at Penryn; in Wales at Castle Malgwyn in Pembrokeshire, at Ruthin in Denbighshire; in Scotland, at Callender and Kinnoul Hill in Perthshire, in Glen Gilp and Cairndow, Argyleshire, and in Arran; in Ireland, at Tinnahinch, County Wicklow; Ballyvaughan, county Clare; Killarney, and Galway. Also in Guernsey and Jersey. More recently the Rev. F. Mules has found it at Marwood, in Devonshire; Miss F. Brown at Dunphail, in Inverness-shire; Mr. Thomas Moore near Guildford, in Surrey; Mr. F. Clowes at Windermere; and myself at Chaigeley Manor, near Clitheroe;

at High Force, Durham; Cromford, Derbyshire; and poor examples at Ashton-on-Mersey. My thanks are due to the Rev. Charles Padley, of Bulwell Hall, for fronds. There are several forms of *deorso-lobata*, some approaching *incisa* in character. It is a large Fern, and known by the enlarged posterior basal lobe of the pinnules which are more or less inciso-lobate with the lobes serrated. The other pinnules are inciso-serrate. A form of this variety sent to me by Mr. F. Clowes, of Windermere, is very interesting. Many of the pinnæ are furcate and bifurcate, and the pinnules also branched in an irregular manner. The pinnules are mostly very large, leafy, irregular in size, many depauperate or erose, occasionally the costa alone, a decurrent portion without a costa, or even wanting altogether. Some of the pinnæ are brief, and these are branched from close to the stipes. Colour vivid green. Length of frond thirty-four inches.

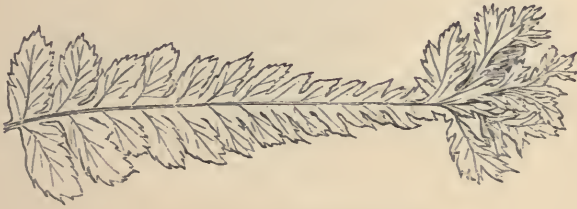


Fig. 207.—Middle pinna.

POLYDACTYLA, Moore. (Fig 207.)—Found at Bromsgrove, in Worcestershire, and made known by Mr. B. Maund. This variety is figured on Plate XXXVII of Mr. T. Moore's "Nature Printed British Ferns." The fronds and pinnæ are multifid, crisped at the apex. The pinnæ do not narrow until near the crispy tassel, where they suddenly become much narrowed. The pinnæ are not short, as is the case in the variety *cristata*. The pinnules are divided almost to the rachis; they are oblong-linear, some widened and some more or less acute, the edges serrated. My thanks are due to Mr. R. Sim, of Foot's Cray, for fronds. Length of frond eighteen to

twenty-four inches, width six to nine inches. The crispy tuft or tassel largest on the basal pinnæ, becoming smaller towards the apex, except the terminal tassel, which is flattish and drooping; many forked, spreading, and large. A variety of the true *Lastrea filix-mas*.

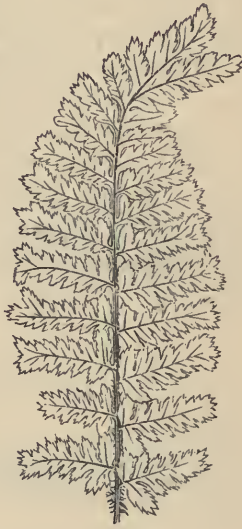


Fig. 208.—Frond, natural size.

MIKRA, *Lowe*. (Fig. 208.)—This Fern is known as *propinqua-cristata*, but as the variety *propinqua* will have to be raised to the dignity of a species, and as the well-known variety *Lastrea Filix-mas cristata* is in reality a form of *Lastrea propinqua*, it is obvious that this name will require to be changed, and, from the smallness of the plant, *mikra* has been selected. Length of frond two inches and a half; width one inch in the widest part. Pinnæ equal in size, except near the apex of the frond, where furcate and crested; pinnæ alternate, their apices flattened out into diminutive crests. Pinnules decurrent, the basal pair (which are the largest) alone divided almost to the costa. 'Minutely scaly.

CRISTATA-DEPAUPERATA, *Monkman*.—A form of *Lastrea propinqua*. A peculiar-looking seedling, raised by Mr. C. Monkman, from spores of *cristata*. The fronds grow perfectly erect, and promise to remain permanently dwarf. The pinnae are much shortened, and contorted; but, as with the frond itself, show more or less the crested character of the parent plant. A strange-looking plant, of which Mr. Monkman has modified forms, shewing less disposition to crest, but which are yet too young to be considered fully developed in character. *Paleacea* type. It is unnecessary to give an illustration of this variety.

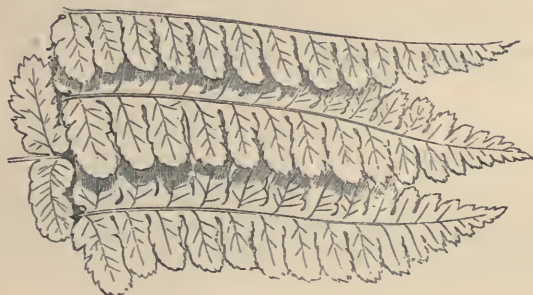


Fig. 209.—Middle pinnae.

FOLIOSA, *Lowe*. (Fig. 209.)—A remarkable Fern found at Woodfield, Moseley, by Mr. Mapplebeck. Length of frond sixteen inches. Pinnae alternate, short and broad, close together and overlapping each other from the base to the apex of the frond. Pinnae broad at their base and the tips pointed, length two inches and a half, breadth three quarters of an inch. Pinnae slightly curving downwards. Pinnules large and broad, rounded, deeply cut almost to the midrib, the margin more crenate than dentate, the inferior basal pinnule much longer and broader and auricled, almost concealing the stipes. Colour of fronds a heavy grass green, pale beneath, very smooth. The rachis and stipes covered with very dark brown scales. My thanks are due to Mr. Mapplebeck for fronds.



Fig. 210.

EROSA-DENTIGERA, *Stansfield, MS.* (Fig. 210.)—Length twenty inches, breadth six to seven inches. Pinnæ distant on the lower half, and approximate on the upper half; opposite or subopposite on the lower half and alternate above, ascending. Pinnules opposite or subopposite, their apices blunt or rounded, dentate and erose. Colour rich green.



Fig. 211.—Middle pinnæ.

RECURVA, *Moore.* (Fig. 211.)—A variety of *Lastrea pseudo-mas*. First discovered near Doncaster, in 1857, by Mr. S. Appleby; and again in Westmoreland, in 1859, by Messrs. Stansfield, of Todmorden. Length of frond eighteen inches. The pinnæ and pinnules recurved, the pinnules being crisped upwards. Sori confined to the upper portion of the frond, where very copious, and eventually confluent. This variety bears a striking resemblance to *Lastrea recurva*, and indeed might be mistaken for that species by those not well acquainted with Ferns. The illustration is from Messrs. Stansfield's fronds.



Fig. 212.—Middle pinna.

OREOPTEROIDES, *Lowe*. (Fig. 212.)—An elegant variety found in the Cumberland Lake district by Miss Beever. This form has fronds that more nearly resemble *Lastrea oreopteris* than those of any other variety, and as it is slightly scented, I have named it after that Fern. Pinnæ subopposite, distant except near the apex, narrow and acuminate except the basal pair, which are elongate-triangular owing to the great size, comparatively, of the lower pinnules. The basal pinnules alone serrate. Sori copious on the upper portion of the frond, becoming confluent. Stipes and rachis slightly scaly.



Fig. 213.—Middle pinnae.

PINNATIFIDA, *Lowe*. (Fig. 213.)—This singular Fern was found in Westmoreland by Miss Beever. Length of frond twenty-four to thirty inches; colour a leaden blue. Pinnæ

dissimilar, especially in the upper half of the frond, alternate; near the apex of the frond the pinnæ suddenly become very small, pinnatifid, irregular, occasionally furcate, the apex of the frond being crested. Pinnules irregular, decurrent, slightly dentate or bidentate, their apices rounded, the basal pair occasionally auriculate. In the upper half of the frond the whole of the pinnules are connected, forming a pinnatifid pinna, and near the apex even a simple bidentate pinna. My thanks are due to Miss Beever for fronds.

CRISTATA, *Moore*. (Plate XXVII.)—Found at Charleston, near St Austell, in Cornwall, and near Ilfracombe, Devonshire, by Mr. J. Dodds. The most ornamental and useful of British Ferns. No Fernery can be complete without it, and it is impossible to grow too many plants: a mass of *cristata* is a picture to look upon. Some years ago Mr. Henderson, of Wentworth, at a time when there were less than half a dozen collections that could boast of this lovely variety, supplied me with spores from which I raised several hundred plants. The fronds are large, upwards of three feet in length, symmetrical in form, gracefully bending, largely crested, and deep green in colour. Fronds narrow lanceolate. Pinnæ brief, somewhat remote, narrow, and tapering from the rachis to the base of the crest; the crest is large, and formed of a branch of multifid crisped segments, every pinna is thus crested, whilst at the apex of the frond there is a much larger tassel, which is more ramose. Pinnules oblong-obtuse, subglaucous beneath. Rachis and stipes covered with golden scales. A form of *Lastrea pseudo-mas*, W. During the last few years many forms of this Fern, differing more or less from the parent, have been raised from spores, some of which, when their characters are more fully developed, will be deserving of distinctive names. My thanks are due to Mr. James, of Vauvert; Mr. R. Sim, of Foot's Cray; Mr. G. B. Wollaston, of Chiselhurst; Mrs. Bolland, of Ashurst Park; Messrs. Stansfield, of Todmorden; the Rev. C. Padley, of Bulwell Hall; Mr. Swynfen Jervis, of Darlston Hall; Mr. Clapham, of Scarborough; Mr. C. Monkman, of Malton; Mr. Clowes, of Windermere; Mr. Henderson, of Wentworth; Mr. J. Smith, of Kew; Mr. D. Moore, of the Glasnevin Gardens; Mrs. Delves, of Tunbridge Wells; Mr. C. Elworthy, of Nettle-



LASTREA FILIX-MAS.
Var. Cristata.

combe; the Rev. F. Mules, of Marwood, Barnstaple; Dr. Kinahan, of Dublin; Mr. Gray, of Exeter; Messrs. Veitch, of Chelsea; and Messrs. Rollisson, of Tooting, for fronds of this variety.



Fig. 214.

INGRAMII, Moore. (Fig. 214.)—Found in Worcestershire by Mr. W. Ingram, of Croydon, and named by Mr. T. Moore after the discoverer. I have not seen the plant, and therefore copy Mr. Moore's description from the "Gardener's Chronicle" of August 8th., 1863:—"Fronds large, being some three or four feet in height, and at least a foot in breadth; the pinnules large, averaging an inch in length, by a quarter of an inch in breadth, the lowest set on by a narrow base, and the rest becoming gradually decurrent and oblique; they are thus of a narrow linear-oblong form, somewhat acute, and cut at the margin into deepish pointed teeth, directed forwards. The long narrow obliquely-decurrent incised pinnules give this Fern a very distinct and remarkable appearance. The upper part of the frond only is fertile, and differs from the lower portion in little, excepting that the pinnules are more acute, more deeply incised, and a trifle smaller; the long narrow outlines and obliquity of insertion being still preserved. This is one of the most striking varieties of *Lastrea filix-mas* of normal development which has come under my notice."

BIFORMIS, Moore.—Accidentally raised from spores by Mr. Moore in the Botanic Gardens, Chelsea. This variety has two kinds of fronds, a portion dwarf and normal, the others much depauperated, the pinnules very small and confluent; pinnae linear, with distant minute marginal lobes, the larger of which are serrated. I have not yet seen this Fern, but include it with Mr. Moore's description.

LATIPES, Moore.—Found at Ruthin, in Denbighshire, by Mr. T. Pritchard, and in Guernsey by Mr. C. Jackson. Fronds of two kinds—thick and fleshy. A portion two feet in length, ovate, coarse, the lower pinnae not shortened, scarcely bipinnate; pinnules oblong, overlapping, somewhat spiny serrate on the margin, and connected by a narrow wing. The rest of the fronds larger; the pinnules large, distant, profoundly incisoblobate, and much decurrent, very irregular in size and form. The upper part of the frond fertile.

TRIANGULARIS, Moore.—Found in Holt Wood, near Maidstone, and in other parts of Kent, by Dr. Allchin. Another of the *incisa* group, and bears a strong resemblance to *Lastrea cristata*. Fronds narrow, stiff, and somewhat erect. Some of the lower pinnae unequally triangular. Pinnules long and adnate, or decurrent, except the basal ones.

PALEACEO-LOBATA, Moore.—A handsome form found at Tarbet, Dumbartonshire; Penryn, Cornwall; Jersey, Guernsey, Ardrishiag, Argyleshire, and Glen Lochy, Perthshire. Fronds very large, glaucous beneath, and bright-coloured scales. The distinction consists in the margins of the pinnules being lobate and somewhat undulate. An illustration is unnecessary.

PALEACEO-CRISPA, Moore.—Found by Mr. R. Hogg at Bogan Green, Coldingham, Berwickshire. Fronds broad and very leafy; the pinnae and pinnules much crowded. The distinction consists in the undulation of the pinnules, which are crispy from being twisted and curled. Pinnules elongate-oblong, the tips acutely serrated. All the pinnules are connected to the rachis by a narrow wing.



Fig. 215.—Apex of Frond.

ELONGATA, Moore. (Fig. 215.)—A handsome form of the *incisa* group. Fronds large, scented, lance-shaped; pinnae distant and caudate. Pinnules elongate, narrow for their length, serrate, the apex subacute, irregular in length. The scales of the stipes fringed. Found in the Isle of Wight by the Rev. W. H. Hawker and Mr. A. G. More, and at Addington, Gloucestershire, by Mr. H. Buckley.

ELEGANS, Willison.—Found by Mr. Willison near Whitby, Yorkshire. A form of *elongata* with pinnules pointing forwards, and somewhat decurrent at the base.

SUBINTEGRA, *Moore*.—Found by the Rev. J. Baird at Ennis, in County Clare, where he found it plentiful. Allied to *pumila* and *abbreviata*; fronds narrow lance-shaped, dwarf, glandular, and only pinnate. Pinnæ short, very obtuse, pinnatifid half way down, into blunt oblong lobes. The sori large, a simple line on either side of the midvein, about equidistant from it and the margin. An illustration is unnecessary.



