NEREIS BRITANNICA;

CONTINENS

SPECIES OMNES FUCORUM

IN INSULIS BRITANNICIS

CRESCENTIUM:

DESCRIPTIONE LATINA ET ANGLICA,

NECNON

ICONIBUS AD VIVUM

DEPICTIS.

Πολλον δε παρεξ᾽ Αλα ΦΥΚΟΣ. *Hom. Il.* 1. *l.* 7.

AUCTORE J. STACKHOUSE, ARM. SOC. LINN. SOCIO.

BATHONIÆ:

TYPIS S. HAZARD: SUMPTIBUS AUCTORIS

LONDINI

Prost: venal: apud J. WHITE, Bibliopol. in Vico FLEET-STREET.

MDCCCI

NEREIS BRITANNICA;

CONTAINING

ALL THE SPECIES OF FUCI,

NATIVES OF THE BRITISH COASTS:

WITH A

DESCRIPTION IN ENGLISH AND LATIN,

AND

PLATES COLOURED FROM NATURE.

By JOHN STACKHOUSE, Esq. F.L.S.

BATH:

PRINTED BY S. HAZARD, FOR THE AUTHOR,

And Sold by Mr. J. White, Fleet-Street; London.

MDCCCI

PRÆFATIO.

SPONSALIBUS plantarum marinarum in ſecreto habitis NEREIS penè tota, (ſi ita dicam) aquis ſuis ſepulta latuit. Nec mirum, ſi ita ſe res habet, florente doctrina ſexuali. Claſſis XXIV^ta^ LINNÆI, ordines IV amplectetur, qui *naturales* appellantur: ex his FILICES, MUSCI, et FUNGI, fructificatione, et habitu inter ſe invicèm ſunt affines; ALGÆ, è contra, genera XIII quam maximè inter ſe diſcrepantia continet. Ordinem hunc, nec modum fructificandi, nec habitum ſpecierum deſcribens, levitèr perſtringit cl. LINNÆUS, animadvertens ſolummodò " quod etiamnum obſcurè quoad fructificationem latent, præter eas, quæ Michelio debentur."

Recentiores Botanici, paulò accuratius rem perpendentes, ALGAS in *terreſtres* et *aquaticas* partiti ſunt; et, ſi Naturam ſequamur, Ordines duo omninò conſtituendi ſunt; quorum alter *Jungermanniam, Targioniam, Marchantiam, Blaſiam, Ricciam, Anthocerum, Lichenem, Tremellam* et *Byſſum*; alter *Fucum, Confervam*, et *Ulvam* amplectetur. Ordine terreſtri prætermiſſo, obſervandum eſt plantarum marinarum genera nullis adhuc certis notis definiri. Quod ad Fucos attinet, character ſexualis LINN.

Maſc. " Veſiculæ villis intertextæ."

Fœm. " Veſiculæ adſperſæ granis immerſis, apice prominulis."

" *Semina* ſolitaria."

ex LXX ferè ſpeciebus vix X convenit.

In quibuſdam è grandioribus, et magis notis, ſatìs conſpicua apparet duplex fructificatio: admonendus tamen eſt Lector, veſiculas fœmineas haudquaquam *conſtantèr* in plantâ reperiri, ſed ſolummodò tempore fructificandi; maſculas autem * *omni ætate* ac *tempore* adeſſe. Notandum eſt item fibras villoſas, nunc *apertas* eſſe, nunc *tectas*. In F. *ſerrato* (vid. Tab. I.) urceoli immerſi in ſubſtantiâ folii, fibris villoſis ad oras cinguntur: in F. *veſiculoſo, nodoſo, ſiliquoſo, &c.* fibræ villoſæ in *interiore* veſicularum grandiorum parte ſitæ ſunt.

Fructificatio mucoſa, quandoque granulata, quandoque ſimplex, in F. *digitato, polyſchide, ſaccharino, &c.* frequentèr apparet; nulla autem (quoad obſervavi†) fibrarum veſtigia. In aliis, *verrucæ;* in aliis, *fructus globoſi, pedunculati;* in aliis, *grana immerſa in ſubſtantiâ folii* conſpiciuntur; adeò ut neceſſe eſt genera nova conſtitui. Quamplurima autem, antequam accuratè definiantur genera, in re tam ſubtili Lynceis oculis inveſtiganda reſtant.

* Vid. notulam præfationi Anglicæ ſubjunctam. Etſi notandum eſt veſiculas aeriferas in junioribus plantis haud conſtantèr reperiri; et fibras, ſeu villos in ore veſicularum aliquando reperiri, aliquando marceſſere.

† REAUMURIUS, ut notat D. VELLEY *Fuci palmati* ſuperficiem fibrarum ſeu villorum faſciculis obtectam obſervavit. Vell. Diſq. de Pl. Mar. propagatione, p. 3. et cum ſit ſuperficie glaberrima, forſan in F. digitato, polyſchide, &c. fibræ denuò detegentur.

Quò ſubtilior tamen eſt inveſtigatio, eò majore opus eſt in ſpeciebus diſcriminandis induſtria; neque omninò prætermittendæ ſunt tabulæ ad vivum depictæ. Icones noſtratium extant perpaucæ, et hæ quidèm, ſparsìm et per intervalla editæ, numerum dimidio totius generis minorem comprehendentes, è quibus antiquiores, rudes admodùm (ne vitioſas dicam) apparent. Præclara in hoc genere edidere Botanici exterarum gentium; opera autem horum, et partu difficilia, nec ſine impenſis maximis omninò acquirenda ſunt. Littora è contra Britanniæ, *Fucis*, *Ulvis*, et *Confervis* mirificè abundant, et poſt procellas præcipuè tota penè cohors in arenâ projicitur. Hiſce perpenſis, FASCICULUM hunc ſpecimen operis, ſemeſtri, vel annuo ſaltèm intervallo ſuſcipiendi, in lucem emitto, nec dubium eſt quin ſpecies omnes, hactenus minùs accuratè depinctæ, paullatim in unum conferantur, amicis adjuvantibus, et favente DEO.

PREFACE.

AMONG the various claſſes, under which the Vegetable Syſtem has been arranged by LINNÆUS, the XXIV^th^, or thoſe with * "Flowers inconſpicuous," are certainly the moſt difficult to be aſcertained, for which purpoſe the united aid of Painting and Deſcription is in an eminent degree required. While the other Claſſes have attracted in modern times the attention of the Botaniſts of this Country in ſuch a manner, as to leave little to deſire further from the Pen or Pencil, it is to be lamented, that many individuals of this claſs have been as yet very imperfectly deſcribed; and that the reſearches hitherto made have not been ſufficient to afford *data* for dividing them accurately into *Genera*. The Families of *Fucus*, *Alga*, and *Conferva*, *or* "Sea Weeds," as they are indiſcriminately called, form a very beautiful, as well as intereſting part of this neglected Claſs.

The firſt Family—*Fucus* compriſes nearly LXX ſpecies: the Fructification, as deſcribed by LINNÆUS, is

Male Flowers?

"BLADDERS ſmooth; hollow, interſperſed within with ſoft hairs."

Female Flowers?

"BLADDERS ſmooth; filled with a pulpy jelly: ſprinkled with grains, prominent at the points."

"SEEDS ſolitary."

This moncœcious character is clearly diſcernible in ſome of the more common ſorts, but a very material circumſtance is omitted, viz. that the former is † *permanent*, and the latter *occaſional*. The former is likewiſe deſcribed as having the fibres interſperſed *within*, whereas in ſome inſtances they are *expoſed to view*. The ſerrated Fucus (Plate I.) is an inſtance of the fibrous fructification *expoſed*: the podded Fucus (Plate II, VI.) is an inſtance of it *concealed*. This contains the moſt conſiderable number; but though LINNÆUS, and our Engliſh Authors, following his example, have put this as an eſſential character at the head of the Genus, I have never been able to trace it in more than VIII or X ſpecies at the moſt.

In the large ſucculent Sea Weeds—the *Saccharine*, *Furbelowed*, and *Fingered*, *a jelly-like pulp* has been obſerved; ſometimes uncovered, and lying in the folds, or wrinkles of the plant; and

* See a moſt accurate Diſſertation on this Claſs prefixed to Dr. Withering's *Botanical Arrangement*, Vol. 3. extracted chiefly from HEDWIG's *Theoria* Plant. Crypt.

† It may ſeem ſtrange to apply the term *permanent* to the ſuppoſed *male* fructification, as it is not ſupported by any analogy to other Plants, but it is probable, the fibres may not always be in a *ſtate of impregnation*, as we obſerve the Catkins on Hazle, and ſome other trees. Reaumur, who, though an ingenious, is a fanciful writer, has ſuppoſed the male fructification to have *Anthers*, though he could never diſcover them. This does not ſeem *eſſential*, no more than that there ſhould be any *Farina*. As the elements of Air and Water differ eſſentially, the impregnation may be effected by a ſubtle vapour. At all events, I only offer my ideas as mere conjecture; though it is ſingular, that without ever reading Reaumur's Eſſay previous to the writing this Preface, our remarks as to the *Monœcious Character* of ſo ſmall a number only of the *genus*, *Fucus* ſhould ſo nearly coincide.

and ſometimes included in a tender pellicle on the ſmooth ſurface of the frond; but no granulations, nor the leaſt veſtige of the * fibrous proceſs is to be diſcovered. A conſiderable proportion of the *Fuci* likewiſe are furniſhed with *ſmall, round, dark-coloured granules*, either imbedded in the ſurface of the frond, or affixed to the ſtem; which mode of fructification has a near reſemblance to that of the fruit-bearing *Ulvæ*. *Pedunculated globules* are obſerved in another tribe of theſe plants; and, laſtly, *tubercles*, or *warts*, round, flatted, or pointed, of a conſiderable magnitude for the ſize of the plant, form a fifth ſpecies of fructification.

In the preſent ſtate of our knowledge it is not to be expected, that the internal Œconomy of theſe different plants, as far as reſpects their fructification, can be aſcertained with any tolerable degree of accuracy; though it is to be hoped that much may yet be done with the aid of ſtrong magnifiers on the *recent* plants. We may, however, conclude from what has been already aſcertained, that the Linnæan character of the *genus* does not hold good with reſpect to the plants of the four laſt deſcriptions, and thoſe plants compriſe at leaſt four fifths of the whole number. As far as regards *Ulva* and *Conferva*, the Linnæan character is ſtill more vague; but as none of theſe families form a part of the preſent publication, I ſhall forbear entering upon the ſubject; more particularly as a very accurate ſynoptic table of the genus *Ulva* is prepared by my Friend Mr. Woodward, and laid before the Linnæan Society, which will throw conſiderable light on the ſubject. This new arrangement is to be accompanied with deſcriptions of ſome newly diſcovered ſpecies. Nor ought I here to omit that this Gentleman, in conjunction with Dr. Goodenough, is engaged in arranging and deſcribing the *genus* Fucus. This taſk being undertaken by two Gentlemen, ſo eminently converſant with thoſe plants, when taken freſh from the ſea, and favoured with a free acceſs to the *Herbaria* of ancient and modern Collectors, will doubtleſs clear up much of the confuſion, which has been introduced by erroneous references, and truſting too much to verbal deſcription. Nothing ſurely can contribute towards a general knowledge of a Family of plants ſo much, as accurately aſcertaining the *individuals*, of which it is compoſed, and indeed, this ought to precede the eſtabliſhment of an *eſſential* character.

Though ſo little has hitherto, comparatively, been publiſhed on the Marine Plants by Britiſh Authors, no country in the world more abounds with them than the ſhores of the Iſland we inhabit: the more beautiful kinds diſplay themſelves in pictures, as we walk on the ſands, while the larger ones are frequently detached from the entangled maſs, when the weather is moderate, and ſeem to ſolicit a place in the *Herbarium* of the Naturaliſt. It muſt not be denied, however, that the entanglements and lacerations of the more tender ſorts, occaſioned by the turbulence of the element which gives them birth, are productive of a degree of chagrin, which is hardly compenſated by the pleaſure received from the more perfect ſpecimens.

With reſpect to the execution of the preſent Work, it is neceſſary to obſerve that both the drawings and deſcriptions have been taken from ſpecimens *freſh from the Sea;* and, as the moſt eligible

* Since writing the above I find *fibres* have been obſerved by Reaumur on the Palmated F. whoſe ſurface is ſmooth and poliſhed as the Plants I am treating of. See Velley's Inq.

eligible mode of diſplaying them on paper previous to drying, may not be generally known, I ſhall take the liberty of ſubjoining it. For this purpoſe a clean piece of writing paper muſt be procured of the ſize of the plant, which muſt be placed at the bottom of a ſoup plate, or larger diſh, as may be neceſſary, and flooded with water to the depth of an inch, or more. When this is done, the ſpecimen muſt be placed in the water, having been firſt waſhed in repeated changes of water to clear it of ſand, and other impurities. The plant will immediately aſſume its natural form, and habit of growth; which may be gently aſſiſted by a large needle faſtened to a pencil-ſtick, or any other ſharp inſtrument. When the ſpecimen is in a poſition to pleaſe the eye, the water muſt be drained off by a gentle inclination of the plate, till it ſettles on the paper. In this ſtate it muſt be removed, without ſuffering the paper to dry, and placed in a quire of blotting paper, under a gentle preſſure of books, if no Botanic preſs is at hand. The following day, or within the ſpace of a few hours in the larger ſpecimens, the plant muſt be moved into freſh paper, and in many caſes it will require ſhifting every other day for a fortnight, or longer; during which time the drier the room is, the leſs danger will there be of the plant getting mouldy: and it is neceſſary to obſerve that ſmooth thin cartridge paper is preferable to blotting paper for the ſubſequent changes. It likewiſe ſhould be noted, that in caſe of any of the jelly-like, clammy ſpecies which adhere to paper being preſerved dry, the operation muſt be effected by means of *oiled paper*.

The numerous individuals of the genus *Fucus* have been arranged under VI diviſions, according to the ſtructure of the frond; they likewiſe admit of a diviſion with reſpect to their roots, or baſes—into *Fibrous* and *Agglutinated*—and theſe latter may be ſubdivided into *Rock-plants* and *Paraſites*.

PENDARVIS, March, 1795.

POSTSCRIPT.

SINCE this Work has been finiſhed, and on my arrival at this place, I have met with a very ingenious Diſſertation on the Propagation of Sea Plants, written by * a Friend, who by the accidents of War has been ſtationed on the S. Coaſt of England, and who has very ſcientifically employed the leiſure, which his military Profeſſion afforded him, in proſecuting his reſearches in this neglected tribe of Plants. I can truly ſay I have received a conſiderable degree of inſtruction from the peruſal of it, as, in addition to his own very accurate obſervations on the *recent* Plants, he has concentrated and brought together all that has been advanced by the moſt eminent foreign Botaniſts on this intricate ſubject. My opinion reſpecting the fructification of theſe Plants is expreſſed above, together with the neceſſity that appears to me of forming two or three new *Genera*; my Friend indeed himſelf † intimates as much: but the ſuppoſition of GMELIN of *uniſexual* and *aſexual* Plants is the moſt unphiloſophic that I could have expected to have

 met

* THOMAS VELLEY, Eſq.

† See Inquiry into the Propagation of Marine Plants. p. 8.

met with in this enlightened Age. Let us attend to what HEDWIG, the moſt accurate and indefatigable inveſtigator of *Cryptogamous* Plants, lays down as a fundamental maxim in his *Theoria.* * "As in the Animal Œconomy, ſo among Vegetables, THAT which *of itſelf* produces a plant ſimilar to its Parent, and which we denominate a SEED, moſt indubitably originates from a FLOWER." In plants, whoſe ſexual parts were ſo ſmall as to elude even microſcopic obſervation unleſs with compound magnifiers, this ardent Naturaliſt has actually raiſed the plants from ſeeds, and † delineated them in the firſt ſtages of their growth.

GÆRTNER's Treatiſe on Fructification I had never met with, and conſequently the idea of the *tubercles*, i. e. granules of Fructification in marine plants being merely *Gems filled with medullary ſubſtance* has now for the firſt time offered itſelf to my conſideration. This ſyſtem is liable to the objection made above to the Theory of GMELIN, and, till we ſee a reaſon for Nature adopting a more "ſimple Proceſs" in ſubmerſed plants, the fact itſelf can never be admitted. Indeed this ingenious author having arranged the *Fuci* into more and leſs perfect, i. e. thoſe with *ſeeds* and thoſe with *gems;* a reaſon, which might otherwiſe be aſſigned for this Proceſs,—their ‡ ſubmerſion, muſt be at once given up.

