PHYSIOLOGICAL OBSERVATIONS

ON THE

STRUCTURE AND FRUCTIFICATION OF FUCI.

IN CONTINUATION.

A CONSIDERABLE Interval has elapſed ſince the Publication of my Second *Faſciculus*. This Delay has been occaſioned partly by the arduous nature of the Undertaking, and partly by the remoteneſs of my ſituation. This Interval, however, notwithſtanding any ſeeming inattention to the Public on my part, has not been miſemployed by me. I have been enabled very carefully to reviſe and correct what I have already publiſhed, and, what is a far more important Object, I have purſued my Inveſtigations on the different Species of *Fuci*, during their reſpective ſeaſons of Fructification in ſucceeding years.

The preſent *Faſciculus*, together with the Appendix, * contains all the Species compriſed under *Genus* FUCUS, which have been hitherto diſcovered in the Britiſh Iſlands; and will terminate, for the preſent at leaſt, a Work, which cogent reaſons have induced me to contract. † I have availed myſelf of all the aſſiſtance which a perſonal Examination of the *Linnean Herbarium*, the *Horti Sicci* of Dr. DILLENIUS and BOBART at OXFORD, and the copious and ſcientific collections of Meſſrs. WOODWARD, TURNER, PITCHFORD, and WIGG made on the NORFOLK Coaſt, as likewiſe the communications of my various Correſpondents and Friends in other parts of the Kingdom could afford me, in order, as much as poſſible, to ſettle every diſputed point.

I have it likewiſe in my power to add a Liſt of ſome foreign Synonyms that have not yet made their appearance in our language. Profeſſor ESPER has publiſhed a work at NUREMBERG entitled ‡ *Icones* FUCORUM *cum characteribus ſyſtematicis, ſynonimis* AUCTORUM, *et deſcriptionibus novarum ſpecierum*, 1798. This Work does not furniſh much original matter deſcriptive of the habits of the different Species, but is very copious in Synonyms, and the Author's Plates are in many caſes characteriſtic, but with that degree of ſtiffneſs which is unavoidable in copying dried Specimens. The learned Profeſſor does not appear to have ſtudied this *Genus* in its *growing ſtate*, and what ſeems extraordinary in the preſent times, he diſcards all inveſtigation into its Phyſiology: § indeed the exiſtence of ſeeds is in one place doubted by him.

* As many Species have been recently, and very accurately delineated, it would have added greatly to the Price of this Work, if I had given them *de novo*. However, for the accommodation of thoſe, who are not in poſſeſſion of thoſe Publications, or who may wiſh to have delineated Specimens of the whole Genus in one Work, I ſhall leave Drawings with the Lady who has coloured the Plates for this Work, of all the Species enumerated in the Appendix, and Sets to bind up with the Work will be ready to be delivered on application to the Publiſher.

† I at firſt meant to include CONFERVA and ULVA in this Work, but the length of time which the Inveſtigation of the preſent *Genus* has occupied, deters me from the undertaking. I have no doubt of its being executed by ſome abler hand. The *Confervæ* in particular, a very numerous Family, have had very little ſcientific pains beſtowed on them: nothing but drawings of their internal ſtructure under a Microſcope will be capable of illuſtrating them ſatisfactorily. Till ſuch a work appears, I would adviſe Collectors of Marine Plants to delineate in Pencil, or Colours, a ſmall bit under a microſcope to ſhew the internal ſtructure, and to lay down the Plant on the Paper underneath.

‡ This Work comes out in *Faſciculi:* the firſt contains 22 Species; the ſecond 33; two are in my poſſeſſion, and a third is ſince publiſhed.

§ "Kerne, oder Saamen, hat man noch nicht wahrgenommen: andere enthalten eine ſchleimigte Maſſe, in welcher aber keine Keime zur Pfortpflanzung zu bemerken waren." Eſp. Ic. p. 5.

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I have been much aſſiſted, with reſpect to Fructification, by the " Calendar of marine Plants," publiſhed by my Friend Mr. TURNER, in the Fifth volume of the LINNEAN TRANSACTIONS. Many Species of *Fuci* do not begin to fructify till late in the Autumn, and the proceſs is not mature till the middle of Winter, when moſt marine Botaniſts have quitted the Sea-ſide. This has been the reaſon why the Fructification of many Species has been hitherto unnoticed. I am happy to aſſure my Readers, that they will find this important point very conſiderably elucidated in the following Pages. A circumſtance of a curious nature has occurred in purſuit of theſe inveſtigations. Many Species of *Fuci* exhibit a remarkable variety in the mode of fructifying. *F. articulatus*, *F. coccineus*, *F. hypogloſſum*, *F. incurvus*, *F. diffuſus*, are among the number. Sometimes theſe dimorphous Fructifications, if I may ſo call them, are found on different branches of the ſame Plant, but more frequently on Specimens from different ſhores. This circumſtance attracted the obſervation of Meſſrs. GOODENOUGH and WOODWARD under the article *F. hypogloſſum*, and they ſolicit the attention of future Botaniſts to inveſtigate the cauſe. Dr. SOLANDER, in his M. S. in the Bankſian Library, expreſſes a doubt whether they are not male and female of the ſame Species. This Idea is combated by the learned Authors of the Differta-" tion, who think both appearances are that of female Fructification—that the granules are the " firſt viſible appearances of the female Fructification, and that ſome of them ſwell into tubercles, " whilſt others are abortive and diſappear." They however ſtart an objection as to the local ſituation of theſe different appearances: Linn. Tr. p. 45. My Friend Mr. WOODWARD, in the courſe of my correſpondence with him, ſuggeſted that the granules are the ripe ſeed after the Tubercle has been burſt and the coats fallen off: but the regularity of their poſition, like the dots on the leaves of *Polypodium* forbid that idea. As to the hypotheſis above-mentioned, of the granules becoming tubercles, it is completely deſtroyed by ſome of my recent diſcoveries, more particularly by the fructified Summits of *F. coccineus*. This ſpecies at times is found with large lateral orbicular Tubercles; * at other times, there is a ſmall panicle generally branching into three or four heads, but ſometimes quite racemoſe. † I have diſcovered minute granules in theſe branching ſeed-veſſels; but my Friend Mr. PIGOTT, who contrived with a part of his Teleſcope a Microſcope of high powers, aſſures me that theſe branches are furniſhed with regular rows of blood red orbicular granules; and he has favoured me with a ſpecimen wherein many of theſe ſeed-veſſels appear to have diſcharged their ſeed, and to have become yellow, and in a ſtate of fading. ‡ This therefore proves that they are real capſules. The differences in the form of Fructification in *F. Pinaſtroides* and *F. diffuſus* are not leſs remarkable, as may be ſeen under their reſpective Articles. Theſe facts are undoubted: but in what manner ſhall we ſolve the difficulty, in reaſoning on the analogy between theſe cryptogamous fructifications, and the œconomy of Nature in the claſſes of Land Plants? We muſt have recourſe either to *monœcious*, or *diœcious* Fructification, or we muſt admit Fructification of different kinds in one and the ſame Species. There are however difficulties attending other genera of cryptogamous Plants. Many *Lichens* are known to produce ſhields very rarely, though they are propagated as abundantly as thoſe which abound with them—moſt probably from ſeeds matured on the ſurface without the aſſiſtance of Shields. One inſtance of two different kinds of Flowers, both hermaphrodite, is aſſerted to ob-

* See Frontiſpiece. *F. coccineus*. a, a. † See Frontiſpiece. Ditto. b, b. c, c. ‡ Ib. d.

