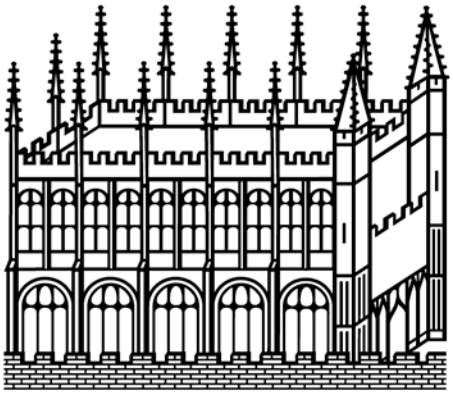


FULL COLOURED.

Part 1 **Price 3s.**

THE

FERNS OF GREAT BRITAIN:

ILLUSTRATED BY

JOHN E. SOWERBY,

PROPRIETOR OF SOWERBY'S ENGLISH BOTANY.

THE DESCRIPTIONS, SYNONYMS, &c.

BY

CHARLES JOHNSON, Esq.,

BOTANICAL LECTURER AT GUY'S HOSPITAL.

LONDON:

PRINTED BY TAYLOR AND FRANCIS, RED LION COURT, FLEET STREET.

FOR THE PROPRIETOR, JOHN E. SOWERBY,

3 MEAD PLACE, LAMBETH.

1854.

Genus 1. POLYPODIUM.

GEN. CHAR. Sori circular, naked. Margin of the frond not reflexed.

One of the most extensive and diversified genera of the order, chiefly distributed over the tropical countries of the Western hemisphere. Of the four British species, three have been occasionally referred to other genera, on account of the supposed presence of an indusium, noticed by Roth, a celebrated German botanist, but certainly not to be detected, in any stage of development, in those specimens that have passed under my own observation, either wild or cultivated, which latter I have diligently examined at every period of their growth.

The generic name is formed from πολὺς, *many*, and ποῦς, *foot*, in allusion to the form of the branched rhizoma in the most common native species.

POLYPODIUM VULGARE. Common Polypody. TAB. I.

Fronds lanceolate, deeply pinnatifid; segments linear-lanceolate, obtuse, indistinctly serrated, approximate.

Polypodium vulgare, *Linnæus*. Ctenopteris vulgaris, *Newman, Hist. Brit. Ferns*, 41.

Very frequent about the roots and moss-grown trunks of trees, on rocks, shady hedge-banks, walls, and old thatched roofs. The rhizoma branches in all directions, the branches, when it has grown long undisturbed, crossing each other and forming a thick mat-like substance: it is at first clothed with a cuticle densely covered with yellowish-brown, membranaceous, lanceolate scales, which, falling off, or becoming obliterated during the winter, leaves the surface nearly smooth and of a yellowish hue. The young fronds begin to appear in May, rapidly attaining the full size, which varies according to situation from the length of five or six inches to that of twelve or eighteen: where much exposed, and at a distance from the ground, they have generally in maturity a drooping habit, and even become almost pendent, but in sheltered localities often retain their original erect position throughout. The rachis is smooth, grooved on the upper face, and bare about half or one-third of its length.

The lateral veins of the segments are alternate, and each divides into from three to five branches, of which the lowest, directed upwards, always terminates midway, while the others are continued nearly to the margin; all of them in the barren segments being

thickened in a club-like manner at the extremity. The fructification is, in most instances, confined to the upper divisions of the frond only, but sometimes they are all fertile. The sori, of a bright yellow or orange colour, changing in maturity to brown, are destitute of indusium, and very regularly disposed in a line on each side of the mid-vein, halfway between it and the margin; a disposition resulting from their development at the extremity of the first branch of the lateral vein. In very vigorous fronds the regular dotted line of fructification thus formed is sometimes disturbed, by the production of a sorus at the extremity of one or even two of the upper branches of the same vein; indeed, the thickening of this part seems to be the first stage in the development of the sorus.

