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FILICES BRITANNICÆ;
A N
H I S T O R Y
O F
BRITISH FERNS.

PART THE SECOND.

With PLAIN and ACCURATE DESCRIPTIONS,
A N D
NEW FIGURES of all the SPECIES,

Taken from an immediate and careful Inspection of the Plants in their Natural State, Drawn of their Natural
Size, and accurately Engraved.

I N C L U D I N G

An APPENDIX to the FORMER PART of this WORK,
By which the Whole is completed.

By J A M E S B O L T O N,

Member of the Nat. Hist. Society, EDINBURGH.

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M,DCC,XC.

INTRODUCTION

CONTINUED.

THE Genus of Plants called *Equisetum*, or Horsetail, constituting a Part of the Order FILICES in the LINNÆAN SYSTEM, together with the two other Genera, the *Isoetes* and *Pilularia*, are the subject of the present Sheets.

The Horsetails, of which no more than six species have been discovered in Great Britain (by that fondness for increasing the number of Plants which almost Universally prevailed amongst the Botanists of the last ages) have been increased to double their real number, by the Addition of imaginary *species*.

Dillenius, in the third Edition of *Ray's Synopsis*, enumerates twelve supposed species ; six of which, that are varieties only, and not species, I will here endeavour to point out.

There is a variety of *Equisetum sylvaticum*, not unfrequently to be met with by Road-sides and in Pathways, having the second leaves all turned to one side of the first leaf or *stem* ; this happens when the first leaf has been trod down, or by some Accident so bent or broken as to lie flat on the
d Ground ;

Ground ; all the second leaves naturally rise upward, but they issue from all sides of the first leaf at the base of the *vagina*, in the declined, as well as in the erect Plant ; the Plant in this state makes the

Equisetum sylvaticum procumbens satis uno versu dispositis.
Ray Syn. P. 131. No. 5.

There is a Variety of *Equisetum arvense*, which grows in very wet soils in close woods, amongst tall grass or under the umbrage of various other Plants, in which the leaves are very slender, and greatly drawn out in length ; in which state it makes the

Equisetum pratensis longissimis setis. *Ray Syn. 131. No. 8.*

The fertile shoots of *Equisetum arvense* come up before the barren ones ; these are destitute of second leaves, they are variegated with brown colours, and soon perish ; in this state they are the

Equisetum nudum minus variegatum basiliense. *Ray Syn. P. 130. No. 3.*

There is a variety of the *Equisetum palustre*, which grows in shady situations or under trees, about the borders of ponds and brooks, wherein both the first and second leaves are very slender, and drawn out in length, much beyond their usual standard, and are frequently of a pale yellow-green colour ; this is the

Equisetum

Equisetum palustre tenuissimis longissimis setis. Ray Syn. P. 131. No. 6.-----This through mistake has been made a variety of *Equisetum Arvense*.

There is another variety of *Equisetum palustre*, in which the branches or second leaves are fertile, producing small flower spikes on their summits. This variety, in most instances where I have had an opportunity of observing it, has been occasioned by that the primary flower spikes, of such shoots as produced secondary ones, had been bit off or otherwise destroyed; this variety is the

Equisetum palustre minus polystachion. Ray Syn. P. 131. No. 7. Tab. 5. Fig. 3.

When the *Equisetum limosum* grows in the mud at the bottom of still ponds or rivers, and is in a luxuriant state, it commonly produces plenty of branches or second leaves; in which state it makes the

Equisetum foliis nudum ramosum. Ray Syn. 132. No. 12.

There is a variety of *Equisetum hyemale*, in which the leaves are rush-like, quite simple, and destitute of branches; in this state it makes the

Equisetum foliis nudum non ramosum sue junceum. Ray Syn. 131. No. 11.

The manner in which the feeds of the Horsetails are discharged is beautiful, and well deserves our regard. The laborious and ingenuous Hedwig has well illustrated this particular, by a number of figures, in his *Theoria Pl. Crypt. Tab. 1, 2.* And I have found the truth of his Observations by examining the same subjects, under the first magnifier of Cuff's Compound Microscope, as now sold by *Nairn* and *Blount*, in London; my figures, however, vary a little from those of Hedwig.