It muſt be acknowledged that many proceſſes of Nature are hidden from us owing to the imperfection of our ſenſes. The ſeeds of the *cruſtaceous* and *foliaceous* Lichens, of Byſſi, and Fungi have been proved to owe their origin to a previous operation of two diſtinct organized principles. Theſe minute ſeeds float unperceived in our atmoſphere, and § contaminate the air we breathe. Some of theſe ſeeds are carried ſo high in the air as to propagate themſelves on the pinnacles of Towers, and on the higheſt ſummits of mountains. As theſe impregnations are carried on in our atmoſphere, there can be no reaſon aſſigned for the *ſimple proceſs* of GÆRTNER in the marine genera; and it is more than probable that the ‖ faint cloudy appearance in many of the tranſparent *Fuci* previous to the formation of the *granule* is an actual *Floreſcence.* Much may, and I truſt will be effected by accurate microſcopic obſervation; but it is probable a complete knowledge of the proceſs will never be attained, as in addition to other difficulties attending the uſe of high magnifiers, it is more than probable in marine ſubjects that the parts might collapſe on being expoſed to the air, or even to the ſtrong light neceſſary for making the obſervations.

The remarks made by my Friend on the difference between Sea and Land Plants ariſing from the abſence of roots, ſtructure of the frond, &c. do not hold *excluſively.* Many of the genus *Lichen;* the Tremellæ, Byſſi, &c. grow likewiſe by *Adheſion to the naked Rock.* In fact, the growth of Plants is a ſilent, but ſtupendous operation of Nature: when we reflect on the ſize of the

* "Veluti omnis proles animantium non niſi generationis actu fit, i. e. combinatione ſexualium facultatum pro ſimili corpore producendo: ſic vegetabilium, *id, e quo ſponte ſua ſimile illo vegetabili de quo venerat pullulat, atque excreſcit ſemen propriè dictum non niſi florum ſequi* nota indubitataque res eſt." Hed. Theor. cap. p. 14.

† Hed. Theor. tab. XIV.

‡ Hedwig and Schmidel have diſcovered all the ſexual parts in *an entirely ſubmerſed* genus—CHARA. Vid. Hed. Theor. p. 125.

§ The *heavy air*, obſervable in Woods, is partly occaſioned by the fruiting of ſo many millions of theſe plants which cover the trunks and branches of trees, as well as the bare ſpots of earth, &c. &c.

‖ Velley's Inq. p. 5.

the *Oak*, which in the lapſe of ages attains its Gigantic Bulk, without drawing from its parent Earth a ſingle particle whoſe ſize would hinder its paſſing through the *minuteſt capillary tube.* Indeed *Vegetable Life* is perfectly analogous to *Animal*, and the veſſels for * abſorbing and throwing off the juices muſt be continued through every part of the former as well as the latter, otherwiſe there could neither be *Life* nor *Growth*, and we may confidently affirm with reſpect to the marine plants from the ſingle circumſtance of the *increaſe of bulk*, that the nutricious liquor or ſap is as much in a regular and progreſſive ſtate of motion in them as in every other vegetable, though the extreme minuteneſs of the veſſels joined to other local cauſes may preclude us from demonſtrating it by actual † experiment.

As I am perſuaded the era is not diſtant when the Families of theſe marine plants will be properly arranged, and when clear diſtinct *eſſential Characters* will be prefixed to each: I ſhall cloſe my Obſervations for the preſent, in order to reſume them at ſome future opportunity.

* Thoſe who wiſh to make themſelves acquainted with this abſtruſe ſubject ſhould read Reichel, Malpighi and Grew on the ſpiral veſſels of Plants, and ſee the ſecretory ducts or *Spiracula* accurately delineated by Hedwig, tab. 3. Theor. General, &c.

† See ſome elegant experiments on theſe minute veſſels extracted from Reichel, Hed. Theor. p. 17. and likewiſe the concluding ſentence of this admirable Work.

BATH, April, 23, 1795.

NEREIS BRITANNICA;

SIVE

FUCI, ULVÆ ET CONFERVÆ

IN INSULIS BRITANNICIS

CRESCENTES:

DESCRIPTIONE LATINA ET ANGLICA,

NECNON

ICONIBUS AD VIVUM DEPICTIS

ILLUSTRATI.

AUCTORE J. STACKHOUSE, ARM. SOC. LINN. SOCIO.

FASCICULUS I,

CONTINENS

Fucum ſerratum,	F. veſiculoſum, (var. β.),	F. verrucoſum,
F. veſiculoſum,	F. membranaceum,	F. articulatum,
F. digitatum,	F. faſtigiatum,	F. rubentem,
F. polyſchidem,	F. puſillum,	F. ſanguineum,
F. filiquoſum,	F. aculeatum,	F. tomentoſum,
F. ſpiralem,		F. plicatum.

NEREIS BRITANNICA;

OR A

BOTANICAL DESCRIPTION

OF THE

BRITISH MARINE PLANTS,

IN LATIN AND ENGLISH:

ACCOMPANIED WITH

DRAWINGS FROM NATURE.

BY JOHN STACKHOUSE, ESQ. FELLOW OF THE LINNEAN SOCIETY.

NUMBER I,

CONTAINING

Serrated Fucus,	Oak-leaved F. (var. β.),	Warted F.
Oak-leaved F.	Pellucid F.	Articulated F.
Fingered F.	Faſtigiated F.	Red F.
Furbelowed F.	Dwarf F.	Dock-leaved F.
Podded F.	Prickly F.	Downy F.
Twiſted F.		Matted F.

BATH

Printed by S. HAZARD, for MESSRS WHITE, FLEET-STREET, LONDON.

M DCC XCV.

F U C U S SERRATUS. TAB. 1.

FUCUS. fronde plana, dichotoma, ſerrata, ad apices tuberculata. *Linn. Syſt. p.* 811.—*Sp. P.* 1626.—4. *Hiſt. Ox.* 3. 648.—*Baſt. l.* 6. *p.* 120.—*Light.* 902.—*With. Bot. arr.* 3. 242. —*Hudſ.* 176.—*R. Syn.* 42.—*Gmel.* 57.—*Act. Gall.* 1711. *p.* 285. *et pars* 2^da^ 1772.

RADIX irregularis, ſubtus plana, agglutinata.

CAULIS nodoſus, cartilagineus.

FOLIA, plana, punctata, bifurcata, coſtâ intermediâ.

A. FRUCTIFICATIO.

Maſc? Veſiculæ glabræ in Fronde ordine regulari immerſæ, ad oras fibroſæ.

Fœm? Veſiculæ glabræ, terminales vel laterales, in fructum mucoſum congeſtæ.

OBSERVATIONES.

PLANTA hæc, omnium vulgatiſſima, ſerraturis foliorum facilè dignoſcitur. E baſi ſubrotunda, ſaxis adhærenti, ad altitudinem pedalem, vel ſupra, aſſurgit. Habitus, dichotomus, et divaricatus: latitudo foliorum varia, rarò autem uncialis; membranâ ex utrâque coſtæ parte, penicillis fibroſis, ordinatim diſpoſitis inſtructâ. Penicilli hi, ſi microſcopium adhibeas, oras urceolorum ſeminalium amplectuntur. Ineunte hyeme, ut obſervavi, ſummitates foliorum turgeſcunt, tuberculis per totam ſuperficiem nullo ordine glomeratis, humore tenaci ſuperfuſis. Vaſcula hæc quoque urceolos referunt, fibris tamen ad oras omninò deſtituta. Obſervandum eſt Linnæum eſſentialem *Fuci* characterem monœcium eſſe velle, qui quidem character generi univerſo, ut nunc ſaltèm ordinatur, minimé convenit, villi etiam in hâc ſpecie *extus* apparent, non "*intus ſunt aſperſi.*" L. Gen. Pl. p. 569. Color Plantæ fuſcus et in quibuſdam olivaceus; juxta baſim, niger; fructus maturus ſub-luteus. Etſi fructus granulatus *incipiens* in plantis adultis omni ferè tempore conſpiciatur, rarò tamen matuieſcit, et, ut ſuprà notavi, nunquam niſi [a] hybernis menſibus. Tunc quidem intumeſcit fructus, et penè totus gelatinoſus et ſubdiaphanus evadit, veſiculis prominentibus humore tenaci et liquido ſuperfuſis.

Hab. ad rupes paſſim.

[a] Quoddam ſimile evenit in plantis quamplurimis Cryptogamicis.

SERRATED F U C U S, PL. 1.

OR

SEA WRACK.*

FUCUS. frond flat, forked, with a midrib; ſerrate-toothed: fructifications terminating, tubercled.

* I have added the old Engliſh name of *Sea Wrack* in conformity with LIGHTFOOT. It originally comprehended the marine plants indiſcriminately, in the ſame manner as ALGA among the Ancients.
"Projecta vilior Alga."

PLATES.

Hiſt. Ox. XV. 9. 1.—*Baſt. op. t.* 11. *f.* 3.—*Act. Gall.* 1711. *T.* 9. *f.* 10.—*ib.* 1772. *T.* 3. *f.* 1, 2, 3, 4, 5, 7, 9.—*Velley's Inqu. T.* 1. (*opt. Fruct. fœm.*)

ROOT, irregular, ſwelling from the baſe of the ſtem, flat at bottom.

STEM, cartilaginous, knobbed.

LEAF, flat, forked, punctured, mid-ribbed.

FRUIT, pitcher-ſhaped or ovate veſſels: Male and Female diſtinct.

OBSERVATIONS.

THE ſerratures ſufficiently diſtinguiſh this plant, which ſtands at the head of the Genus in the *Species Plantarum* of LINNÆUS, and is, perhaps, the moſt univerſal among them. The leaf appears dotted on each ſide of the mid-rib; theſe dots have pencils of whitiſh hairs. With the aſſiſtance of glaſſes theſe dots appear to be *urn-ſhaped* or rather *ſemi-ovate veſſels*, deep immerſed in the ſubſtance of the leaf and empty at top; their rims fringed with *ſhining, fibrous, glaſs-like threads*. Towards Winter the upper parts of many of the principal leaves, which through the Summer had ſhewn incipient fructification, grow *turgid*, and appear covered with *tubercles*; they are now mucilaginous, and the colour alters to a dirty yellow. On examining theſe tubercles with a glaſs, they appear of the ſame ſhape as the former, bellying out at bottom, and contracted at the mouth, and overflowing with a *clear mucous fluid*. As one part only of this plant aſſumes this appearance, it ſeems highly probable this is a *monœcious* plant; the [a] pencilled dots being probably the *male*, and the mucous tubercles the *female* fructification.[b] Theſe plants, when lying in water, convert it ſpeedily into a [c] *thick liquor*, which probably is generated on the ſurface and may ſerve to convey the impregnating particles from the veſſels on each ſide of the mid-rip, to thoſe cluſtered together at the extremities.

Lightfoot ſays the Dutch prefer this ſpecies, as being deſtitute of mucous veſſels, for preſerving their crabs and lobſters. He likewiſe ſays it does not abound ſo much with lixivial ſalts as the other ſpecies. However this and all the larger kinds ſerve a very beneficial purpoſe excluſive of the rich manure they afford; as they are converted by a ſlow proceſs by fire into KELP, which is an eſſential ingredient in the making of glaſs.

a. A ſlice of the ripe tubercle with the imbedded female veſicles. *a. a.* The ſame magnified.
b. A ſlice of the frond with the pencilled veſicles. *b. b.* The ſame magnified.
c. Seeds highly magnified.

Hab. common on Rocks, below High-Water mark.

[a] See the note in the Engliſh Preface, and the fortuitous coincidence of opinion in ſome reſpects between the Author and a celebrated French Naturaliſt. p. 111.

[b] My Friend, Major Velley, has accurately drawn the tubercled ſummit of this plant (PL. 1.), but not conſidering it as monœcious he has omitted the pencilled veſicles.

[c] There are many circumſtances attending the fruiting of theſe plants, which are yet undiſcovered, the Tamariſk-leaved F. emits at the ſummits a fluid, which is of a faint bluiſh purple. As this is one of the *bladder* Fuci, and conſequently agreeable to my Theory *monœcious*, may not the oleaginous fluid, in conveying the impregnation, cauſe this appearance?

FUCUS VESICULOSUS. TAB. II.

FUCUS. fronde dichotoma, integra; caule medium folium percurrente, veſiculis ſparſis, fructu marſupii-formi, laterali, granulato.

(Vide notulam Obſ. Angl. ſubjectam.)

RADIX, orbicularis, ſubtus plana.

CAULIS cartilagineus, margine lacero.

FOLIA dichotoma, coſtata, punctata.

VESICULÆ aeriferæ nullo ordine ex utrâque coſtæ parte, axillaribus *ſolitariis*.

A. FRUCTIFICATIO.

Maſc? In interiore veſicularum grandiorum parte.

Fœm? Veſiculæ rotundiuſculæ, apice perforatæ, muco ſuperfuſæ, connaſcentes.

OBSERVATIONES.

PLANTA, cujus iconem exhibuimus veſiculis aeriferis ex utrâque coſtæ parte, præſertìm ſub axillis, inſtructa eſt; quarum pars interior fibris intertexta, et tuberculis lævibus, floris maſculi, ut videtur, fungitur vice.* Per maturitatem producitur fructus *lateralis* granulatus, gelatinoſus, bicornis, è baſi anguſtâ ſensìm ſeſe dilatans. Libet ergo cum cl. LINNÆO ſuſpicari ſpeciem hanc quoque monœciam eſſe. Obſervavimus quoddam ſimile in Fuco nodoſo, ſiliquoſo, &c. minimè autem in ceteris quamplurimis ejuſdem familiæ.

In æſtuariis, et vadis ubique occurrit hæc ſpecies, una cum, plantis congeneribus; nec mirum ſi per tot horas in ſicco relictæ propriùs habitu terreſtribus accedant, quam quæ ſub aquis perpetuò ſubmerguntur. Margines foliorum rarò undulati, nunquam ſerrati, occurrunt: ſubſtantia, ut in priore, coriacea; altitudo pedalis, vel ſuprà. Notandum eſt varietates hujuſce Fuci quamplurimas occurrere, inter quas tanta eſt affinitas, ut vix notatu dignæ ſint; quæ autem fructu, et veſicularum ordine conſtantèr inter ſe diſcrepant, ut ſpecies diſtinctæ, potiùs quam varietates, contra Gmelini ſententiam, ut opinor, recenſendæ ſunt; ſin minùs, emendanda eſt deſcriptio LINN. "veſiculis axillaribus *geminis*," quæ etiam in ſyſtemate Gmelini occurrit.

In tabulâ D. VELLEY fructificationem F. veſiculoſi exhibente, apices frondis, utpote in F. ſerrato, fructiferi ſunt, unde cuivis facilè apparebit *differentias eſſentiales* ſaltem quoad fructum variis hujuſce Familiæ *Speciebus*, vel ſi mavis *Individuis*, ineſſe.

Hab. in rupibus paſſim.

* Etſi frons punctata ſit, ut in F. ſerrato obſervavimus, veſiculas tamen immerſas, nunquam adhuc obſervavi, ſed fibrarum ſolummodò pennicillos, adeò ut conjicere libeat interiorem veſicularum aeriferarum partem, urceolorum vice fungi. Vide ſectionem veſiculæ apud D. Velley prorsùs ſingularem. *t.* 1. *fig.* 3. Res tamen adhuc in incerto eſt.

BLADDER FUCUS, PL. 11.

OR

SEA OAK.

FUCUS. frond, flat, forked, with a mid-rib running through the centre; bladders imbedded without order on each ſide, and in the angles of the branches: Fructification lateral, granulated, purſe-ſhaped.*

(No ſpecific Plate.)

ROOT as in the foregoing ſpecies.

STEM cartilaginous, naked, with the membrane lacerated.

LEAF mid-ribbed, dichotomous, ſtraddling.

BLADDERS, oblong, ſmooth, *not in pairs.*

A. FRUCTIFICATION.

Maſc? Bladders reticulated on the inſide with fibres and tubercles.

Fem? Roundiſh veſſels, collected together in a purſe-ſhaped gelatinous fruit.

OBSERVATIONS.

THERE ſeem to be many varieties of this common plant, and the Linnæan character of "Bladders in pairs" may lead to confuſion. This is a characteriſtic of ſome, but by no means of all the varieties. In the plant under conſideration the air-bladders are found in various parts of the leaf without any determinate order. On cutting open theſe bladders, whitiſh, ſhining fibres are viſible to the naked eye ſurrounding the inner coat, and there are likewiſe ſome tubercles diſcernible in the [a] inner ſubſtance of the coat of the bladder. At a more advanced ſtate a compreſſed, granulated fruit makes its appearance, *laterally* near the top, which reſembles in ſome ſort a pouch drawn together with the bottom upwards. On conſidering theſe different parts of fructification, the Swediſh Naturaliſt was, I think, well-founded in conſidering it as [b] *monœcious*: a character, however, which, as I noted in F. *ſerratus*, obtains only in a few ſpecies. Lightfoot obſerved that the air-bladders at the angles of the branches were often ſingle (p. 904.), which may be the caſe in many varieties, but not in this. The bladder ſituated there often aſſumes a *triangular* heart, or rather a compreſſed ſhape. The ſize of this plant ſeldom exceeds a foot in height; the breadth of the leaves about one inch. Its texture thick and leathery, and the ſhape of the bladders elliptic. The fructification of this ſpecies ſo much reſembles the different parts in Pl. 1. that I have not thought it neceſſary to delineate them.

a. A ſeedling plant.