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tain in the ſame individual Species. Sign^r. MARATTI is the Diſcoverer of this Fact, and the inſtance adduced is the *Filix Lonchitis.* *

Doubts have been expreſſed † as to the Fact mentioned in my Note, p. xi, reſpecting the experiment of ſowing the ſeeds of *F. canaliculatus;* and it was ſuggeſted, that pebbles which had never been in Sea-water ſhould have been made uſe of. If my ſituation for a proper length of time would have admitted it, I ſhould have gladly repeated the Experiment; but when it is conſidered that the pebbles were taken from the beach, where by means of their conſtant friction it was impoſſible for any previous ſeed to have remained affixed, and that the ſeeds vegetated on the preciſe ſpot where the drops of water containing the ſeeds were poured, I think thoſe doubts can no longer be entertained. The ſeeds of *F. veſiculoſus, ſerratus,* and other punctured coriaceous *Fuci* were found to be pear-ſhaped. ‡ I have ſince diſcovered that different *Fuci* produce differently ſhaped ſeeds, and from thence ſurely generic diſtinctions may hereafter be obtained. The ſmooth-ſkinned opaque *Fuci* have orbicular ſeeds. *F. lumbricalis, faſtigiatus, &c.* have kidney-ſhaped or curvilinear ones, and probably ſtill further diſcoveries will be made towards eſtabliſhing *Genera.* §

On Inſpection of this and the preceding *Faſciculi,* the Catalogue of Britiſh *Fuci* will appear to have increaſed ſince the publication of the Paper of Dr. GOODENOUGH and Mr. WOODWARD, in the Third Volume of the Linnean Tranſactions; and there can be no doubt but the preſent ardour for marine Botany, and the immenſe extent of Shore we poſſeſs, will occaſion the diſcovery of many new Species.

F. SHERARDI. ——— This Species, which is the ſubject of the Second Article of this *Faſciculus,* has been ſeparated by me from *F. ſpiralis.*

F. VIRIDIS. ——— This very beautiful Species has been recently found here. It was noticed abroad in the FLORA DANICA, and firſt found on the Engliſh Coaſt, as I am informed, by Sir THOMAS FRANKLAND, Bart. The Specimen, from which the Drawing is taken, was communicated by my Friend Mr. TURNER, to whoſe indefatigable reſearches the Botanical world, I truſt, will owe many more obligations.

F. FRUTICULOSUS. ——— The ſame Gentleman has likewiſe diſcovered *F. fruticuloſus* on the Weſtern Coaſt, and as he means to publiſh a Deſcription and Figure of it in the next Volume of the Linnean Tranſactions, it is here given in the Appendix; accompanied however by a Drawing for thoſe who chooſe it from a Specimen of my own. It may be proper to notice, that *F. diffuſus, F. Pinaſtroides,* and *F. Lycopodium,* have evidently the internal ſtructure of *Genus* CONFERVA. They are, however, on account of their general reſemblance to *Fuci,* their ſize, and the opacity of their outer ſkin, as well as with proper deference to the authority of Dr. GOODENOUGH and Mr. WOODWARD, admitted into the preſent Catalogue.

* Ioh. Fr. MARATTI Liber rariſſimus de verâ florum exiſtentiâ in plantis dorſiferis. Gottingæ 1790.

† Analytical Review. ‡ See Tab. IX. B. F.

§ ROTH in his "*Bemerkungen*" advances an opinion, that not a half, and probably not more than a third of the ſpecies of ſubmerſed plants, is as yet diſcovered. p. 66.

F. TOMEN-

F. TOMENTOSUS. ——— Since the publication of my former *Faſciculi*, I have had an opportunity, in company with Mr. CORREA DA SERRA, of conſulting OLIVI's ZOOLOGIA ADRIATICA in the Library of Sir JOSEPH BANKS, Bart. That learned Naturaliſt has formed a *Genus*, which he calls LAMARKIA, the Species of which are two: 1ſt. *L. Burſa* *—2d. *L. Vermillara*: the firſt ſimple, the ſecond branched. The ſtructure of the *Genus* conſiſts, he ſays, of "pellucid bladders or tubes,† hollow, pellucid, and filled with a tranſparent aqueous fluid, "together with other minute capillary filaments for the purpoſe of imbibing water, and diſ-"charging the ſeeds, which are at this period eaſily to be diſtinguiſhed: a ſtructure in which "theſe bladders and filaments are entirely compoſed of a delicate, equable, tranſparent mem-"brane, in texture as in every other eſſential character, reſembling *Fucus*, and *Ulva*: a ſtructure, "which inſtead of diſſolving and decaying away, grows firm and hardens: which has not the "leaſt portion of animal ſubſtance, is not endued with ſpontaneous motion, and emits no offen-"ſive ſmell on being deſtroyed. Its fructification in fine is like that of *Genus* FUCUS, conſiſting "of globular congeries of ſeeds in membranaceous pericarps." The ſecond Species called *Lamarkia Vermillara*, is illuſtrated by a Drawing, and there cannot be a doubt that it is our *F. tomentoſus*. ‡

F. SELAGINOIDES. ——— Meſſrs. GOODENOUGH and WOODWARD have inſerted this Species in their catalogue on the authority of fragments of plants and imperfect ſpecimens thrown on our coaſt; having never ſeen it, as they acknowledge in a growing ſtate. Being well aware of the different appearances of *F. Tamariſcifolius* § in its different ſtages of growth, I then had my doubts of the exiſtence of *F. ſelaginoides* as a Britiſh ſpecies. The Gentlemen above-mentioned have ſaid nothing of the imbedded air-bladders in this ſpecies, which are always ſeen previous to the fruiting of the ſummits. Mr. WOODWARD, in the courſe of our correſpondence, has favoured me with a ſight of his Specimens of *F. ſelaginoides*, and I have no heſitation in pronouncing them fragments of *F. tamariſcifolius* with the leafits ſwollen at the baſe. Profeſſor GMELIN's Pl. ii. A. called by him *F. Abies marina*, and which is referred to as a Synonym, differs entirely from his verbal deſcription, which Meſſrs. G. and W. acknowledge; as does likewiſe Profeſſor ESPER's Tab. XXXI, in his late publication; he has delineated an undoubted ſpecimen of *F. tamariſcifolius* for it. In my viſit ſometime ago to Sir JOSEPH BANKS's Library, I met

* The *Alcyonium Burſa* of Linn. Bauhin, &c.

† "Una fabrica ſimpliciſſima di nell' altro compoſta che d'un puro aggregato di otricelli * cavi, pellucidi, è ripiene d'un fluido traſparen-"te, aqueo; è ſoltanto munite di altri minimi filamenti capillari deſtinati ad aſſorbire l'aqua, ed a eſpellere i ſemi gia manifeſtamente ricon-"noſcibili: una fabrica, in cui queſte parti, tutti uniformi, non ſono compoſte che d'una membrana ſottile, equabile, conſiſtente, lucida, "ſicca, è perfettamente ſimile nel teſſuto, è in tutte gl'altri charatteri a quelle, onde ſono formati i FUCHI, le CONFERVE, è l'ULVE: "una fabrica che, in vece de ſpappolarſi, è corromperſe reſiſte è ſi ſecca: che non ha la piu piccola portione gelatinoſa vivente, è che, pu-"trifacendoſi non da ni odore, ni reſiduo animale, e non paleſa alcun movimento ſpontaneo, una fabrica finalmente, che come le ALGHE ha i ſemi globoſi, collocate ne' vaſſelini membranoſi, componenti tutto il ſuo corpo." Olivi Zool. Adriat. p. 258.