The fronds of this fern are in perfection from August to November, but are, in exposed situations, always disfigured by the first frost. Under shelter it becomes evergreen, retaining the old fronds until the appearance of the new ones. In cultivation it does not generally succeed so well as do most of our native species: Mr. Newman observes that it is somewhat parasitic, and I believe he is right, never having been able to keep it in luxuriance, until it was accommodated with a large proportion of decayed wood, moss, and straw, mingled with the compost previously employed, into the interstices of which the delicate root-fibres very soon penetrated, lining every cavity with their brown hair-like spongioles.

Several varieties are met with, distinguished chiefly by the division and serrature of the segments, viz.:

1. *bifidum*, in which each segment is divided at the extremity into two diverging lobes,—not an uncommon occurrence, indeed, in the frond itself.

2. *serratum*, characterized by the more distinct or deeper serratures.

3. *Cambricum*, Welsh Polypody, with a broader frond and the segments irregularly cleft: this is always barren. Linnæus, by whom it was first described, regarded it as a distinct species.

4. *Hibernicum*, Irish Polypody, distinguished by the broader frond being bi- or tri-pinnatifid and fertile. A very striking and beautiful variety, found by Mr. Mackay, in the Dargle, in the county of Wicklow, Ireland.

Intermediate varieties connect all of these with the normal or common form.

The rhizoma is mucilaginous and has a sweetish flavour, but by long boiling it becomes bitter. An infusion of it in a recent state is sometimes administered in the country as a mild cathartic. It was once highly esteemed by the faculty as an expectorant, and especially recommended for hooping-cough; but although still occasionally employed as a domestic remedy, it has long been excluded from the list of orthodox medicines.

POLYPODIUM PHEGOPTERIS. Mountain Polypody. TAB. II.

Fronds triangularly lanceolate, acuminate, subpinnate: pinnæ linear-lanceolate, acute, deeply pinnatifid, with obtuse, entire lobes; the lowest pair distant, deflexed. Sori nearly marginal.

Polypodium Phegopteris, *Linnæus*. Polystichum Phegopteris, *Roth*. Lastrea Phegopteris, *Newman*. Gymnocarpium Phegopteris, *Newm. Hist. Brit. Ferns*, 49.

Not unfrequent in the alpine and subalpine or rocky districts of the south-western and northern counties of England, and in Wales and Scotland; but apparently of rare occurrence in Ireland. Its favourite habitats are moist woods, and shady spots about mountain lakes, rills, and waterfalls. The rhizoma is of a blackish hue, slender, wiry, branching and creeping in every direction, so as often to form a network over the face of the moist rock where there is no trace of soil, striking its hair-like rootlets into every crevice. The fronds make their appearance about the same period, or rather earlier than those of the common Polypody, and are in perfection from July to September: they are of a pale green colour, hairy, and vary from five or six inches to a foot in height, of which the leafy portion occupies less than half, its general outline being triangular, but much acuminated. The pinnæ are mostly opposite, the lowest pair being rather distant from the others and directed downwards and forwards, forming a very remarkable feature by which this fern is readily recognized; they are likewise perfectly distinct, and attached to the rachis by a short stalk: the upper ones, on the contrary, point toward the apex of the frond, and, with the occasional exception of the second pair, are sessile, and attached by their entire base, so as to appear confluent, as indeed those toward the extremity usually are. The lateral veins of the lobes are alternate, mostly simple, and extend to the margin, bearing, each, near the end a small circular sorus, the whole fructification thus forming an intromarginal line of spots.

It is an elegant species under cultivation, spreading very freely, and requiring little attention in planting, except to secure the almost universal requirement of the Fern, shade. Exposure to the sun, though only for a very short time, changes the delicate green hue of the frond to brown, and soon destroys a plant naturally adapted to those moist situations in which alone it luxuriates.

POLYPODIUM DRYOPTERIS. Tender three-branched Polypody. TAB. III.

Fronds ternate, glabrous; branches pinnate, drooping; pinnæ pinnatifid, with obtuse crenated segments. Sori nearly marginal.

Polypodium Dryopteris, *Linnæus*. Polystichum Dryopteris, *Roth*. Lastrea Dryopteris, *Newman*. Gymnocarpium Dryopteris, *Newm. Hist. Brit. Ferns*, 57.