Hab. common on rocks.

* I have not given the references to Authors in their place, but ſhall add them at the end of this Note. The received opinion is, that this ſpecies varies in an endleſs manner. In the courſe of my obſervations I have made out two or three ſorts that appear *conſtant to their kinds.* I ſhall deſcribe them with ſpecific characters in the courſe of this Work. If I could fix on a ſpecific plant for LINNÆUS's ſpecific character I ſhould call this plant var. (α), and the plant Pl. VI. var. (β), but in fact the ſpecies with a *conſtant pair of* "*axillary bladders*" I do not remember to have met with. This remark relates to F. *veſiculoſus* in a reſtrained ſenſe; when modern Authors refer F. divaricatus, ſpiralis, and inflatus to this ſpecies, it ſeems to be confounding every idea of ſpecific character. I ſhall only remark in general that as theſe plants are produced from ſeeds, and as the diſtinguiſhing characters are *in their fructification*, it is not philoſophical to huddle together plants which differ ſo eſſentially in thoſe ſexual parts.

Fucus veſiculoſus. *Linn.* 1158, 1380.—*Hudſ.* 466, 576.—*R. Syn.* 40.—*Bauh. Pin.* 263.—*Lob. ic. p.* 252.—*Gmel.* 1156.—*Park.* 1293.

[a] See an accurate delineation of this proceſs in Major Velley's *Tab.* 1. *f.* 3. which clearly ſhews the air-bladders to be intended for ſome *other purpoſe* than mere buoyancy.

[b] LINNÆUS, who had ſo vaſt a field before him, could not be expected to attend minutely to the *cryptogamous plants.* Having ſeen a monœcious appearance in ſome of the larger plants, he inferred its belonging to the whole *genus.*

FUCUS DIGITATUS. TAB. III.

FUCUS. fronde palmata, foliis enſiformibus; ſtirpe tereti. *Linn. Syſt. Nat.* 815.—*Ger. Em.* 1570.—*Hudſ.* 579.—*Lightfoot.* 935.—*With. Bot. arr.* 3. 244.—*Ray. Syn.* 46.—*Imperati. Hiſt. Nat.* 741. *Fuco giganteo.*

RADIX fibroſa, divaricata, valida, cornea.

CAULIS cylindricus, longus, ſurſùm attenuatus, baculi magnitudine.

FOLIUM, amplum, craſſum, enerve; laciniis, prælongis, enſiformibus.

FRUCTIFICATIO—veſiculæ irregulares, nullo ordine, in cutis ſuperficie?

OBSERVATIONES.

Species hæc, congenerum ferè maxima, et, ut Raius aptè dicit, "arborea," radicibus validis in fiſſuris rupium, aut inter lapillos in argilloſo maris fundo infixa, vim fluctuum ſuſtentat. Caulis, in quibuſdam baculi magnitudine, validus, tenax, rotundus, ſolidus; cutis, ſeu mavis cortex craſſus, coriaceus, Fucis tenerioribus Ulvis, et Confervis undique obſitus. Summitas caulis in folium [a] peramplum illicò ſe repandit, laciniis plurimis longiſſimis, enſiformibus. Mira hujuſce Fuci varietas, quoad magnitudinem et longitudinem caulis, ut rectè obſervavit D. Lightfoot. adeò ut minimè mirum ſit, ſi plures ſint ſpecies; ſin minùs, veriſimile eſt capita ad juſtam magnitudinem in junioribus provenire, caules autem tardè creſcere, et non niſi provectâ ætate perfici. Subſtantia folii, craſſa admodùm, glabra, enervis, pellucida, et, ut ait Gerardus (p. 1570.) edulis. Fructificatio, à nemine adhùc, ut ſcio, obſervata, in veſiculis tenuibus continetur, quæ quidem variæ magnitudinis et formæ in foliorum ſuperficie producuntur: liquor intus gelatinoſus ſine granulis conſpicuis. Notandus hic error D. Raii, Syn. p. 47. qui Fucum *polyphyllum* Doodii, varietatem, vel juniorem faltèm plantam hujus ſpeciei eſſe exiſtimat, quum potiùs, ſi ex deſcriptione libet conjicere, palmati varietas, recenſenda ſit. Et reverà ſpecimen F. palmati prope *Harvicum* reperti, qui cum plantâ *Doodianâ* in omnibus convenit in herbario D. Woodward. conſervatur, ut ipſe nuperrimè mihi mandat.

Hab. juxta Weymouth ſparſim; in littoribus Cornubiæ, copioſiſſimè.

[a] Raius in Synopſi Fucum hunc Balteiformem appellat. p. 46.

FINGERED FUCUS, PL. III.

OR

Sea Hangers.

FUCUS. frond hand-ſhaped, ſegments ſword-ſhaped; ſtalk cylindrical. *Linn. Syſt. Nat.* 815.

PLATES.

Fl. Dan. 392.—*Gunn.* 1, 3.

ROOT branching, ſpreading, horny.

STEM round,* ſolid, elaſtic, tapering upwards.

LEAF very broad, ſwelling from the top of the ſtem ſuddenly, ribleſs, fleſhy, of a ſhining poliſh.

FRUCTIFICATION in thin veſicles of various ſizes on the ſurface of the leaf—*rare*—without any apparent granulation.

OBSERVATIONS.

THIS is one of the moſt common Fuci on the Weſtern Coaſt, and, being a bulky plant, forms an eſſential article of the Huſhandman's attention after a ſtorm. Its ſtrong fibrous roots inſinuate themſelves into the larger crevices of rocks, and amongſt the pebbles in the ſtiff ooze, lumps of which are wafted aſhore with it. Ray calls this, and the Furbelowed F. "*Tree-like*," and indeed its firm elaſtic ſtem is capable of performing the office of the trunk in trees, and ſupporting, with the aſſiſtance of its native element, its wide expanded foliage. The ſize of the larger ſtalks is equal to that of a walking-ſtick, ſolid, elaſtic, coated with ſmooth thick bark, which is generally beſet with ſmaller ſea plants. Theſe ſtalks taper pretty much towards the top, when they ſuddenly expand into leaves of a foot or more in breadth. This leaf or head is divided into a number of ſegments (from four to twelve, *Lightfoot*), tapering to a point. The ſtem of this Fucus is as incorruptible as a cabbage-ſtump. A very ſingular circumſtance will ſtrike the obſerver of this plant, viz. that among individuals, whoſe heads are nearly equal in ſize, the ſtalks will be found to vary from the ſize and height of a walking-ſtick, to that of a little finger; whether theſe are varieties, or junior plants, whoſe leaves firſt attain their ſize, is at preſent uncertain. The ſubſtance is thick and ribleſs. The fructification I ſhould think rare, as not being noticed. It conſiſts of thin inflated pellicles of various forms produced without order on the ſurface. The mucus within had no apparent granules. This plant is of a rich browniſh yellow colour when freſh, and appears as ſhining and ſmooth as if it had been varniſhed.

a. a. a. The veſicles filled with mucus.

Hab. on the ſhores at Weymouth, and on all the S. Coaſt, but largeſt and moſt plentiful towards the Weſtern extremity of the iſland.

* Mr. Woodward ſuſpects this plant may ſometimes have a cavity in the ſtem.

FUCUS POLYSCHIDES. TAB. IV.

FUCUS. fronde palmata, foliis enſiformibus, radice tuberoſa, cava; ſtirpe plana marginibus plicatis. *Lightfoot. Fl. Sc. p.* 936.—*Gmel. p.* 202.—*Reaumur. Act. Gall.* 1712. *p.* 21.—*Hudſ.* 579.—*With. Bot. Arr.* 3. 244.

RADIX magna, tuberculata, cava, depreſſa; fibris cartilagineis ſubtus.

CAULIS, latus, compreſſus, ad margines plicatus.

FOLIUM, amplum, ſegmentis numeroſis.

FRUCTIFICATIO—Veſiculæ per ſuperficiem foliorum nullo ordine diſpoſitæ?

OBSER-

OBSERVATIONES.

Species hæc, à Linnæo non deſcripta, in occidentali Angliæ parte frequens reperitur. Bulbus, rapi maximi magnitudine, in centro depreſſus, concavus, externè verrucoſus, radices plurimas rigidas, tortuoſas, ex imâ parte in fundum maris uliginoſum, vel inter lapillos emittit. Caulis, amplus, compreſſus, centro modicè craſſus, marginibus, præſertim juxta baſim, mirè fimbriatus eſt. Altitudo caulis bipedalis, vel ſupra, eſt; ſummitate illicò in folium dodrantali latitudine ſeſe repandente. Folium, ſeu mavis caput plantæ, peramplum ſegmentis plurimis prælongis, lævibus, craſſis, enervibus.

Sub nomine "Fuci arborei" ſpecies hæc à Raio cum Fuco digitato confunditur, etſi caule, et radicibus toto cœlo differunt. Mira enimvero, ut ait D. Lightfoot. tanti viri hallucinatio! Obſervandum eſt caules duos, treſve perſæpè ex bulbi ſummitate provenire, et adeò immenſa eſt moles plantæ ut quandoque vix humeris ſuſtinenda ſit. In profundo maris oritur; in uliginoſis, ut libet conjicere; et, uncunque piſcibus alendis, vel protegendis inſerviat, poſt procellas tamen in littore haud inutilis projicitur. Fucus hic, qui à Gmelino palmatus, ab Hudſono ſatis aptè bulboſus, vocatur, una cum F. digitato, F. palmato, F. ſaccharino in occidentali Angliæ parte ſtercoris vice fungitur. In inſulis Caſſiteridum quoque Sal Kali Kelp vulgò dictum lento igni ex iiſdem conficitur.

Hab. in Devoniæ et Cornubiæ littoribus.

FURBELOWED FUCUS, PL. IV.

OR

Great Furbelowed Hangers.

FUCUS. frond hand-ſhaped; leaves ſword-ſhaped; root, tuberous, hollow; ſtalk flat, plaited at the edge. *Lightfoot.* 936.

PLATE 9.

Gmelin. f. 30.—*Reaumur. Act. Gall. f.* 1.

ROOT very large, hollow, flatted, ſtudded with warty excreſcencies, puſhing ſtrong, horny, fibrous roots from beneath.

STALK flat, broad, thick in the middle; much furbelowed at the edge.

LEAF, very wide at top: ſegments very long, ſword-ſhaped (from 6 to 30).

FRUCTIFICATION, thin, irregular bladders?

OBSERVATIONS.

OBSERVATIONS.

It is remarkable, that this immenſe plant, which is produced in ſuch quantities on the Weſtern Coaſt of England, as to afford a valuable article of manure, ſhould have eſcaped unnoticed by Linnæus, and the older Writers, and that Ray our countryman, who muſt have ſeen the Corniſh ſhores at leaſt covered with it, ſhould have paid ſo little attention to it, as to confound it with Fucus digitatus. Hudſon, in his ſecond edition, has introduced it under an appoſite name—Bulbous-rooted; and Gmelin has figured it under the title of F. palmatus, a term pre-occupied by another ſpecies, and which does not ſo properly accord with a leaf cut into many ſegments. From a large *oblongo-oblate*, knobbed, hollow bulb ariſes, generally, one; ſometimes two, or even three compreſſed ſtalks, four inches, or more wide, thick in the middle, thinner at the edges, where it is ſtrangely [a] furbelowed, and contorted. This ſtem, which is upwards of two feet long, ſuddenly expands into a very wide head, which is afterwards divided into numerous ſword-ſhaped ſegments. The weight of the whole is immenſe: its ſubſtance ſemi-tranſparent, totally free from veins or fibres, and covered with a coat of varniſh. Its colour is deep brown. It is to be obſerved that the bulb ſends forth numerous ſtrong horny roots, which ſtrike deep into the ooze, or lay hold of the ſtones in the larger crevices of the rocks—a circumſtance neceſſary to enable ſo bulky a plant to reſiſt the violence of the waves. I have not yet ſeen it in fruit; but there is little doubt, from its affinity to F. digitatus, that the fructification is in ſimilar veſicles. In the Scilly Iſlands, and on ſome ſpots in the Weſt of Cornwall, this ſpecies, with the other large ſucculent ones, are burnt in conſiderable quantities to make Kelp.

a. The bulb and part of the ſtem, natural ſize.

b. An entire plant reduced.

Hab. on the Devonſhire and Corniſh Coaſts, plentiful, (at Icolmkill, Scotland. Lightfoot.).

[a] This very ſtrong ruffle at the rim of the ſtalk ſeems to be for the purpoſe of ſtiffening it, and enabling it to bear up in water its very large flowing head.

FUCUS SILIQUOSUS. TAB. v.

FUCUS. fronde compreſſa, ramoſa; foliis diſtychis, alternis, integerrimis; fructificationibus pedunculatis, oblongis, mucronatis. *Linn. Sp.* 1629.—*Syſt. Nat.* 813. *Seb. Th.* 11. *p.* 186.—*Gmel.* 81.—*Lightfoot.* 921.—*With. Bot. arr.* 3. 236.—*Ray. Syn.* 48.—*Hudſ.* 574.

RADIX, orbicularis, ſubtus plana.

CAULIS, compreſſus, cartilagineus, prælongus.

FOLIA, nulla.

FRUCTUS, pedunculatus, mucronatus, tranſverſim ſiliquæ ad inſtar ſulcatus.

OBSER-

OBSERVATIONES.

Fucus hic in longitudinem cubitalem extenditur, ramis paucis, prælongis. Caulis compreſſus, undulatus, tenax, glaber, uniformis: folia, ut vocantur, diſtycha, variæ in diverſis individuis magnitudinis, adeò ut ſpecies diverſæ videantur. Minùs accurata tamen Linnæi deſcriptio reſpectu foliorum, reverà enim, Fucus hic ramis, et filiquis ſolummodò conſtat. Siliquæ enim immaturæ foliorum vice funguntur; maturæ, turgeſcunt, tranſverſìm extus ſulcatæ; intus, in loculos diſpoſitæ; fibris numeroſis, albis, ſplendentibus è baſi ad verticem extenſis. In Fucis præcedentibus, ſerrato ſc. et veſiculoſo, fibroſam et gelatinoſam fructificationem à ſe remotas, et disjunctas notavimus, in hâc autem ſpecie *apparent* conjunctæ; mucus enim, vel gelatina, cavitatem filiquæ, fabæ in leguminoſis domicilium, ſibi vindicat,[a] fibris per medium tranſcurrentibus, ut in icone videre eſt. Siliquarum roſtra in longum ſæpiſſimè protenduntur. Veſiculas ſeminales in gelatina à D. Lightfoot. notatas nunquam adhùc inveni; mucus quippe omni tempore pellucidus et ſine granulis conſpicitur; veriſimile ergo eſt fructificationem fœmineam, vel in roſtris filiquarum, vel in ſummitate plantæ ineſſe; aut ſaltèm ſeminula, vel in fibris, vel etiam in muco, parvitate ſuâ aciem oculorum effugere. Color olivaceus, ſiccitate niger.

Hab. in profundo mari juxta Weymouth, et in littoribus Devoniæ et Cornubiæ.

[a] Siliqua biſſecta longitudenalitèr.

PODDED FUCUS. PL. v.

FUCUS. frond compreſſed, branched; leaves pointing two ways, alternate: Fructification on footſtalks, oblong, ſharp-pointed, (beaked). *Linn.* 1629.

PLATES.

Ger. em. 1569. *f.* 7.—*Seb. Th. t.* 95. *f.* 3.—*Fl. dan. t.* 106.—*Gmel. t.* 2. B. *Giſeke. t.* 75.

ROOT, ſwelling out, flat at bottom, adhering.

STEM, ſmooth, ſhining, compreſſed, zig-zagged.

LEAVES, o.

PODS on long footſtalks, ſometimes with very long ſnouts, barred acroſs, with cavities inſide, and fibrous, ſilken threads ſtretched acroſs.

OBSERVATIONS.