In the annexed Plate, A, is a single shield separated from the flower spike, and magnified with its curved support, and its six feminal valves unopened. These valves open by a longitudinal future from top to bottom, on the inner side, and copiously discharge a soft downy powder, which when newly fallen or shook out may, through a moderate spy-glass, be seen to skip and leap about as if alive; after the discharge of this powder the feminal valves or capsules remain for some time in an horizontal direction, empty and dry, as is expressed at B; where the underside of the shield and the inside of the valves are represented.

The separate seed-vessels, if such we may call them, consist of an oval placenta, and four spoon-shaped filaments or straps; to these last the feeds immediately adhere. While
these

these seed-vessels are included in the seminal valves, the straps are rolled round the placenta, in two opposite spiral directions, as is expressed at C, where they are beginning to unroll ; at D, they are represented as farther disengaged ; at F, they are quite expanded ; and at G, the elastic force of the filaments being quite exhausted, they are at rest. This unrolling of the straps or filaments, however, is not gradual, as I have represented it, but performed in an instant, by a sudden jerk ; by which the seeds are thrown off with force, and committed to the air, where they float innumerable. *What is their use ?* Certainly they are produced for other purposes besides the propagation of the species ; every perfect seed spike produces millions of these, and yet the plant is propagated by the root ; nay, so rarely do the seeds answer the purpose of propagation, in this family, that I could never yet discover a seedling plant of any one of the species.

The same observation holds good, in respect to all the other Ferns, and to the Fungi ; the multitude of seeds produced by an Agaric or a Boletus, is innumerable ! is astonishing ! yet not one of ten thousand answers the purpose of propagation. Is not the Air we breathe charged with them all the declining part of the year ? Do we not receive them into our Lungs with every breath we draw ? Whence proceed the
Quinsies,

Quinsies, Coughs, and other complaints, which prevail in Autumn?

I am not here to inquire into their noxious or salutary effects, when received into our Lungs; yet it cannot surely be amiss, to drop this short hint to those whose province it is to make such inquiries.

Stannary, near Halifax,
October 16, 1790.

FILICES BRITANNICÆ.

PART THE SECOND.

EQUISETUM.

Lin. Gen. Plan. 1169.

EQUISETUM sylvaticum.

Lin. Sp. Pl. 1516. *Flo. Ang.* 447. *Scot.* 664. *Cant.* 383. *Ray Syn.* 131. *Ger. Em.* 1114. *Park.* 1201.

T A B. XXXIII.

WOOD HORSETAIL.

FROM a brown, jointed, fibrous, tough, creeping root, the fertile shoots begin to appear about the end of March, or beginning of April. These shoots at their first appearance are of a dark rusty-brown colour on the outside, which is composed of several vaginæ, of a thin filmy substance, and lie over one another in an imbricated order; each separate vagina is divided in three or four dents at the rim, and marked with about twelve striæ at the base, as at b. From the uppermost of these vaginæ the flower spike appears; it is of an oval or oblong figure, consists of numerous hexangular shields, close thrust together, their upper or naked part of a pale brown colour, and a smooth surface. As it advances in growth, these shields separate, and the feminal valves under each shield are librated, and discharge the seeds in form of a soft, downy, bluish powder. By this time the stem has attained the height of eight or ten inches; it is of a smooth surface, and a pale-green colour. The second leaves make their first appearance like little teeth, in a circle, round the base of the uppermost vagina, as expressed in the Plate at a; where I have shewn them at the base of the third vagina. When this first circle has made some progress in growth, another circle begins to appear in like manner, at the base of the second vagina, and thus proceeds downwards, as is expressed in the shoot a, *Tab.* 34.

The

The second leaves are jointed, and have vaginæ at the joints; from the base of which vaginæ the third leaves are produced, three or four from each joint.

These third leaves, like the first and second, are jointed and vaginated; and, in some luxuriant specimens, I have seen fourth leaves of a similar structure.

B A R R E N L E A V E S, *Fig. c.*

These spring from different parts of the same root, which produces the fertile ones, and like those are at first wholly covered with vaginæ, but are readily distinguished from them, by being much smaller, and of a pale, dusky, green colour.