Not unfrequent in dry stony woods and shady rocky places in the mountainous parts of the north of England, and in Wales and Scotland; often very luxuriant about waterfalls, where it is kept constantly moistened by the spray, but rarely in this case producing fructification. The rhizoma, very slender, often almost filiform, spreads widely, forming, with its complicated branches and dark-coloured radicles, a dense turf-like mass. The fronds spring up in April, and present a remarkable form of vernation, the three branches being separately coiled, so as to resemble, as observed first by Mr. Newman, three little balls supported on slender wires. In maturity they vary from three or four inches to a foot in height, are of a pale bright green, perfectly smooth, and supported by an erect, very slender brittle stalk or rachis, clothed with a few scales at the base. A general tendency to droop is characteristic of the whole of the leafy portion of this delicate fern, affecting not only the primary branches, but giving a striking convexity to all of the segments, a circumstance well expressed in our figure. The fronds are mostly barren; the fertile ones rise higher than the others, and are farther distinguished by the comparative narrowness of their segments. The lateral veins of the segments are generally branched, and, where fertile, the sori are produced near the extremity of the uppermost branches; in luxuriant specimens their regular arrangement is often disturbed by development from some of the other branches of the vein. Fructification in June and July.

In cultivation, shade is even more essential to this species than to the preceding. Next to the delicacy of texture and graceful habit, the vivid green hue of the foliage constitutes its principal beauty, and this latter is entirely lost by exposure to direct sunlight. Abundant moisture, though recommended by many, is so far from being necessary to its flourishing condition, that, unless drainage is at the same time complete, it will soon destroy the plant by causing the decay of the rhizoma. Attention to these circumstances will ensure the fact, that one of the most elegant and beautiful of our smaller ferns is likewise one of the most free growers and most easily kept.

POLYPODIUM CALCAREUM. Rigid three-branched Polypody. TAB. IV.

Fronds triangular, subternate, erect, glandular; branches pinnate; pinnæ of the lower ones pinnatifid, with obtuse segments, those of the upper branch nearly entire. Sori marginal.

Polypodium calcareum, *Smith.* Lastrea Robertiana, *Newman.* Gymnocarpium Robertianum, *Newm. Hist. Brit. Ferns,* 63.

Apparently confined in its natural growth to limestone districts. Sir J. E. Smith first noticed it as a distinct species, and it is perhaps more frequent than generally supposed. In the rocky parts of Derbyshire it is far from uncommon, occurring among grass and bushes in broken limestone and tufa; the Cheddar cliffs and Ingleborough are other stations; and the growing specimens in my garden are from the vicinity of Kenilworth, where it accompanied *P. Dryopteris,* a species with which it has often been confounded, although in habit and other respects very dissimilar. The rhizoma is thicker and less spreading than that of the latter plant; the frond less distinctly ternate or three-branched, the lower branches being shorter than the terminal or middle one; all the three are rigid, expanding upward on the same plane, and not at all drooping. The colour of the frond is of a dull green, owing to the presence of numerous minute stalked glands that give a mealy appearance to the surface, and similar glands communicate a glaucous hue to the rachis. The sori arising from the extremities of the lateral veins of the segments form a more distinct intramarginal series than those of *P. Dryopteris,* and generally become confluent when the thecæ open.

Being of less compact growth than the last species, and more rigid, it is a much less ornamental plant; but it bears exposure better. Most persons who have had it under cultivation complain of its liability to die off, but I believe this to be the effect of confinement and superabundant moisture: left to itself, few ferns are more hardy, but it likes pure air and perfect drainage. Even in the wild state it cannot be styled a "free-grower," and being a very local plant, its natural condition must be considered as much as possible in our efforts to naturalize it in the fern garden. It flourishes best on a sloping bank, planted near the surface, with an admixture of lime rubbish to the ordinary compost, the ground about it being studded with fragments of stone or burs from the brick-kiln to prevent evaporation. Under these circumstances it does not seem to be injured by daily exposure to four or five hours of the mid-day sun. If grown in pots, they should be large, and about one-third filled with draining material.

Genus 2. WOODSIA.

Gen. Char. Sori circular; invested by an inferior involucre, the margin of which is divided into numerous jointed, generally capillary segments.