Though Linnæus and ſubſequent Authors give leaves to this plant, it is in reality without them. The pod-like fruit, which comes out thick on each ſide of the ſtalk, in its younger ſtate is flat, and without ſwelling, and has the reſemblance of leaves. This was noticed by Lightfoot, and my obſervations fully confirm it. The ſporting of Nature is remarkable in this plant: ſhe here produces ſo perfect a *Legume*, that one would expect on opening it to find a fruit: yet notwithſtanding there are the requiſite cavities, there is no *bean* within. The fibrous fructification, which prevails in the foregoing, is obſervable in this. Many ſilky, white filaments are extended quite acroſs the cavities from the baſe to the ſummit. There is a clear liquor within on firſt cutting open the pod, but no thick mucilaginous matter, as in the fruit of the preceding ſpecies, nor have I been able to diſcover

cover the "ſeminal veſicles" mentioned by Lightfoot. p. 922.[a] This is one of the moſt trailing of the Fucus kind. I have picked it up four feet long, the ſtalk compreſſed, undulating in a zig-zag direction, and nearly uniform in ſize throughout. The individuals of this ſpecies vary exceedingly in the length and breadth of their pods; ſo much ſo, as almoſt to induce the belief of the exiſtence of two ſeparate kinds. It is to be obſerved that the pod has frequently a footſtalk nearly as long as itſelf, and a long extended beak of a ſimilar length, blunt at the tip; ſo it ſhould have been called *roſtratus* inſtead of "*mucronatus*." Vid. ſup.

Hab. Adheres by its flat baſe to rocks in deep water. Weymouth, and on the Devon and Cornwall Coaſts, plentiful.

[a] In a correſpondence I have been favoured with from Mr. Woodward, I find that he has ſearched in vain for granulations, or ſeeds, in this ſpecies. It may happen, that this plant matures its ſeeds in the Winter months; if not, as the general habit ſtrongly indicates its affinity to the Oak-leaved, and Knobbed Fuci, the granulations muſt be ſearched for in the long extended beak of the pod, or in ſome of the ſhorter pods near the ſummit of the plant, and it is not unlikely that the *mucous* liquor may have inviſible ſeeds, as I ſuſpect to be the caſe in the veſicular tumours on the leaves of the P. *digitatus*.

F U C U S SPIRALIS. TAB. v.

FUCUS. fronde dichotoma, integra, caule folium percurrente, infernè nudo, veſiculis verrucoſis terminalibus. *Linn. Sp. Pl.* 1672.—*Ger. em.* 1570.—*Moriſ. hiſt. Ox.* 1. 15.—*Baſt. l.* 6. *p.* 120.—*Lightfoot. p.* 911.—*With. v.* 3. *p.* 242.

RADIX, irregularis, ſubtus plana.

CAULIS, cartilagineus, nudus, dichotomus.

FOLIA, integra, coriacea; coſtâ medium cujuſque percurrente.

FRUCTIFICATIO, mucoſa, granulata, ovata, terminalis; bina, ternave.

OBSERVATIONES.

Species hæc ubique, ferè, permiſta fucis congeneribus, veſiculoſo ſc. nodoſo, et inflato reperitur. Habitu et texturâ parùm differt à F. veſiculoſo; veſiculæ tamen aere inflatæ [a] *nunquam* occurrunt in folio. Caulis dichotomus folium percurrit, infernè nudus, membranâ utrinque, per ætatem, aut forſan vi fluctuum, primùm laceratâ, dein penitùs deficiente. Juxta baſim caulis foliola plurima, ut in F. veſiculoſo, naſcuntur; incertum plantæ ſuffulciendæ, an reparandæ, inſervientia. Folia ordine dichotomo, marginibus integris, apice bifurcato, producuntur. Habitus plantæ ſpiralis, unde et nomen à Linnæo inditum, etſi minimè ſit character eſſentialis hujus ſpeciei; Fucus enim, volubilis, F. inflatus, et, quandoque etiam, F. veſiculoſus, variè ſeſe contorquent. Ex apice foliorum oriuntur fructus bini, vel terni, oblongi, ovati, granulis intus in muco repleti, oleas conditas figurâ, et colore referentes. Folia levitèr punctata ex utrâque coſtæ parte, ut in veſiculoſo, et congeneribus; punc-

[a] Linnæus fructificationem gelatinoſam in hâc ſpecie, utpote in F. veſiculoſo, minus aptè *veſiculas verrucoſas* nominat.

tulis,

tulis, ſive penicillis fibroſis,[b] ut æquum eſt ſuſpicari, partem fructificationis maſculam continentibus. Obſervandum eſt Gerardum ſpecies duas treſve *in eâdem plantâ*, i. e. ex eâdem radice provenientes, deſignaſſe, p. 1567. n. 4. auctorem, quoad fucos, minimè omnium fidendum.

Fructificatio vitro ſubjecta urceolos, ſeu veſiculas rotundiuſculas, apice perforatas, ut obſervavimus in F. ſerrato et F. veſiculoſo, exhibuit. Vid. partes fruct. F. ſerrati (Tab. 1.), ex fronde deſcriptas, et ope microſcopii depictas.

Hab. in æſtuariis et ad rupes in occidentali Angliæ parte.

[b] Vid. Obſ. in F. ferratum.

SPIRAL FUCUS. PL. V.

FUCUS. frond flat, forked, very entire; the ſtem pervading the leaf, naked at bottom; fructifications in pairs, terminating, tubercled. *Linn. Sp. Pl.* 1672.

PLATES.

Fl. dan. 286.—*Baſt.* ii. 1.

ROOT, ſwelling, roundiſh, flat at bottom.

STEM wire-like, naked, twiſted, dichotomous.

LEAVES, mid-ribbed, dotted, entire, edged, twiſted, forked at top.

FRUCTIFICATION in pairs (ſometimes 3 together) terminating.

OBSERVATIONS.

NOTWITHSTANDING Gmelin conſiders this ſpecies, as well as *volubilis*, *inflatus*, *divaricatus*, and ſome others under the general name of F. *veſiculoſus*, yet there can be no doubt of their being diſtinct kinds; if it only depended on the abſence of the air-bladders, which I think I have ſhewn to be parts of fructification. LINNÆUS has denominated it *ſpiral*, from its being often found with its leaves twiſted, which is by no means an appropriate character. It ariſes from a flat baſe with wire-like ſtalks, naked, and deſtitute of the membrane on each ſide, branching, dichotomous. The leaves are long, waved, entire at the edge, dotted, and forked at the tips. Near the baſe the ſtalk is garniſhed with a cluſter of ſmall ſtiff leaves, either as a ſupport to the plant in the abſence of the air-bladders, or to aſſiſt its re-production when torn off by the waves. The fruit comes out in pairs, and ſometimes three together, at the ſummits; it is oblong, granulated, filled with mucous matter, and of the colour of the preſerved Spaniſh olive. The punctures, immerſed in the leaves in a regular ſeries, being garniſhed with pencils of fibres, though not ſo conſpicuous as in F. *ſerratus*, are ſuppoſed to contain the male fructification in this ſpecies. It is ſeldom ſo tall, as repreſented by Ray. Syn. 41. nor have I ever ſeen the ſtalk *channelled* as LINNÆUS obſerves, which very likely is another ſpecies. As the parts of fructification reſemble thoſe of F. ſerratus, it was judged unneceſſary to delineate them.

Hab. On the Devon and Cornwall Coaſts, on rocks below High-Water mark.

FUCUS VESICULOSUS. TAB. VI.

(VAR. β.)

FUCUS. fronde dichotoma, coſtata, integerrima; veſiculis undique ex adverſo binis; axillari *ſolitario;* fructu tuberculato, terminali.

(*Vid. Obſerv. in F. veſic. p.* 3.)

RADIX orbicularis, ſubtus plana.

CAULIS, cartilagineus, marginibus laceris, foliolis juxta baſim.

FOLIA, undulata, veſiculis *binis* oppoſitis.

FRUCTIFICATIO terminalis, tuberculata.

OBSERVATIONES.

VARIETATEM alteram Fuci veſiculoſi à priore (p. 3.) longè diverſam ſubjicimus. Character eſſentialis F. veſiculoſi apud LINN. conſtat veſiculis *binis axillaribus*, qui quidem character nequaquam Fucis hujus ſpeciei noſtratibus, quoad hactenùs obſervavi, obtinet. Veſiculæ in hâc varietate *conſtantèr* ex oppoſito binæ producuntur (non ſparsìm, ut in priore), glabræ, ovatæ, numeroſæ. In axillis autem foliorum, ſeu potiùs, in ramulorum dichotomiâ, veſiculæ occurrunt *ſolitariæ*, irregulares, figuræ perſæpè triangularis. In ceteris, ut videtur, ſpecies hæc cum Linnæanâ convenit; bini enim ad apices occurrunt fructus, mucoſi, granulis intus repleti, adeò ut neceſſe ſit tres ſaltèm ſpecies diſtinctas conſtitui. Habitus, præcedenti, utpote et F. veſiculoſo LINNÆI, totis partibus minor. Conchæ affixam invenimus, ut in icone videre eſt. Veſiculas aerias, ſeu maſculas, in ſubſtantiâ folii fibris intus inſtructas obſervavimus, figuræ etiam penè orbicularis ſunt, non ovatæ, ut in F. veſiculoſo (Tab. 2.).

Hab. ad oppidum SIDMOUTH, *in Devoniâ.*

OAK-LEAVED FUCUS. PL. VI.

(VAR. β.)

FUCUS. frond flat, forked, with a mid-rib throughout; bladders in pairs oppoſite; between the branches, ſolitary fruit veſſels in pairs terminating.

(*No ſpecific Plate.*)

ROOT, orbicular, flat at bottom, adhering.

STEM cartilaginous, naked, wire-like.

LEAVES flat, forked, mid-ribbed; air-bladders oppoſite.

FRUCTIFICATION, granulated, terminating in pairs.

OBSER-

OBSERVATIONS.

This variety differs eſſentially from the preceding one (Pl. 11.), and from the F. *veſiculoſus* of the later editions of Linnæus. In the firſt edition of the Species Plantarum, p. 1158, and in the Flora Laponica, and Suecica, the axillary bladders in pairs are not noticed,[a] but as it occurs in the Syſtema Naturæ, and in the later editions of the ſpecies, we may ſuppoſe it the reſult of accurate obſervation on the plants in the Northern Seas. In the ſpecies under deſcription, the air-veſſels are produced in pairs *exactly oppoſite* on each ſide of the mid-rib; are more turgid and crouded than in the preceding, and the whole plant is much more diminutive in ſize. Inſtead of *lateral* purſe-ſhaped, or horned fruit, as in F. veſic. Pl. 11. the ſeminal veſſels are produced in pairs at the *ſummits* of the leaves; they are oblong, granulated, and full of *mucus*. On cutting open the air-veſſel, the ſame fibrous fructification appeared, as in the kindred plants. It is more than probable that future inveſtigation will detect many more ſpecies nearly allied; at leaſt, with reſpect to this, and F. veſic. Pl. 11. as the difference lies in the *parts of fructification*, and is ſo well defined, it can never be proper to ſubſcribe to the opinion of Gmelin, who thinks they are merely accidental varieties.[b] This ſpecimen was found growing on a Limpet, which it had buoyed up, and wafted aſhore, ſo that it was in a perfect growing ſtate.

Hab. Sidmouth, *Devon.*

[a] The fructification is likewiſe improperly termed by Linn. "Warty bladders," whereas the hollow in the inſide is inconſiderable, the whole ſubſtance being a *granulated thick mucus*.

[b] See the note on F. veſiculoſus.

FUCUS MEMBRANACEUS. TAB. VI.

FUCUS. fronde dichotoma, membranacea, pellucida; coſtata ramulis, et foliolis ſparsìm è coſtâ erumpentibus.

(Species nova.)

RADIX, plana, orbiculata, agglutinata.

CAULIS dichotomus, cartilagineus, ſubnudus.

FOLIA, membranacea, dichotoma; caule medium folii percurrente, prolifero.

FRUCTIFICATIO, in punctis glomeratìm diſpoſitis.

OBSERVATIONES.

Species hæc, ut ſuſpicor, rariſſimè occurrit, nec â quopiam, quoad ſcio, adhuc deſcribitur. In incerto plantarum marinarum ſtatu, dubitare fas eſt, annon inter Ulvas, potiùs quam inter Fucos recenſendenda ſit; præſertìm ſi recentiores Botanicos conſulamus: ulvæ enim ſpecies temporibus noſtris triplicitèr ſaltem auctæ ſunt, et D. Woodward nuperrimè, ut mihi mandat, partitiones plurimas conſtituit, quarum una *carpophora* eſt. Habitus omninò fucorum, qui "*dichotomi frondeſcentes*" appellantur; ſubſtantia autem, ſi ita dicam, prorsùs *ulvacea*. Apices foliorum bifidi, vel etiam trifidi; fructificatio penè ſingularis: microſcopio ſubjecta, è centro punctulorum ex utrâque coſtæ parte producuntur aciculæ acutæ, incurvæ, ſingulæ, vel binæ, tranſverſim, faſciis

ciis rubris, et albis notatæ. Color pallidè luteus, tenuitate membranæ in aquâ prorsùs evanidus. Altitudo totius plantæ pedalis circiter, latitudo folii rarò uncialis. E coſtâ folium percurrente, oriuntur folia, et perſæpè etiam ramuli, ſicut in F. *hypogloſſo* dicto. (Vid. Act. Linn. v. 2.). Fructificatio, à D. Woodward. nuperrimè vitro vis magnæ ſubjecta, *Conſervas* naſcentes exhibuit, adeò ut aciculæ ſupradictæ minimè pro partibus fructificationis reputandæ ſint, quæ, ut videtur, ſeminulis congeſtis, et ordinatìm diſpoſitis ex utrâque coſtæ parte, conſtat. Coſta folii ſiccitate rubeſcit.

Hab. ad oppidum SIDMOUTH *in Devoniâ, juxta Promontorium occidentale.*

PELLUCID FUCUS. PL. VI.

FUCUS. frond thin, tranſparent, mid-ribbed, dichotomous, forked, punctured on each ſide the rib; leafits and branches coming out of the *midrib* of the frond.

(An undeſcribed ſpecies.)

ROOT, roundiſh, flat at the bottom, agglutinated.

STEM, wire-like, cartilaginous, naked.

LEAF, thin, membranaceous, pervaded by a mid-rib, punctured, regular.

FRUCTIFICATION, in cluſters of regular dots.

OBSERVATIONS.

THE membranaceous, pellucid texture of this ſpecies ſhould rather cauſe it to be claſſed as an *Ulva;* at leaſt, when the *Genera* ſhall be better aſcertained, it will be found not to be a *Fucus*. If we take the ſtrict Linnæan character of Ulva, viz. "a ſimple membrane without leaf or ſtem," the numerous tribe ſo much increaſed of late will be much diminiſhed. But it ſeems better to relinquiſh the *mere membrane*, and to adopt other diſtinctions from texture and fructification united, as has been ſucceſsfully attempted by Mr. Woodward, who has arranged them in ſeparate diviſions, as he has juſt informed me. I have reaſon to think this ſpecies is rare; being probably a native of deep and ſtill waters, the delicacy of its ſtructure may prevent its coming aſhore perfect. In ſize and habit it reſembles the larger *dichotomous Fuci*. The leaves are regularly dotted, which being viewed in a microſcope exhibit a ſingular appearance. From the centre of the dots ariſe one or two crooked needle-like ſubſtances, tapering to a point, which towards the ſummits are barred acroſs with white and red. The powers of my glaſs were inſufficient to proſecute my reſearches any further into this ſingular appearance. The regular ſituation of theſe dots forbid the idea of their being Fluſtra, or any minute marine inſect, and may, on more accurate inveſtigation, cauſe this plant to be arranged as a genus by itſelf.

This plant having been ſubmitted to the inveſtigation of Mr. Woodward, he has favoured me with a letter, in which he ſays, that by means of a ſtrong eye-glaſs he has diſcovered thoſe needle-like ſubſtances to be infant *Conferv*æ, and has no doubt but the cluſters of dots, which conſtitute the ſpots regularly arranged on each ſide the mid-rib, are the real fructification.

Hab. SIDMOUTH, *Devon. Auguſt*, 1794.

FUCUS FASTIGIATUS. TAB. VI.

FUCUS. fronde filiformi, dichotoma, ramoſiſſima, faſtigiata, obtuſa. *Linn. Syſt. Nat.* 815. *Hudſ. n.* 7.—*Light.* 930.—*With.* 3. 257.

..... fronde filiformi, dichotoma, ramoſiſſima, acuminata. *Linn. ib.*—*Hudſ. n.* 25.—*Light.* 932.—*With.* 258. *var.* β. —*R. Syn.* 45.—*Moriſ.* 648.—*Bauh. Pin.* 366.

RADIX, fibroſa, implicata, cartilaginea.

CAULIS, teres, dichotomus, tenuis.

RAMULI, teretes, ad baſim tenues, apicibus vel furcatis vel prælongis, acuminatis.

FRUCTIFICATIO, lateralis, veſiculoſa, rugoſa.

OBSERVATIONES.