From the uppermost vagina, the rudiments of the second leaves make their first appearance, in form of a close, rough, pale-green, tapering spike.

The vaginæ are green, except at the point, where they are divided in four brown dents, as in the fertile shoots; but in this they are smaller, and embrace the stem more closely than in that.

The second leaves are about twelve in number, produced in circles from the base of the vaginæ, each having a proper, brown, short, tridentate vagina, at its base; they are quadrangular, jointed, and have quadridentate vaginæ, from the base whereof grow the third leaves, three or four at a joint, and are of the same structure with the second. A full grown second leaf is seen in the Plate, at d.

It grows in wet, sandy soils, in woods and meadows about *Halifax*, abundantly.

E Q U I S E T U M arvenſe.

Lin. Sp. Pl 1516. *Flo. Angl.* 447. *Scot.* 647. *Cant.* 344. *Ray*
Syn. 130. *Ger. Em.* 1114. *Park.* 1202.

T A B. *XXXIV.*

C O R N H O R S E T A I L.

THE root is of a dark brown or blackish colour, jointed at equal distances, emits numerous black fibres from the joints, and creeps to a great distance under the surface.

The fertile shoots at *a*, make their appearance about the end of March; the flowering spike being at first hidden under the brown imbricated vagina; when the spike first appears it is of a greenish colour, afterwards changes to brown, and when at maturity the valves open, and discharge a pale coloured downy powder, which is the seed.

The stem is round, smooth, hollow, and of a pale pleasant brown, it consists of seven or eight joints, each surrounded by the base of a fuscous vagina, which is a little inflated, and divided at the top in about twelve narrow, pointed, brown segments. This stem very rarely produces any second leaves; it generally falls and disappears before the appearance of the barren leaves.

B A R R E N L E A V E S.

The barren leaves, *b*, appear in April, and grow from the same roots as the fertile ones; at their first coming up the second leaves are hidden under the vagina, but soon make their appearance in about twelve short whirls, and form the resemblance of a rough spike. When full grown it is about two feet high from the root to the top, and consists of fifteen or
twenty

twenty joints ; five or six of which joints are destitute of second leaves, but are, as well as the rest, surrounded each with a vagina, not inflated as in the fertile shoot, but closely embracing the stem ; they are of a pale-green colour, and each is divided in about twelve black acute points at the margin.

The second leaves grow from the base of the vaginæ, at the joints of the first leaf ; each has a pale-coloured, pellucid, quadridentate, proper vagina, at its base ; each consists of eight or ten joints, quadrangular, with quadridentate vaginæ at each joint. In the specimen before me, the first leaf consists of sixteen joints, five of which, from the root, produce no second leaves ; at the sixth the leaves are shorter than at the seventh, and grow gradually a little longer upwards to the tenth, from whence they diminish to the top, where they are shortest.

The barren leaves in this plant so nearly resemble those of the *Equisetum palustre*, in some stages, that they are not easily distinguished at first sight ; but may at all times be known by this remark, That the second leaves in the arvense are quadrangular, and the vaginæ quadridentate ; but in the palustre they are pentangular and quinquidentate.

The fertile shoots of this species cannot be distinguished from those of the *Equisetum sylvaticum*, before the second leaves appear, except by the number of lacinæ into which the vaginæ are divided, in the first being twelve, in the last three or four.

It grows in shady moist places about woods and rivulets, and flowers in April.

EQUISETUM palustre.

Sp. Pl. 1516. *Flo. Angl.* 448. *Scot.* 648. *Cant.* 384. *Ray Syn.* 131.
Tab. 5. *Fig.* 3. *Var.* b. *Ger. Em.* 1113. *Park.* 1202.

T A B. XXXV.

MARSH HORSETAIL.

THE root is slender, black, jointed, and creeping; emitting black hard fibres from the joints.

The fertile shoots are slender, and of a fresh green; they are eight or ten inches high, and consist of seven or eight joints, surrounded with vaginæ; two or three of the lowest of which are wholly black, the others green, except the top, which terminates in seven or eight black acute dents, with white filmy margins.