A very small genus of alpine ferns, named in memory of Joseph

Woods, a British botanist. Chiefly remarkable on account of the singular character of the so-called involucre, which is however only a modification of an indusium, opening in the centre, and splitting more or less regularly into the conferva-like filaments accompanying the magnified sorus in our figure of *W. Ilvensis*. Its true nature is very obvious on examination of the immature sori. The two British species are among the rarest of our indigenous plants: notwithstanding a considerable difference in habit, and in the divisions of the frond, many modern botanists regard them only as varieties.

WOODSIA ILVENSIS. Oblong Woodsia. TAB. V.

Fronds lanceolate, pinnate; pinnæ oblong, deeply pinnatifid, chaffy beneath. Rachis chaffy.

Woodsia Ilvensis, *R. Brown.* Acrostichum Ilvense, *Linnæus.* Polypodium arvonicum, *Withering.* Polypodium Ilvense, *Swartz.*

Only found growing in the crevices of moist rocks about the summits of our higher mountains, and so sparingly distributed in these localities as to be regarded exceedingly rare. The recorded habitats are few, viz. Falcon Clints, Teesdale, Durham; Clogwynn-y-Garnedd, Snowdon, and Llynn-y-cwn, on Glyder Vawr, Wales; and the Clova mountains, Scotland. A careful explorer of the bleak regions over which many other rarities of our alpine flora are distributed, would however probably find reason to conclude that its extension is far less limited. This remark is not one at random; but the wanton appropriation, or it might rather be styled depredation, exercised by certain wholesale collectors, not of specimens only, but of entire plants, has rendered the true botanist, in cases like the present, averse to the promulgation of his discoveries.

The fronds grow in a tuft at the extremity of a very short rhizoma, seldom exceed two or three inches in height, and in very dry or exposed situations are sometimes not above one inch. In general outline they are lanceolate and pinnate, with mostly opposite, oblong, deeply-lobed pinnæ. The under surface is more or less covered with glossy, jointed hairs, accompanied, especially about the mid-veins, by long, attenuated scales, which, with the capillary segments of the indusium, often nearly conceal the sori. The sori are produced at or near the extremities of the lateral veins of the lobes, a crenation of the margin of the latter generally attending their development. They attain maturity in August and September.

The hairiness of the rachis, always conspicuous on the young fronds, is sometimes obliterated in their after-growth.

WOODSIA HYPERBOREA. Alpine Woodsia. TAB. VI.

Fronds linear-lanceolate, pinnate; pinnæ obtusely triangular, pinnatifid, with rounded segments.

Woodsia hyperborea, *Brown. E. B.* 2023. *Smith. Hooker and Arnott.* Woodsia alpina, *Newman, Hist. Brit. Ferns,* 79. Woodsia ilvensis, var., *Babington.* Acrostichum alpinum, *Bolton.*

Met with in similar situations as the preceding, but apparently of rarer occurrence. The habitats hitherto recorded are, Clogwynn-y-Garnedd, and Moel Sichog, Snowdon, in Wales; Ben Lawers, Mael-dun-Crosk, and Craig-Challiach, Perthshire; and, according to Dr. Balfour, in Glen Fiadh, Forfarshire, in Scotland. In habit it is not unlike *W. Ilvensis,* but the narrower fronds are of a thinner texture, and less hairy and chaffy; while the pinnæ, almost invariably alternate, are shorter, and nearly triangular in their general outline, and their lobes fewer and more rounded.

Our figures of these two ferns will convey the idea of specific distinction, and those of Mr. Newman, above quoted, are even more decided in this respect; but the comparison of specimens of both from different localities, and even from the same gathered in different years, renders it very doubtful whether they ought to be regarded as other than mere varieties of one species.