* See Tab. XII. c, c, c, c. The Author one would imagine had this figure before him.

‡ I ought juſt to notice in this place an error of the Engraver in repreſenting ſome dark coloured punctures on the ſurface of this Species, Pl. VII. Its texture ſhould have been delineated ſmooth and velvety. Since the publication of the laſt *Faſciculus*, this Species has been delineated in Engliſh Botany, but nothing is ſaid of its curious ſtructure, which was deſcribed, Pl. XVII. XXII, and a ſummit delineated by me, Pl. XII. c. c. c. previous to that publication.

§ *F. ericoides*. Linn. Tr. v. 3. p. 130.

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with an inedited Set of Plates of marine Plants and *Zoophytes* of the late Profeſſor MICHELI: among theſe is one inſcribed *F. Abies marina Gmel.* differing very materially from Pl. ii. A. of that Author, but exactly according with his deſcription. Unfortunately no Letter-preſs, or manuſcript, accompanies theſe Plates, to inform us where the Specimen was collected.

F. ROSEUS ——— Is a Species recently diſcovered by me on the S. W. Coaſt. I had before ſeen it, but not in fructification, and from its naked ſtraggling habit I had taken it for the lacerated ſtem of *F. ſanguineus*. Its beautiful racemoſe fructification diſtinguiſhes it readily, when in this ſtate, and it is not unlikely that it fructifies only during the Winter months. I only poſſeſs two or three Specimens; one of which, however, ſhall be preſented to the LINNEAN SOCIETY.

F. CARTILAGINEUS. ——— My much-lamented Friend Dr. WITHERING ſent me, ſome time previous to his deceaſe, two Specimens of *F. capenſis*, the original *F. cartilagineus* of LINNEUS, differing greatly in ſplendour of tints from the real Cape Specimens, but not unlike the Northern Specimens of *Horn-tang*, which ESPER deſcribes as being of a yellowiſh colour. * Theſe ſpecimens had a Label in the Dr's hand-writing "*from Freſhwater Bay, I. of Wight.*" As I underſtood by his Letters, that Mrs. WATT of BIRMINGHAM had ſent him theſe ſpecimens, I had great hopes of adding this Species to the Britiſh Catalogue, eſpecially as I had read in Biſhop GUNNER'S FLOR. NORWEGIÆ, and ſince in Profeſſor ESPER'S work that *F. cartilagineus* was a native of the North. I accordingly wrote to that Lady, and ſhe was ſo polite as to furniſh me with a Packet of Sea Weeds in a rough ſtate, collected by her at FRESHWATER BAY, which ſhe informed me, "had been ſubmitted to Dr. WITHERING, who *ſelected* what he "wanted, and returned the Parcel." Several large Specimens of *F. coronopifolius* in fructification were among them, which in their dry ſtate appeared *horny and cartilaginous*, † but not the ſlighteſt branch of *F. cartilagineus*. I therefore for the preſent, though with reluctance, omit this elegant Species, not without a hope however from the Dr's Label, and the teſtimony of Mrs. WATT, of his having "ſelected Specimens from her Parcel," that this Native of the Northern Seas will by ſome future Botaniſt be added to the Britiſh Species.

F. UNDULATUS ——— Is likewiſe another Species ſeparated from the punctured coriaceous *Fuci*. I hope the characteriſtic marks I have enumerated will ſufficiently juſtify this Arrangement.

F. LONGISSIMUS. ——— I have here departed from the Catalogue of Meſſrs. GOODENOUGH and WOODWARD in arranging theſe Species under three trivials inſtead of two—viz. *Confervoides*, *Longiſſimus*, and *Gracilis*.

F. COSTATUS. ——— A newly diſcovered membranaceous *Fucus*, from the Coaſt of CORNWALL, having a nerve pervading the frond.

* "Dieſe nordiſche ſind von gelber Farbe." Eſp. Ic. Fuc. p. 15.

† Mr. HUDSON formerly miſtook *F. coronopifolius* for *F. cartilagineus*, moſt probably from this rigid appearance when dry.

F. PALLESCENS. ——— A non-deſcript Paraſitical Species, with a ſingular Fructification.

F. DISCORS. ——— This Species of LINNEUS and HOUTTUYN has been diſcovered to be a Native of theſe Iſlands. I collected it at SIDMOUTH ſeveral years ago, and ſent it to Mr. WOODWARD as an unknown Species. Its Fructification is ſingular; this however has not been remarked either by LINNEUS, HOUTTUYN, or ESPER. I do not vouch for this being preciſely the ſame Species with Profeſſor ESPER's *F. diſcors*, as he deſcribes "two rows of dark "coloured oblong grains" on each ſide of the nerve which pervades the Leaf* when viewed through a Microſcope, which muſt, I think, be ſeeds, and beſides it is to be remarked, that his Pl. XXVI, has no terminal racemoſe fructification.

F. GRACILIS. ——— An affinity of *F. longiſſimus*, ſubſtituted in the place of *F. albidus*, LINN. TR. from which it materially differs.

F. PALMETTA. ——— This Species of Profeſſor ESPER, Pl. XL, which he has confounded with *F. ſinuoſus*, Pl. XLII, is by no means unfrequent in Cornwall. My Friend Mr. TURNER very lately diſcovered its Fructification, which has eſtabliſhed the Species.

With reſpect to the cluſters of capillary veſſels, or pencils of whitiſh filaments which occupy the ſurface of the frond in *F. veſiculoſus, ſpiralis, &c. &c.* which I had aſſerted to be ſtrings of exſuding mucus, my Friend COL. VELLEY has noticed them in a very intereſting Paper, he has juſt publiſhed in the 5th Vol. of the LINN. TRANS. in which he purſues the inveſtigation into the nature and propagation of marine Plants. He there aſſerts that "theſe ſtrings are certainly "tubes; that they remain in an unaltered ſtate in the water, and are diſcernible by means of an "aquatic Microſcope." Of this fact I have no doubt, from the accuracy of my Friend's experiments. I had aſſerted that the maſs of *Mucus* exſuded in a large veſſel was immiſcible with water, and proved it by Experiments with tinted water: † I am not in the leaſt inclined to controvert the opinion that theſe whitiſh hairs may be capillary filaments through which this thick *mucus* exſudes. ‡ I have ſince beſtowed great attention on this ſubject, and, as the fronds of theſe coriaceous *Fuci* are covered with infinite numbers of theſe pencilled fibres, which are diſcernible even on infant Plants, § ſome wiſe purpoſe in the œconomy of Nature is moſt probably intended to be anſwered by them, fructification being out of the queſtion. On this occaſion the Obſervations made by DR. PRIESTLY, in his Treatiſe on Air, ſtrike me very forcibly. He ſays that "great

* "Langſt dieſer Stiele ſind, unter der Vergroſſerung, doch nur gegen das Licht gehalten, zwey Reihen dunkler langlicher Korner." Eſp. Ic. p. 60.