The uppermost vagina, which is placed immediately under the spike, is longer than any of the rest, and is divided in very long, slender, black dents.

The flower spikes are smaller than in any of the other species, black at first, but pale-coloured when full grown; the feminal valves being white, and discharging a pale-coloured powder.

The first leaves produce second leaves at the base of the vaginæ, which grow erect, each having a proper black vagina at its base; they
 are

J. Bolton del. et sculp.

are unequal in length, consisting of an uncertain number of pentangular joints, with quinquidentate black vaginæ at each joint.

B A R R E N L E A V E S,

These grow from the same root with the fertile ones, and resemble them in substance and colour, but are taller and consist of more numerous joints; in a full grown plant, twenty or more; and the second leaves are also longer and more numerous. One of the second leaves is a little magnified at a.

It grows in marshy places, about brooks and woods. On the banks of the canal below *Mear-Clough-Bottom*, near *Halifax*, plentifully, along with the two former species; it flowers in May.

It is distinguished from the *Equisetum limosum*, by being a lesser plant, by its small black root, by having fewer dents in the vagina, and in that the first leaves always produce secondary ones about the joints; but in the *limosum* they are frequently naked.

Sometimes the secondary leaves are fertile, producing small flower spikes on their summits, as figured by Dillenius, in Ray's Synopsis, *Pl.* 5. *Fig.* 3.

I have seen the secondary leaves fertile, but never, except in instances where the primary flower spike had been bit, or accidentally broken off.

EQUISETUM fluviatile.

Sp. Pl. 1517. *Flo. Ang.* 448. *Scot.* 649. *Cant.* 385. *Ray Syn.*
130. *Hall. Hist.* 1675. *Ger. Em.* 1113. *Park.* 1290.

T A B. XXXVI. XXXVII.

RIVER HORSETAIL.

FROM a jointed, black, fibrous, creeping root, as in the other species, the fertile shoots, a. make their appearance in April; they are at first surrounded by large, rough, husky, imbricated, brown vaginæ; each divided in about twenty-four long, narrow, pointed, rust-coloured segments; from the uppermost of these the flower spike is produced.

The shields at first are smooth, closely compacted together, and of a brown colour.

The spikes, when full grown, are three inches long, and of a proportionable thickness; the feminal valves are white, and when the spike is in full blow it makes an elegant appearance.

The fertile stems, A, grow about a foot high, and consist of eight or nine vaginated joints, but produce no second leaves.

B A R R E N

BARREN LEAVES.

The barren leaves, *Tab. 36, B.* and *Tab. 37*, are entirely covered by the vaginæ, till they attain the height of ten or twelve inches; in this state they are of a mixed brown and green colour, terminating in an acute point at top, and, by the numerous divisions of the vaginæ, seem as if surrounded with a rough, hairy, or bristly covering.

From the joints, towards the top of the stem, the second leaves first make their appearance in close circles round the base of each vagina, as *Fig. B. Tab. 26*. Each circle is surrounded at its base by the brown lacinæ of the vagina next below it.

The second leaves when full grown, *Tab. 37*, are quadrangular, five or six inches long, and grow about thirty in a circle; each consists of seven or eight joints, with black vaginæ, and having a proper brown vagina, supported by a black scale at its base. *b*, the proper vagina. *a*, the black scale, *Tab. 37*.

The barren leaves, in a proper soil, rise to the height of five or six feet, and when fresh and full grown are very elegant. The figure, *Tab. 37*, represents four joints of the first leaf, with three circles of second leaves, and, I think, gives a better idea of the plant, than could have been conveyed by giving a whole figure, so much reduced in size, as to bring it into the compass of my plate.

Grows in marshy places, and about the borders of rivers. The specimens from which I took the figures, were sent me, in a fresh state, by my obliging friend Mr. Edward Robson, of *Darlington*, in the county of *Durham*.

E Q U I S E T U M limosum.

Sp. Pl. 1517. *Flo. Ang.* 448. *Scot.* 648. *Cant.* 385. *Ray Syn.*
131. *Tab.* 5. *Fig.* 2. *Hall. Hist.* 1677.

T A B. XXXVIII.

S M O O T H H O R S E T A I L.