Fig. 216.—Full-sized Frond.

SCHOFIELDII, *Sim*. (Fig. 216.)—Found near Buxton, in Derbyshire, by Mr. James Schofield, of Rochdale. Described and figured in my "Natural History of New and Rare Ferns," page 23, Plate XI—A. An interesting diminutive Fern, quite permanent. Fronds from two to six inches long, and very variable. Sometimes symmetrical, single, pinnate, with oblong-obtuse, lobate, or serrate pinnæ, and a crispy outspread apex, more frequently unsymmetrical, more or less depauperated or irregular in development, frequently multifid at the apex, or ramose, branching occasionally from the stipes, or from the lower portion of the frond. My thanks are due to Messrs.



LASTREA FILIX-MAS.

Var. Acrocladon.

XXVIII

Stansfield, of Todmorden, and to Mr. Sim, of Foot's Cray, for fronds, the former having purchased the plants from Mr. Schofield, who is a collector.



Fig. 217.—Pinna.

MULTI-CRISTATA, *Lowe*. (Fig. 217.)—Raised from spores at Highfield House. This variety was figured on page 46 of my "Natural History of Ferns," vol. vi, as one of the forms of *cristata*. In subsequent growth it has not altered its character, and therefore is deserving of a distinctive name. This variety differs from the ordinary form in having a greater number of crests, some of the branches commencing in the centre of the pinna instead of merely at the apex. The size and form of the frond normal. A very handsome variety.

ACROCLADON, *Lowe*. (Plate XXVIII.)—Raised from spores. Described and figured in my "Natural History of New and Rare Ferns," Plate LIV, page 127. A very distinct handsome

Fern, having a strong resemblance to *Polystichum angulare*. The fronds are elegant in form, and deep green in colour. Pinnæ alternate, approximate, their apices, as well as the apex of the frond, dilated into fan-shaped fingers, hence its name; these multifid apices of the pinnæ largest on the basal pinnæ, and becoming smaller towards the apex, near where not multifid, except the terminal pinna, which is slightly so. Pinnules deeply incised and decurrent. Length of frond two feet. My thanks are due to Mr. Clapham, of Scarborough, for fronds.



Fig. 218.—Pinna.

PUMILA, Moore. (Fig. 218.)—Found on Snowdon by the late Mr. D. Cameron, and more recently near Llyn Ogwen by Mr. S. O. Gray. A dwarf alpine variety, erect in habit. Length of frond nine to twelve inches, occasionally fifteen or eighteen inches; stipes two or three inches in length, and having fimbriate scales. Fronds lanceolate and pinnate. Pinnæ brief, blunt, and somewhat deflexed, profoundly pinnatifid, the apex recurving. Pinnules small, oblong, obtuse, crenate, convex, apex recurved. Fronds and pinnæ concave. Veins once forked. Sori confined to the anterior branch of the lowest anterior vein, forming a single line on each side the midrib of the pinnæ. Fronds sweet-scented. I am indebted to Mr. J. R. Pearson, of Chilwell, near Nottingham; to Mr. Joseph Sidebotham, of Manchester; to Sir Oswald Mosley, Bart., of Rolleston Hall; and to Mr. Edwin Cooling, of Derby, for plants. This Fern is very distinct in habit and general appearance, and is separated by Mr. G. B. Wollaston as a doubtful species. Readily cultivated, and, like the form *abbreviata*, rapidly propagates itself. When a plant has been growing for four or five years it may readily be divided into from twelve to twenty plants, which would not be the case with the true forms of *Lastrea filix-mas* or of *Lastrea pseudo-mas*.

BISERRATA, *Moore*.—Found by Mr. S. Appleby, at Rossington, near Doncaster. A sub-variety of *incisa*, having large, oblong, blunt, adnate, semi-decurrent pinnules, having serrate-crenate lobes, producing a conspicuous biserrate margin. The upper basal pinnules deorsely-lobate.



Fig. 219.—Frond.

MONKMANII, *Lowe*. (Fig. 219).—A curious monstrosity, found by Mr. C. Monkman, of Malton, in 1863, growing from beneath the platform at the Hornby railway station, near Lancaster. The pinnæ are extremely abbreviated, scarcely bipinnate, many being mere lobes. Every part of the plant is remarkably irregular. The pinnæ are very coriaceous, and papillose, some marginate; giving to the fronds a peculiarly rough aspect. So far there is no sign of fertility. When

found the previous year's fronds were still attached, and were equally as curious as the one illustrated. Mr. Monkman has no doubt of the permanency of this curiosity, and reports the plant as being healthy.



Fig. 220.

POLYDACTYLA-BLOXAMII, *Lowe*. (Fig. 220.)—Mr. Wollaston has furnished me with information of several subforms of *crinata*. One found near Tenby in South Wales, and brought into notice by Mr. R. Bloxam, of Eltham, Kent. It is a very beautiful and symmetrical polydactylous form, perfectly normal in all its parts, except that the apices both of the frond and pinnæ are many-fingered or hand-shaped. It might be distinguished by the name *polydactyla-Bloxamii*. My thanks are due to Mr. R. Bloxam for the illustration. Another found near Petersfield, Hampshire, by Mr. G. B. Wollaston, is one of the subcristate forms, connecting the normal form, through the polydactylous, with the truly cristate varieties of the species. It is of the ordinary type, but having in all its parts the germs of cristation, even to the pinnules. The autumnal is generally more developed than the spring growth, which is sometimes perfectly normal; it might be distinguished as *subcrinata*. Another found by Mr. Swynfen Jervis in Drumble Lane, near Darlaston Hall, Staffordshire, is another subcristate variety, differing only from the last in being less multifid, and being of rather attenuated growth. A fourth subcristate variety was found at Uckfield, Sussex, by Mr.

G. B. Wollaston, who remarks that it has not been sufficiently long in cultivation to speak of its merits, but it appears to be the least cristate variety yet found, and yet has sufficient characters to shew that under certain conditions it will be dichotomous in its principal members, namely, the apices of the frond and pinnæ.

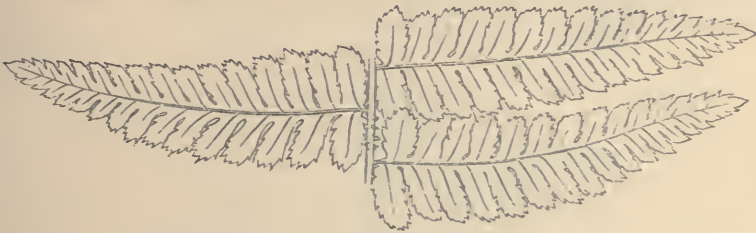


Fig. 221.

ATRO-VIRIDIS, *Jervis*. (Fig. 221.)—Mr. Swynfen Jervis, who was the finder of this variety in Staffordshire, feels very doubtful whether it be a variety of *Lastrea filix-mas*. Its coriaceous structure and permanently dark and subevergreen habit is strong proof that it is not so; but Mr. G. B. Wollaston, who has taken great notice of this form is of a different opinion. It is a fine, robust, and symmetrical variety with sub-bipinnate fronds, scarcely ever attaining a length of eighteen inches. The lobes subimbricate, rounded, and larger at the summit than the base. Its general appearance is intermediate between *Lastrea filix-mas* and *Lastrea pseudo-mas*, Wollaston.

PALEACEA, *Moore*.—This is *Lastrea pseudo-mas* of Wollaston, described on page 253; there are several varieties too nearly allied to the normal form to be described. The most compact form is found about Ambleside, and in many places in the lake district, as well as at Chaigeley Manor, Lancashire, and Matlock, Derbyshire. This I have figured under the original name. The pinnæ are shorter, and broader for their length, approximate, the pinnules are also approximate. There is a marked difference between this form and the normal form

of *Lastrea filix-mas*. In the Fernery of Mr. W. Winstanley, at Chaigeley Manor, there are fine examples of both these Ferns; the latter had fronds from six to seven feet in length, lax; the former did not exceed four feet, and were compact, and not so coarse in general appearance. Mr. Winstanley shewed me both these forms growing in abundance on various portions of his estate, through a range of several hundred feet of elevation, the most luxuriant being in the woods along the River Hodder.

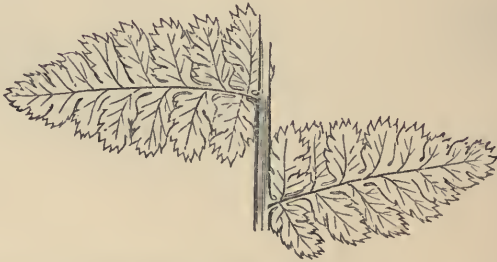


Fig. 222.—Pinnae.

BARNsii, Moore, (*Curta*, Wollaston.) (Fig. 222.)—A very narrow variety, found in Lancashire by Mr. T. M. Barnes, of Levens, near Milnthorpe, Lancashire. A narrow-fronded variety, in which the pinnae are brief, distant and subopposite below, approximate and alternate above. Length of frond fifteen inches; breadth almost equal, narrowing slightly towards the base and towards the apex, and being only two inches and a half wide in the widest part, that is, in the middle of the frond. Pinnae brief, elongate-triangular, and one inch and a quarter in length, and three quarters of an inch wide, about fifteen pairs on each frond. Pinnules ovate-oblong, the basal pair slightly stalked, the next two pairs widely attached to the rachides, and the remainder attached throughout their breadth, broad, leafy, touching each other, and bidentate on the margin. Stipes and rachis rather scaly. The lower four inches naked. Mr. Wollaston's name is very appropriate, yet Mr. Moore's takes precedence, and, as named after the discoverer, is equally appropriate. My thanks are due to Mr. Thomas Moore, of the Chelsea Botanic Gardens, for fronds.



Fig. 223.—Apex of frond and basal pinna.

SCOTTII, *Lowe*. (Fig. 223.)—Found near Swansea, in South Wales, in September, 1857, by Mr. Frederick J. Clouston Scott. A singular leafy variety, with pinnæ close set and overlapping each other, opposite below and alternate above. Length of frond fifteen inches, breadth five. One half of the pinnæ are branched, and all more or less irregular, some only consisting

of a single lobe; usually the branching pinnæ have three pairs of opposite pinnules below the branching, the other pinnæ have only the basal pair opposite, the remainder being alternate. The basal pinnules are deeply cut and irregular in shape, the others being merely strongly bidentate. The apex of the frond is also branched. My thanks are due to Mr. Scott for fronds.



Fig. 224.—A. Pinnae of young frond. B. Apex of mature frond.
C. Middle pinna of mature frond.

MULTIFORMIS, *Wollaston*. (Fig. 224).—A variety of *Lastrea propinqua*, *Wollaston*. A slightly interrupted form, having the tips both of the frond and more or less of the pinnæ, irregularly multifurcate or crested, and the lobes laciniately divided. Otherwise it is of the ordinary type of the species. Found by Mr. T. M. Barnes, of Levens, Lancashire, in Long Sleddale, to whom I am indebted for fronds.

PALEACEO-EROSA, *Moore*.—Found by Mr. Thomas, at Cwm-Glyn, near Pont-y-Pool. Differing in having small irregular-sized pinnules with erose margins.



Fig. 225.—Apex.

GRANDICEPS, *Wollaston*. (Fig. 225.)—The finest and most crested form of the true *Lastrea filix-mas* ever found, having the apex of the frond densely tasseled and ramulose. The pinnæ are also beautifully crested, and occasionally the pinnules or the lobes of the same. In other respects the variety is normal.

DENTEX, *Moore*.—Raised from spores, by Messrs. Stansfield, of Todmorden. A form of *Lastrea propinqua*. The apex of the frond is always truncate or abrupt, having an ordinary sized pinna in the place of the usually attenuated upper

portion. Frond bipinnate. The apices of the pinnæ bifid or ramose, but not crispy. Pinnules oblong, close-set, profoundly, conspicuously, and sharply serrate. A singular variety. Mr. Stansfield is afraid that it is now dead.

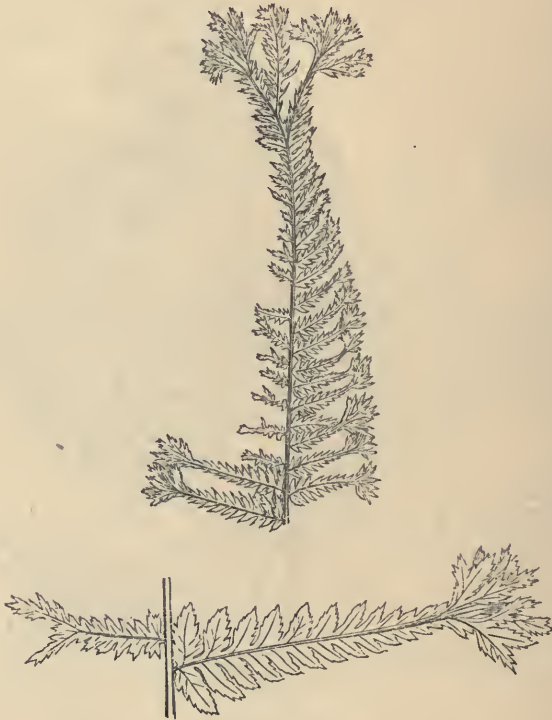


Fig. 226.—Apex of frond (reduced.) Pinnæ (natural size.)

LOWELÆ, Lowe. (Fig. 226.)—Raised from spores in Mrs. E. J. Lowe's fernery. A somewhat dwarf-fronded variety, the pinnules wide at the base of each pinna, and opposite, narrowing to very minute pointed lobes near the apex, and then widening out into a large crested tuft. The frond also branching and tufted at the apex. On one side the frond, from its centre to the apex, are either almost wanting or very brief, narrow, and branching pinnae or pinnules. Length of frond twelve inches, of which the basal inch and a half is naked. Stipes and rachis copiously hirsute.

INCISO-RECURVA, *Moore*.—Found in 1857, by Mr. S. Appleby, near Doncaster. A sub-variety, with pinnæ and pinnules recurved, which distinguishes it from its otherwise near allies *incisa* and *deorso-lobata*.



Fig. 227.—Frond.