† See Page XII. ROTH, in his generic character of *Fucus*, ſays theſe pores diſcharge *mucus—poris mucifluis. Bemerk.* p. 32.

‡ I have thought it right in addition to the repreſentation, Pl. I, to give a magnified drawing of a tranſverſe ſection of the frond (Pl. XIII. a.) of *F. ſerratus* placed edgeways on the field of the Microſcope; by which it will appear that the urceolate veſſels, as I obſerved, p. XIII, only penetrate to the center of the frond from either ſide. The above ſection is illuſtrative of the generic character of *Genus* FUCUS in ROTH's Bemerkungen, p. 32. "Veſiculæ aggregatæ in ſubſtantiâ frondis nidulantes."

§ Theſe *Papillæ* are very numerous even on ſmall ſeedling Plants. I have a ſmall Specimen of *F. ſerratus*, which, though not exceeding an Inch and half in length, has 43 of theſe *Papillæ*.

"quantities

" quantities of pure dephlogiſticated air are given up from the * ſummits of Sea Plants, which " ſerve to prevent pure water from becoming putrid: the minute diviſions of the leaves in ſeve- " ral, and the papillæ † in others, ſeem to ſerve a purpoſe hitherto unattended to." Had it fallen in with this ingenious Author's plan to have purſued his inveſtigations on growing Plants, he would have found what immenſe quantities of *mucus* undoubtedly impregnated with this pure air, a ſingle plant will produce; and when we conſider how many thouſand Acres, or rather ſquare Miles of Rock, are covered with theſe *Fuci*, which, from their tough coriaceous texture, ſeem leaſt adapted for the food of Fiſhes, and that theſe plants occur chiefly in our harbours, and inlets of *freſh water*, we can have no doubt that this Theory will admit of an extenſive application.

Since the Publication of my laſt *Faſciculus*, I have read with great ſatisfaction the Remarks of a celebrated Naturaliſt, Dr. ALBRECHT WILLIAM ROTH of BREMEN, on the Study of cryptogamic Water Plants, ‡ ſubſequent to the appearance of his *Catalecta Botanica*. He has divided theſe Plants into Nine *Genera*.—1. FUCUS. 2. CERAMIUM. 3. BATRACHOSPERMUM. 4. CONFERVA. 5. HYDRODICTYON. 6. ULVA. 7. RIVULARIA. 8. TREMELLA. 9. BYSSUS. § His generic Character of Fucus is " Veſicles aggregate, imbedded in the ſubſtance of the " Frond, furniſhed with mucifluous Pores." ‖ This conciſe and expreſſive deſcription exactly agrees with the ſtructure of the Frond of the punctured coriaceous *Fuci* deſcribed in my Firſt *Faſciculus*; ¶ but the term " aggregate " ſhews the Author meant to apply it to the Fructification, and he has therefore adopted the Errors of LINNEUS and thoſe of my Firſt *Faſciculus*, which ſubſequent obſervations under the Microſcope enabled me to detect. * The veſicles in the Frond have *no reference* to Fructification. The raiſed conical *Papilla*, with a perforation for the diſcharge of the ripe ſeed in the ſummit, has *no veſicle underneath*; it communicates with the " reticulated *mucus* in which the ſeed-maſſes are placed." (p. IX. X.) The Author, however, in his obſervations which follow the generic character of FUCUS, details with accuracy its true mode of Fructification, p. 32, 33.—His Second *Genus* CERAMIUM appears to be a judicious ſeparation of ſome Species from the *Genera* of FUCUS and CONFERVA, under which by different Authors they have been arranged. It is defined—" Filaments *membranaceo-cartilaginous* ſomewhat " geniculated; [b] capſules with generally one ſeed [c] ſcattered on the *outſide* of the Branches." p. 33.—CONFERVA is defined—" Small Tubes, or *herbaceous* filaments with granules of Fructification " ſcattered on the *inſide* coats of the Tube." The ſubſtance of the Frond, and the ſituation of the ſeed, are here made the diſcriminating characters; but as there are many of the herbaceous CONFERVÆ, which have *external* capſules of Fructification, and which are very unlike *F. diffu-*

* The Doctor is not accurate in ſaying " from the ſummits."—Both the ſurfaces give it out through the *papillæ* together with the *mucus*.

† The *Papillæ* ſeem to be intended by the Doctor to refer to the prominent tubercles in the fructified ſummits which have another office: but his obſervation loſes nothing of its force when applied to the ſuperficial *Papillæ*.

‡ " Bemerkungen uber das ſtudium der cryptogamiſchen Waſſergewächſe." Hannover, 1796.

§ This arrangement reſembles Profeſſor GMELIN's, with the addition of N. 2, 3, and 7, as new *Genera*.

‖ " *Veſiculæ aggregatæ in ſubſtantiâ Frondis nidulantes, poris mucifluis præditæ.*" P. 32.

¶ I have delineated a tranſverſe ſection of the Frond, Pl. XIII. *a*. * See the beginning of Second Preface, p. IX, and Tab. IX. AA. CC.

[b] It might have been expreſſed poſitively, as the Structure in all I have examined, where not impaired by Age, is furniſhed with *ſepta*, though not viſible from the opacity of the Skin.

[c] This does not hold with reſpect to *F. Pinaſtroides, diffuſus, &c.*

ſus,

ſus, Pinaſtroides, &c. it ſtill ſeems neceſſary to conſtitute an intermediate *Genus*.—ULVA, the only remaining *Genus* with which we have any thing to do, * is defined—"an expanded diapha-"nous membrane with granules of fructification principally towards the margin, imbedded." The exiſtence of ſeeds in *Genus* ULVA is doubted by Mr. WOODWARD, Linn. Tr. 3. 48, and, if admitted, they are by him ſuppoſed to be on all parts of the frond. An ingenious conjecture, however, is offered by Dr. ROTH for their ſituation near the margin, as theſe parts decay firſt, and thereby liberate the imbedded ſeeds. The definition of ROTH naturally excludes the gelatinous and tubular ULVÆ of Mr. WOODWARD. With reſpect to the ſeeds, they are ſuppoſed by ROTH to have ſomething peculiar about them, as they do not under the higheſt magnifiers exhibit a regular and appropriate ſhape, † as is the caſe with the ſeeds of the ſame ſpecies in Land vegetables, but ſeem like cartilaginous Germs, ‡ which require the decay of the Frond to enable them to vegetate. The uniformity of colour with the ſkin, in which the ſeeds are imbedded, prevents their being uſually diſcovered.