For successful cultivation of the *Woodsia,* shade, a moist atmosphere, and perfect drainage about the roots, are points of the utmost importance, and are especially indicated by its natural localities. Owing to their rarity as British ferns, few persons have ventured to plant them in the open air; in which, however, sheltered from the sun in summer, and from the drying easterly winds of spring, I am informed they may be grown luxuriantly. When potted, sandy peat, mingled with a small quantity of yellow loam, broken limestone and slate, affords a soil among which the black wiry roots readily extend; and if the pot be previously half filled with small fragments of stone and sand sifted among them, the plant will not be liable to suffer from the accumulation of moisture. Although a damp atmosphere is favourable during the growing season, these ferns will not bear confinement in close frames or cases; however vigorously they may grow at first, they are soon rendered feeble by the want of a free circulation of air.

Genus 3. LASTREA.

GEN. CHAR. Sori nearly circular, seated upon the back of the lateral veins; covered by a reniform indusium attached by its sinus.

The ferns included in this and the following genus, *Polystichum*, are by some botanists associated under the general name of *Aspidium*, to which genus they are referred in "English Botany." A difference in the form and attachment of the indusium has been considered a feature of sufficient importance to warrant their division. The name *Nephrodium*, originally suggested by Mr. Brown, has given way to that of *Lastrea*, bestowed upon it by Presl in honour of M. De Lastre of Chatelleraut.

LASTREA THELYPTERIS. Marsh Fern. TAB. VII.

Rhizoma creeping. Fronds lanceolate, pinnate: pinnæ linear-lanceolate, pinnatifid; lobes oblong, obtuse, the fertile ones with revolute margins. Sori submarginal.

Lastrea Thelypteris, *Presl.* Aspidium Thelypteris, *Swartz. Smith. Hooker. E. B. the fig. a mistake.* Hemestheum Thelypteris, *Newman, Hist. Brit. Ferns,* 123. Acrostichum & Polypodium, *Linn.*

A very local species, found only in a wet spongy soil, in marshes and bogs; not unfrequent in England and Wales, but rare in Scotland and Ireland. Where met with it is generally abundant, in consequence of its creeping habit, which is not unlike that of the common Brake (*Pteris aquilina*), the long, slender rhizoma growing rapidly, and branching in every direction. It is a colonizer of wet soils, as the latter fern is of dry ones. The fronds are of two kinds, barren and fertile, and spring up at short intervals, never in tufts: the barren ones make their appearance in the latter end of April or the beginning of May, and in their ultimate growth seldom attain more than a foot in height; the fertile, produced about July, are taller, not unfrequently reaching three feet or even four, the lower half or two-thirds of the rachis being devoid of pinnæ. The lateral veins divide in pairs about halfway between the mid-vein and the margin, and, in the fertile fronds, bear the sori, one on each division, forming thus an intromarginal series just within the recurvation. In maturity the sori become confluent, and all traces of the reniform indusium are obliterated.

The species is a very elegant one, and not at all difficult of cultivation; it does not seem to be injured by moderate exposure to the sun, provided the soil in which it is planted be sufficiently

Polypodium vulgare.

J E.S. Fecit.