THE root, A, is large, tough, branched, jointed, and vaginated; it is of a rusty brown colour, and creeps horizontally under the mud.

The young shoots appear in April, and are covered with brown rust-coloured vagina; each of which is divided in twelve or fourteen black acute dents, at the top. The spaces between the vaginæ are of a pale green, and smooth surface.

In the full grown plant, the vaginæ change to a pale green, retaining only a faint tinge of brown near the base of the dents, which still remain black. The uppermost vagina of the fertile leaf is paler, more large, more lax, and the black dents longer than in the rest; and the stem above it, which supports the flower spike, is white.

The shields, which compose the flower spike, are at first black, and close thrust together; when the spike opens, the feminal valves are of a pale colour, and copiously discharge a white powder.

The

J. Bolton

The fertile leaves consist of fewer joints than the barren, and sometimes produce a few second leaves at the base of the vaginæ.

B A R R E N L E A V E S,

The barren leaf which is cut into three parts, in the plate, *Fig. B*, rises from the same root as the fertile leaf, and consists, when full grown, of twenty-six or thirty joints, rises to the height of three feet or more, is of a fresh green colour, and smooth surface, while young; when dry, becomes channelled, with twelve or fourteen furrows. The joints are closely embraced by the vaginæ, while the plant is fresh; when dry, the stem is contracted, the vaginæ are lax, and spread out at the margin.

The first leaves are most commonly simple and naked, as at *B*; but sometimes one or two branches rise from the lower joints, as at *C*; which branches are of the same structure as the first leaf or principal stem.

The first leaves also sometimes produce proper second leaves, *D*, from the base of the upper vaginæ; two or three of these at a joint, sometimes, though rarely, six or seven; they are unequal in length, jointed, pentangular, and the joints surrounded with a black quinquentate vagina.

Grows in shallow ponds and standing waters; and flowers in May.

E Q U I S E T U M

EQUISETUM hyemale.

Sp. Pl. 1517. *Flo. Angl.* 448. *Scot.* 650. *Cant.* 385. *Ray Syn.* 131. *Hall. Hist.* 1679. *Ger. Em.* 1113. *Park.* 1207.

T A B. XXXIX.

ROUGH HORSETAIL.

THE root is black, hard, tough, jointed, creeping, and emitting black, tough, hard fibres from the joints.

The fertile shoots, at their first appearance, are clubbed at the top, by reason of the flower spike, which is wrapped up in the uppermost vagina.

This uppermost vagina is divided, at the margin, in twelve or fourteen pointed dents or segments; whereas all the other vaginæ terminate in very short, blunt, black dents.

The shields, in the flower spike, are closely thrust together, and black at first; when the flowers are blown, the feminal valves are white, and discharge a bluish soft powder.

The full grown stem is about twenty-four inches high, consisting of nine or ten joints, the remotest of them about three inches asunder; and each

each furrounded with a short lax vagina, black at the base and margin, but of a pale green in the middle.

The spaces between the joints are of a strong bluish green, channelled with twelve or sixteen furrows, and having alternate ridges, which are armed with hard, short, rough spines, regularly placed in one line, along each ridge, as is expressed at b; where a vagina, a, and part of the stem are magnified.

The stem, as in the other species, consists of a number of fistular tubes, which are bound together by an external and internal bark, and form one general fistular tube. In this species the inner bark is smooth and white.

The barren leaves in this species are not to be distinguished from the fertile in any thing, but the want of fructification, and in their upper extremities terminating in a fine point.

Both the one and the other are most commonly simple, but sometimes emit one or two branches from the lower joints, as is expressed in the plate. These are of the same figure and structure as the primary leaves, only smaller, and consisting of fewer joints.

This species is distinguished by the short obtuse dents of the vaginae, by the remoteness of the joints, by the roughness of the touch, and by being an evergreen.

The only places where I have seen it grow, are amongst the bushes close by the brook at the lower end of the *Helk*, near *Ingleton*; and in a field, belonging to an estate called *Upper Brier*, in *Northowram*, near *Halifax*.

PILULARIA.

Lin. Gen. Plan. 1183.

PILULARIA globulifera.