APICIBUS longis, acutis, filiquarum æmulis, quoſdam individuos hujus ſpeciei, necnon alios furcatis, obtuſis, brevibus, ex eâdem radice perſæpè videre eſt. Speciminibus inducti, LINNÆUS, et plerique noſtrates Botanici, ſpecies duas conſtituere: radix, ſi ita vocetur, fibrillis intertextis conficitur; quæ, etſi plantæ inter lapillos figendæ inſerviant, tamen ipſæmet ſæpenumerò cauleſcunt. Ramuli ſubtùs graciles, ſurſùm grandiores, per dichotomiam ramoſiſſimi, et longitudinis æqualis, ſummitatibus quaſi in ſcopas congeſti ſunt. Apicibus mirè illudit hæc planta; oblongis, ſc. tumidis, acuminatis, unde nomen "*lumbricalis*," Hudſoni; et obtuſis, brevibus, *bi*, *tri*, vel *quadrifariàm* furcatis. Altitudo varia; ſæpè dodrantalis, et aliquando vix triuncialis; color etiam varius; viridis, fuſcus, olivaceus, ruber; et quandoque ex eâdem radice. Manipuli ſatìs ampli poſt procellas in arenâ projiciuntur. Fructificationem, ut in icone repræſentatur, frequentèr obſervavimus, in apicibus acuminatis, nunquam adhùc in furcatis. Juxta ſummitates è latere erumpunt veſiculæ, tumidæ, rugoſæ, muco repletæ, et per maturitatem dehiſcentes. Cum tam diſſimiles inter ſe ſint ramuli, æquum eſt conjicere cum D. Woodward. With. Bot. Arr. 258. plantam hanc monœciam eſſe.

Hab. paſſim.

FORKED FUCUS. PL. VI.

FUCUS. frond thread-ſhaped, forked; very much branched, of the ſame length, blunt. *Linn. Syſt. Nat.* 815.—*Hudſ.* 588.

..... frond, thread-ſhaped, branched; tips worm-like, long, acuminated. *Linn. ib.*—"Lumbricalis." 589. *Hudſ.*

PLATES.

Fl. Dan. 393. 419.—*Gmel.* 6. 1. 2.—*Hiſt. Ox.* 15. 2. 9. 1. 4.—*Velley. Inq. Tab.* 4.

ROOT

ROOT fibrous, entangled, cartilaginous.

STEM, round, ſlender, dichotomous.

BRANCHES, cylindrical, biggeſt at top, equal lengths; ſome forked, others worm-like.

FRUCTIFICATION, lateral, near the top, veſicular.

OBSERVATIONS.

THIS plant has two appearances ſo very different, that LINNÆUS, and ſubſequent Botaniſts have conſtituted two diſtinct ſpecies, under the names of F. faſtigiatus, and F. furcellatus, for the latter of which Mr. Hudſon has adopted the expreſſive name of F. *lumbricalis*. The great ſingularity attending this ſpecies is its root, which appears a congeries of implicated, horny fibres, which ſupply the double purpoſe of fixing the plant, and ſupplying freſh branches when Age or Accident have robbed the parent of its firſt offſpring. Theſe fibrous parts ſeem to be in a continual ſtate of advance towards branching. Large maſſes grow together, and the tips appear with the pod-like; the forked, (either 2, 3, or 4 times); or the plain varieties: often in the ſame maſs; but more frequently, the whole cluſter appears ſimilar. There is likewiſe no leſs variety in ſize, and colour; varying from nearly a foot to 3 inches, and exhibiting every tint of the brighteſt graſs green, olive, brown, red, and purple.

The fructification, as far as it has occurred to me, reſides in the long worm-like tips, but we have authority to ſay the forked ones are likewiſe fruitful, which makes me apprehend this plant is *monœcious*. Lightfoot and Gmelin have diſcovered fructification in the forked tips, and likewiſe annular projections, which probably form diaphragms. The ſize and ſhape appear in the drawing: they are veſicular, wrinkled, and burſt open when ripe.

a. a. a. The lateral fructification burſting out and ſplitting lengthways.

b. b. The ſame in the ſmaller ſpecimen.

Hab. common.

FUCUS PUSILLUS. TAB. VI.

FUCUS. fronde cæpitoſa, repenti, ramoſa; foliis ſpathulatis; junioribus obtuſis, provectioribus bi-vel tri-furcatis.

(Species non deſcripta.)

RADIX, ſubtus plana, ſaxis agglutinata.

CAULIS, rotundus, repens, implicatus.

FOLIA, ſpathulata, (apicibus, aliis rotundis, aliis furcatis) enervia, minutula.

CÆSPES totus in nudo ſaxo licheniformis.

OBSER-

OBSERVATIONES.

PARVITATE ſuâ, ut opinor, adhùc inobſervata permanſit ſpecies hæc; etſi nil mirum ſi minimè ſit vulgata; ſimul enim; idque in rupibus arenaceis, juxta SIDMOUTH in Devoniâ oblata eſt. Fucum pygmæum D. Lightfoot. primo aſpectu refert, ſub-nigra ſc. et cruſtacea; vitro aucta pallidè rubet. Cæſpes totus mirè implicitus, rupes, Lichenis, vel potiùs Jungermanniæ ad inſtar, operit. Caulis, tenuis, et ſubrotundus in tres vel plures ramulos dividitur, juxta baſim foliolis linearibus obſitus. Folia ſensìm ſeſe dilatant, apicibus, vel rotundis, vel furcatis. Fucus totus cartilagineus eſt, et enervis. Haud mirum, ſi plerique Botanici Fucum hunc, pygmæo mole ſaltèm affinem, obſervantes accuratiorem indagationem evitaverint, et forſan ſpecies permultæ puſillæ, *licheniformes*, adhùc latent; cruſtaceam enim unam in ſtirpe F. digitati, Licheni foliaceo ſimilem in occidentali Angliæ parte detexi, incertum an Fucus, an ſit potiùs Corallinæ ſpecies. Hîc quoque minimè prætereunda ſpecies à D. Lightfoot. obſervata, ſub nomine F. repentis. p. 961. et à Dillenio inter Muſcos conſcripta. p. 50. t. 10. f. 9. A, B, C, D. à me ad oppidum *Tenby* in WALLIA frequentèr reperta. Etſi multis numeris major ſit, ſaxa prærupta, et vi fluctuum oppoſita ſimili modo operit. [a] Articulis dividitur, ſimili modo ac F. articulatus, differt tamen texturâ tenaci admodùm et corneâ, necnon fibrillis ad genicula. Fructus adhùc latet. Diſtinctio inter F. pygmæum et puſillum cuivis ſatìs obvia occurrit. Fucus enim pygmæus *erectus*; F. puſillus, *repens* reperitur.

Hab. ad oppidum SIDMOUTH, *in Devoniâ. Aug.* 1794.

[a] Vid. Obſerv. in F. articulatum.

DWARF FUCUS. PL. VI.

FUCUS. frond matted, creeping, branched; leaves *ſpathula-ſhaped*; ſometimes round at top, at other times with two or more forks.

(*New Species.*)

ROOT flat at bottom, agglutinated.

STEM round, creeping, matted.

LEAVES *ſpathula-ſhaped*; ſometimes forked, thoſe near the root linear.

PATCHES on the rock reſembling *Lichens*.

OBSERVATIONS.

NICE examination will evince this plant to be different from Lightfoot's *Pigmy Fucus*, though to a common obſerver it might paſs for that plant. However, as I never met with it but once, and that on no common ſtone, it may not prove a common plant. The *habitat* I have aſcertained, is the ſoft, crumbling, red ſandſtone at SIDMOUTH in Devonſhire. It grows in blackiſh patches, which are cloſely matted together. The ſubſtance rigid, and horny: on holding it to the light, it appears of a pale red. On ſeparating a plant from the cluſter, it appears

appears branched from the root, the lower parts of the branches garniſhed thick with linear *cilia*. Theſe trailing branches towards the end, produce leaves of a *ſpathula-ſhape;* when young, round at the tips; when advanced, forked, and divided into 2 or more ſharp horns. No fructification has yet been diſcovered, in which caſe, however, ſhould it be found to have the remarkable hollow on the top, noticed by Lightfoot in the pigmy Fucus, p. 965, and which links it with the *Genus* LICHEN, we probably may ſet it down only as a variety of that ſpecies, which is very frequently to be met with, and may be ſportive in its form. I have no doubt but many more minute ſpecies will be hereafter diſcovered. The general growth of theſe two diminutive ſpecies appears to differ eſſentially; the Pigmy being *erect*, the Dwarf *creeping*.

a. a. a. Cluſters of plants natural ſize.

b. A ſingle plant natural ſize.

c. The ſame magnified.

Hab. at SIDMOUTH, *in Devonſhire.*

FUCUS RUBENS. TAB. VII.

FUCUS. frondibus membranaceis, oblongis, undulatis, ſinuatis; ſtirpe tereti. *Linn. Sp. Pl.* 1630.—····· ramoſâ. *Linn. Syſt. Nat.* 816. F. crenatus.—*Gmel. p.* 184.—*Hudſ.* 475. 573.—*Lightfoot.* 946.—*With.* 3. 235.

RADIX, è baſi caulis intumeſcens, ſubtus plana.

CAULIS, teres, ligneus, ramoſus.

FOLIA, pedunculata, coſtata, fibroſa, foliolis è coſtâ.

FRUCTIFICATIO ad margines foliorum, et per totum caulem ciliatim diſpoſita.

OBSERVATIONES.

PLANTA hæc una cum F. ſanguineo, cui quidem videtur affinis planta, foliis fibroſis, ut in arboribus, donatur. Subſtantia foliorum tenuis admodùm, et pellucida: variat multùm ſerraturis foliorum, quæ perſæpè in lacinias abeunt. Prolifera eſt ubique, et foliolis, non modo ad caulem cingitur, ſed etiam ad coſtam, et nervos foliorum. Habitus prorsùs ſingularis, et tenuitati plantæ accommodatus; membranâ enim folii vi fluctuum abrasâ, coſta folii in ramulum vertitur, foliolis plantæ renovandæ inſervientibus, inſtructum. Idem obſervavimus in Fuco ſanguineo, ſed [a] *perrarò* ita tamen ut affinitati, quam ſuprà notavimus, ſtabiliendæ valeat. Forma foliorum oblonga, crenata, undulata: haud rarò ad extremitates occurrunt laciniæ irregulares admodùm. Elegantiſſima eſt ſpecies, et vi tempeſtatum minimè accommodata, adeò ut perrarò integra, et illæſa reperiatur. Fructificationem in ciliis marginalibus obſervavit D. Lightfoot. notandum, tamen, eſt minùs accuratam eſſe deſcriptionem ciliorum tenuium fructificantium. p. 944. Reverà ſpecies hæc fructûs tempore fimbriata, potiùs quam ciliata,

[a] Idem obſervavit D. WOODWARD. ſed rariſſimè.

apparet,

apparet, adde etiam caulem undique fructificatione obſitum. Nuperrimè tantum; menſe ſc. Februario ſpecimina quam multa fructu copioſiſſimo mihi oblata ſunt. Forma fructûs vitro aucta, oblonga, pellucida, granulis tribus, aut quatuor coccineis intùs.

Hab. ad oppidum WEYMOUTH, *ſparsìm; in occidentali Angliæ parte, nec non in Walliâ, copioſiſſimè.*

RED FUCUS. PL. VII.

FUCUS. frond membranaceous, oblong, waved, indented; ſtalk round, branched. *Linn.*

PLATES.

Fl. dan. 552.—*Gmel.* 24. 1.

ROOT ſwelling from the bottom of the ſtalk.

STEM, round, woody, branched.

LEAVES, on footſtalks, mid-ribbed, veined, crenated, often laciniated.

FRUCTIFICATION, at the edges, on the leaves and on the ſtalks; oblong clear veſſels with blood-red ſpots.

OBSERVATIONS.

THIS is a moſt beautiful ſpecies, and very accurately deſcribed by Lightfoot, p. 943. Its texture is delicate, and the leaves veined as in trees: the edges are toothed or crenated, from whence it had the name of F. *crenatus* given it by Gmelin. The colour is fainter than in F. *ſanguineus*, having often greeniſh and olive tints. The form of the leaf is variable, as it often becomes in a manner palmated at the tips. The ſtalk is branched and extended, and garniſhed throughout with leaves of every ſize, but chiefly ſmall ones; and the ſame is obſerved in the mid-rib, and even in the ſmaller veins of the leaves; a mode of vegetation which I have never obſerved in any other plant. The F. *ſanguineus*, which is nearly allied, has * ſometimes ſome ſmall leaves on the mid-rib of the leaf, but I have obſerved it very rarely. It ſhould ſeem that this peculiar mode of producing leaves is to anſwer ſome peculiar end in the œconomy of this plant. The membrane, being ſo extremely delicate, in all probability, ſoon vaniſhes either from the force of the waves, or the bite of inſects, while the mid-rib and ſtronger veins remain as branches, which are in this manner provided beforehand with a crop of incipient leafits. Its fructification is beautiful, and I rather think rare. The edge of the leaf becomes richly fringed, as likewiſe the branches; the *cilia* either ſwell or totally diſappear, and the little blood-red dots deſcribed above are viſible with the commoneſt magnifier, and ſometimes with the naked eye.

a. Part of a leaf magnified.

b. Part of the ſtalk with the fructification.

c. The ſame magnified.

d. A mucous veſſel with the imbedded granules.

Hab. common.

* See the Latin note.

FUCUS SANGUINEUS. TAB. VII.

FUCUS. frondibus membranaceis, ovato-oblongis, integerrimis, petiolatis; caule tereti, ramoſo. *Linn. Syſt. Nat.* 815.—*Mantiſſ.* 136.—*Moriſ.* 645.—*R. Syn.* 49.—*Gmel.* 185. *Hudſ.* 573.—*Lightfoot.* 942.—*With.* 3. 235.

RADIX, intumeſcens, ſubtus plana.

CAULIS, ligneus, breviſſimus, ramoſus.

FOLIA ampla, oblonga, obtuſa, fibroſa, margine integro.

FRUCTUS pedunculatus, ſubrotundus.

OBSERVATIONES.

MAGNITUDINE et pulchritudine foliorum F. ſanguineus palmam obtinet inter plantas ſubmerſas. Perrarò autem illæſus, et integer, imo vix unquam, niſi penitùs dilaceratus, obſervandum nobis ſeſe præbet. Diebus Halcyoniis quærenda eſt hæc ſpecies; membrana enim folii, quâvis cuticulâ tenuior, ſimplici maris æſtu facillimè diſrumpitur. A formâ foliorum *Lapathi ſanguinei marini* nomen olìm obtinuit. Caulis breviſſimus in tres vel plures ramulos ſtatìm è radice dividitur, ligneus, nodoſus, atro-rubens. Folia, pauca, ampla, oblonga, coſtâ, et nervis donata, producuntur; color roſaceus; in quibuſdam, ut nomen indicat, ſanguineus; aliquando etiam gilvo variegatus. Foliola ad coſtam folii, ut in F. rubente, quandoque ſed perrarò occurrunt. D. BORLASE, in Hiſt. Cornubiæ, F. *ſenſitivum* appellat; folia enim exſiccata, tacta manu recedunt, et vi quâdam elaſticâ trepidant. Fructificationem adhuc nunquam obſervavi; [a] juxta radicem, vel potiùs baſim folii, fructum orbicularem, pedunculatum nigrum detexit Œderus, Fl. Dan. t. 349. Idem obſervavit D. Hudſon. 573. In hoc quidem differt à F. rubente, qui, quando eſt fructifer, omnium apparet fœcundiſſimus.

Hab. præcipuè apud DAMMONIOS.

[a] D. Woodward. mandat mihi fructum pedunculatum à ſe in coſtâ folii reperiri.

DOCK-LEAVED FUCUS. PL. VII.

FUCUS. leaf membranaceous, egg-oblong, very entire; on leaf ſtalks: ſtem round, branched. *Linn. Syſt. Nat.* 815.—*Mantiſſ.* 136.

PLATES.

Gmel. 24. 2.—*Fl. Dan.* 349.—*Gif.* 1. 24.—*Moriſ.* XV. 8. *row.* 1—6.

ROOT, flat at bottom, ſwelling from the ſtem.

STEM, very ſhort, woody, branched.

LEAVES, oblong, obtuſe-pointed; margin ſmooth, with a mid-rib, and branching veins.

FRUCTIFICATION, roundiſh, on footſtalks.

OBSER-

OBSERVATIONS.

This elegant Fucus was not noticed by Linnæus in his early publications, and from the account of Ray it appears to be confined to the [a] Weſtern ſhores of this Iſland. Unleſs by a rare accident, it is never met with in a perfect ſtate. I have found it at Weymouth, and from thence down the coaſt to the Land's End. Its favourite ſituation is in deep bays, and protected from the Weſterly winds. Mounts-bay in Cornwall abounds with it. Though Authors mention the leaf as extending to a foot in length, I have rarely found it of ſix inches; its breadth is about an inch and half; it is rounded at the tip, and has been thought to reſemble the *Rumex obtuſifolius* or broad-leaved Dock, from whence its name. The root is ſwelling, and with a flat baſe adhering to rocks, and the ſtem or branches very ſhort in proportion; ſcarcely one ſixth of the length of the leaf. The ſubſtance of the leaf is as thin as Gold-beater's ſkin; its colour, pink, or red; often barred acroſs with faint ſtripes of a dull pinky yellow, like the ſtripes in the leaf of a tulip. The leaves are in general few in number, though occaſionally there are cluſters of them. The fructification differs eſſentially from its kindred plant. Among the numbers I have ſeen I have not yet diſcovered it; it is deſcribed by Œder and Hudſon, as a roundiſh, black-red fruit, fixed on the footſtalk of the leaves, and ſometimes [b] higher up. It is right to notice that there is a ſucceſſion of minute leaves at the bottom, and that here and there are to be met with ſmall leaves budding forth from the mid-rib of the leaf, as in F. *rubens*.