LACERATO-CRISTATA, *Monkman*. (Fig. 227.)—This oddity is a sport from spores of the variety *cristata*, raised by Mr. C. Monkman, of Malton, who is of opinion that the variety will remain permanently dwarf, and it is promising to be constant. The parentage is unmistakable, but the pinnæ are variously shortened and wanting, and in place of pinnulets are deeply incised into irregularly lobed divisions, which shew some tendency to crest. The pinnæ and the fronds are sometimes crested, but not always distinctly so, and occasionally not at all. So far there has been no indication of fertility. Fronds six to eight inches in length. The illustration is from Mr. Monkman's plant—the only one known.

GIGANTEA, Lowe.—Found near Marwood, Devonshire, by the Rev. F. Mules. Normal in form, and gigantic in size. Length of fronds fifty inches, width ten inches. The pinnæ very close together, ascending, and therefore making the frond narrow, the pinnæ being eight inches in length, and one inch and a quarter wide at the base. The frond nearly equal in width, slightly narrowing at the base, where eight wide, and rapidly narrowing at the apex. Stipes and rachis densely scaly; the base of the stem an inch in diameter, and at nine inches above the base half an inch, densely clothed with rich reddish brown scales, so thick as to make the stem appear an inch and a half in diameter. The pinnæ commence six inches above the base. The upper thirty-four inches entirely covered on the under side of the frond with spore-cases from the base to the apex of the pinnæ. The lower half of the pinnæ having from ten to twelve spore-cases on each pinnule, the central pinnæ having from two hundred and ten to two hundred and twenty spore-cases on each, which are large in size, and very prominent. Pinnæ attenuated into a sharp point. Pinnules long, with a rounded apex; the edges smooth and entire, except the rounded apex, which is slightly dentate; the pinnules are copiously scaly on the under side of the frond, and extending beyond the margin as a fringe of narrow hair-like scales. It is unnecessary to give an illustration. My thanks are due to the Rev. F. Mules for fronds.

FLEXUOSA, Moore.—Found by Mr. S. Appleby, near Doncaster. A sub-variety of *deorso-lobata*, differing in the main-rachis being curiously and strongly twisted in a zigzag manner, the secondary rachides being also tortuously curved.

CRISPATA, Wollaston.—Perfectly normal, except that it is crispy-waved in every part of the frond. Found in Devonshire by Mr. G. B. Wollaston, and near Levens, Lancashire, by Mr. T. M. Barnes. A form of *Lastrea pseudo-mas*.

TENUIFORMIS, Wollaston.—A form of *Lastrea filix-mas* found near Swinnerton, in Staffordshire, by Mr. G. B. Wollaston. As its name implies it is a delicate, graceful form of the

species. All its parts are diminutive, the teeth of the lobes remarkably so; but in other respects its growth is of the ordinary size.

MAPPLEBECKII, *Lowe*.—Found in two places near Grasmere, in the English Lake District, by Mr. J. E. Mapplebeck, of Bromsgrove, in August, 1862. The fronds are twelve inches or more in length, polydactylous, and fork into two distinct fronds near the base, and frequently the basal pinnæ are divided in the same manner. The apex of the pinnæ cristate, as well as the apex of the frond. My thanks are due to Mr. Mapplebeck for fronds.



Fig. 228.—Pinnæ.

WINSTANLEYI, *Lowe*. (Fig. 228.)—Raised from spores at Highfield House from *cristata*, yet differing from that variety in several respects. The fronds are long and narrow—twenty inches in length, and only three inches and a half in width; slightly widest in the middle, narrowing rapidly to the apex, and slightly to the base; the apex of the frond is furcate and cristate. It differs from *cristata* in having a tufted crest, which forms a compact rounded head, all the margins of which are deeply cut. The pinnæ are close, alternate, and narrow, being widest at the base. Pinnate, the segments being deeply cut near the base, the basal inferior lobe being the largest. The margins of the lobes finely dentate. Sori confined to the upper half of the frond, a single row on either side the midrib, and much smaller in size than in *cristata*. The pinnæ near the base of the frond are dilate, much branched, but not tufted; and only shew a tendency to be cristate. An elegant and more slender form.

Before describing the varieties of *Lastrea filix-mas* we mentioned that Mr. Wollaston had divided this Fern into three species, and as we figured and described the varieties, reference was made regarding the species to which they belonged. Mr. Wollaston has bestowed great care and attention to this subject, and his labours will be best understood by recapitulation, especially as he informs me that I have made several errors with regard to his new species; thus *abbreviata* is *Lastrea propinqua* and not *Lastrea pseudo-mas*; *cristata-angustata* and *Pinderi* are, however, forms of *Lastrea pseudo-mas* instead of *Lastrea propinqua*. The following arrangement will clear up this difficulty.

1. LASTREA FILIX-MAS, *Presl*, consisting of—

| | |
|---|--|
| Atroviridis, <i>Jervis</i> . | Gracilis, <i>Wollaston</i> . |
| Barnsii, <i>Moore</i> . (Curta, <i>Wollaston</i> .) | Grandiceps, <i>Wollaston</i> . |
| Biformis, <i>Moore</i> . | Jervisii, <i>Moore</i> . (Cristata, <i>Woll.</i>) |
| Bollandiæ, <i>Moore</i> . (Sterilis, <i>Woll.</i>) | Polydactyla, <i>Moore</i> . |
| Clowesii, <i>Moore</i> . (Cristata, <i>Woll.</i>) | Ramosa, <i>Moore</i> . |
| Crispata, <i>Wollaston</i> . | Schofieldii, <i>Sim</i> . (Minima, <i>Woll.</i>) |
| Defecta, <i>Wollaston</i> . | Tenuiformis, <i>Wollaston</i> . |
| Erosa, <i>Clowes</i> . | Willisonii, <i>Moore</i> . (Excurrens, <i>Wollaston</i> .) |
| Flavo-tincta, <i>Wollaston</i> . | |
| Furcans, <i>Moore</i> . | |

2. LASTREA PROPINQUA, *Wollaston*, consisting of—

| | |
|------------------------------------|---------------------------------|
| Abbreviata, <i>Babington</i> . | Furcans, <i>Wollaston</i> . |
| (L. propinqua, <i>Wollaston</i> .) | Interrupta, <i>Wollaston</i> . |
| Cristata, <i>Wollaston</i> . | Multiformis, <i>Wollaston</i> . |

3. LASTREA PSEUDO-MAS, *Wollaston*, consisting of—

| | |
|---|---|
| Aspera, <i>Wollaston</i> . | Imbricata, <i>Wollaston</i> . |
| Crispata, <i>Wollaston</i> . | Obtusidactyla, <i>Wollaston</i> . |
| Cristata, <i>Moore</i> . | Paleacea multifida, <i>Moore</i> . |
| Cristata-angustata, <i>Moore</i> . (Cristata, <i>Wollaston</i> .) | “ lobata, <i>Moore</i> . |
| Erosa, <i>Wollaston</i> . | “ crispa, <i>Moore</i> . |
| Furcans, <i>Wollaston</i> . | Pinderi, <i>Moore</i> . (Compacta, <i>Woll.</i>) |
| | Pumila, <i>Moore</i> . |

Mr. Wollaston has studied *Lastrea filix-mas* more than any one, and moreover is an authority in which we must put confidence; we have therefore fallen in with his views, although some of our authorities will not agree with this new division of a British species, whilst others go even further and say that even *Lastrea cristata* and *Lastrea æmula* are only forms of *Lastrea filix-mas*.

RECAPITULATION.

PRODUCTA.—Mr. Elworthy has found this variety near Nettlecombe. Length of frond twenty-six inches, width eight inches; pinnæ ascending, (the longest as much as five inches,) widest in the middle of the frond; pinnæ short and horizontal at the base. Stipes five inches, covered with pale brown scales. Sori copious on the upper half only of the frond.

RAMOSA, Stansfield.—A curious branching variety, with various formed pinnæ and very large pinnules, thin in texture, and vividly green in colour. The pinnules near the base are deeply divided, and those near the apex shallowly, strongly dentate. Length of frond twelve inches. The branched apex ascending, the branches overcrossing each other.

SCHOFIELDII, Moore, (Minima, Wollaston.)—We have described this beautiful pigmy variety at page 266. It was formerly considered a variety both of *Lastrea spinulosa* and *Lastrea dilatata*.

FURCANS, Moore.—There is a sub-variety of *furcans*, in which the furcations are wide spread, being almost at right angles to the pinna, and somewhat resemble the horns of a cow.

POLYDACTYLA, Moore.—Also found at Redditch, in 1860, by Mr. Gold, fronds of which have been forwarded by Mr. Mapplebeck. See page 250.

ALPHABETICAL LIST OF VARIETIES OF
LASTREA FILIX-MAS.

| | | | |
|--|----------|--|----------|
| Acrocladon, <i>Lowe</i> | page 267 | Jervisii, <i>Moore</i> | page 236 |
| Abbreviata, <i>Babington</i> | 237 | Lacerato-cristata, <i>Monkman</i> | 277 |
| Abbreviata-cristata, <i>Clowes</i> | 240 | Latipes, <i>Moore</i> | 264 |
| Atro-viridis, <i>Jervis</i> | 271 | Loweia, <i>Lowe</i> | 276 |
| Barnsii, <i>Moore</i> | 272 | Mapplebeckii, <i>Lowe</i> | 279 |
| Bollandia, <i>Moore</i> | 240 | Marsdenia, <i>Lowe</i> | 250 |
| Beeveria, <i>Lowe</i> | 251 | Monkmanii, <i>Lowe</i> | 269 |
| Biserrata, <i>Moore</i> | 269 | Multi-cristata, <i>Lowe</i> | 267 |
| Biformis, <i>Moore</i> | 264 | Multiformis, <i>Wollaston</i> | 274 |
| Crispata, <i>Wollaston</i> | 278 | Mikra, <i>Lowe</i> | 258 |
| Cristata, <i>Moore</i> | 262 | Oreopteroides, <i>Lowe</i> | 261 |
| Cristata-angustata, <i>Moore</i> | 242 | Pumila, <i>Moore</i> | 268 |
| Cristata-depauperata, <i>Monkman</i> | 259 | Piuderi, <i>Moore</i> | 241 |
| Clowesii, <i>Moore</i> | 239 | Producta, <i>Moore</i> | 243, 281 |
| Crispa, <i>Sim</i> | 248 | Paleacea, <i>Moore</i> | 271 |
| Dentex, <i>Moore</i> | 275 | Paleaceo-trapeziforme, <i>Monkman</i> | 249 |
| Depauperata-Monkmanii, <i>Monkman</i> | 247 | Paleaceo-erosa, <i>Moore</i> | 275 |
| Dentata, <i>Lowe</i> | 254 | Paleaceo-crispa, <i>Moore</i> | 264 |
| Dissimile, <i>Monkman</i> | 254 | Paleaceo-lobata, <i>Moore</i> | 264 |
| Deorso-lobata, <i>Moore</i> | 256 | Pinnatifida, <i>Lowe</i> | 261 |
| Erosa, <i>Clowes</i> | 248 | Polydactyla, <i>Moore</i> | 257, 281 |
| Erosa-dentigera, <i>Stansfield</i> | 260 | Polydactyla-Bloxamii, <i>Lowe</i> | 270 |
| Elongata, <i>Moore</i> | 265 | Propinqua, <i>Wollaston</i> | 253 |
| Elégans, <i>Willison</i> | 265 | Recurva, <i>Moore</i> | 260 |
| Eulophe, <i>Lowe</i> | 252 | Ramosa, <i>Moore</i> | 255, 281 |
| Furcans, <i>Moore</i> | 244, 281 | Schofieldii, <i>Sim</i> | 266, 281 |
| Foliosa, <i>Lowe</i> | 259 | Scottii, <i>Lowe</i> | 273 |
| Flexuosa, <i>Moore</i> | 278 | Subintegra, <i>Moore</i> | 266 |
| Gigantea, <i>Lowe</i> | 278 | Serrato-multifida, <i>Moore</i> | 249 |
| Grandiceps, <i>Wollaston</i> | 275 | Tenuiformis, <i>Wollaston</i> | 278 |
| Interrupta, <i>Moore</i> | 242 | Triangularis, <i>Moore</i> | 264 |
| Incisa, <i>Moore</i> | 246 | Variabile, <i>Monkman</i> | 245 |
| Inciso-recurva, <i>Moore</i> | 277 | Willisonii, <i>Moore</i> | 251 |
| Ingramii, <i>Moore</i> | 263 | Winstanleyi, <i>Lowe</i> | 279 |
| Imbricata, <i>Monkman</i> | 249 | | |



ADIANTHUM DILATATUM.



Fig. 229.—Portion of pinna.

LASTREA DILATATA.

PRESL.

The Broad Prickly-toothed Buckler Fern.