Sp. Pl. 1653. *Flo. Ang.* 462. *Scot.* 682. *Ray Syn.* 130. *Vail. Paris.*
Tab. 15. *Fig.* 6. *Dill. Musc. Tab.* 79, *Fig.* 1. *Flo. Dan. Tab.* 223.

T A B. XL.

PEPPER GRASS.

WHAT has been called the root in this plant, may perhaps not improperly be termed the first leaf, or main stem of the plant. It creeps on the surface of the ground, in various winding directions, is of a brownish-green colour, having knots or joints at distances.

At each knot of the creeping stem, the roots, consisting of three or four strong white fibres, run down into the moist sand, among which it grows; and at the same knots or joints, on the upper side of the stem, the second leaves are produced, two or three together. While young they are coiled up in a close curl, like most other of the ferns; when full grown they are about three inches long of a fresh green colour; each
 one

one having a brown, dusky, granulated line, on the inner side ; which is the male flower.

On the creeping stem, in the centre of these tufts of leaves, the seed-vessels are produced ; they are about the size of a pepper-corn, and of the same figure ; at first green ; when at full growth of a brown colour, and covered with a short hairy shagginess ; they are divided into four cells, and filled with small, brown, globular seeds. When the plant dries it changes to a brownish colour.

Grows in wet sands, in places sometimes overflowed with fresh water. It grows in several parts of *Wales*, and, as is said, on *Honslow-Heath* ; and is in perfection in July.

I S O E T I S.

I S O E T I S.

Lin. Gen Plan. 1184.

I S O E T I S lacustris.

Sp. Pl. 1563. *Flo. Angl.* 462. *Scot.* 683. *Dan.* 191. *Ray Syn.*
306. *Dill. Musc. Tab.* 80. *Fig.* 2.

T A B. *XLI.*

QUILL WORT.

THE root consists of numerous strong, white, round fibres, which are connected together under the base of the leaves, and descend deep into the mud, at the bottom of lakes.

The leaves grow eight or ten from the same root, are four or five inches long, flat or plain on the inside, round or gibous on the outside; each consists of several fistular tubes, slender, and imbedded in a soft spongy substance. These tubes are furnished with small diafragms, at certain distances, and are surrounded with one common, smooth, pale-green cover; and thus the leaf is constructed. When newly taken out of the water, it is pellucid; and, if viewed between the eye and the
light

light, the diafragms, in the internal small tubes, may be easily discerned.

The outer leaves are greatly swollen and dilated at the base, as at a, b, c; where the fructification is lodged. The stile and stigma are placed in the hollow part of the base of the outer leaves; the germin is supported by a cordate valve, or flower-cup, as at e; and the edges of the inflated base, of these outer or female leaves, is a thin fine membrane, which so closely embraces and surrounds the gibous part of the male leaf within as to exclude the water.

The inner or male leaf, b, opens on the outer or gibous side of the base, within the embraces of the female leaf. Its fructification consists of a roundish anthera, without filament; and it rests on a cordate valve or flower-cup, similar to that of the female. By the above admirable contrivance, the two flowers come in near contact with each other, and, though in the bottom of deep lakes, are secured from the intrusion of the water.

The seed-vessel is of an oblong form, consisting of two valves, filled with white globular seeds; each of which is girt round with a prominent ring, as at d. After the discharge of the seeds, the outer leaves fall off and perish, and the next in order perform the same office a succeeding year; and the number of leaves is kept up by a supply of young ones from the centre.

Grows in lakes on high mountains. I have dragged it out of several lakes on *Snowden*, and it has been sent me from *Westmoreland*.

A N

A P P E N D I X

T O T H E

FIRST PART of this HISTORY of FERNS.

ACROSTICHUM. Part I. Page 21. *the*

ACROSTICHUM alpinum.

Frondeb subbipinnatis, pinnis remotis subalternis, lobis rotundis subcrenatis subtus hirsutus, stipite lævi. Pluk. Phyt. Tab. 89. Fig. 5. Barrelier Icon. 432. Fig. 2.

T A B. XLII.

ALPINE ACROSTICHUM.

THE root of this little Acrostichum consists of a few black, hard branches, connected to a small head, and furnished with black, hard, capillary fibres.