Hab. Weſtern ſhores of this Iſland, Ireland, Guernſey; ſometimes on the Eaſtern Coaſt, as at Yarmouth.
Mr. Woodward.

[a] This muſt not be underſtood excluſively, as Mr. Woodward has gathered it very perfect at Yarmouth.

[b] See the Latin note.

FUCUS TOMENTOSUS. TAB. VII.

FUCUS. fronde ſubtereti, craſſa, ramoſa, ſubdichotoma, furcata, tomentoſa, angulis ramulorum, rotundiuſculis. *Hudſ. Fl.* 584.—*Hiſt. Ox.* 3. 647.—*R. Syn.* 29. 3, 4.

RADIX, è baſi caulis intumeſcens, ſubtus plana, ſaxis agglutinata.

CAULIS, ſub-teres, craſſus, brevis, tubuloſus.

RAMULI, ſub-teretes, tomentoſi, angulis ovalibus, vel rotundiuſculis.

OBSERVATIONES.

Species hæc nullibi, ut opinor, niſi apud Danmonios occurrit. Ramuli pennæ anſerinæ magnitudine, ordine plerùmque dichotomo proveniunt. Planta recens, in arenâ projecta, vel ſub aquis immerſa, ſpongiæ ad inſtar humore repleta eſt; propiore autem inſpectu fibrillis lanoſis, ut ope microſcopii obſervavimus, intertexta eſt. Ramuli tubuloſi muco tenui implentur; tranſversìm autem, vel per longitudinem ſecti, vi elaſticâ adeò contrahit ſeſe cuticula, ut fructificationem intus, ut videtur, latentem indagare, fruſtrà adhuc laboraverim. Color amœnè viridis exſiccatione, ut in Fucis quamplurimis, ſtatìm nigreſcit. Obſervandum eſt, characterem F. tomentoſi

tomentoſi apud Hudſonum "fronde compreſſa, dichotoma, obtuſa" quodammodo cum plantâ noſtrâ convenire; minimè autem F. elongati apud eundem, qui, ut rectè admonet, D. Woodward. F. loreo perquam affinis eſt. Rectiùs, ut videtur, Moriſonus noſter, [a] "F. ſpongioſus, teres, ramoſus, viridis, erectus," quem tamen, nunquam à ſe viſum, ut ſuſpicor, F. elongato incautè aſcivit LINNÆUS. Nec dubium eſt quin "Spongia dichotomos" Raii, Syn. 29, 3, 4. huc referri debeat: plantula ſc. quæ, ut ſub aquis, aut exſiccata, oculis ſubjecta fuerit, vel ſpongioſi, vel tomentoſi, characterem apud Botanicos obtinuit.

Hab. in littoribus Devoniæ et Cornubiæ: copioſè in rupe Long Rock *dictâ, prope oppidum* PENSANCE. Hon. Mr. WENMAN.

[a] Moriſ. Hiſt. Ox. 3. 647.

DOWNY FUCUS. PL. VII.

FUCUS. frond roundiſh, branched, velvety, obtuſely forked at the tips: the angles of the forks and branches roundiſh.

PLATES.

Moriſ. Hiſt. Ox. 15. t. 8. f. 7.

ROOT ſwelling out from the bottom of the ſtem, flat underneath, agglutinated.

STEM ſhort, roundiſh, hollow within.

BRANCHES, roundiſh, tubular, downy, forked, ſub-dichotomous.

OBSERVATIONS.

THIS ſpecies, which moſt probably occurs no where in England, but on the coaſts of Devon and Cornwall, has occaſioned much confuſion to modern Botaniſts. Its general height is about ſix inches; the branches of nearly an equal ſize throughout, which is that of a ſmall quill. It ariſes from a ſingle ſtem; is generally dichotomous, and buſhy in its habit; forked at the tips, with the points obtuſe. When taken freſh from the ſea, or viewed in a baſon of water, it has the appearance of a ſponge; when a little drained, it has a moſt beautiful and ſoft, velvety appearance; and when quite dry, and in a ſtate of preſervation in the cabinet, it appears to the eye, and ſtill more with the aſſiſtance of a glaſs, to be wholly compoſed of black woolly fibres. Hence it has been called alternately woolly, downy, or ſpongy; nor has its nature been known to thoſe, who have not viſited it on the ſpot. It is accurately deſcribed as a ſponge by our countryman Ray, Syn. p. 29. 3, and probably 4. as likewiſe by Moriſon, Hiſt. Ox. 3. p. 647. whoſe figure is a pretty faithful repreſentation of it. The colour of the recent plant is a beautiful graſs green, ſometimes inclining to olive.

Hab. On the Devonſhire and Cornwall Coaſts: on the Long Rock *between* MARAZION *and* PENSANCE *plentiful.* Hon. Mr. WENMAN.

FUCUS PLICATUS. TAB. VII.

FUCUS. fronde cartilaginea, filiformi, ramoſiſſima, implicata, diaphana. *Hudſ.* 470. 589.

..... fronde capillari ..... ramulis, ſubſecundis implicatis diaphanis. *Lightfoot.* 929. *Gmel.* 142.

RADIX, ſubtus plana?

CAULIS, capillaris, intortus; (plurimi ſimul naſcentes, implicati).

RAMULI filiformes, implicati, ſub-ſecundi, ramulis nullo ordine breviſſimis.

FRUCTIFICATIO, exigua, globoſa, lateralis.

OBSERVATIONES.

FUCUS hic, à LINNÆO prætermiſſus, Plukenetii tabulæ 184, refertur, etſi haudquaquam ut obſervavi "coloris aurei." Varietates duas conſtituit D. Hudſon. ed. 1ma 470, plantas ſc. Doodii. App. 329, 330, quæ tamen à Raio, Syn. n. 26 and 27. p. 51, ut ſpecies diverſæ reputantur. Rarò admodum in arenâ recens projicitur, adeò ut minimè mirum ſit, ſi inter ſe diſcrepent Botanici. D. Lightfoot. plantam recentem, et exſiccatam obſervavit, et utramque accuratiſſimè deſcripſit. E radice, quam nunquam adhùc obſervavimus, plures exire videntur cauliculi filiformes, implicati; ramulis nullo ordine diſpoſitis, uniformibus, ſub-ſecundis; è quibus ramuli alii breviſſimi; ſive pullulantes ſolùm, ſeu fructificantes, ſparsìm naſcuntur. [a] Ramuli hi, vitro aucti, ſummitatibus purpureis diaphanis conſpiciuntur. Magnitudo ramulorum filum emporeticum æquat; color, ad lucem purpureus, aliàs ſubfuſcus, apicibus frequenter pallidè luteis, et quaſi exſiccatis. Soli expoſitus citò indureſcit, et ichthyocollam ementitur. Fructificationem nunquam obſervavi; à D. LIGHTFOOT. globoſa exigua, lateralis deſcribitur, ideoque F. verrucoſo affinis videtur ſpecies. In ſpecimine penes D. Woodward. fructificatio terminalis reperitur.

Hab. In auſtrali et occidentali Angliæ littore frequens reperitur.

[a] Vid. *a.* in icone ubi ramuli aucti delineantur.

MATTED FUCUS. PL. VII.

FUCUS. frond griſtly, of an equal ſize, much branched, matted, ſemi-tranſparent. *Hudſ.* 470. 589.

..... frond capillary ..... little branches, moſtly one way. *Lightfoot.* 929.

PLATES.

Gmel. F. 14. 2.—*Fl. Dan.* 408.

ROOT

ROOT ſuppoſed to be flat at bottom.

STEM thread-ſhaped, crooked, horny; many together from the baſe, entangled.

BRANCHES, thread-ſhaped, entangled, growing without order, with ſhort budding ſhoots.

FRUCTIFICATION, ſmall lateral globules.

OBSERVATIONS.

THIS plant, like F. *ceranoides* of Hudſon, ſeems to be very rapidly blanched, when caſt on the ſands. Its cartilaginous, horny ſubſtance is undoubtedly the cauſe of it. On this account it is very rarely met with in a growing ſtate, which has occaſioned no ſmall confuſion among modern Botaniſts. Ray's n. 26, 53 and 57, in the Synopſis, p. 45, 51, have been ſucceſſively, and, perhaps, all of them erroneouſly referred to by different Authors. LINNÆUS makes no mention of it. It is well denominated from its mode of growth, being ſo entangled, and ſo horny and brittle as not to be unravelled. It may ariſe either from a flat baſe with numerous matted ſtems, or elſe, like F. *faſtigiatus*, it may have a fibrous origin. I have never ſeen it perfect at bottom, and ſuſpect from the ſubſtance being ſo brittle, that the root is ſeldom torn off with the plant. Numerous branches are produced in all directions, which grow in a kind of net-work; the principal of which are furniſhed with very ſhort, budding, or fruiting branches; the height of this plant rarely exceeds 6 inches; the ſize of ſtem and branches is not bigger than ſmall packthread; the purple colour does not appear, but when held to the light, or in the ſummits of the buds; in other ſituations it is of a dark brown, and not unfrequently the ſummits are light coloured and tranſparent. Gmelin mentions it, as an orange-red, which muſt be a foreign variety, or, perhaps, a different plant. The fruit, as deſcribed by Lightfoot, ſhews its affinity to F. *verrucoſus*. When found blanched, which is the uſual appearance, it reſembles the ſtrings of a *Kit*, or ſmall fiddle, matted together.

a. A ſingle plant detached.

b. A branch with the budding ſhoots magnified.

Hab. at WEYMOUTH, *and on all the W. Coaſt, plentiful.*

FUCUS ACULEATUS. TAB. VIII.

FUCUS. fronde filiformi, compreſſa, ramoſiſſima; dentibus marginalibus, ſubulatis, alternis, erectis. *Linn. Syſt. Nat.* 814.

..... ramis ſparſis, ſpinis mollibus alternis. *Linn. Sp. Pl.* 1161.—*Gmel.* 130.—*Hud.* 485. *R. Syn.* 48.—*Lightfoot.* 924.—*With.* 3. 259.

RADIX orbiculata, ſubtus plana.

CAULIS, lævis, ſolidus, rotundus.

RAMULI ſub-compreſſi, prælongi; ramulis aliis ſparſis; ſpinis mollibus.

FRUCTIFICATIO, axillaris, obtuſé echinatus, per maturitatem expanſus.

OBSER-

OBSERVATIONES.

Species hæc in quibuſdam cornea admodum et tenax, in quibuſdam ſubſtantiæ penè gramineæ, è profundo mari in littus projicitur. Caulis pennæ anſerinæ magnitudine, brevis, inflexus, ſolidus, lævis. Ramuli prælongi, compreſſi; ſpinis per totam longitudinem alternis, erectis, acutis, mollibus. Ramuli hi primarii undique aliis obſidentur, nullo ordine diſpoſitis, triuncialibus, (aut ſuprà) ſpinoſis, compreſſis. Obſervandum eſt habitum magnoperè variare: in quibuſdam individuis, ramuli ſparsìm producuntur; in aliis ita dènsè congeſti ſunt, ut caudam equinam, ut rectè obſervavit D. Gunner, quodammodo referre videatur Fucus hic. Haud equidem certè ſcio, an ſpecies ſint diverſæ, vel ſolummodò varietates; minùs accurata tamen F. caudati deſcriptio apud D. Lightfoot. p. 926. Caulis enim, ut ſuprà notavi, rotundus, craſſus; ramuli autem ſemper ſunt compreſſi, et cùm color luteo-viridis, et fuſcus in eâdem plantâ haud rarò reperiatur minimè mirum eſt ſi unus et idem ſit F. aculeatus et F. caudatus. Fructificationem huc uſque latentem nuperrimè detexi. In axillis ramulorum producitur fructus, obtusè echinatus, irregularis, per maturitatem ſeſe expandens, ſubſtantiâ intus granulatâ. Nonniſi hyeme fructiferum eſſe ſuſpicari libet, menſe enim Februario collegi. Si dentur ſpecies duo, Fuco caudato referenda eſt hæc deſcriptio. Etſi character eſſentialis Linn. ſatis aptè conveniat, notandum eſt obitèr, nomen triviale "muſcoidis," et obſervationem ut "exſiccatus nequeat a Muſcis diſtingui," Sp. Pl. 1630. minimè convenire cum plantâ noſtrâ. Fucus etiam fæniculaceus Raii Hiſt. 3. 13. in ſegmenta adeò tenuia capellacea, brevia, &c. diviſus, toto cœlo, ut videtur, à Fuco aculeato differt.

Hab. juxta Promontorium Portland Head *dictum, nec non in occidentali Angliæ littore copiosè.*

Prickly FUCUS. PL. VIII.

FUCUS. frond thread-ſhaped, compreſſed, much branched: marginal teeth awl-ſhaped, alternate, upright. *Linn. Syſt. Nat.* 815.

····· branches without order, prickles ſoft, alternate. *Linn. Sp. Pl.* 1161.

PLATES.

Fl. dan. 355.—*Hiſt. Ox.* xv. 9. *row.* 1. 4.—*Gmel. Lib.* 12.

ROOT ſwelling, flat at bottom.

STEM round, ſmooth, ſolid, horny.

BRANCHES, compreſſed, extended; with alternate, ſharp, ſoft prickles.

FRUCTIFICATION at the ſetting in of the branches, near the bottom, irregular, obtuſely echinated, expanded.

OBSERVATIONS.

This Fucus inhabits deep waters, and is often caught in the Fiſherman's Trawl, as well as thrown on the ſhore. Its ramification is ſingular, and has cauſed it to be compared to the tail of a ſorrel horſe. The principal branches are much extended, and come out from one, to three or more, from a crooked, twiſted, wiry ſtem of the ſize of a ſmall quill. This ſtem is of a ſhining ſmoothneſs, either of an olive, or browniſh red colour, and being cut through appears to be ſolid. The primary branches, which are often two feet long, are garniſhed

through

through their whole length with branches coming out without order, uſually ſingle, but ſometimes two, or more together, all nearly of a length, which is about four inches, and theſe branches have occaſionally other ſmaller ones. Both primary and ſecondary branches vary little in ſize from each other, and are beſet on each ſide, with crooked, ſharp alternate prickles pointing upwards. This plant, which is by no means uncommon with us, has occaſioned ſtrange perplexity among Authors. [a] Though well deſcribed, as to the ſoft ſpines, it does not appear to have been known to LINN. otherwiſe he would not have referred the Fennel-leaved F. of R. Syn. 3. 13. to it, or have made the obſervation, that "when dry it reſembled a Moſs." Sp. Pl. 1630. It is ſtrange this ſhould have eſcaped the penetration of Lightfoot, who certainly was well acquainted with the plant in all its forms. This latter author has given a var. (β), which probably is only an older, and more luxuriant plant. It is ſtrange that the thick fleſhy ſtalk is not noticed. Lightfoot ſays expreſsly the ſtalk is very ſmall: Major Velley ſays thread-ſhaped. With. Bot. Arr. 3. 260. I have many that anſwer this deſcription, but I incline to think the elder plants, having their heads either torn off by the ſea, or eaten off by fiſh, ſwell into thoſe woody, crooked, cylindrical ſtems from whence the principal branches are thrown up. I was fortunate enough to procure this plant in ſeed this Winter, and, as I have before obſerved, I ſuſpect the fruiting time of many Fuci to be during the Winter months. It conſiſts of an irregular, echinated, wart-like excreſcence coming out near the bottom at the ſetting on of the branches. It expands, when ripe, and falls down round the branch, expoſing to view a beautifully granulated ſurface, yellowiſh, ſtudded with brown.

a. a. The Fruit, natural ſize.

b. The ſame, magnified.

Hab. at the Bill *of* PORTLAND ISLAND, *and on all the S. Coaſt of Devon and Cornwall.*

[a] Though the Linnæan ſpecific character is adopted both in Lat. and Eng. it muſt be remarked that it was moſt probably intended for a different plant, though ſtrikingly characteriſtic of this.

FUCUS VERRUCOSUS. TAB. VIII.

FUCUS. fronde filiformi, tereti, ramoſa; ramis alternis ſubdiſtychis, longiſſimis uniformibus; (*fructu verrucoſo, ſparſo, laterali*). *Lightfoot.* 928.—*Hudſ.* 1. *ed.* 470, 588.—*With.* 3. 256.—*Ray. Syn.* 51.