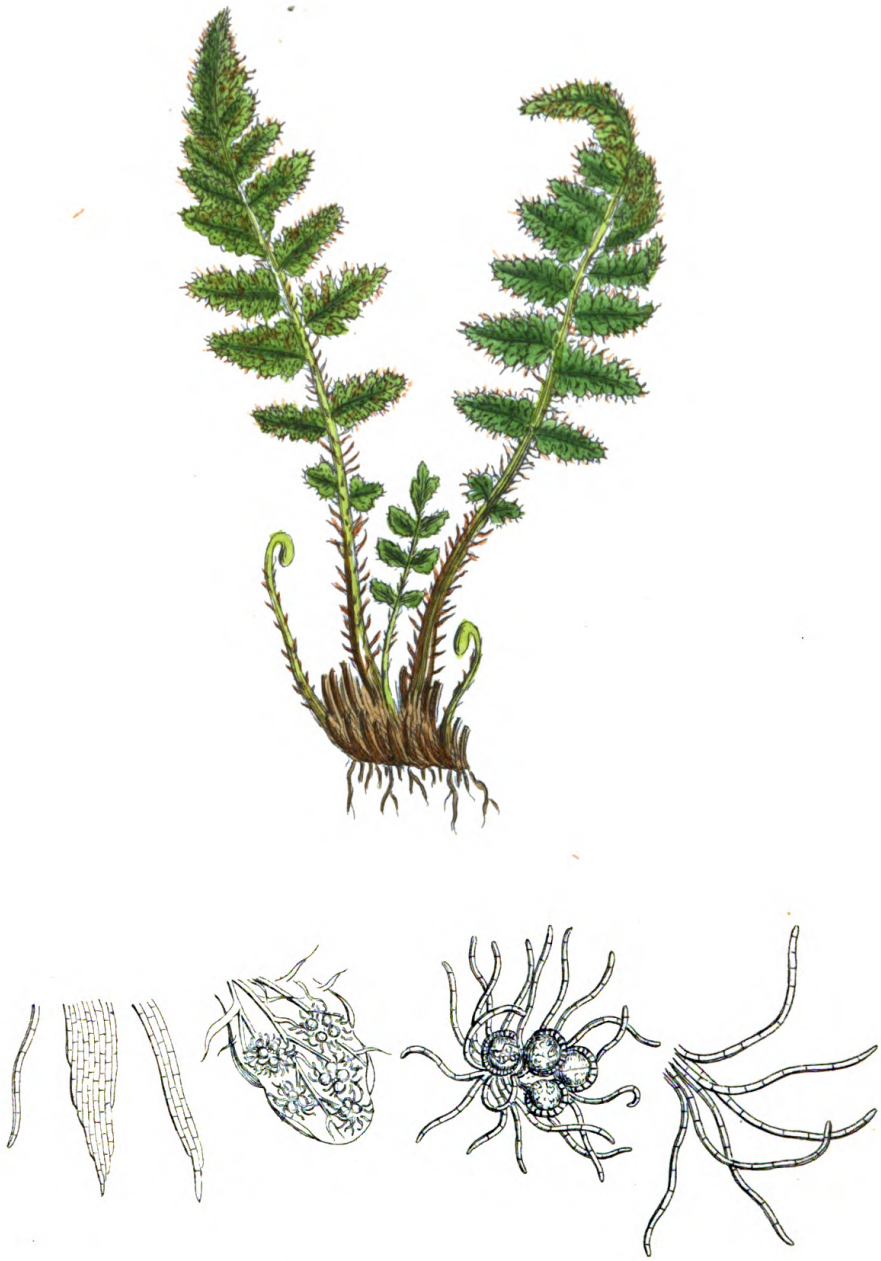
Polypodium Phegopteris.

Polypodium Dryopteris.

J.E.S. Fecit

Polypodium Calcareum.

J.E.S. Fecit.



Woodsia Ilvensis.

J.E.S. Fecit.

Woodsia Hyperborea.

J E S Fecit

PROSPECTUS.

THE increased attention that has of late years been directed to this beautiful and interesting tribe of plants, and the absence of any coloured figures on the subject, have induced the publication of the present work. When completed, it will contain figures and descriptions of forty-six species and varieties of Ferns found in the British Isles. The descriptions will be in every instance carefully revised and adapted to the present advanced state of Cryptogamic Botany. The figures will be all accurately drawn and engraved from the respective plants, and thus many errors in identity and general detail, which had unavoidably occurred in "The English Botany," owing to the difficulty of procuring recent specimens of some of the rarer species, will in this work be rectified.

The object of the Publisher will be to present to the observer of nature a book, in which he may find with ease a delineation and description of every Fern he is likely to meet with within the four seas. He hopes that in so doing, he may induce many to study the natural history of these elegant plants, who have hitherto shrunk from the apparent difficulty attending its investigation; and, at the same time, to furnish with a complete yet concise compendium on the subject, the more advanced student of these most graceful of Nature's vegetable productions.

The Work to be completed in 8 parts on the annexed terms:—

	s.	*d.*	
Fully coloured, corresponding with the first edition of the "English Botany," at	**3**	**0**	per part.
Partly coloured, as in the second edition of the above work, at	**1**	**6**	per part.

Subscribers wishing to have **fully coloured** copies are requested to send their names, as early as possible, to the Proprietor, either direct, or through the medium of their Booksellers, in order that a sufficient supply may be prepared.

JOHN E. SOWERBY, 3 MEAD PLACE, LAMBETH.