The rib of the first leaf, when full grown, is about three inches high, of a pale, brownish-green colour, slender and smooth, being quite destitute of hairs.

Second leaves, six or seven pairs, opposite below, alternate above, of a triangular figure, obtuse at the corners; three or four of the lowest pairs being all of equal size, and remote; two or three of the upper gradually lessening, and growing closer together.

Lobes

Strictly copied from the Plant. by James Bolton

Lobes of the second leaves most commonly five; two on each side of the rib, and one at the end; they are of a roundish figure, grow close together, and are obscurely crenated round the margin. The colour on the upper side is a brownish kind of green; the underside thickly covered with a brown hairy nap.

The lower figure represents one of the second leaves, as it appeared when a little magnified; the seed vessels are disposed in three or four clusters, on each lobe, partly hidden amongst numerous, strong, brown, hair-like filaments, by which also the whole under side of the leaf, quite to the margin, is thickly covered.

The specimen above described is very exactly figured on plate 42, and is a plant so perfectly distinct from the *Acrostichum ilvense*, in its usual state, that it seems to me unreasonable to suppose them both of the same species.

The *Acrostichum ilvense*, described in the former part of this work, page 14, and accurately figured on plate 9, was brought from *Snowden*. *Oeder*, in *Flora Danica*, has given an excellent figure of the same plant, *Tab.* 391. And the figure in *Pluk. Phyt. Tab.* 179, *Fig.* 4, (which is cited by Linnæus, in *Flo. Suecica*, *Ed.* 2. *No.* 938,) agrees pretty aptly with both *Oeder*'s and my own: But are all very different from the *Acrostichum alpinum* above described.

The specimen figured on plate 42, was brought from *Scotland*, but the plant is also a native of *South-Britain*; for in a volume of dried plants, collected by the late Mr. T. Knowlton, I have seen specimens of the same plant, with this note, in his own hand writing, *From the Mountains of Wales*. From these, and some other circumstances, I am induced to think, that two species of British Ferns have been confounded together, under the name of *Acrostichum ilvense*; and I believe that future observation will confirm the truth now discovered.

ACROSTICHUM

ACROSTICHUM thelypteris.

Sp. Pl. 1528. *Flo. Suecica. Ed. 2.* 928. *Lobel. Icon.* 814. *Filix querna repens. Park.* 1041.

T A B. XLIII. XLIV.

LADIES ACROSTICHUM.

THE root creeps horizontally under the surface of the ground, is of a black colour and brittle substance, crooked, and about the thickness of a duck's quill; it emits many branches, the size of small pack-thread, which are hung round with numerous, dark brown, capillary fibres.

From the root, as it creep along, the first leaves rise at distances, two or three near together. The rib is from nine to fifteen inches high, smooth and naked, very slender, and of a pale herby colour.

The second leaves from ten to fifteen pairs, opposite, except one or two of the lowest pairs; lower pairs remote, growing gradually closer upwards, longest about the middle pair, all of them lance-shaped, and placed nearly at right angles with the rib of the first leaf.

Lobes of the second leaves ten or twelve pairs, divided down to the nerve; they are broad, short, rounded off at the extremity, and quite smooth and entire on the edges; their upper surface smooth and plain, not obviously marked with veins, as in the *Polypodium thelypteris*; this circumstance, together with its creeping root, and its being a much smaller

Given in the Copper immediately from the Plant September the 26. D 1790. by J. Walton at Stannary near Halifax.

smaller plant, are sufficient at all times to distinguish it from that; though a resemblance in habit and external appearance has caused the two species to be confounded together. This, however, could not have happened, had a strict regard been had to the fructification in both.

In the *Polypodium thelypteris*, the seed-vessels are arranged in close regular lines, along the margin of the lobes; at first of a pale colour, changing brown in the progress; and, after the discharge of the seeds, spread out in breadth so as to occupy the whole disk, except the middle only; this, however, is not always the case, for in some specimens the lines remain distinct and separate to the last; and in those most effectually covered, the disposition and arrangement of the seed-vessels, in marginal lines, remain visible.