PLATE XXXII.

| | |
|-----------------------------|------------------------------------|
| <i>Lastrea dilatata</i> , | PRESL. NEWMAN. BABINGTON. |
| “ “ | SOWERBY. MOORE. PRATT. |
| “ <i>multiflora</i> , | NEWMAN. DEAKIN. |
| “ <i>dumetorum</i> , | MOORE. (Var. <i>dumetorum</i> .) |
| “ <i>collina</i> , | NEWMAN. (Var. <i>dumetorum</i> .) |
| “ <i>maculata</i> , | DEAKIN. (Var. <i>dumetorum</i> .) |
| “ <i>Chanteriæ</i> , | MOORE. (Var. <i>Chanteriæ</i> .) |
| “ <i>lepidota</i> , | MOORE. (Var. <i>lepidota</i> .) |
| “ <i>glandulosa</i> , | NEWMAN. (Var. <i>glandulosa</i> .) |
| <i>Aspidium dilatatum</i> , | SMITH. SWARTZ. FEE. METTENIUS. |
| “ “ | TENOBE. E. J. LOWE. |
| “ <i>spinulosum</i> , | SWARTZ. SMITH. WILLDENOW. |
| “ “ | HOOKE AND ARNOTT. BENTHAM. |

- Aspidium spinulosum*, FRIES. RUPRECHT.
 “ *Carthusianum*, STEUDEL.
 “ *dumetorum*, SMITH. (Var. *dumetorum*.)
 “ *dilatatum*, WILLDENOW. (Var. *tanacetifolia*.)
 “ *spinulosum*, SCHKUHR. (Var. *tanacetifolia*.)
 “ *erosum*, SCHKUHR. (Var. *tanacetifolia*.)
Polypodium dilatatum, HOFFMAN.
 “ *cristatum*, HUDSON. HOFFMAN.
 “ *Carthusianum*, VILLARS.
 “ *multiflorum*, ROTH.
 “ *tanacetifolium*, HOFFMAN. (Var. *tanacetifolia*.)
 “ *aristatum*, VILLARS. (Var. *tanacetifolia*.)
Polystichum multiflorum, ROTH.
 “ *spinulosum*, DE CANDOLLE. LEDEBOUR.
 “ *dilatatum*, DE CANDOLLE.
 “ *tanacetifolium*, DE CANDOLLE. (Var. *tanacetifolia*.)
Nephrodium cristatum, MICHAUX.
 “ *spinulosum*, HOOKER.
 “ *dilatatum*, DESVAUX.
Dryopteris dilatata, A. GRAY.
Lophodium multiflorum, NEWMAN.
 “ *collinum*, NEWMAN. (Var. *dumetorum*.)
 “ *collinum*, NEWMAN. (Var. *collina*.)
 “ *glandulosum*, NEWMAN. (Var. *glandulosa*.)
 “ *glanduliferum*, NEWMAN. (Var. *glandulosa*.)
Aspidium spinulosum,
 var. *dilatatum*, LINK. A. GRAY.
Polystichum spinulosum,
 var. *dilatatum*, KOCH.
Lastrea dilatata,
 var. *dumetorum*, MOORE. (Var. *dumetorum*.)
 “ *dilatata*,
 var. *maculata*, MOORE. (Var. *dumetorum*.)
 “ *dilatata*, var. *collina*, MOORE, in part. (Var. *dumetorum*.)
 “ *multiflora*,
 var. *collina*, NEWMAN. (Var. *dumetorum*.)
 “ *dilatata*, var. *collina*, MOORE, in part. (Var. *collina*.)
 “ *multiflora*,
 var. *collina*, MOORE. (Var. *collina*.)
 “ *dilatata*,
 var. *Chanteriæ*, MOORE. (Var. *Chanteriæ*.)
 “ *dilatata*, var. *angusta*, MOORE. (Var. *angusta*.)
 “ *dilatata*, var. *alpina*, MOORE. (Var. *alpina*.)
 “ *dilatata*, var. *nana*, MOORE. (Var. *nana*.)
 “ *multiflora*, var. *nana*, NEWMAN. DEARIN. (Var. *nana*.)
Lophodium multiflorum,
 var. *nanum*, NEWMAN. (Var. *nana*.)

- Lastrea dilatata*,
 var. *tanacetifolia*, MOORE. (Var. *tanacetifolia*.)
 “ *multiflora*,
 var. *dilatata*, DEAKIN. (Var. *tanacetifolia*.)
 “ *dilatata*, var. *lepidota*, MOORE. (Var. *lepidota*.)
 “ *dilatata*, var. *crinata*, MOORE. (Var. *crinata*.)
 “ *dilatata*,
 var. *glandulosa*, MOORE. BABINGTON. (Var. *glandulosa*.)

Lastrea—.....? *Dilatata*—Expanded, or spread out.

A COMMON British variety, found in Cornwall, Devonshire, Somersetshire, Hampshire, Dorsetshire, Wiltshire, Sussex, Kent, Hertfordshire, Middlesex, Surrey, Essex, Oxfordshire, Norfolk, Northamptonshire, Cambridgeshire, Warwickshire, Gloucestershire, Monmouthshire, Worcestershire, Herefordshire, Cheshire, Staffordshire, Shropshire, Lincolnshire, Nottinghamshire, Derbyshire, Leicestershire, Lancashire, Yorkshire, Westmoreland, Durham, Cumberland, and Northumberland. In Wales in Denbighshire, Flintshire, Merionethshire, Carnarvonshire, Pembrokeshire, Cardiganshire, Glamorganshire, Radnorshire, and Brecknockshire.

In Scotland in Dumfriesshire, Lanarkshire, Roxburghshire, Berwickshire, Edinburghshire, Morayshire, Invernesshire, Banffshire, Kincardineshire, Aberdeenshire, Forfarshire, Perthshire, Stirlingshire, Clackmannanshire, Kinrosshire, Dumbartonshire, Fifeshire, Argyleshire, Rosshire, and Sutherlandshire. In Ireland in counties of Waterford, Clare, Limerick, Tipperary, Wicklow, Galway, and Down. In the Islands of Anglesea, Orkney, Lewis, Hoy, Harris, N. Uist, Jersey, and Guernsey.

Abroad it is a native of America, at Silka, Rocky Mountains, New England, and Canada. In Asia in Kamtschatka and Mingrelia; in Africa in the Azores and Bourbon; whilst in Europe it is generally distributed in Lapland, Norway, Spain, Portugal, Alps, Italy, Croatia, Transylvania, France, Germany, and Switzerland.

In some parts of Northern Spain it is not uncommon. I found it occurring in the Hoz de Barcena; at Las Caldas; and between Las Caldas and the entrance to the Hoz de Barcena associated with *Woodwardia radicans* and *Adiantum capillus-veneris*, and

most abundant between Reinosia and Allar, on one of the spurs of the Pyrenees, known by the name of the Villia Escusa, here it spread its branches over the chasms on the rocks, and afforded shelter to the numerous wolves that inhabit these mountains. It is also said to be a native of New Zealand.

A plant requiring no skill in its cultivation, preferring a shady situation and decayed leaves, yet growing well in any kind of soil. In woods of some years standing, where the subsoil is a cold clay, the roots spread themselves in the decaying leaves close to the surface, so that the plants can be removed by merely pulling at the fronds, under such circumstances they seem more especially to delight. In wet situations five or six hundred feet above the sea, they grow in more exposed situations, as amongst the grass in the fields along Longridge Fell, between Preston and Clitheroe; here I found them much more stunted in growth, the fronds almost cuneate, more rigid, recurved, and richer in the green colour of the fronds.

A very handsome subevergreen Fernery plant.

Very prolific in varieties, some of which are exceedingly distinct.

Included in this species are several forms that will eventually be raised to the dignity of species. We have the normal form, *spinulosa*, *uliginosa*, *collina*, *glandulosa*, and others all strikingly different, and amongst these *uliginosa* and another very similar variety can hardly be said to be varieties of *L. dilatata*. I would have considered *uliginosa* and another form closely resembling it as forms of the same Fern, yet one is always found growing in boggy situations, associated with *Lastrea cristata* and *L. oreopteris*; whilst the other is found in dry woods, where these two species could not exist; then again on removing these plants to a Fernery, if the one found in boggy places is planted high and dry, it soon dwindles away in the same manner as *Lastrea cristata*; whilst the other is equally unfortunate if planted in situations favourable to *Lastrea cristata*.

I am quite convinced that however much *Lastrea uliginosa* and *Lastrea spinulosa* agree with *Lastrea cristata*, they do not belong to that species. I have watched these plants in various places, and living near Oxtou Bog, a well-known locality for

Lastrea cristata, my attention has been specially directed to these plants, and the conclusion arrived at is that they cannot be grouped with each other. The other similar form is a wide-spread Fern, but always found in woods growing in similar situations to those suitable to *Lastrea dilatata*, but unlike that species, sending its roots perpendicularly down into the subsoil, it is always upright in growth, and having very long naked stems. I have seen it in woods at Bulwell and Wollaton, in Nottinghamshire; in the lake district; near Highforce, in Durham; at Chaigeley Manor and Browsholme Hall, Lancashire; and at Matlock, in Derbyshire, yet in no place have I found it where *Lastrea cristata* grows. Then again, *Lastrea spinulosa* has often been associated with *Lastrea dilatata*, and some growers have even affirmed that the pinnæ and pinnules of the former have in course of time expanded into similar ones to those of the latter. Plants in my Fernery, ten and fifteen years old, have never altered their character. Provisionally, however, we will group all these Ferns under *Lastrea dilatata*, yet with a firm conviction that they cannot long remain united.

After describing the varieties we may return to the subject.

The normal form occurs at every elevation from the sea level to more than three thousand six hundred feet in height.

The fronds vary from twelve inches to six feet in length, and from four to eighteen inches in breadth. Spreading, and usually drooping; ovate, or ovate-lanceolate in form, and bipinnate or tripinnate. Pinnæ distant below, becoming more approximate upwards; numerous, and opposite or subopposite. The basal pair are obliquely-triangular elongate, the posterior much larger than the anterior.

Pinnules ovate-oblong, the basal ones stalked, the upper ones sessile and decurrent, all the divisions are sharply dentate, and terminating in a bristle-like point.

Veins branching.

Fructification occupying the whole underside of the frond.

Stipes terminal, and adherent to the caudex, variable in length, very thick at the base, and densely scaly. Rachis convex behind, and channeled in front.

Caudex stout, and mostly erect.



Fig. 230.—Frond.

MINIMA, *Moore*. (Fig. 230.)—This is a very dwarf Fern found in Cant Clough, near Todmorden, by Mr. Stansfield. A pretty Fern with diverse fronds. Length of frond from three and a half to seven inches, ovate, yet more or less depauperated, many of the basal pinnæ are depauperated, some only of the size of pinnules having incised margins, others very brief with much smaller pinnules, not unfrequently consisting only of a few lobe-like teeth. The pinnules very diverse, some oblong, with acuminate lobate-serrate teeth,

usually decurrent and frequently narrowing below. My thanks are due to Messrs. Stansfield, of Vale Nursery, Todmorden, for fronds.

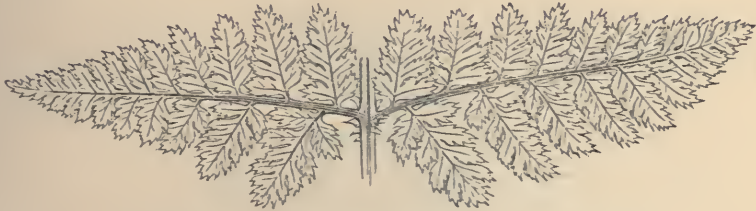


Fig. 231.—Pinnae.

DUMETORUM, Moore. (Fig. 231.)—Found in Silverthwaite, Westmoreland, and in several other fells, by Miss M. Beever; at Hawes Water by Mr. F. Clowes; at Elter Water by the Rev. G. Pinder; Challacombe, Devonshire, by the Rev. J. M. Chanter; Ilfracombe by Mr. J. Dodds; Ingleborough, Yorkshire, by Mr. T. Blezard; Glamrhin, above Rhayader, by Mr. J. R. Cobb; at Snowdon by Mrs. Jennings. In Scotland in Argyleshire, Dumbartonshire, Aberdeenshire, Rosshire, and Caithness, by Mr. G. R. Alexander, Miss Griffith, Mr. Thomas Moore, Mr. Tait, Miss Murray, and others. In Ireland in Wicklow and Kerry by Mr. R. Barrington. The Isle of Man by Dr. Allchin. I found plants near Longridge Fell, Lancashire, and several plants in an alder wood at Chaigeley Manor. In this wood I found several hundred specimens of the *Clausilia laminata*, and quantities of *Azea tridens*, *Balea fragilis*, *Zua lubrica*, *Pupa pusilla*, *Pupa umbilicata*, *Vitrina pellucida*, *Arion flavus*, *Arion hortensis*, *Zonites cellarius*, and other conchological species. I name this to shew that “two birds could be killed with one stone,” at least very often: conchology and botany can very well be worked together. Fronds bipinnate, and dwarf, seldom exceeding twelve inches in length; of a lengthened triangular-ovate form, very glandular on the rachides, stipites and lower surface of the veins. Pinnae blunt and concave. Pinnules convex, oblong-ovate, crispy, having broad, coarse teeth, tipped by a small bristle. Stipes

scaly. Copiously soriferous, covering the whole under surface of the frond, and even young plants a few months old are abundantly fertile. Sori large and distinct. Indusia conspicuously fringed, with stalked glands.



Fig. 232.—Pinna.

VALLIDA, *Moore*. (Fig. 232.)—Found at Nettlecombe, Somersetshire, by Mr. C. Elworthy, near Tunbridge Wells, by Mr. W. W. Reeves, in Devonshire by the Rev. J. M. Chanter, Dunphail, in Invernesshire, by Miss F. Brown, and in Guernsey by Mr. C. Jackson. A handsome stout erect-growing Fern, thick and fleshy. Fronds bipinnate, or often tripinnate, large and broad. Stipes stout and moderately scaly. Pinnae broad and crowded. Pinnules more or less divided, almost to the midrib; oblong ovate, and curving somewhat forwards. The lobes oblong obtuse, lobate-serrate, with bristle-tipped teeth. The venules end on the margin on the upper surface in a hair-like white line, giving a falsely strigose appearance. A similar form has been found in Monkland

Glen, near Ardrrie, Lanarkshire, by Mr. Tait; it is named by Mr. Moore as a sub-variety (*erecta*), having long stipites and ovate triangular fronds, very erect in habit, pinnae distinctly concave, pinnules as distinctly convex, having a crispy appearance. Length of frond above two feet.



Fig. 233.—Frond.

INTERRUPTA, Moore. (Fig. 233.)—Found near Harrogate, Yorkshire, by Mr. Clapham, of Scarborough. The fronds are lanceolate-ovate in form, of medium size, and of irregular development; occasionally ramose as well as interrupted; the pinnae are sometimes wanting, or reduced to less than half their usual length, the pinnules being irregularly incised or lacinated on the margin, occasionally more or less normal. Subsequently found by Mr. C. Monkman in the Hole of Hercum, Yorkshire,

and near Malton. Mr. Monkman remarks that "the plants were large and handsome. The pinnules irregularly shortened or wanting; sometimes a mere horn-like midrib, devoid of foliage, projecting."



Fig. 234.—Frond.

PIGMÆA, Moore. (Fig. 234.)—Found in Cant Clough, in the beautiful vale of Todmorden, Lancashire, by Mr. Stansfield, of Vale Nursery, Todmorden. A very dwarf form having the pinnæ scarcely bipinnate, the basal pinnules at the base of the frond being divided, the others irregularly confluent; having crowded lobes of various forms, and with unequal serratures which terminate in a bristle. Its main peculiarity consists in the rachis or stipes being ramose. A singularly pigmy variety, for fronds of which I am indebted to Messrs. Stansfield, of Todmorden.