On reviſing my Synoptic Table after the lapſe of more than Three Years, I beg leave to offer the following Remarks.—FUCUS, in a reſtricted ſenſe, would form a clear and diſtinct *Genus*, from the ſtructure of the Frond in Dr. ROTH's words, ſubſtituting *ſeriatim* for *aggregatæ*. § This would include my Firſt Diviſion, with the exception of *F. nodoſus, ſiliquoſus, ſiliculoſus*, and *cæſpitoſus*.—A Second *Genus* might be formed from thoſe of ſimilar fructification, but different habit of frond. ‖—The *Genus*, I had denominated in my Table CERAMIUM, is very different from that of Dr. ROTH. Inſtead of the generic character there inſerted, I ſhould wiſh to ſubſtitute one taken from fructification and ſtructure;—ſkin ſmooth, gloſſy, poliſhed on each ſide, with a colourleſs *mucus* within; forming together a thick conſiſtent ſubſtance, with the ſeeds very minute, naked, orbicular, of the colour of the ſkin, diſpoſed in patches, or in lines, juſt within the ſurface of the cuticle. ¶ This *Genus*, in poliſhed ſurface and mode of Fructification, much reſembles ULVA, and, as CERAMIUM has been twice occupied, it may be called PALMARIA. —CHONDRUS has a fructification that differs from that of any other in its ſimple ſtate, and wants no alteration: it includes only one Species, *F. criſpus* with its varieties: but the mamillous and echinated varieties cannot be included, and indeed in RAY theſe Species are ſeparately marked.

SPHÆROCCUS of the Synoptic Table, compriſing the globuliform *Fuci* of GMELIN, is of courſe a numerous Family. No alteration is neceſſary in the Generic Character; but my obſervations on Fructification enable me to alter the arrangement, and form ſome new *Genera*. The opaque ſkinned geniculated Species, *Pinaſtroides, diffuſus, Lycopodium*, will arrange under *Genus* CERAMIUM of ROTH. *Pinnatifidus*, and *Oſmunda*, have naked imbedded ſeeds, and belong to *Genus* PALMARIA. *Faſtigiatus*, and *radiatus*, with ſome newly diſcovered *Fuci* which have been arranged, p. 89, from Fructification, will form a clear and diſtinct *Genus*. *F. alatus, ſinu-*

* n. 3.—BATRACHOSPUMUM ſeems, though conſiſting of not more than 2 Species, to be very judiciouſly conſtituted.—n. 7. RIVULARIA has never occurred to me.

† The expreſſion in German is difficult to tranſlate: "kunſtliche zuſammengeſetzte ſtructur." p. 53.

‡ "Knoſpenartiger Keime oder Fortsätze (propaginus gemmaceæ)." p. 53. § See ROTH, p. 32.

‖ "Semina in muco retiformi in orbem congeſta, fronde lævi complanatâ, ramosâ."

¶ "Semina minutiſſima, orbicularia in maculis irregularibus, vel in lineis in cute, innata; fronde planâ utrinque lævissimâ, muco intermedio pellucido, membranâ retiformi mucum percurrente."

oſus,

oſus, and perhaps many of their affinities, whoſe granules are produced in proceſſes in which they are immerſed, are perhaps improperly called tubercled. I have not been enabled from diſſection to determine whether they are ſingle ſeeds or pericarps. In all theſe Species which have genuine tubercles or capſules, with a hard external coat, the character as GMELIN well obſerves is clear and diſtinct. Hiſt. Fuc. p. 27. With reſpect to CODIUM, that *Genus* has been illuſtrated before from Obſervations made by OLIVI, p. 258. The increaſing lights thrown on this ſubject will I doubt not ſoon enable us to eſtabliſh a more permanent Table of *Genera* and Species.

Conſidering the interval which has elapſed ſince the appearance of my former *Faſciculi*, and that my reſearches have been continued during that period, it will be proper to notice under each article the reſult of ſubſequent Obſervations.

F. SERRATUS. ——— This Species ſeems to * fruit all the year: I have found its pods in almoſt every month. Profeſſor ESPER has figured it in two Plates, but the ſize of his Work only admits of the repreſentation of the ſummits, and his narrow-leaved ſort has no fructification.

F. VESICULOSUS. ——— I received from Mr. PIGOTT in July, 1798, ſpecimens of this *Fucus* from AUST FERRY on the R. Severn. They belonged to Dr. WITHERING's 2d. Diviſion. † At this time the plants ſeemed to be ſhedding their ſeeds, and the ſeed-veſſels were covered with an indurated *Mucus*, of a ſaffron colour, which brought to my mind the remark made by Mr. CORREA DE SERRA; Phil. Tr. 1796. p. 2. Profeſſor ESPER has figured Two Varieties of this *Fucus*, and likewiſe *F. inflatus*, the inflation of whoſe ſummits I apprehend to be only accidental, and probably preparatory to fructification. ‡ He has given likewiſe *F. divaricatus*, which in the arrangement below conſtitutes my 2d. Diviſion of *F. veſiculoſus*. The particular time of fruiting of this ſpecies is omitted in Mr. TURNER's Calendarium, as ſuppoſing it to be at all times of the year. Indeed I have found its ſeed-pods during all the Summer, and moſt of the Winter months.

F. DIGITATUS. ——— The *Papillæ* perforated at top are often diſcoverable in this ſpecies, and particularly after the ſeeds are ſhed, even in dry ſpecimens; but the ſeeds are too minute to be obſerved, unleſs in the form of ſmall blackiſh duſt, under a high magnifier. With us the ſtem is undoubtedly ſolid, § and a tranſverſe ſlice exhibits concentric circles with a dark pith,

* Mr. TURNER has publiſhed a memoir on the times of fruiting of different Species of *Fuci* from actual obſervation. I ſhall avail myſelf of the information it contains in my Table of Synonyms.

† Dr. WITHERING's Diviſions of varieties are of uſe in diſcriminating the immenſe varieties (if there are not many kindred Species), which are arranged under *F. veſiculoſus*; but as the diſtinction is taken from the tubercles, as well as the air-veſſels, it may be better to reduce and new modify the Diviſions in this manner.

Diviſion 1. Bladders in pairs, narrower than the frond; axillary one, ſolitary, round, or oval.
2. ····· wider than the frond: axillary one triangular. *F. divaricatus.*
3. Bladders irregular; three or more in an oblique direction.
4. Bladders axillary, ſingle; on the frond few or none: in this diviſion, when two branches are near together, the axillary bladders appear *in pairs*; hence LINNEUS's expreſſion "axillaribus geminis."

‡ This certainly happens in reſpect of *F. canaliculatus.*

§ ESPER ſays "*Innen aber iſt er hohl*;" but whether he ſpeaks of the bulb or ſtalk, it is uncertain; but his expreſſion as to the branching baſe is very appropriate: "*wurtzeln, die ihn als Klammern zur befeſtigung an andere Körper dienen.*" p. 101. They are certainly not roots, but agglutinated creepers.

or *medulla*. ESPER has given two Drawings, but he has confounded this and *F. bulboſus* together, and made the ſtem bigger upwards. *

F. BULBOSUS. ——— I have no new Obſervations to make on this Species. *Papillæ* are much more rare than in *F. digitatus*, but imbedded ſeed-bearing granules are frequently diſcernible on diſſection in the Knobs on the back of the bulb.

F. SILIQUOSUS. ——— I have found ſince my former publication, fruiting Pods on Specimens of this Plant very frequently during the Winter months; they are eaſily to be diſtinguiſhed by the protuberant *Papillæ*, and the abſence of the tranſverſe bars on the outſide. The inſide is like that of the pods of *F. veſiculoſus*. In the months of April and May, they fall off. Profeſſor ESPER has figured it without fruit, Pl. VIII.