But in the specimen of *Acrostichum thelypteris* now before me, which is in a middle state of growth, and is accurately figured, *Tab. 43, Fig. a*, some of the seed-vessels are visible, as is expressed at *Fig. c*; they are small, white, and placed irregularly on each side of the nerve; some are further advanced in growth than others; and the whole disk, when a little magnified, appears beset with small tubercles, under which other seed-vessels, yet in embryo, are lodged.

In the full grown plant, of which two second leaves are figured, *Tab. 44*, on *Plate 45*, the whole under side, except the margin only, is closely covered with small seed-vessels, and they originate in every part of the disk, as in the genus *Acrostichum*, not in regular lines or rows, as in *Polypodium*. *Fig. a.* in *Tab. 44*, is a single lobe magnified.

The barren leaves, *Fig. b*, were in a state of half growth in the specimens I examined; after the decay and fall of the second leaves, the rib of the first leaf turns brown, and abides on the root over winter.

POLYPODIUM. Part I. Page 32.

POLYPODIUM rhœticum.

Sp. Pl. 1552. *Ray Syn.* 124. *Pluk. Phyt. Tab.* 89. *Fig.* 4.

T A B. XLV.

RHETIAN POLYPODY.

THE root of this plant, I have not had an opportunity of observing.

In the specimen before me, the height of the *frons*, or first leaf, is about twelve inches; the rib is of a pale colour, furrowed on the upper side, convex or rounded on the under; is more stout, and much less brittle than that of the *Polypodium fragile*.

The second leaves are about twelve pairs, placed alternately, very remote below, growing gradually nearer each other upwards, but are distinct quite to the top; they are placed at an acute angle with the middle rib.

The third leaves are divided, down to the nerve, into about three pairs of distinct lobes, of an oval figure, sharply and distinctly serrated about the edges.

Those third leaves which grow on the upper side of the rib of the second leaf, are larger than those which grow on the lower; by which character alone the species is at once distinguished from the *Polypodium fragile*, with some varieties of which it has been confounded.

The inequality of size in the upper and lower third leaves, is most obvious in the first pair; for in some of the upper pairs, the triple division

J. Bolton del. et sculp.

vision ceases, and the second leaf terminates in distinct, sharply serrated lobes.

The seed-vessels are placed in round dots, on the under side of the lobes; two or three on the smaller, five or six on the larger; they are of a brown colour, and distinct. The whole plant is larger, firmer, more robust, and of a stronger green than the *Polypodium fragile*.

The *Polypodium fragile* in some of its states, see part 1, page 51, so nearly resembles the *Polypodium rhæticum*, that others, as well as myself, have been deceived by it. Hallar, Wais, &c. seem to doubt its existence; and it appears from their descriptions, that they had not examined the true *Polypodium rhæticum*; no more had I, otherwise so obvious a character as the inequality of size in the third leaves, on the opposite sides of the rib of the second leaf, could not have been disregarded.

In my plate of varieties, *Part 1, Tab. 2*, those of the *Polypodium fragile* not being sufficiently expressed, at the instance of several friends, I have added *TAB. XLVI*; in which I have carefully copied these varieties. For on the two stems given in the plate, by varying the second leaves, as I found them in separate specimens, I have represented all those varieties which have been supposed most to resemble the *Polypodium rhæticum*.

Specimens of *Polypodium rhæticum* and *Acrostichum thelypteris* were sent me by my friend Dickson, author of the *Plantarum Cryptogamicarum Britanniae*; the first he gathered in *Scotland*, the last, he informs me, grows in plenty about *Norwich*.

ERRATA IN THE FIRST PART.

INTRODUCTION, p. 6, l. 17, for *supine* r. *prone*.—P. 16, l. 3. r. *Anglica*.—In the Book, p. 5, l. 3. r. and when the seeds are discharged.—P. 40, l. 2, 3, erase *Ger. Em. & Park*.—P. 41, l. 1, tab. 22.—P. 41, l. 3, erase from this, and the rest of the sentence.—P. 51, l. 15, erase this is; and the rest of the sentence;—same line, after *delicate*, add tab. 46.—Throughout the Book, for *Polipodium* r. *Polypodium*.

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F I N I S.

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