ADIANTHUM DILATATUM,

Var. *sepidota*.

XXXIII

TANACETIFOLIA, Moore.—Found in Devonshire, Kent, Surrey, Middlesex, Worcestershire, Yorkshire, Lancashire, Nottinghamshire, and Derbyshire. Exceedingly abundant in many places between Clitheroe and Preston, and Clitheroe and Lancaster. A common form. Fronds tripinnate, broadly triangular and large, often very large and lax, making a conspicuous interesting fernery plant. The stipes abundantly scaly, the scales entire, lanceolate, dark brown, with a darker belt down their centre.



Fig. 235.—Pinnæ of *Lepidota*.

LEPIDOTA, Moore. (Plate XXXIII.)—Said to be found in Yorkshire, but its history obscure. Mr. Tait, of Edinburgh, brought it under notice, having procured it from Mr. Stark, a Nurseryman of that city. Singularly distinct, dwarf, and having much-divided fronds. Fronds quadripinnate, very broadly ovate; length about eighteen inches. Pinnæ everywhere very unequal, the posterior ones much the largest. Pinnules small and distinct, the primary pinnules elongate-ovate and distant on the rachides, and pinnate. The secondary pinnules also distant, blunt, brief ovate, having a tapering stalk-like base; below they are divided into broad lobes, being tertiary pinnules on the basal posterior pinnule of the basal pinna. The ultimate divisions are small. Densely scaly, with large, entire, lepidote, brown scales. Mr. Moore remarks a striking peculiarity in the development of the fronds, the evolution of the fronds being indefinite, for the basal pinnules of a pinna have matured and scattered their sori before the apex of the same pinna has expanded itself or become unrolled. I am indebted to Mr. Cooling, of Derby, for plants.



Fig. 236.—Middle pinna.

LEPIDA, *Moore*. (Fig 236.)—Found on the confines of Yorkshire and Lancashire. This form is rather larger than the variety *concinna*, having the pinnæ, as well as the pinnules, more distant. The pinnules are also more obtuse, and their lobes more widely apart. This is a slender form, having sharply toothed lobes. The fronds, including the stipes, exceed eighteen inches in length.



Fig. 237.—Middle pinna.

CRISTATA, *Moore*. (Fig. 237.)—Found near Doncaster by Mr. Appleby, and brought under general notice by Mr. R. Sim, of Foot's Cray. A distinct crested variety, with somewhat dwarf habit. The pinnæ are usually twice forked into brief bluntly spread segments, terminating in a slightly crisped tuft as well as the apex of the frond. All the pinnæ are not regularly crested, but where not so they are dilate, showing a tendency to fork. When the plant becomes older it will no

doubt become more perfectly crested. A much more crested variety was found in Devonshire by the late Mr. C. Jackson, which is now in the possession of Mr. G. B. Wollaston, of Chiselhurst. Subsequently Mrs. Thompson, of Exeter, found a crested variety in Devonshire, which assumes this form in a marked degree. My thanks are due to Mr. R. Sim, of Foot's Cray, and to Mrs. Thompson, of Exeter, for fronds.



Fig. 238.—Basal portion of Frond.

RAMOSA, *Moore*. (Fig. 238.)—Apparently a ramose form of *dumetorum*. Usually twin-fronded, but sometimes each twin-frond again divided, forming a large variously-branched flabellate mass of foliage, and is in that state very remarkable. Copiously fertile, and moderately constant. Mr. Monkman's plant, from which the illustration is given, was received from Messrs.

Stansfield, of Todmorden. Mr. Monkman has found this variety, more than any other, to be liable to the attacks of the green fly, which, if not closely watched, quickly destroys the foliage. In a Malton atmosphere the variety is only semi-persistent. A very fine and really interesting Fern. A Scottish form. The stipes and rachis forked, so as to produce a branched frond.



Fig 239.

GLANDULOSA, Moore. (Fig. 239.)—First discovered in a boggy portion of Ankerbury Hill, near Lydbrook, in the Forest of Dean, Gloucestershire, and subsequently near Windermere by Mr. F. Clowes; near Linley, Broseley, Shropshire, by Mr. G. Maw; at Barnes, Surrey, by Mr. T. Moore; at Hastings by Mr. J. Stidolph; and in Epping Forest, Essex, by Mr. H. Doubleday. A large-growing, almost erect-habited form, with tall robust fronds, not unlike a large and broad *spinulosa*, yet differing in having the scales on the stipes more lanceolate in form and two-coloured, and in the indusia which covers the spore-cases being glandular fringed. Caudex somewhat creeping. The stipes varying from one third to one half the length of the entire frond, scaly, thickly so near the base, and sparingly upwards. The stipites, rachides, and under surface of the fronds covered thickly with stalked glands. Length of fronds from twenty-four to forty-eight inches, oblong-lanceolate in form in the fully-developed fronds. Tripinnate below, bipinnate above. Pinnæ ascending, and twisted almost horizontally, the lower ones unequally deltoid and wide, above lanceolate-ovate, two inches broad near the base, and six inches in the longest.

Pinnules usually an inch in length, the posterior pinnules on the basal pinna as much as an inch and three quarters, lanceolate-ovate and acute. The basal ones stalked, above these decurrent, then adnate, and towards the apex confluent. Pinnules pinnatifid almost to the midvein; lobes oblong, adnate, cut or dentate, all the serratures terminating in a bristle-like point. Fructification extending over the whole frond. Somewhat similar varieties have been found in various places, which are all glandular, yet have more or less difference from the original normal form. I am indebted to Mr. F. Clowes, of Windermere, for fronds.



Fig. 240.

TENERA, *Moore*. (Fig. 240.)—Found at Windermere by Mr. F. Clowes. More nearly approaching *fuscipes* than any other variety, yet more divided and more delicate. A very fine glandular form. Frond two to three feet in length, thin, delicate, ovate in form, and tripinnate. Pinnæ broad, and caudately acuminate. The posterior pinnules of the two basal pinnæ elongate oblong-acuminate, the remainder shorter. Pinnulets sessile below, adnate above, often somewhat falcate, having a tendency to the development of an auricle-like basal anterior lobe, profoundly serrated with acute mucronate teeth. Stipes pale chesnut in colour. Scales lanceolate and dark coloured. Stipes copiously glandular, as well as the rachides and veins underneath. My thanks are due to Mr. F. Clowes, for fronds.

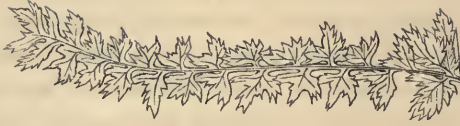


Fig. 241.—Pinna towards the apex.



Fig. 242.—Middle pinna.



Fig. 243.—Basal pinna

HOWARDII, *Monkman*. (Figs. 241, 242, 243.)—This is the most remarkable form of *dilatata* yet discovered; indeed it may be said to present an entirely new arrangement hitherto without parallel in the British Filices. In no other species, excepting perhaps in *Athyrium Filix-fœmina* var. *Fieldiæ* and *Polystichum angulare* var. *Elworthii*, has any approach to this peculiarity of development been observed. And in the case of *Fieldiæ*, a whole frond is requisite to give an idea of each separate pinna of *Howardii*, therefore the peculiarities of the latter may

be regarded as entirely new. The variety was found in July, 1863, by Mr. C. Monkman, of Malton, and also by Mr. Stabler, of Levens, Milnthorpe, and accidentally by one of Lord Carlisle's labourers, growing luxuriantly in the Raywood, closely contiguous to his Lordship's Yorkshire seat, Castle Howard. In all six vigorous plants were found, and as they are exclusively in the hands of collectors, some time must elapse before the variety is at all common. One half the find is held by Mr. Monkman and Mr. Clapham, and the rest went to Mr. Barnes, at Milnthorpe. Plants stout growing, as in the species; the outlines of the fronds present a contracted appearance towards the apices, which are lengthened caudately, resembling a pinna. The basal pinnæ are normal, becoming, as they ascend, curiously dwarfed and transformed, as follows:—pinnules, excepting the basal ones, dwarfed and irregularly palmately branched into three, four, or five short divisions, which, according to their size, resemble small pinnules or pinnulets, and are finely and continuously toothed. The arrangement of the pinnules has the peculiar cruciate form, which renders a pinna of *Howardii* so much like the whole frond of *Athyrium Filix-fœmina* var. *Fieldiæ*. Fructification copious, but, so far, there has not been time to test the reproductibility of the variety from spores, and certain very small off-sets from the old plants are yet indisposed to sport, showing no departure from the normal frond. However, as six very large crowns were found, and growing some yards distant from one another, and as all the fronds, without exception, are alike marked, there can be no doubt as to the permanency of the variety. The name *Howardii* was given in compliment to the Earl of Carlisle, and in acknowledgment of the interest his Lordship has taken in the Ferns of the Castle Howard district. It is apparently a form of the variety *micromera*. Quite unique in character, and a most remarkable Fern. The pinnæ, with their transformed forked pinnules, bear a strong resemblance in character to the small fronds of the oddly-shaped *Athyrium filix-fœmina*, variety *Fieldiæ*, and *Polystichum angulare*, var. *Elworthii*. Mr. Moore is of opinion that the plant belongs to the elegantly small pinnuled type or division of *Lastrea dilatata*, to which it has been proposed to apply the name *micromera*. The illustrations are from fronds sent by Mr. Monkman.



Fig. 244.

CRISPA, Moore. (Fig. 244.)—Found in the neighbourhood of Nettlecombe by Mr. C. Elworthy. A thick textured variety, somewhat resembling *valida*. Differing in having the pinnules much curved or crisped. Fronds dark coloured. Mr. Elworthy forwarded fronds of this variety.



Fig. 245.

CHANTERLÆ, Moore. (Fig. 245.)—Found in 1854 in tolerable abundance at Hartland, in North Devon, by the Rev. J. M. Chanter and Mrs. Chanter, after the latter of whom Mr. Moore has named it. A beautiful and very distinct variety, with narrow attenuated fronds. Length of fronds twenty-four

inches, oblong-lanceolate in form, narrowing at the base abruptly, and elongate-caudate at the apex. Pinnæ distant, spreading slightly, and twisted upwards, the basal ones three inches and a half long, and one inch and a half broad, extremely unequally deltoid, the anterior basal pinnules being only half the length of the posterior ones, the latter being nearly pinnate. The basal pinnules of the upper pinnæ oblong, with a very blunt apex. Sori minute, numerous, a single line on either side near the midrib of the small pinnules, and on the lobes of the larger ones. I am indebted to Mr. C. Elworthy, of Nettlecombe, for fronds.



Fig. 246—Basal pinna.

CURVATA, *Lowe*. (Fig. 246.)—This variety was found by myself at Chaigeley Manor, near Clitheroe, in Lancashire. A frond was sent to Mr. G. B. Wollaston, of Chiselhurst, who has suggested *Curvata* as a suitable name. Length of frond twenty-four inches, of which the lower eight inches are naked; width ten inches, except the basal pinnæ and near the apex, where narrower. A somewhat slender, copiously soriferous form, and having all the pinnæ curving like a wide arch. In the basal pinnæ the inferior pinnules are much longer than the superior ones, and more attenuated; in the other pinnæ this difference does not exist. Pinnules stalked, the lobes quite divided to

the costa, and dentate. A handsome feather-like frond. The pinnules near the rachis much changed, depauperated, or frequently wanting.



Fig. 247.

ALPINA, Moore. (Fig. 247.)—An elegant Fern, with a frond of very thin and delicate texture, more so than in any other variety. It was first found among rocks on the loftier portions of Ben Lawers, in Perthshire. Mr. A. Croall has also found it in Glen Callater, Braemer; Mr. W. Sutherland at Loch-na-gar, (where it is dwarfed and depauperated;) Mr. F. Clowes, at Hawes Water, Westmoreland; Mr. T. Blezard on the north-east of Ingleborough, Yorkshire; Mr. Thomas Moore near Lancaster. Mr. Moore also considers that the form found by Dr. Balfour on Ben Voirlich, Perthshire, (known as *montana*,) is a dwarf state of *alpina*. Fronds oblong, occasionally ovate in form. Tripinnate below, bipinnate upwards. Pinnæ membranaceous, ascending, obliquely deltoid, ovate below, and nearly equal above; the basal pinnæ are very unequal-sided. Pinnules ovate or elongate-ovate, the lowest divided into serrate lobes. Sori numerous and conspicuous, a double line. Scales entire and broad. My thanks are due to Mr. A. Tait and Mr. F. Clowes for fronds.

ANGUSTA, Moore.—Found near Tunbridge Wells by the late Miss Bower, and subsequently a somewhat similar form at Hartland, Devonshire, by Mrs. Chanter. Bipinnate, about two feet high, narrow linear-lanceolate. Pinnæ briefly deltoid, the basal ones very unequally deltoid, the posterior pinnules being

the largest. Pinnules narrow, oblong, obtuse, profoundly pinnatifid. The lobes oblong, and furnished with aristate teeth. Stipes half the length of the frond, and scantily scaly. Sori abundant, covering the whole under surface of the frond, small in size. A *spinulosa*-looking form. An illustration is unnecessary.



Fig. 248.—Middle pinna and basal pinna.

COLLINA, Moore. (Fig. 248.)—Found at Elter Water, Westmorland, by the Rev. G. Pinder, and since at Torver, near Conistone, by Mr. T. Ecclestone; found also at Langdale, Mardale, and Hawes Water, in Westmorland, by Mr. F. Clowes; in Forfarshire, by Mr. A. Croall; at Tarbet, in Dumbartonshire, Ardrishiag, in Argyleshire, and at Arran, by Mr. T. Moore; at Wollaton and Stanton-on-the-Wolds, Nottinghamshire; in several places near Windermere Lake, Westmorland; and at Browsable Hall, near Clitheroe, Lancashire, by myself; Dumfriesshire, by Mr. J. Anderson; and Ben Ledi, Perthshire, by Mrs. Hume Macleod. Also in Devonshire and Yorkshire. A distinct handsome variety. Erect in habit. Fronds ovate-lanceolate, the apex of the frond being attenuately elongated. Pinnæ distant and spreading, and more especially the basal

ones; the basal pair unequally deltoid, the next more elongate, and the rest narrower and parallel-sided. Pinnules bluntly ovate-oblong, and convex; the basal pinnules slightly stalked, the others sessile or decurrent; the largest pinnules are profoundly pinnatifid, with blunt, sparingly-toothed lobes. Sori in two lines. Fronds two feet in length, and deep green in colour. Stipes variable, some one third and others one half the length of the frond. Scaly. Scales entire, dark brown, with a darker central belt.