F. SPIRALIS. ——— This is well delineated by ESPER, Pl. XIV. I have never ſeen a bladder on this Species, though doubtleſs an occaſional one may be found. The protuberant olive ſhape of the terminal Seed-veſſels, and their being always in pairs, are infallible characteriſtic marks. †

F. PUSILLUS. ——— I have ſince found this Species on the perpendicular rocks at the Pier at St. MICHAELS MOUNT, where it grows in ſuch denſe patches as to collect the ſand and ooze. The expanded ſummits, though compreſſed, appear through the Microſcope to be ſucculent, and when held to the light, of a purple colour, with little blood-coloured granules imbedded.

F. SINUOSUS.—See F. RUBENS, Pl. VII. ——— I have nothing new to notice reſpecting this *Fucus*. The HUDSONIAN name of *rubens*, under which it is deſcribed, p. 18, I here abandon, which was applied by LINNEUS to the *F. prolifer* of LIGHTFOOT; and I here adopt that given by Meſſrs. WOODWARD and GOODENOUGH.‡ Profeſſor ESPER, in a very characteriſtic Drawing, Pl. XLII, has given it as a Variety of *F. Palmetta*.

F. SANGUINEUS. ——— ESPER has given this Species, Pl. XXXVIII, but inſtead of its uſual ſhort ſtem it has a long one, with leaves ſet on alternately as on a ſpray of laurel.

F. PLICATUS. ——— This Species is delineated in ESPER's *Fuci*, Pl. XXXVII, but the principal branches are repreſented larger than the ſecondary ones, which I have never obſerved; and the branches are not ſufficiently crooked and entangled.

* There are doubtleſs many varieties of this Species, as one can hardly imagine ſo great a miſtake would have been committed.

† "*Fructificationes geminæ, terminales, pedunculatæ, oblongæ, craſſiuſculæ.*" Linn. Sp. Pl. N.B. The figure and ſituation of the Seed-pods in this Species is particularly to be attended to; they are terminal, and as RAY juſtly obſerves, "*breviores* et tumidiores quam *in pri-*" *ori*," ſc. *F. veſiculoſo*. Moriſon's t. 8. f. 10, is referred to as *F. ſpiralis*, Linn. Tr. v. 3. p. 148. but an examination of the Figure will diſcover the error, as the fructification is there repreſented neither ſwollen, nor altered in ſhape.

‡ We owe the rectifying this miſtake to the arrival of the *Linnean Herbarium* in England. I had noticed it before, p. xxiii.

F. ACU-

F. ACULEATUS. ——— The repreſentation of this Species in ESPER's ICONES does not reſemble the habit of the growing plant. Few Specimens preſerve their Baſe: In the Collection of COL. VELLEY I noticed two perfect Plants: the baſe was very ſmall in proportion to the Stem.

F. SACCHARINUS. ——— Attending more minutely to the fructification of this Species, I found in the Winter months that conical *Papillæ*, with a perforation at top, were viſible on many ſpecimens. Some, which I gathered, February, 1799, had ſhed their ſeeds, and the apertures had widened conſiderably: the ſeeds, as ſuppoſed, were adhering to the outer coat of the Frond, but ſo ſmall as to be diſcoverable only as duſt, with high magnifying powers. * Profeſſor ESPER has figured this Species in two Plates, but they afford no Idea of our † Gigantic Var. α, Pl. IX. On examining ſome recent Plants, I diſcovered that the thick welted part in the middle of the frond ſerves the purpoſe of, and may be conſidered as, a midrib. It branches off on each ſide in beautiful undulations, from the main ſtem, like the veining of leaves.

F. NODOSUS. ——— Profeſſor ESPER has delineated this Species in a characteriſtic manner, though manifeſtly from a dried ſpecimen, not in fructification. This generally takes place late in the Autumn, or in the Winter months, and like thoſe of *F. filiquoſus*, when fully ripe, they drop off; which is the reaſon that they are rarely, if ever, found during the Summer Months.

F. LOREUS. ——— The above Author has given two Plates with repreſentations of parts of this Species: Pl. XIX, part of the ſummit; Pl. XXXIX, the *Radices Calycares*, as he calls them, or *Peziza-ſhaped Baſes*. He has collected a variety of Synonyms, but thoſe referring to *Ulva pruniformis* ſeem out of place, as appears by GUNNER's Deſcrip. p. 2. p. 89, and by ESPER's Ic. p. 82.

F. FILUM. ——— There are ſingular miſtakes with reſpect to this ſpecies committed by Profeſſor ESPER. His Pl. XXI, which he calls *F. filum, Linn. Syſt. Nat.* p. 717, adding as a Synonym the *Lagerſtroem. Amœn. Ac.* 259. n. 53—the Indian Graſs, which is now known to be an animal Production, is in fact the repreſentation of a Chineſe Land Plant. On the contrary, his Pl. XXII, which he calls *F. tendo, Linn.* is certainly *F. filum, Linn.* His Plate repreſents ſeveral coming up from a common Baſe. In that reſpect, as well as in ſize, *F. filum, Linn.* differs from the Species delineated in this Work.

F. TAMARISCIFOLIUS. ——— Nothing has occurred in addition to the ample account given of this Species—the *F. ericoides* of LINN. TR. For the miſtakes concerning this *Fucus*, ſee what has been obſerved under *F. ſelaginoides*, p. XXVIII.

* Probably every Specimen has not perforated *Papillæ*: ſome may produce their ſeeds imbedded in the outer ſkin, and others in the *mucus* of the ſinuous furrows where LIGHTFOOT diſcovered them.

† A ſpecimen of the largeſt ſize, and likewiſe a fructified ſpecimen, are depoſited in the Library of the LINNEAN SOCIETY. It is 6 feet long by 9 inches wide.

F. OSMUN-

F. OSMUNDA. ——— This is given by Profeſſor ESPER, Pl. LXII, in 6 elegant and appropriate figures,* though its affinities *F. pinnatifidus*, var. α,β, tab. XI of this Work, which are ſo common with us, are omitted. I mentioned that the fructification is internal in *F. Oſmunda*, p. 48. I have however had opportunities lately of ſeeing this Species more fully fructified, and have delineated a ſummit, Pl. XVI. c, cc. the ſeeds are deeply imbedded in the frond, and when mature they drop out, and as the inſide is pellucid, the cavities left by the ſeeds falling out appear like holes. This circumſtance ariſes from the ſkin being very thin and tinged with purple; very probably in the thick-ſkinned opaque *Fuci*, ſuch as *F. palmatus, edulis, &c.* a ſimilar fructification may obtain without the ſkin being penetrated through.

F. LACERUS. ——— The Examination of the LINNEAN *Herbarium* has enabled me to correct an error. The Plant delineated and deſcribed by me under this Title is one of the ſportive varieties of *F. criſpus*.

F. STELLATUS. ——— This is likewiſe another variety of the LINNEAN *F. criſpus*: they were both deſcribed by RAY as ſeparate ſpecies. In HUDSON and LIGHTFOOT they appear as varieties of *F. ceranoides*. I have lately received a ſpecimen from CORNWALL, which was more buſhy and echinated than my ſpecimen, Pl. XII: indeed it was crumpled and twiſted into a ball; but the ſummits, on examining them, appeared *mammilloſe*, ſo as to leave no doubt of its being a variety of *F. criſpus*. The Specimen and Drawing will be preſented to the LINNEAN SOCIETY.