RADIX orbicularis, ſubtus plana.

CAULIS filiformis, teres, ramoſus.

RAMULI, longiſſimi, filiformes, nullo ordine, quandoque plures ex uno latere.

FRUCTUS, ſub-globoſus, lateralis.

OBSERVATIONES.

SAXIS, lapillis, conchiſve agglutinata longiſſimè extenditur ſpecies hæc; ramulis ejuſdem ferè magnitudinis à radice ad ſummitatem filiformibus, ſc. diaphanis, teneris. Juxta baſim juniores naſcuntur ſurculi, ramis avulſis ſuppeditandis, ut in F. faſtigiato, obſervavimus, deſignati. Tempore fructificandi verrucæ ſub-globoſæ, laterales, pro magnitudine plantæ ſatis amplæ (non, ut ait Gmel. *parvulæ*) producuntur. Veſiculæ minus rectè nominantur à D. Hudſ. ed. 1. p. 470; ſolidæ enim ſunt, aut ſaltèm muco ſpiſſo admodùm repletæ. Fucus hic à D. Lightfoot. p. 928. *flagelliformis* vocatur, ſatis aptè quidem, ſi longitudinem ſpectes in quibuſdam individuis,

dividuis, apud nos communitèr pedalis, vel etiam ſemi-pedalis reperitur. Maris æſtu irretitus, et in nodum collectus in arenâ projicitur, ita ut F. plicatum quodammodò referat; facilè autem diſtinguitur ſubſtantiâ tenerâ admodùm, et gelatinosâ, necnon magnitudine fructûs. Color roſaceus, in quibuſdam olivaceus, ferè ſemper ad radices ruber, ut in icone. Fucus plicatus, è contra, ligneus admodùm, ramulis, non maris æſtu, ſed modo creſcendi, implicatis.

Hab. in littoribus Devoniæ et Cornubiæ.

WARTY FUCUS. PL. VIII.

FUCUS. frond briſtle-ſhaped, cylindrical, branched; branches alternate, very long, of one ſize throughout: fructification warty, ſcattered, lateral.

PLATES.

Fl. Dan. 358. 650.—*Gmel. f.* 13.—*Act. Gall.* 1712. *t.* 5. *f.* 9.

ROOT orbicular, flat at bottom.

STEM briſtle-ſhaped, cylindrical, branched.

BRANCHES, very long, ſize of the ſtem, without order, many from one ſide.

FRUCTIFICATION wart-like, ſcattered, lateral, large.

OBSERVATIONS.

THIS plant affixes itſelf to pebbles, ſhells, &c. and is frequently thrown on the beach in a growing ſtate. Its uſual length with us ſeldom exceeds 6 or 9 inches; though Lightfoot, who calls it *flagelliformis*—WHIPCORD FUCUS, has found it 2 feet long. The baſe is a ſmall knob firmly adhering to its place of growth, which ſends out a few long ſtraggling branches of one uniform ſize throughout—that of packthread. The baſe, or root throws up a ſucceſſion of ſhoots, which are intended to ſupply branches in the place of thoſe, either torn off, or eaten by the fiſh. Its ſubſtance is tender and tranſparent: the colour roſe, or olive; and, not unfrequently, the former near the root, with the upper part olive. This plant, being tender and flexible, is apt to be much entangled by the waves, ſo as to occaſion a difficulty in ſeparating. During the Summer months, the fructification is commonly to be met with, and is very conſpicuous (not *minute*, as Gmelin and Lightfoot have deſcribed it), but large in proportion to the plant, [a] globular, ſeſſile, filled with *mucus* within, and coming out without any order on the ſides of the branches. This ſpecies, even in its entangled ſtate, may be eaſily diſtinguiſhed from [b] F. *plicatus*—matted F. which is very horny, ſtiff and cartilaginous, and appears to be matted and entangled, not by the waves, but by its peculiar mode of growth.

Hab. on the Coaſts of Devonſhire and Cornwall.

[a] Semi-globoſe, according to Mr. Woodward, and probably the Engliſh term *Warty* beſt expreſſes the idea which is flat at the baſe, or point of contact with the ſkin.

[b] See F. plicatus. Pl. VII.

FUCUS

FUCUS ARTICULATUS. TAB. VIII.

FUCUS. fronde articulata, ramoſiſſima; articulis ovato-cylindricis; ramis oppoſitis, et verticillatis. *Lightfoot.*

ULVA. tubuloſa, ramoſiſſima articulata: articulis cylindricis; ramis oppoſitis. *Hudſ.* 476. 569.—*Lightfoot.* 959.—*With. Bot. arr.* 3. 240.

RADIX è baſi caulis intumeſcens, ſubtus plana.

CAULIS, brevis, ovato-articulatus.

RAMULI ovato-articulati, oppoſiti, ad nodos aliquando verticillati.

FRUCTIFICATIO in punctulis, rotundis, juxta ſummitatem immerſis.

OBSERVATIONES.

PLANTA hæc apud Hudſonum inter Ulvas enumeratur, et ſi fructificationem in ſubſtantiâ articulorum *immerſam* perpendamus, inter Ulvas adhuc forsàn recenſenda eſt. In tantâ fructificationis obſcuritate, ſi dentur genera intermedia inter Fucum, et Ulvam, ſpecies hæc, una cum F. verticillato, F. repenti, et aliis fructu punctato, *immerſo*, locum ſuum ſeorsìm obtinebit. Utcunque ſe res habet, duplicem Fuci fructificationem, "villoſam, et granulatam," in hâc ſpecie incaſsùm perſcrutabimur. Affinis videtur F. verticillato, et F. repenti. E baſi planâ caulis aſſurgit brevis, ramulis undique oppoſitis, foliolis, ſeu potiùs articulis, binis ſæpiſſimè, aliquando quaternis ad nodos articulorum. Articuli ſinguli, ut rectè obſervat D. Lightfoot. ovato-cylindrici, apicibus acuminatis; gelatinoſi, tubuloſi. Altitudo plantæ rarò triuncialis; color, vel roſaceus, vel dilutè purpureus; haud rarò etiam luteo-viridis; ſplendens, pellucidus. Varietas occurrit articulis compreſſis, et, ut videtur, ſolidis, rariùs ad nodos verticillata cujus occurrit deſcriptio ſub nomine Corallinæ in Synopſi Raii 34. Obſervandum eſt F. repentem D. Lightfoot. 964 etſi articulatione affinis ſit, minimè pro varietate hujus ſpeciei recenſendum eſſe. In Walliâ ad oppidum *Tenby* frequentèr collegimus, cartilagineum et tenacem, rupibus præruptis, maris æſtui oppoſitis firmitèr adhærentem, ope fibrillarum vel radiculorum. Fuco articulato nulla ferè eſt ſpecies vulgatior in Cornubiâ, nec eſt piſcibus, vel inſectis marinis alendis, accommodatior. Species hæc ferè ſemper paraſitica eſt, et nunquam, ut ſuſpicor, è nudo ſaxo oritur.

Hab. In Devoniæ et Cornubiæ littoribus.

ARTICULATED FUCUS. PL. VIII.

FUCUS. frond jointed, very much branched; joints egg-cylindrical, tubular; branches oppoſite, with "occaſional" whorls of 2 and 4. *Lightfoot.* 959.

ULVA. tubular, jointed, branches oppoſite, forked. *Hudſ.* 569.

PLATES.

Hiſt. Ox. XV. 8. *row.* 2. 14.

ROOT ſwelling out from the ſtalk, flat beneath.

STEM ſhort, ſlenderer than the branches, jointed; joints egg-cylindrical.

BRANCHES oppoſite, jointed, ſwelling in the middle, whorls of leafits in 2 and 4.

FRUCTIFICATION, blood-red dots imbedded.

OBSERVATIONS.

It is remarkable that this ſpecies, ſo common with us, is omitted by Linnæus. Its particular mode of growth, the branches reſembling ſtrings of oval beads, ſharp at each end, give it the appearance of ſome of the geniculated *Conferv*æ, and ſtill more of ſome of the Corallines. Lightfoot and Dr. Withering claſs it among the *Fuci*, and, though it may be more nearly related to that Genus than to *Ulva*, yet from what I have remarked on the eſſential character of *Fucus*, it will, I truſt, be abſolutely neceſſary to ſub-divide that Genus. There appear to be ſeveral varieties differing in ſize and colour, as well as in the flatneſs or roundneſs of the joints: the uſual ſize from 2 to 3 inches high, pretty thickly branched; the branches, at firſt, oppoſite, towards the ſummits, dichotomous. The joints of the ſtem, and the branches, ſmall at bottom, bigger in the middle, and ſmall at the top. At the joinings often come out leafits, like the joints, but ſlenderer, in whorls of 4, or in pairs. It ſeems as if this appearance, which nearly connects it with F. *verticillatus*, does not take place univerſally, and only in the cylindrical ſpecies, as Hudſon and Ray mention nothing of it. The round jointed ſpecies is tubular, many of the compreſſed kinds appear to be ſolid; which, however allied in general habit, tenderneſs, and tranſparency, will keep them aſunder. Theſe plants are oftener Paraſites, than Rock plants: the ſtems of F. *digitatus* are covered with them. The colours, pink, pale purple, or yelloviſh green, beautifully tranſparent. The fructification, minute blood-red dots, imbedded in the upper joints.

Hab. common.

N. B. Since printing the Preface to this *Faſciculus*, wherein I deſcribed the mode of preſerving and diſplaying the ſpecimens, I have had a correſpondence with an ingenious * Friend, who is a very accurate Botaniſt, and he informs me *from his own experience*, that the larger and more ſucculent ſpecimens are apt to grow mouldy, even after they have been treated with all the attention I have recommended. This ariſes from the quantity of ſalts remaining after preſſure. To remedy this, he has ſteeped his plants in large earthen pans filled with freſh water for ſeveral days, changing the water twice or thrice a day; and by this method he has preſerved ſome fine ſpecimens of the largeſt kinds, which have kept their freſhneſs and beauty for ſeveral years, without the ſlighteſt appearance of any mouldy ſtains.

* The Rev. Mr. Baker, of Stouts Hill, Glouceſterſhire.

The ſection in Major Velley's Plate of F. *veſiculoſus*, which I had conſidered as a biſſected Air bladder, I find upon reference to the Plate and the Explanation, to be a tranſverſe ſection of the diſtended ſummit in a magnified ſtate. This has been kindly communicated to me by the Major himſelf.

It

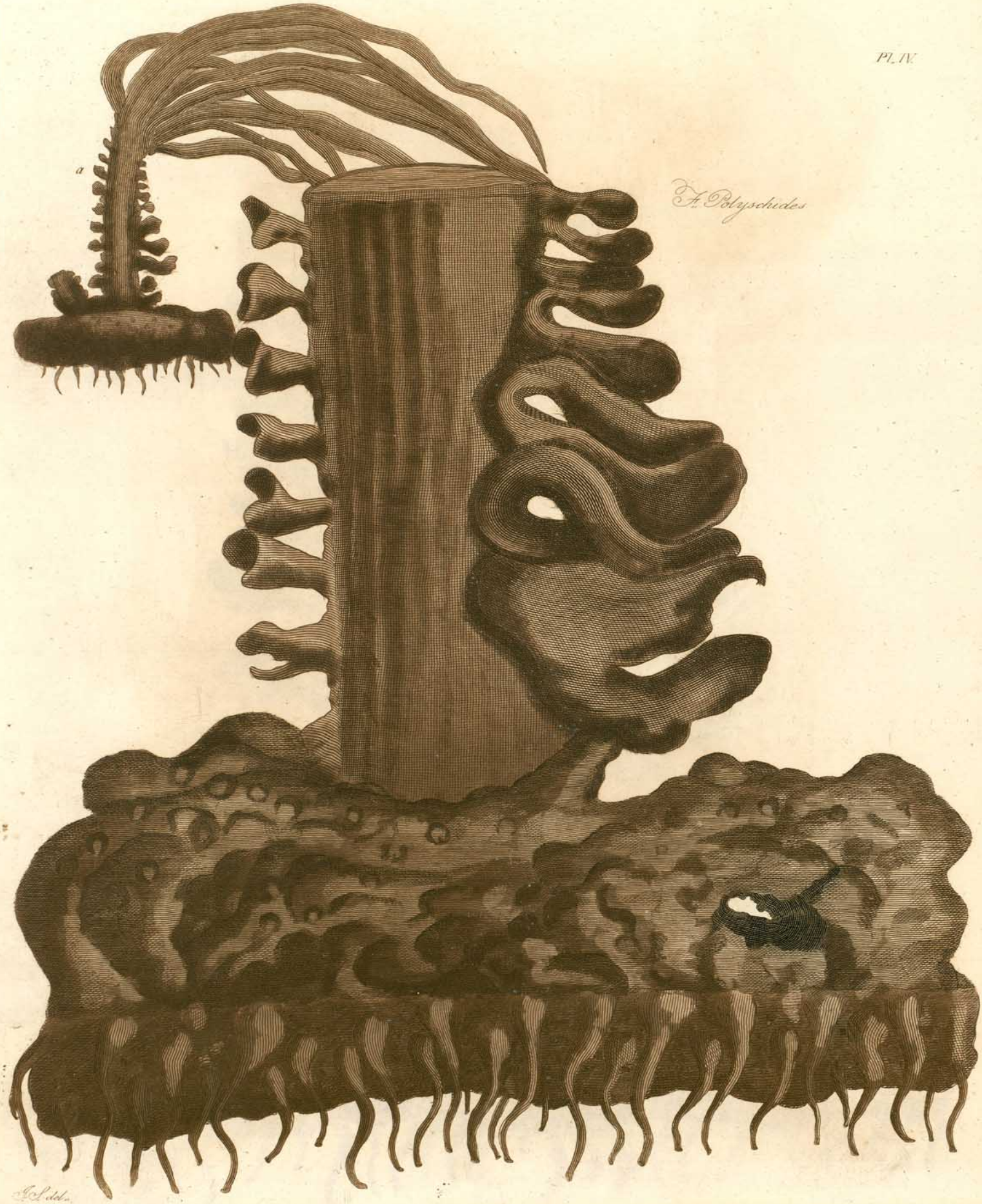
It may be neceſſary to repeat here, that the Theory of the *concealed fibrous fructification*, as far as regards F. *veſiculoſus*, reſts entirely on the ſilky filaments being found *conſtantly on the inſide of the bladder:* as this plant is furniſhed with imbedded, urn-ſhaped veſſels in the ſame manner as F. *ſerratus*, it may involve a difficulty, as ſuppoſing a two-fold male fructification; but the ſame does not hold with F. *ſiliquoſus*, where the filaments are found extended longitudinally acroſs the cavities of the pod. In treating too of F. ſperalis, it is inſinuated that F. *divaricatus* is not furniſhed with air-veſſels. The Plant I have taken for this ſpecies, has few, if any, and thoſe inconſiderable ones; but Lightfoot aſſerts it is veſiculated, and Major Velley's Obſervations confirm the fact. But notwithſtanding the difficulties which may attend the inveſtigation I cannot help being of opinion, from the ſilky filaments conſtantly found on the inſide coat of the air-bladder, that ſome further uſe than mere buoyancy is intended by Nature. May it not be to maturate the impregnating vapour, and to preſerve it from contact with water? However the caſe may be, it is hoped the attention of thoſe whoſe ſituation gives them an opportunity will be directed towards this ſubject.