Fig. 249.

FUSCIPES, Moore. (Fig. 249.)—Originally found in the Island of Guernsey by Mr. G. Wolsey, and subsequently at Castle Malgwyn, Pembrokeshire, by Mr. W. Hutchison; at Ruthin, Denbighshire, by Mr. T. Pritchard; at Glendruid, Dublin, by Mr. R. Barrington, who has also found it at Gweedore, Donegal, at Kerry, and on the Three-rock Mountain. An elegant glandular variety. Length of frond twenty-four to thirty inches. Stipites somewhat slender, pale chesnut behind, with dark narrow scales. Fronds almost triangular, and delicate in texture. Tripinnate below. The pinnæ and tips of the fronds acuminate. Segments oblong, the largest lobate as well as serrate. Dentation large and mucronate. My thanks are due to Mr. Elworthy, of Nettlecombe, for fronds.

PUMILA, Moore.—Found at Ilfracombe, Devonshire, by the Rev. J. M. Chanter; at Ham, near Plymouth, by the Rev. C. Trelawny; at Castle Malgwyn, Pembrokeshire, by Mr. W. Hutchison; Rhuabon, Denbighshire, by Mr. A. L. Taylor; at Aber, Carnarvonshire, by the Rev. W. A. Leighton; in

Perthshire, Forfarshire, Aberdeenshire, and Dumbartonshire, by Mr. A. Croall; at Bute, Arran, Donegal, the Dingle, Glen of the Downs, and Galway, by Mr. R. Barrington; the Dublin Mountains, by Mr. J. R. Kinahan; Wentworth, Yorkshire, by Mr. J. Henderson; and at Chaigeley Manor, Lancashire, by myself. A dwarf ovate-deltoid variety; fronds bipinnate. The scales are pale, but two-coloured.



Fig. 250.—Pinna.

ORDEANÆ, *Moore*. (Fig. 250.)—Found on the West coast of Scotland. The finely divided character of this Fern makes it very elegant. As in *micromera* all its parts are small, but it is larger and more slender than that variety. The pinnules are from three quarters of an inch to one inch and a half in length, having small, distinct, oblong, or occasionally slightly falcate lobes, which are profoundly cut into smaller lobes or teeth.

CYSTOPTEROIDES, *Willison, MS.*—Found at Whitby, Yorkshire, by Mr. Willison, and considered by Mr. Moore to be a form of *angustipinnula*, but the pinnules are not so much narrowed.



Fig. 251.—Apex of frond and middle pinna.

ADNATA, Moore. (Fig. 251.)—Found in the West of Scotland. A neat and very elegant form. Lamina less than twelve inches. Its deeply cut and even character give it the appearance of a much divided variety. Rather slender. The pinnules are of a nearly regular oblong-ovate acute form, cut almost to the midrib, and to almost the same extent all the way up into small even-sized acutely-dentate lobes, so that the midrib of

the pinnules seem to have a narrowish equal wing throughout its length, with which the lobes are adnate. Pinnules sessile.



Fig. 252.—Apex of frond and basal pinna.

BROWNII, *Lowe*. (Fig. 252.)—A very slender distinct variety, found near Kirkaldy, in Scotland, by Mr. Archibald Brown.

Length of frond sixteen inches, width in the widest part four inches and a half. Pinnæ ascending, alternate, about twelve pairs. In the basal pinnæ the posterior pinnules double the length of the remainder, and the next three pairs slightly larger, the rest of the pinnæ merely pinnate, the pinnæ being remote, and the pinnules small and somewhat ovate, the margin of the pinnules dentate. Pinnules sessile. From the centre of the frond upwards the pinnæ varying from half an inch to two inches and a half in length, are only a quarter of an inch wide. Rachis and stipes thin and moderately scaly, the scales being pale in colour. Abundantly soriferous, from four to six spore cases on each pinnule. My thanks are due to Mr. Brown for the illustration.



Fig. 253—Middle pinna.

GRANDIDENS, *Moore*. (Fig. 253.)—Found in Kent by the Rev. J. Dix, and at Barnstaple by the late Mr. Jackson. A neat but large-growing variety. Pinnæ and pinnules somewhat distant. Remarkable for the evenly ovate-oblong outline of the pinnules, of which the sides curve inwards at the top to form a scarcely acute apex. This variety is also remarkable for the blunt oblong segments, the pinnules being divided into these segments quite down to the costa, and for having, like *collina*, a few broad, spreading, conspicuous teeth.

SMITHII, *Moore*.—From Spike Island. A dwarf form, with more oblong fronds and more equal-sided pinnæ than *collina*. Length of frond twelve inches, stipes three inches. Pinnæ of basal half of equal length, with a tapering apex. Form of

frond narrow, lengthy, subtriangular-ovate. Pinnæ opposite, horizontal, distinct. Pinnules at right angles, the basal ones pinnatifid. Lobes blunt, with acuminate teeth. Scales dark and two-coloured. It is unnecessary to give an illustration.



Fig. 254.—Pinna.

STRICTA, Moore. (Fig. 254.)—Found in Somersetshire. This is an unusual-looking oblong-fronded variety, having a narrow lamina, of eight or nine inches in length, to the upright-growing fronds. The pinnæ are also all point upwards at an angle of 45° . I am indebted to Mr. Elworthy, of Nettlecombe, for fronds.



Fig. 255.—Portion of Frond.

IRREGULARIS, Moore. (Fig. 255.)—Found on Witherslack Moss, in 1862, by Mr. J. M. Barnes, of Levens, near Milnthorpe. A dwarf Fern, irregular in the size of the pinnæ and pinnules. Pinnæ subopposite below, alternate above. Pinnæ irregular in size; pinnules, some large and divided into lobes, others brief,

sometimes only represented by a lobe or altogether wanting; very various in form, and conspicuously dentate. Stipes and rachis only slightly scaly. My thanks are due to Mr. Barnes for the illustration.



Fig. 256.—Apices.

SPARSIFOLIA, *Lowe*. (Fig. 256.)—Found in Scotland, in Calender Woods, September 14th., 1864, by Mr. P. Neill Fraser, Canonmills Lodge, Edinburgh. The present variety takes its name from the scanty number of pinnules on the upper half of the frond. An interesting variety of medium size. Length of frond thirty inches, of which the stipes is fifteen inches, width in the widest part seven inches and a half. Stipes copiously scaly. Rachis sparingly scaly. Pinnæ subopposite

below, alternate above, gradually diminishing in size from the base to the apex of the frond. Pinnules much more normal on the basal half of the frond, above exceedingly various, some normal, others as if bitten off, contracted, distorted, depauperated, and often wanting; not infrequently a portion of the rachides destitute of pinnules, and even the apices of the pinnæ are naked and stick-like. A distinct and sparse variety. My thanks are due to Mr. P. Neill Fraser for fronds.



Fig. 257.—Frond.

COMPACTA, Sim. (Fig. 257.)—Raised from spores at Mr. Sim's Nursery, at Foot's Cray, Kent. . A distinct and pretty novelty. Length of frond from four to eight inches. Brief stipes, spreading-fronded, short-triangular, twice-divided, thick-textured, very leafy fronds. Pinnæ broadish, brief, very close, and blunt-ended, the basal pair very broad, and more or less right-angled triangular in outline; pinnules broad, somewhat variable in outline, overlapping, obscurely stalked next and near

the rachis; beyond these all are conspicuously decurrent at the base. In the upper portion of the fronds the pinnules are one-spined and broad-toothed, at the lower part shallowish, broad-lobed, and spiny-toothed. My thanks are due to Mr. Sim for a frond, from which the illustration is taken.



Fig. 258.—Portion of Frond.

DILACERATUM, *Stansfield MSS.* (Fig. 258.)—Length thirteen inches, width in middle of the frond six inches and a half. A very slender delicate-fronded variety. Pinnæ distant, and more or less horizontal, opposite or subopposite; throughout the frond long and narrow, about five pairs, and the ultimate pinna. Pinnules distant, much laciniated, and the anterior and posterior almost equal in size. My thanks are due to Messrs. Stansfield, of Todmorden, for fronds.

EROSA, *Wollaston*.—Found at Tunbridge Wells by Mr. G. B. Wollaston, of Chiselhurst, and at Windermere by Mr. F. Clowes. A variety somewhat resembling *Collina*, but having the dentation of the margin of the pinnules so arranged as to produce the appearance of having been nibbled. Bipinnate, narrow ovate, pinnules distant, oblong obtuse, the lobes serrated, the serratures being bristle-pointed, and frequently curved. The pinnules and lobes unequal in size.



Fig. 259.—Pinna.

ANGUSTIPINNULA, Moore. (Fig. 259.)—Found in Lancashire by Mr. R. Morris. A singular form, depauperated to a certain extent. Length twelve inches, oblong-lanceolate, bipinnate, pinnæ distant below. Pinnules rather distant, usually linear, the basal anterior one often elongated. The linear pinnules are nearly an inch long, their margins being unequally inciso-serrate. Near the apex of the frond the pinnules are shortened into irregular roundish lobes.

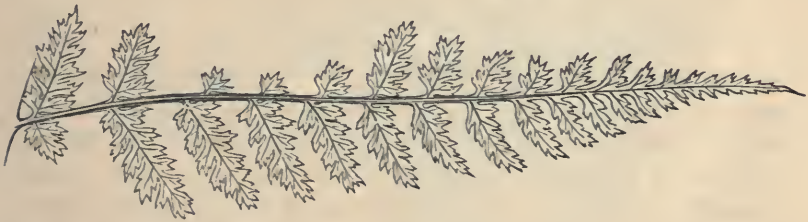


Fig. 260.—Middle pinna.

AMÆNA, Lowe. (Fig. 260.)—A very handsome variety, found in Scotland by Mr. Todd. Length of frond twenty-one inches, of which only five inches is the length of the stipes; width of frond seven inches. A slender graceful Fern, somewhat lax. Pinnæ varying in size, some long and tapering to a point, others ending in a rounded, much cut, terminal pinnule, and others branching; the latter only half the ordinary length. Pinnules very various in size and form, some pinnate, others pinnatifid, more or less depauperated, and occasionally wanting. Lobes

bidentate. Sori copious, more or less confluent, every pinnule, even to the minute depauperated ones, soriferous. My thanks are due to Mr. P. Neill Fraser for the illustration.



Fig. 261.—1. Apex. 2. Basal pinna.

HYMENOPHYLLOIDES, *Lowe*. (Fig. 261.)—A curious, dwarf Fern, found at Ilfracombe, by Mr. Dadds, now I believe in the possession of the Rev. Charles Padley, of Bulwell Hall. More or less normal in the general outline of its fronds, yet differing in the striking resemblance which they bear to some of the exotic *Hymenophyllums* and *Trichomanes*. Length of frond eight or nine inches, width, which is nearly equal, except at the apex, two inches and a half. Stipes and rachis very

strong for the size of the frond. Pinnæ ascending, at an angle of 45° , subopposite below, alternate above. Pinnules large, crowded, and overlapping. The illustration is from Mr. Dadds' fronds.



Fig. 262.—Portion of middle pinna.
(Padley's.)

Portion of middle pinna.

MICROMERA, *Moore*. (Fig. 262.)—Found near Ilfracombe, Devonshire, by the Rev. J. M. Chanter; Barnstaple by the late Mr. C. Jackson; Littleham, North Devonshire, by the Rev. C. Padley, of Bulwell Hall; Castle Malgwyn, Pembrokeshire, by Mr. W. Hutchison; and at Glen Croe, Argyleshire, by Mr. Thomas Moore. This form differs in being more finely divided, and is a most interesting Fern. The stipes is thick, and covered with very large dark scales. The form is ovate-lanceolate. Length of frond twenty-four inches. The fronds, though small in comparison with some of the varieties, are almost quadripinnate. The lobes are small, and on their margins are many small sharp teeth. Mr. Padley's plants differ somewhat, the pinnæ and pinnules being wider apart. Length of frond thirty-one inches, width twelve inches. Pinnæ subopposite, about twenty pairs. My obligations are due to Mr. E. Cooling, of Mile-ash Nursery, Derby, for plants; and to the Rev. J. M. Chanter, of Barnstaple; the Rev. Charles

Padley, of Bulwell Hall, Nottinghamshire; and Mr. Elworthy, of Nettlecombe, for fronds.



Fig. 263 — Middle pinna.

GRACILIS, *Lowe*. (Fig. 263.)—A lax slender form, found in the island of Arran in September 1863, by Mr. P. Neill Fraser, of Edinburgh. Length of frond two feet, of which ten inches to twelve inches is the stipes, width nine inches in the middle of the frond. Pinnæ distant, opposite or subopposite, ascending, acuminate, about ten or eleven pairs. Pinnules lax, sometimes opposite, sometimes alternate, long, narrow, and rounded more or less at the apex, and frequently dilated, or even forked. A hemlock-looking variety when growing vigorously. Stipes densely scaly. My thanks are due to Mr. P. Neill Fraser for fronds.

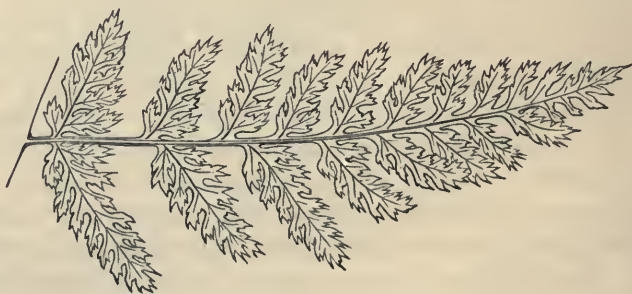


Fig. 264.—Middle pinna.