F. EDULIS. ——— Profeſſor ESPER has likewiſe omitted this *Fucus*, which I formerly obſerved agrees in ſome reſpects with *F. dulcis, Gmel.* I am not ſure it is the ſame plant.

F. PALMATUS. ——— Of this *Fucus* I am perſuaded there are ſeveral ſpecies, to be ſeparated hereafter by attention to fructification. I have in my poſſeſſion one ſpecimen, thickly garniſhed with imbedded orbicular cavities with a raiſed margin. This I ſhall preſent to the Society: its fructification is given, Pl. XV. They ſeem many of them to contain one central ſeed. In younger leaves of the ſame ſpecimen, patches of very minute orbicular granules are to be ſeen. † A var. if not a new ſpecies, of a thin texture and an olive colour, without any pedunculated leaves, or *cilia*, at the edges, is to be met with at SIDMOUTH in DEVON.

F. CÆSPITOSUS. ——— I received ſome beautiful ſpecimens of this ſpecies from Mr. PIGOTT, collected near the Mouth of the River SEVERN: the tips were inflated, and had projecting perforated, conical, *papillæ*.

F. CORNEUS. ——— I delineated Var. β, of Linn. Tr. 3. 181, as the only *F. corneus* I had met with. The learned Authors of the Diſſertation on *Fuci* enumerate three Var. intimating the almoſt endleſs gradations of kindred Plants which had occurred to them in their reſearches. But, however, with reſpect to the Line to be drawn between Mr. HUDSON's *F. corneus*,

* N. 4, ſeems to be a *Pinnatifidus*.

† See Pl. XV. k, ll—m, n.

his

his *Pinnatifidus* and *Filicinus*, I think the two latter are clearly diſcriminated by their ſucculent and almoſt gelatinous texture from *F. corneus*, which is cartilaginous. Profeſſor Esper, Pl. lxiii, has given *F. corneus* with the habit of *F. criſpus*, *Linn.* though he quotes Gmel. Pl. xiv. 3. a very different ſpecies. Meſſrs. Goodenough and Woodward, on the contrary, omit Gmelin's *F. corneus*, and quotes his *F. ſpinoſus*, Pl. xviii. f. 3. I incline to think they are right in their conjectures; but this ſpecies requires further elucidation. *F. ſpinoſus*, Gmel. *F. pectinatus* and *ptilotus*, Gunner, *F. nereideus*, Light. and *F. corneus*, Ner. Brit. are nearly allied Species.

F. CRISPUS. ——— Profeſſor Esper has figured *F. rubens* of the *Linnean Herbarium*, under the Hudſonian name—*F. criſpus*; and he has referred to Gmelin's t. xxi. f. 1. which, though called by him *F. ciliatus*, certainly is *F. laciniatus*.

F. THRIX. ——— I have made no further Obſervations on this Species, which ſeems more properly to belong to *Genus* Ulva, and will arrange under the diviſion of *Ulvæ* in Mr. Woodward's Catalogue (Linn. Tr. p. 3. p. 51.) U..., *ſubgelatinoſæ; fronde tereti, tubuloſa.* *

As Profeſſor Gmelin has given a Chemical Analyſis of two Species of *Fucus*, differing very greatly in their texture, I thought it would be gratifying to my Readers in the preſent advanced ſtate of Chemical Knowledge, to procure a Friend to undertake the office of analyzing likewiſe two Species; eſpecially as I had an opportunity of having it done in my own Neighbourhood from Plants of my own direction, by a Gentleman who poſſeſſes a conſiderable ſhare of merit as a Chemiſt. The whole † proceſs is ſubjoined, and will complete what I have to offer on the

 Phyſiology

* *Fucus Byſſoides*, the only omitted *Fucus* of the Linn. Tranſ. Catalogue, is too decidedly an *Ulva* to be admitted.

† Fucus Vesiculosus. ——— 500 Grains of this *Fucus Veſiculoſus*, being expoſed to a red heat for 3 hours, in a coated glaſs retort, connected with a receiver and pneumato-chemical apparatus; produced 267 cubic inches of air, which being agitated for ſome time in lime-water, 137 cubic inches of carbonic acid were abſorbed.

The remaining 130 cubic inches contained, by the teſt of ſulphurat of potaſh, 39 cubic inches of oxygen.

The 91 cubic inches that remained, and which burned with a blue flame, were mixed at different times with known quantities of oxygen, and ſucceſſively exploded in a glaſs tube, by means of the electric ſpark.

They were now reduced to 10 cubic inches, which proved to be azotic gas, (as it inſtantly extinguiſhed a lighted candle) mixed with a ſmall quantity of carbonic acid gas, which was formed in the deflagration, by the union of a part of the carbone, contained in the hydro-carbonate, with the oxygen.

There came over into the receiver 228 grains of an almoſt tranſparent liquid, that had a ſtrong ſmell of ammonia, and produced copious white fumes when it was held near an open veſſel containing muriatic acid, and alſo a thick brown fetid empyreumatic oil, which ſwam on the ſurface of the above liquor, and weighed 54 grains.

The above 228 grains were diluted with diſtilled water, ſaturated with muriatic acid, and filtered; and being gently evaporated, there remained in the veſſel about 300 grains of muriat of ammoniac. 90 grains therefore were ammonia, and 138 grains water, including the weight of a ſmall quantity of carbonic acid gas, diſengaged from the ammonia by the addition of the muriatic acid.

The charry reſiduum in the retort, weighed 136 grains; this was expoſed in a crucible to a heat gradually raiſed to redneſs, when the charcoal was conſumed, the ſaline maſs that remained weighed 50 grains, and was of a dark brown colour; but after being expoſed to the air for a few hours, it changed to a very dark green colour: its ſolution in hot water was alſo of a green colour; but when it was cold, it became perfectly limpid, and had a ſtrong ſmell of ſulphurat of potaſh.

To diſcover the quantity of ſulphur it contained, diluted nitric acid was added, till the effervеſcence ceaſed; it was then filtered, and the depoſite on the filter waſhed with a large quantity of diſtilled water. A dark grey powder remained on the filter, which being dried, weighed 6, 5 grains. When this was expoſed to a gentle heat in a ſmall porcelain crucible, it burnt with a ſulphureous flame: when the deflagration ceaſed, the crucible was made red hot: what remained weighed 2 grains. It was of a light reddiſh brown colour, and proved to be ſilex, mixed with a ſmall quantity of iron; as muriatic acid digeſted on it, gave a blue precipitate with the pruſſic acid.

Phyſiology of GENUS *Fucus*. The reſult under the Retort of two common Species, the one ſucculent, the other coriaceous, muſt appear ſurpriſing: the one containing five-ſixth parts of water, the other not quite one-fourth part: * the one containing only 82, 5 cubic inches of different gaſes, while the other yields 267 ditto. The *Soda* in the former was little more than half the quantity of what was found in the latter, and the empyreumatic Oil not more than one-ninth, or ſix to fifty-four. It will be unneceſſary for me to extend my obſervations on theſe comparative *Analyſes*. I cannot, however, conclude without obſerving, that from the above ſtatement it clearly appears that, contrary to the generally received opinion among Farmers, the coriaceous Species are preferable as manure to the ſucculent ones. With

50 Grains of ſalt, made by carefully burning the weed, were digeſted for an hour in hot diſtilled water, and frequently agitated; it was then filtered. A reſiduum of a dark lead colour weighing 17, 5 grains was collected on the filter: this, being thrown into a crucible, heated nearly to redneſs, burnt for a very ſhort time, with a ſulphureous flame: after being made red hot, it weighed 15, 8 grains, and was of a light brown colour.