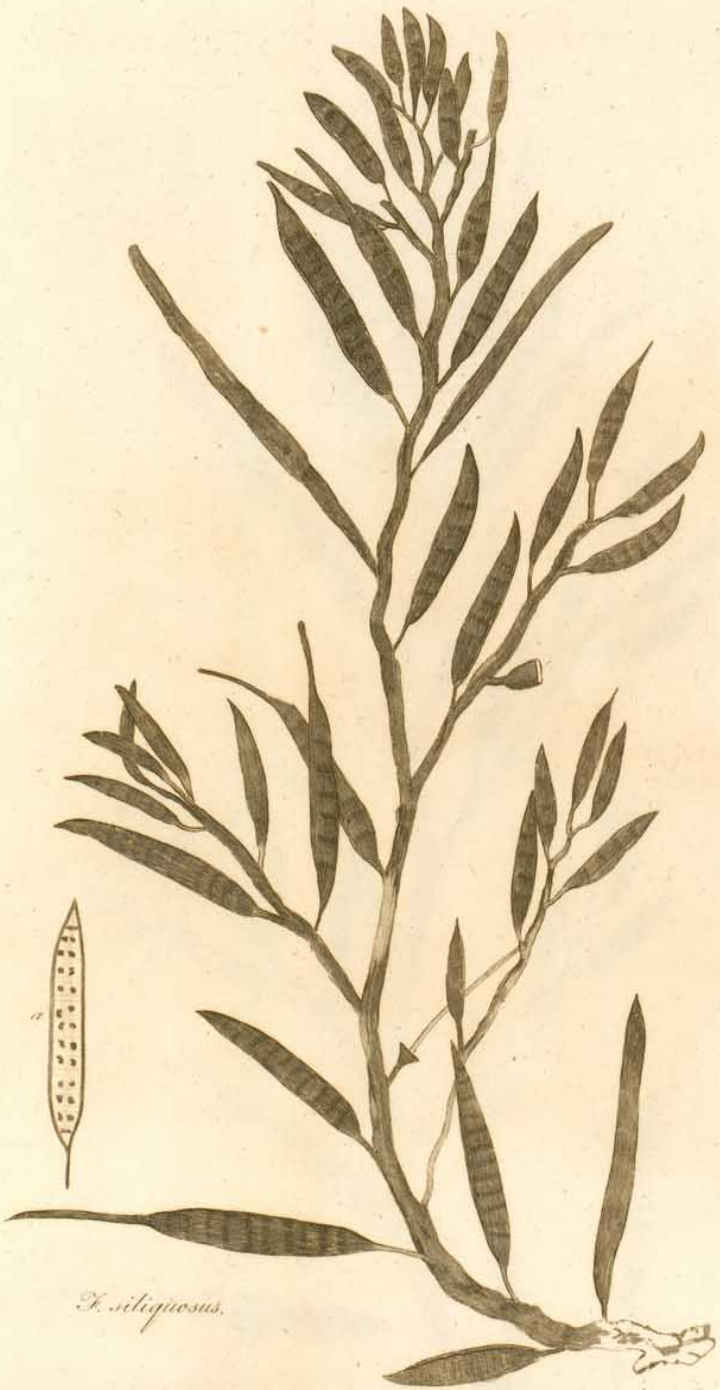
F. SANGUINEUS. *Pl.* VII.——Since the foregoing ſheets have gone to the Preſs, the Preſident of the Linn. Society has favoured me with a ſight of a Plant of this ſpecies, moſt beautifully fructified. By his permiſſion, the ſegments of the leaf ſtalk (*a.* natural ſize: *b.* magnified) have been delineated and inſerted in the Plate. Theſe fructifications will appear at firſt ſight to be very nearly ſimilar to thoſe on the ſtalks of F. *rubens*, and, if they are really pedunculated, the upper part of the pedicle is conſiderably incraſſated. It appears rather *pyriformis*—pear-ſhaped, which, with ſome undulations, is the form of the mucous fruit with the blood-red granules on the ſtem and the edges of the leaf in F. *rubens*, as will appear by the inſpection of the magnified Drawings of that Plant.

H. Vesiculosus

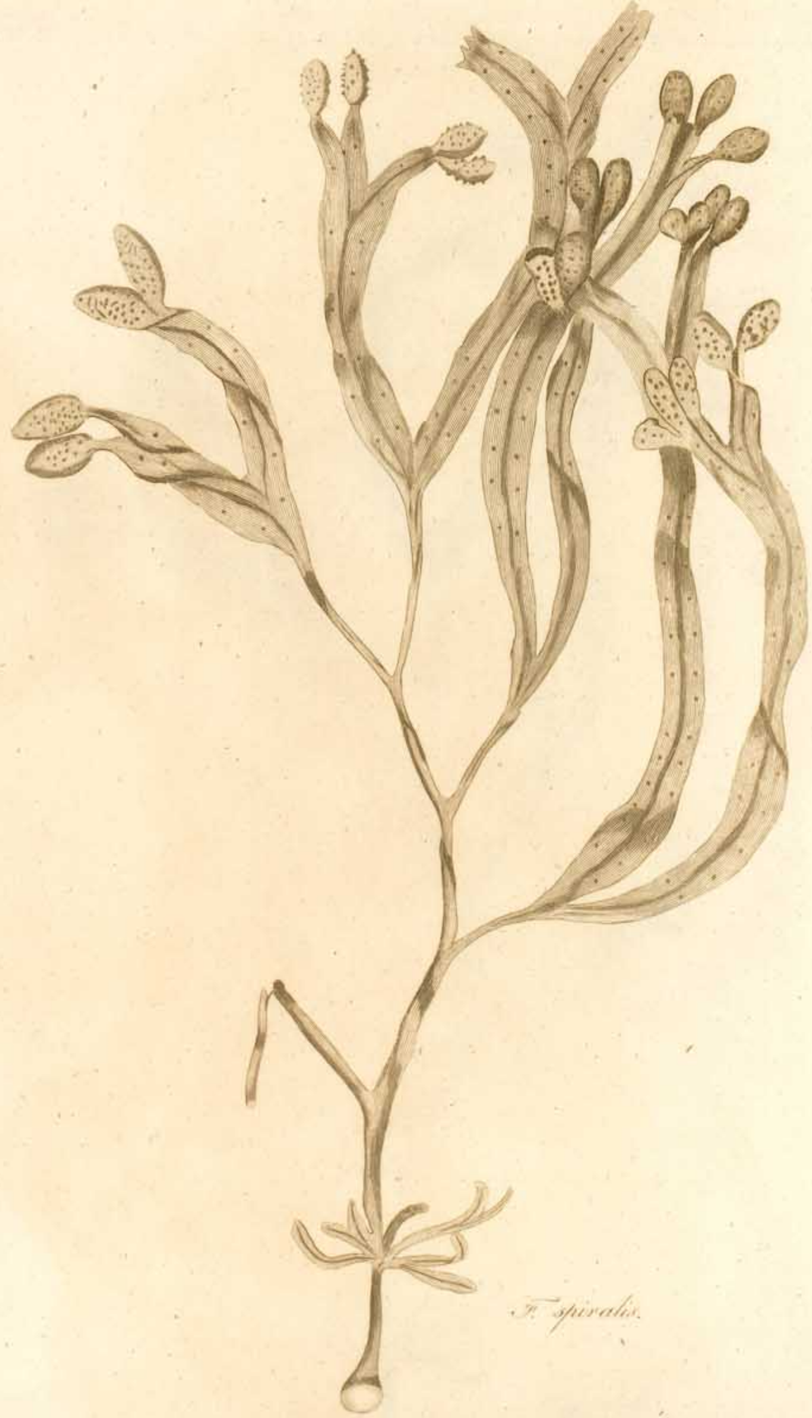
J. S. del.


F. Digitatus
a
a


a
F. Polyschides

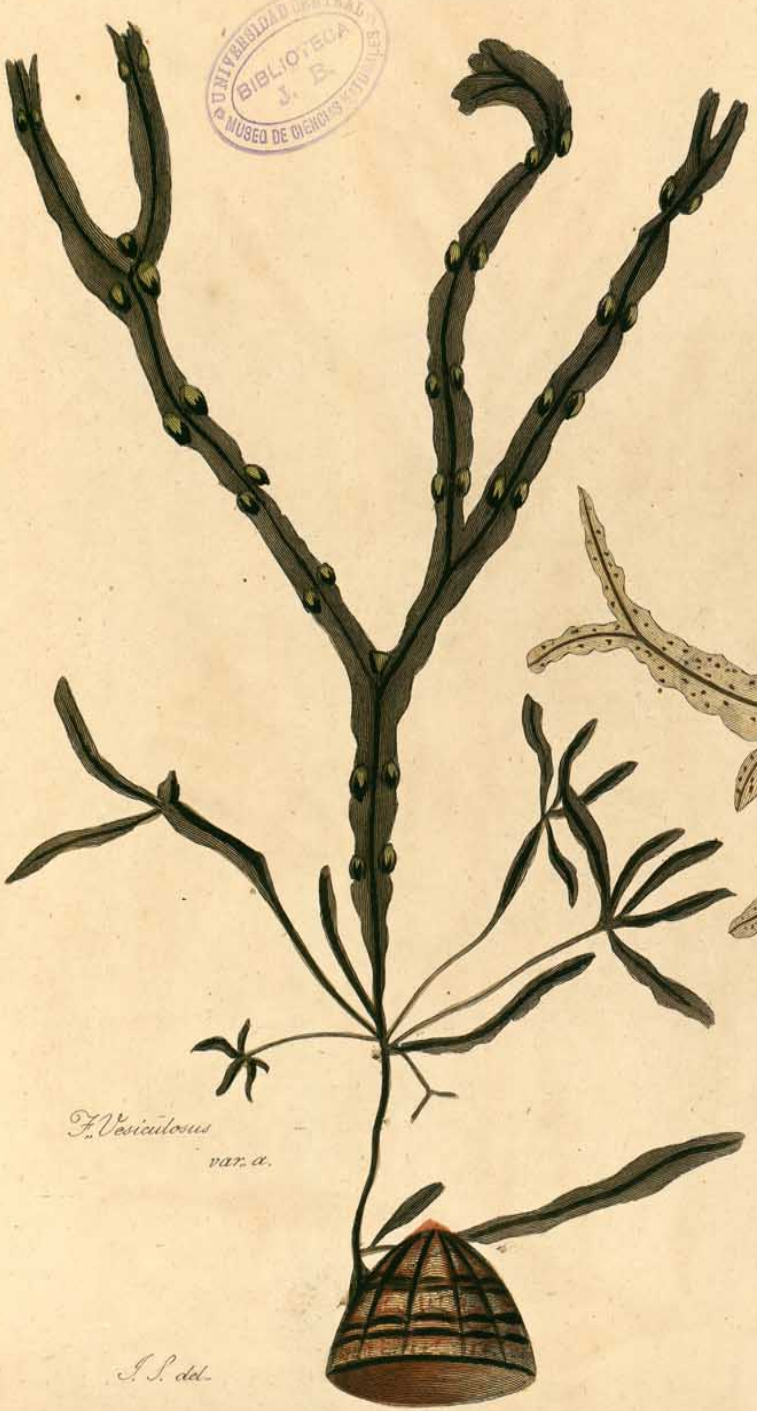


F. siliquosus.



F. spiralis.

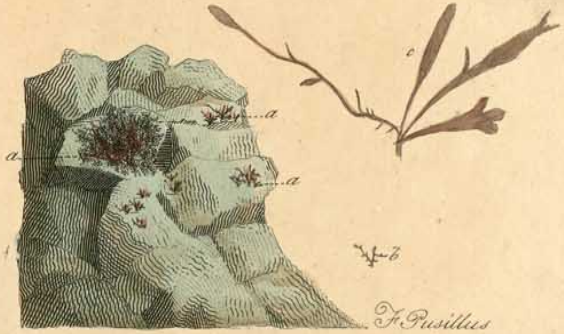
J. S. del.



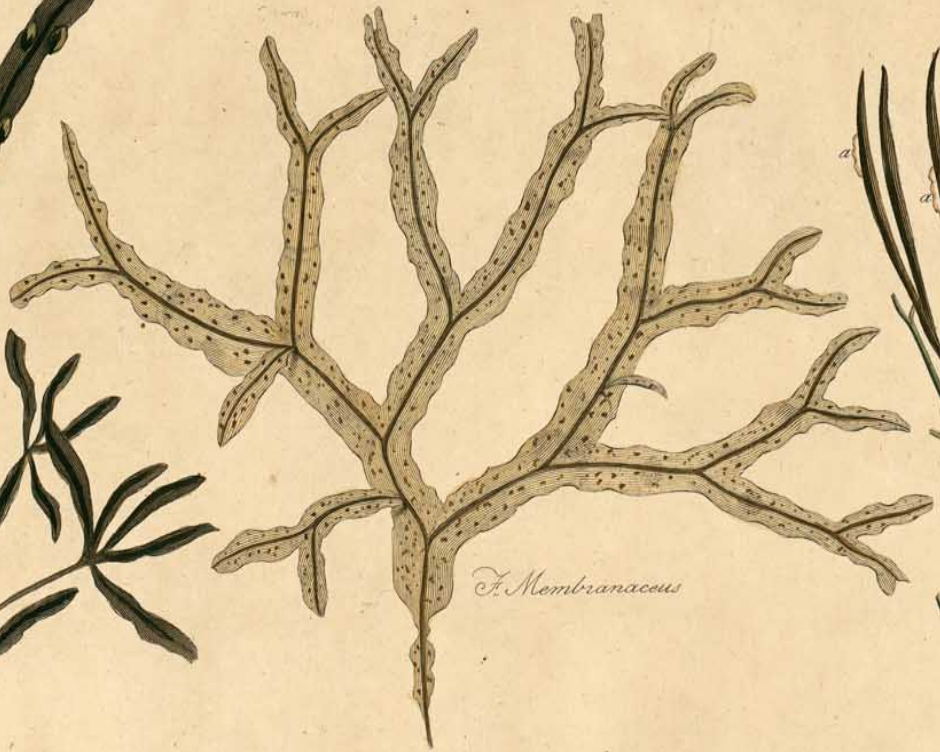
F. Vesiculosus
var. a.

J. S. del.

F. Fastigiatus



F. Pusillus



F. Membranaceus

a

F. Fastigiatus

F. Plicatus

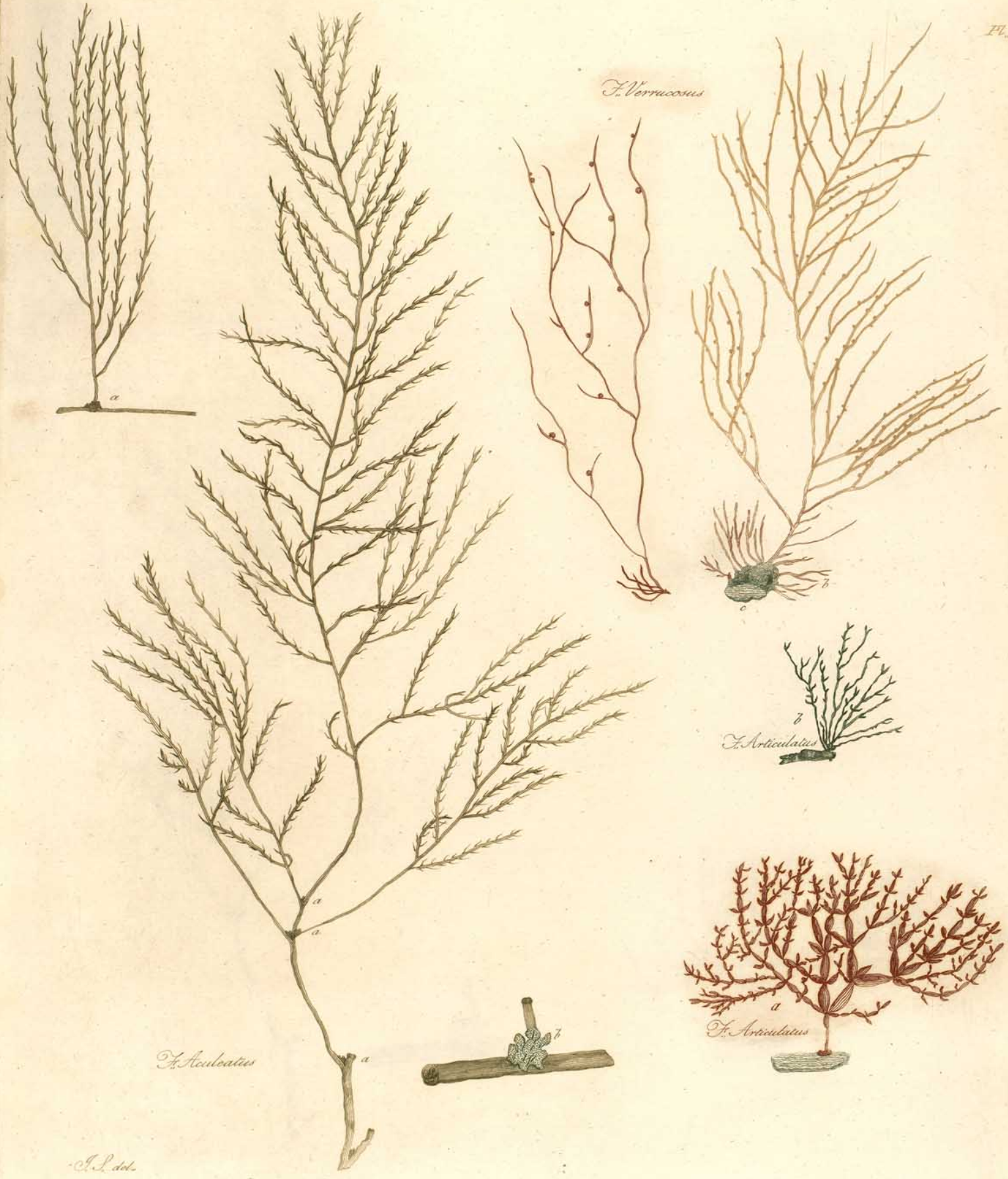
F. sanguinus

F. Rubens

F. Tomentosus

J. S. del.

Vide Pag. xiii.


F. Verrucosus
a
b
c
F. Articulatus
F. Aculeatus
a
a
a
b
F. Articulatus
J. L. del.