DAVALLIOIDES, *Lowe*. (Fig. 264.)—An interesting, slender, *Davallia*-looking form, found in August, 1864, at Callender, by

Mr. P. Neill Fraser, and receiving the present name at the request of the discoverer. Length sixteen to eighteen inches; narrow—width five inches. Stipes very sparingly scaly and thin. Substance thin, pinnules leafy, solid, dentation small. Apex of frond somewhat wedge-shaped. The inferior basal pinnules of all the pinnæ, except near the apex, twice the size of the superior ones. My thanks are due to Mr. P. Neill Fraser for fronds.



Fig. 265.—Apex.

SUCCISA, *Lowe*. (Fig. 265).—A somewhat robust, compact, and upright-growing variety found by myself at Dale Abbey in Derbyshire, in August, 1864. Length of frond about fifteen inches. Pinnæ approximate and ascending. Pinnules crowded and leaf-like. More or less normal, except as regards the apex of the frond which is as if clipped off, making a flat and broad termination to the fronds. The plant had a dozen fronds on when found, and has since sent up several others, all of which have this peculiarity. *Succisa* is an interesting and remarkably distinct variety, and when growing, from its habit, shews off its square-ended fronds to the most advantage.

NANA, *Newman*.—Found near Settle, in Yorkshire, by Mr J. Tatham; near Ilfracombe by the Rev. J. M. Chanter; at Challacombe, Exmoor, in Devonshire; Tarbot, Dumbarton-

shire; Slieve More, near Dugort, County Mayo; and on the Island of Achill by Mr. R. Barrington; Glen of the Downs, Wicklow, and Killarney, by Mr. R. Barrington; Longridge Fell, Lancashire, by myself. In the hilly districts of Scotland, Ireland, and Wales, by Mr. E. Newman. A dwarf variety. Fronds varying from two to ten inches in length, ovate, broadest at the base, and bipinnate. Pinnæ spreading, and somewhat acuminate; the basal pair unequal-sided, but not the remainder of the pinnæ. Basal pinnules stalked, the larger ones profoundly lobed, with serrated edges, the smaller ones only serrate. Teeth acute and mucronate. Sori mostly covering the whole under side of the frond, frequently most copious towards the apex, forming a line on either side, the midvein of the pinnules being somewhat nearer to the midrib.

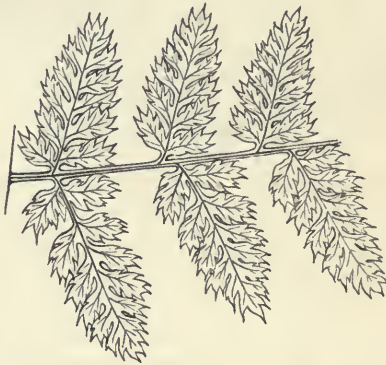


Fig. 266.—Portion of middle pinna.

EROSO-ELWORTHII, *Lowe*. (Fig. 266.)—A lax form. Length of frond two feet, width in centre nine inches. Pinnæ subopposite below, alternate above, being smaller to the acuminate apex. Pinnules lax, broad, rounded, distant. Secondary pinnules, the basal half divided to the costa, decurrent, their apices terminating in a dilated bifid or trifid dentation, in the larger ones the sides are also dentate. Although this Fern is known as Mr. Elworthy's form of *erosa*, the fronds which I have seen are not sufficiently erose for its name. This variety was found at Nettlecombe by Mr. Charles Elworthy, to whom I am indebted for fronds.

ALTA, *Moore*.—Found at Aberdeen, where it is common. One of the larger forms, with oblong fronds. Robust in habit and erect in growth. Length of frond from forty-eight to sixty inches. Distinctly tripinnate. The pinnules are mostly an inch, and the larger ones two inches in length, and the lobes, which are somewhat distant and oblong, are a quarter of an inch long. The lobes have their tips strongly dentate, and are almost entire towards their base, where they are more or less confluent. This variety somewhat resembles *grandidens* in the prominent apical dentation.

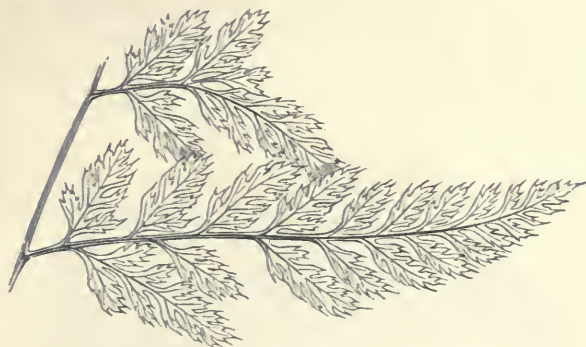


Fig. 267.—Portion of Frond.

DECURRENS, *Moore*. (Fig. 267.)—Found near Scarborough, in 1855, by Mr. Clapham. An interesting dwarf monstrosity. Fronds triangular; length twelve inches, of which three inches is the stipes. The usual obliquity of the basal pinnae is not always developed. Pinnae sometimes much abbreviated. Pinnules somewhat distant, narrow, oblong, pointing forwards, and narrowed below, the base decurrent; basal lobes usually brief and depauperated.

DELTOIDEA, *Moore*.—Found in Devonshire by the Rev. J. M. Chanter. Length of frond two feet. Fronds deltoid, tripinnate, and finely cut. Stipes slender, with dark scales. Pinnules and lobes blunt, and having conspicuous mucronate unequal teeth. A beautiful light and elegant variety.

HANKEYANÆ, *Moore*.—Found by Mrs. George Henkey in Cumberland. This is remarkably slender and elegant. Both the pinnæ and the pinnules are unusually distant from each other. The pinnules are long and narrow, the lobes small and finely dentate, and the whole so remarkably convex in form, that the fronds cannot be flattened. A somewhat similar form has been found near Aberdeen. Doubtfully distinct from *recurvifolia* of Moore.

UNCINELLA, *Moore*.—Found in Somersetshire. A very dwarf variety. The fronds only from four to five inches in length. The lamina of the fronds briefly ovate. Bipinnate and almost tripinnate. The pinnules are peculiarly decurrento-confluent. Dentation large. The teeth on the lobes, which they terminate, have a marked tendency to become incurved.

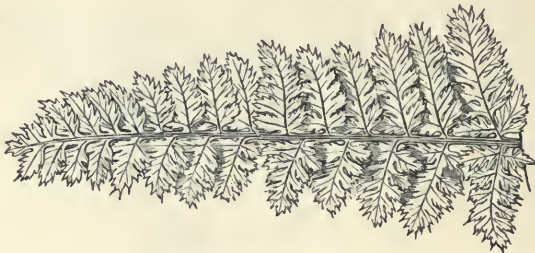


Fig. 268.—Upper pinna.

RUGOSA, *Tait*. (Fig. 268.)—Found by Mr. Tait in Monkland Glen. Length of frond two feet, width at the base eight inches. A narrow-fronded very leafy variety, distinct on account of its rugose habit. My thanks are due to Mr. P. Neill Fraser, Canon Mills Lodge, Edinburgh, for fronds.

CONCINNA, *Moore*.—Found in the west of Scotland. This variety has a lamina nine inches in length on a six-inch stipes, the outline being more or less oblong-ovate in form. Tripinnate, with the parts small. The pinnules are stalked, and are sub-falcate and acute. The lobes being small, linear-oblong, with a few sharp teeth, which are most evident at their tips. The anterior basal lobes most prominent. Sori small.

RECURVIFOLIA, Moore.—Found at Aberdeen and Moffat. From the latter locality the fronds are rather broader. It is a comparatively dwarf variety, and is distinguishable from having somewhat crowded sessile pinnules, which are decidedly convex on their upper surface, whilst the fronds themselves have a tendency to concavity along the centre of the pinnæ.

OBTUSA, Moore.—Found at Hampstead, Middlesex, by Mr. Thomas Moore. Distinct, and having moderate sized fronds. Fronds narrow-ovate. Pinnules oblong-obtuse and shallow lobed, attached to the stem almost at right angles. Teeth few, coarse, and acuminate.



Fig. 269.—Middle pinna.

STANSFIELDII, Moore. (Fig. 269.)—A new variety found in Cheshire by Mr. J. Lord. Length of frond eight to ten inches, breadth four to five inches; outline of frond ovate-lanceolate or subtriangular; pinnæ strap-shaped, blunt; pinnules bluntly-ovate, mostly biserrate, thick, leathery, recurved. The characteristic difference of this variety is the crisping or recurving of the pinnules, which are of a thick, leathery texture, and so abundantly glandular as to give almost a horny aspect to the frond. My thanks are due to Messrs. Stansfield and Sons, of Vale Nursery, Todmorden, for fronds.

DISTANS, Moore.—Found at Coombe Wood, Surrey, by Mr. S. F. Gray. Fronds smoother and more lax than *Chanteriæ*, which it most nearly resembles. The form of the frond ovate; length thirty-six inches. Pinnæ distant, the lowest pair only very oblique, and the next pair slightly oblique; scarcely enlarged on the posterior side, except at the base of the frond.

Pinnules distant on the rachis, and ovate-oblong, the basal pinnules only, profoundly cut. Lobes brief, obtuse, and coarsely dentate, with acuminately aristate teeth. Sori abundant, in two lines near the midrib.

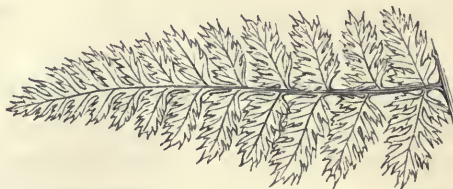


Fig. 270.—Second pinna from base.

ODONTOMANES, *Moore*. (Fig. 270.)—Fronds one foot to eighteen inches in length, four to six inches in breadth, broad, triangular, blunt; pinnæ triangular, obtuse; pinnules broad, deeply toothed. Distinguished by the large teeth of the pinnules and a somewhat crispy appearance. Gathered in the Vale of Todmorden in 1862.

FISSA, *Monkman*.—Found near Malton, in 1862, by Mr. C. Monkman. There was a batch of plants all pretty uniformly cleft at the apices of the fronds. The pinnæ are normal.

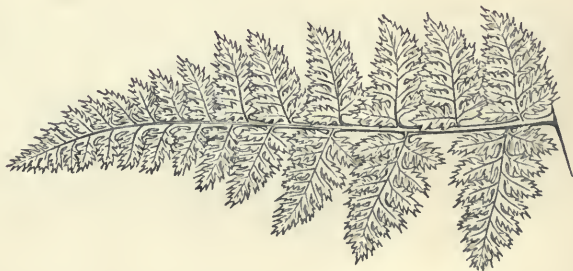


Fig. 271.—Second pinna from base.

LATA, *Moore*. (Fig. 271.)—A Lowland Scotch plant. One of the broad-fronded forms, having large pinnules, and coarse broadly confluent lobes, which give the fronds a peculiar leafy character.

ROBUSTA, Moore.—Found in the Lowlands of Dumfriesshire. A distinct variety, with tall very stout fronds. Pinnules crowded, broadly-ovate, and stalked. The basal lobes are more ovate than oblong. The teeth are small, but spreading in the way of *collina* and *grandidens*.

RAMOSA-NANA, Moore.—Found by Messrs. Stansfield, of Todmorden. A most singular dwarf variety. Length of fronds only a few inches. The fronds having uneven branch-like pinnæ, as in *Athyrium filix-fœmina*, var. *crispum*; pinnules interrupted, irregular, varying both in size and form.



Fig. 272.—Portion of Frond.

INEQUALIS, Moore. (Fig. 272.)—Fronds small, six inches to one foot in length, and three to six inches in breadth. Outline triangular, acuminate, pinnæ triangular, long-pointed; pinnules unequal, narrow, serrate. A dwarf variety, found in the Vale of Todmorden in 1860.

INTERRUPTA-BARNESII, Lowe.—Found in 1861 on Witherslack Moss by Mr. Barnes. This variety is allied to *interrupta*, yet is more slender and attenuated than the *interrupta* found by Mr. Clapham at Harrogate. The pinnæ are more distant, and the pinnules narrower. Length of frond twelve inches, width scarcely three inches.

BLAKEI, Moore.—Found near Aberdeen, and named after the discoverer Mr. James Blake. A most striking Fern. Tall, and upright in its habit, not unlike the variety *alta*, and evidently a depauperated form of that Fern. The whole frond is affected with irregular development. Mr. Moore remarks

“this is so completely the case with *Blakei*, that the frond becomes symmetrically unsymmetrical, if such a paradox can be conceived.” The form *Blakei* has also a tall, oblong outline, which is another peculiarity. Doubtfully distinct from *angustipinnula*.

ALPHABETICAL LIST OF VARIETIES OF
LASTREA DILATATA.

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LASTREA ULIGINOSA.

XXXIII *

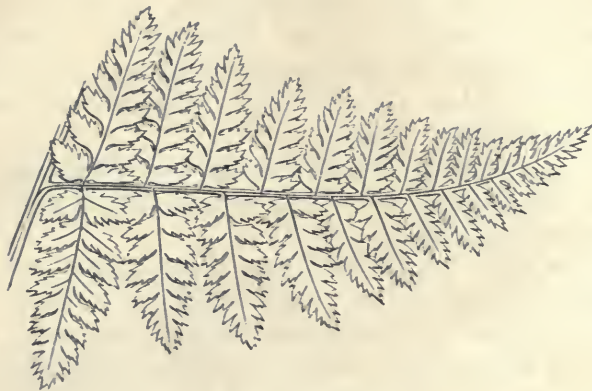


Fig. 273.—Pinna.

LASTREA ULIGINOSA. NEWMAN.

(LASTREA CRISTATA, VAR. ULIGINOSA. MOORE.)

The Fen Buckler Fern.

PLATE XXXIII.*

| | |
|--|--------------------|
| <i>Lophodium uliginosum,</i> | NEWMAN. |
| <i>Lastrea cristata,</i> var. <i>uliginosa,</i> | MOORE. BABINGTON. |
| <i>Aspidium cristatum,</i> var. <i>uliginosum,</i> | HOOKEE AND ARNOTT. |
| “ <i>cristatum,</i> var. <i>spinulosum,</i> | MILDE. |
| “ <i>spinulosum,</i> | HOOKEE AND ARNOTT. |
| “ <i>spinulosum,</i> var. <i>subcoriaceum,</i> | RUPRECHT. |

Lastrea—.....?

Uliginosa—Bog.

THERE has been great diversity of opinion as regards this Fern. Mr. Newman figured it in the “Phytologist” as a distinct species first as *Lastrea uliginosa*, and then as *Lophodium uliginosum*. Mr. Moore places it as the variety *uliginosa* of *Lastrea cristata*; and in Hooker and Arnott’s “British Flora” it is also placed under this Fern, as *Aspidium cristatum*, var. *uliginosum*; and Mr. Braun calls it *Aspidium spinulosum*, var. *uliginosum*.

This Fern and *spinulosa* seem to me to be distinct species.

Found at Oxtan Bog, Nottinghamshire, by myself; also at Wybunbury Bog, Cheshire; near Malton, Yorkshire, by Mr. C. Monkman; Bawsey Heath, Wymondham Broad, and Surlingham, Norfolk; Newcastle-under-Lyne, Staffordshire; Broseley, Shropshire. In Ireland at Killarney, and in Glen Flesk, near Kenmare, Kerry.

Caudex stout and decumbent. Fronds erect, linear-lanceolate in form. Height from twenty-four to fifty inches; bipinnate at the base of the pinnæ.

Fronds of three kinds. The first fronds fertile, quite erect in growth, bipinnate; the basal pinnules distinct; pinnæ stalked, the upper surface turning towards the apex of the frond. The second kind shorter and barren, small, spreading, pinnate; pinnules oblong-obtuse and decurrent. The third kind are produced later in the season, are sometimes barren and sometimes fertile, the pinnules being broader and blunter, and decurrent.

Pinnæ elongate-triangular, the lower ones broader, shorter, and more oblique than those above them.

The basal posterior pinnule is an inch in length, and the basal anterior pinnule three quarters of an inch; in the middle of the frond the basal pinnules are distinct, oblong, acute, pinnatifidly lobed, the lobes having long, spinulose, or aristate teeth; the upper pinnules adnate, and sharply and profoundly serrate.

Fructification most copious towards the apex of the frond.

This Fern differs from *Lastrea cristata* in having in the earlier fertile fronds more acute pinnules, and in being more copiously lobed and toothed.

Some few years ago I found it abundant on Oxtan Bogs, and in 1864 as a common plant at Browsholme Hall, the seat of Capt. Parker. At Oxtan it has promise of being preserved, as the present proprietor, Mr. Henry Sherbrooke, is taking care that it and *Lastrea cristata* shall not be destroyed. Mr. Monkman, of Malton, remarks that it grows with *cristata* in the Malton district, also plentifully at Castle Howard, (but here there is not *cristata*.) In 1857 Mr. Monkman found *uliginosa* growing with *Osmunda regalis* on the west side of Derwent Water, near Keswick. There were amongst them a few depauperated plants, but he is not aware whether these will prove permanent varieties.



LASTREA SPINULOSA.



Fig. 274.—Portion of Pinna of mature Frond, under side.

LASTREA SPINULOSA. PRESL.

The Spiny Buckler Fern.

PLATE XXXIII.**

| | |
|---|----------------------------|
| <i>Lastrea spinulosa</i> , | PRESL. BABINGTON. |
| “ “ | SOWERBY. MOORE. |
| “ <i>cristata</i> , var. <i>spinulosa</i> , | MOORE. |
| “ <i>dilatata</i> , var. <i>linearis</i> , | BABINGTON. |
| “ <i>spinosa</i> , | NEWMAN. DEAKIN. |
| <i>Aspidium spinulosum</i> , | SWARTZ. SCHKURH. |
| “ “ | SPRENGEL. FEE. E. J. LOWE. |
| “ <i>spinulosum</i> , var. <i>cristatum</i> , | LASCHNER. |
| “ <i>spinulosum</i> , var. <i>elevatum</i> , | A. BRAUN. |
| <i>Nephrodium spinulosum</i> , | STEMPPEL. |
| <i>Polypodium spinulosum</i> , | MULLER. |
| “ <i>cristatum</i> , | HOFFMANN. |
| “ <i>multiflorum</i> , var. <i>spinosum</i> , | ROTH. |
| “ <i>filix-fœmina</i> , var. <i>spinosa</i> , | WEIS. |
| <i>Polystichum spinosum</i> , | ROTH. |
| <i>Lophodium spinosum</i> , | NEWMAN. |

Lastrea—.....?

Spinulosa—Spiny.

FOUND in Cornwall, Devonshire, Somersetshire, Hampshire, Dorsetshire, Sussex, Hertfordshire, Kent, Middlesex, Surrey, Buckinghamshire, Essex, Suffolk, Norfolk, Northamptonshire, Cambridgeshire, Warwickshire, Gloucestershire, Monmouthshire,

Hampshire, Worcestershire, Staffordshire, Shropshire, Leicestershire, Nottinghamshire, Derbyshire, Cheshire, Lancashire, Yorkshire, Durham, Northumberland, Westmoreland, and Cumberland. In Wales, in Brecknockshire, Glamorganshire, Carnarvonshire, and Carmarthenshire. In Scotland, in Ross-shire, Dumfriesshire, Edinburghshire, Forfarshire, Perthshire, Argyleshire, and Dumbartonshire. In Ireland, in Ullster, Munster, Leinster, and Connaught. Isle of Wight, North Uist, Lewis and Harris Isles.

Fronde narrow, bipinnate, oblong-lanceolate in form; pinnæ triangular, oblique; pinnules oblong, acute, inciso-serrate, or pinnatifid, lobes aristate; the posterior basal pinnules of the basal pinnæ much larger than the anterior basal pinnules.

Caudex creeping and stoutish.

Fronde erect, from two to five inches in length, and yellowish green in colour, tapering at the apex. Stipes terminal, nearly as long as the rachis, stoutish, rich brown purple at the base, sparingly scaly, the scales pale brown and membranaceous.

Rachis stoutish, channeled in front, pale green, and scarcely scaly.

Pinnæ numerous, opposite or sub-opposite below, the basal ones distant; in the basal pinnæ the posterior pinnules are nearly two inches in length. Pinnæ stalked, more or less drooping, frequently twisting upwards. Pinnules oblong, acute, broadest at the base, the basal ones pinnatifid almost to the midrib, having oblong, acute lobes.

Lobes conspicuously serrated with spinulose teeth pointing upwards.

Barren fronds broader.

Fructification mostly confined to the upper half of the frond, occasionally extending throughout the whole length of the frond.

Sori numerous, forming a line on either side of the midvein, sometimes crowded. Indusium entire on the margin, without glands.

NANA, Sim.—Only six inches high. Constant in this dwarf pigmy character, which is its peculiarity.

CRISPA, Moore.—Found near Sheffield. Very rigid, the margins of the lobes closely rolled back, and partially hiding the sori. Sori very large and very dark in colour. This

variety is described by Dr. Deakin in his "Florigraphia Britannica."

INTERRUPTA, *Moore*.—Found at Malton, Yorkshire, by Mr. C. Monkman. Pinnules irregularly developed, occasionally depauperated, some much larger and broader than usual.

TRIPINNATA, *Moore*.—Locality uncertain. It was brought into notice by Mr. F. C. Wilson, of Stamford Hill. A handsome Fern. Fronds narrow, erect, and stiff. Pinnæ short. Pinnules small, the anterior and posterior ones unequal in size. The pinnules distinctly divided into pinnulets, which are oblong, obtuse, lobate-serrate, or biserrate.

STRIGOSA, *Moore*.—Found in Pett's Wood, St. Paul's Cray Parish, Kent, by Mr. R. Sim. Differing in having the spiny teeth longer and more bristly than usual. When growing wild its pinnules were somewhat depauperated, distant and confluent, but under cultivation these peculiarities have disappeared.



LESTREA MINOR.

XXXIV

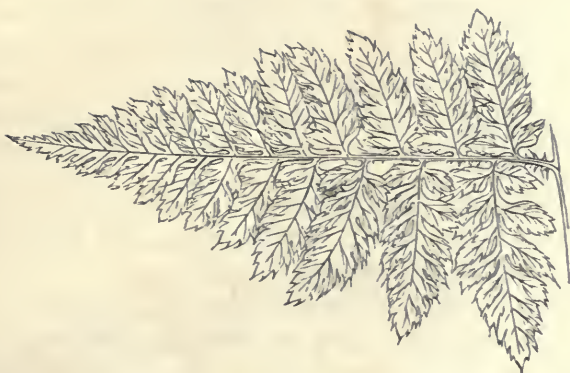


Fig. 275.—Barren pinna.

LASTREA ÆMULA.

BRACKENRIDGE.

The Hay-scented Buckler Fern.

PLATE XXXIV.

| | |
|------------------------------|-------------------------|
| <i>Lastrea æmula,</i> | BRACKENRIDGE. SMITH. |
| “ “ | MOORE. JOHNSON. |
| “ <i>recurva,</i> | NEWMAN. |
| “ <i>concava,</i> | NEWMAN. |
| “ <i>Fæniseeii,</i> | WATSON. BABINGTON. |
| “ “ | DEAKIN. MOORE. SOWERBY. |
| <i>Lophodium recurvum,</i> | NEWMAN. |
| “ <i>Fæniseeii,</i> | NEWMAN. |
| <i>Nephrodium Fæniseeii,</i> | LOWE. |
| <i>Aspidium Fæniseeii,</i> | KUNZE. FEE. |
| “ <i>æmulum,</i> | SWARTZ. WILLDENOW. |
| “ “ | SPRENGEL. E. J. LOWE. |
| “ <i>odoratum,</i> | LOWE. |
| “ <i>spinulosum,</i> | BENTHAM, in part. |
| “ <i>recurvum,</i> | BREE. |

| | |
|--|---------------------|
| <i>Aspidium dilatatum</i> , var. <i>concauum</i> , | BABINGTON. |
| “ <i>dilatatum</i> , var. <i>recurvum</i> , | BREE. |
| “ <i>spinulosum</i> var., | HOOKEER AND ARNOTT. |
| <i>Allantodia æmula</i> , | DESSAUX. |
| <i>Polypodium æmulum</i> , | AITON. |

Lastrea—.....?

Æmula—To rival.

A VERY beautiful Fern apparently distinct from *Lastrea dilatata*. This is one of the scented Ferns, the fronds giving out a fragrance like newly-mown hay.

The fronds, which are triangular-ovate, sometimes quite triangular, are tripinnate, having concave pinnules, and on this account it is sometimes called the “Concave Buckler Fern.” Scales of the stipes whole coloured, narrow lance-shaped in form, and lacinate or fimbriate on the margin, frequently contorted. The pinnulets are pinnatifid, the lobes mucronately serrate, and curving upwards.

The indusium has minute sessile glands on the margin.

The caudex thick and copiously scaly.

The stipes is usually about half the length of the whole frond, rigid, somewhat stout, and purplish brown in colour. Copiously scaly.

Rachis greenish, and less scaly.

Rachis, stipes, and secondary rachides bearing many small, sessile, spherical glands.

Fronds numerous. Height from twelve to twenty-four inches, breadth from five to eight inches. Colour rich bright green, paler beneath. Elongate-triangular, tripinnate, the upper surface crispy.

Pinnæ opposite or subopposite. Broadly and unequally deltoid.

Pinnules in the anterior side less than those on the posterior side. Profoundly pinnatifid, the lobes oblong and serrated.

The basal pinnæ, pinnules, and pinnulets stalked.

The margins of the pinnules and lobes mucronately toothed, the margins turning upwards from the drooping fronds so that all the divisions are concave, giving the whole frond an elegant crispy appearance.

Fructification occupying the whole under surface of the frond.

Sori numerous, circular, and indusiate, forming two rows along the pinnules and pinnulets, situated near the midvein, and eventually becoming confluent. Indusium uniform, having a jagged uneven margin.

Found in many parts of Cornwall and Devonshire. In Somersetshire, Sussex, Herefordshire, Shropshire, Yorkshire, Lancashire, Cumberland, Northumberland, Glamorganshire, Pembrokeshire, Anglesea, Merionethshire, Carnarvonshire, Forfarshire, Dumbartonshire, Argyleshire, Inverness-shire, Isles of Arran, Mull, North Uist, Orkney, and Guernsey. In Ireland in Antrim, Londonderry, Donegal, Sligo, Mayo, Galway, Wicklow, Waterford, Clare, Cork, and Kerry.

Abroad it is a native of the Azores, Madeira, and Cape de Verd Isles.

A Fern easily cultivated in a porous soil of loam, peat, and sand.

I am indebted to the Rev. F. Mules, for fronds from Marwood, Devonshire; also to Mr. C Monkman, for others from Hackness; and to the late Dr. J. R. Kinahan, for others from Foxe's Cove.

In 1862 I visited the woods above Hackness, where I found this Fern growing in the greatest profusion, yet only near the summits of these hilly plantations. It appeared to delight in these shady rocky situations.

This species is not given to much variety from the normal form, the following, however, may be mentioned:—

ANGUSTIPINNULA, Moore.—Found near Cushendall, in Antrim, by Mr. D. Moore, of the Glasnevin Gardens. The peculiarity consists in the secondary pinnules being more confluent, the lobes irregularly shortened, and the teeth more evidently aristate.

INTERRUPTA, Clapham.—Found at Hackness by Mr. Clapham, of Scarborough. Fronds variously depauperated, the pinnæ and pinnules (more frequently the latter) shortened and mis-shapened.

RAMOSA, Clapham.—Found at Hackness, about the year 1858, by Mr. Clapham, of Scarborough. The peculiarity of this variety is having twin fronds attached or joined together at the base.

LASTREA FILIX-MAS, VAR. DEPAUPERATA.

WOLLASTON.

PLATE I.*—FRONTISPIECE.

THIS remarkable depauperate variety, which is quite distinct, and a very fine form, was found in the parish of West Buckland, North Devon, and was brought to notice by the Rev. C. Padley, M.A., of Beaconfield House, near Plymouth. It is now in the possession of Mr. G. B. Wollaston, of Chiselhurst.

It is a barren variety, of dwarf habit.

The fronds are vividly green in colour.

My thanks are due to the Rev. Charles Padley for the illustration.

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* These are true *Lastrea filix-mas*, the remainder may some of them belong to *Lastrea propinqua*, and some to *Lastrea pseudo-mas*, not having as yet been sufficiently determined.

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