The above filtered liquor, was divided into three equal parts.

One part being ſuperſaturated with nitric acid, was left 24 hours in the glaſs, at the end of which time, a precipitate was formed, which weighed about 1 grain, and proved to be ſulphur.

The ſecond part was gently evaporated in a glaſs veſſel, and left 11 grains of a greyiſh ſaline ſubſtance, which I found to be ſoda united with the ſulphuric, muriatic, and carbonic acids. To diſcover the proportion of the two firſt acids; to the firſt part of the liquid after the ſeparation of the ſulphur, nitrat of ſilver was added till it no longer formed a precipitate: it was then filtered, and the muriat of ſilver when waſhed and dried, weighed 13, 5 grains, which contain about 2, 2 grains of real muriatic acid.

The third portion of the liquid was ſuperſaturated with nitric acid: after the ſulphur was carefully ſeparated, nitrat of barytes was added as long as it produced a white cloud: the ſulphat of barytes when waſhed and dried, weighed 4, 5 grains, one third of which 1, 5 grains is ſulphuric acid.

The above brown earthy reſiduum weighing 15, 8 grains, were found to conſiſt of magneſia 14 grains, ſilex 1, 5 grain, and iron 0, 3 grain.

500 Grains therefore of the *Fucus Veſiculoſus*, conſiſt of the following ſubſtances:

		Grains.
Water		138.
Ammoniac		90.
Charcoal		86.
Empyreumatic oil		54.
Soda		18, 5.
Magneſia		14.
Silex		1, 5.
Iron		0, 3.
Muriatic acid		6, 5.
Sulphuric ditto		4, 5.
Sulphur		4, 5.
Carbonic acid gas	137 Cubic Inches.	60.
Oxygen gas	39	13.
Hydro-carbonate gas	81	2.
Azotic gas	10	3.
	267.	495, 8.
	Loſs	4, 2.
		500.

F. DIGITATUS. ——— I treated 500 grains of the *Fucus Digitatus* exactly in the ſame way, and with the ſame degree of heat, as the *Fucus Veſiculoſus*. It yielded 82, 5 cubic inches of air; 48, 5 cubic inches of which were azotic gas, 23 oxygen, and 11 carbonic acid gas.

In the receiver was a yellowiſh coloured liquid, which weighed 427 grains, and a few drops of a thick fetid empyreumatic oil, which ſunk in the liquid, and weighed 6 grains.

The reſiduum in the retort weighed 38 grains.

The yellowiſh liquor did not change the colour of the acidulated, or common tincture of litmus: nitrat of ſilver and acetat of lead dropped into it, formed no precipitate. It proves therefore to be pure water, holding a ſmall quantity of empyreumatic oil in ſolution.

The ſaline maſs left by burning the 38 grains of coal that remained in the retort, weighed 24 grains, and was found to be compoſed of the following ſubſtances: Magneſia 3 grains, ſilex and iron 0, 5 grains, muriatic acid 9 grains, ſulphur 1, 5 grains, and ſoda 10 grains.

Contents of 500 *Grains of the* F. DIGITATUS.

		Grains.
Water		427.
Charcoal		14.
Soda		10.
Muriatic acid with a very ſmall quantity of ſulphuric acid		9.
Empyreumatic oil		6.
Magneſia		3.
Silex and iron		0, 5.
Sulphur		1, 5.
Azotic gas	48, 5 Cubic Inches	14, 5.
Oxygen gas	23.	7, 5.
Carbonic acid gas	11.	4, 5.
	82, 5.	497, 5.
	Loſs	2, 5.
		500.

RIVIERE, near HAYLE, CORNWALL. RICHARD EDWARDS.

* This muſt ariſe from the great quantity of *mucus* this ſucculent Species, *F. digitatus*, contains within its external Coats.

With reſpect to preſerving Specimens, in addition to what I obſerved before, * I beg leave to ſtate, that the larger kinds, both coriaceous and ſucculent, after previous ſoaking and clearing off the Fluſtra, &c. which may be facilitated either by ſoap or acids, ſhould, after a day or two of moderate preſſure, according to the circumſtances of the caſe, be bruſhed over with oil of turpentine, in which there is a ſlight ſolution of Gum Maſtic, or Oil varniſh from the ſhops; by which, under judicious management, the gloſs which they have, when taken out of the water, may be perfectly imitated.

I have juſt been favoured with an account of Profeſſor ESPER's Third *Faſciculus*, and beg leave to offer the following remarks on the Species it contains. Pl. LXIV, *F. lactuca;* this is *F. edulis*, Ner. Brit. Pl. LXV, *F. acinarius*, foreign: Pl. LXVI, *F. natans*, ditto: Pl. LXVII, *F. filicinus;* this is not a Britiſh variety: Pl. LXVIII, *F. confervoides*—very different from *F. confervoides* of this work, or of the Linn. Tr. N.B. *F. confervoides* of HUDSON and GMELIN ſeem from deſcription to be *Conferva verticillata*, which is *F. hirſutus* of ESPER, not *F. rudis:* ſee my Obſervations, p. 97. Pl. LIX, *F. corniculatus;* foreign. Pl. LXX, *F. canaliculatus;* a variety of *F. criſpus*. N.B. the channelled frond is very apt to miſlead unexperienced Botaniſts. In the true *F. canaliculatus*, it prevails through the whole underſide of the frond up to the fructifying ſummits; while in many of the varieties of *F. criſpus* the ſtem is rolled in at the edges, and gives the appearance of a furrow. Pl. LXXI, *F. volubilis;* foreign. Pl. LXXII, *F. ſpiralis;* this is rather a variety of *F. veſiculoſus*. Pl. LXXIII, *F. canaliculatus*, var. this is another variety of *F. criſpus*, but with the ſegments very narrow. N. B. The remark I have made on *F. canaliculatus* in the Appendix, viz. that the ſummits have two rows of perforated *papillæ*, if attended to, will prevent future miſtakes. Pl. LXXIV, *F. caprinus;* this Plate is a mixture of *F. edulis* and *F. palmatus*. Pl. LXXV, *F. rubens;* this is *F. palmatus*. Pl. LXXVI, *F. carnoſus;* a Specimen of *F. edulis* diſcoloured. Pl. LXXVII, *F. compreſſus;* foreign. Pl. LXXVIII, *F. uvarius;* taken from JACQUIN's *Collectanea*. It is the *F. ſedoides* of Ner. Brit. and Linn. Tr. the *F. ovalis*, Hudſ. and *Vermicularis*, Gmel. Pl. LXXIX, *F. marginalis;* foreign. Pl. LXXX, *F. Pſeudo ceranoides;* not ſuppoſed to be a *Fucus*. Pl. LXXXI, *F. ſericeus;* foreign. Pl. LXXXII, ditto, ditto. Pl. LXXXIII, *F. veſiculoſus;* var. Pl. LXXXIV, ditto. Pl. LXXXV. *F. concatenatus?* Pl. LXXXVI, ditto, ditto. Pl. LXXXVII, *F. fruticuloſus*, JACQ.

On obſerving the miſtakes made in the above Catalogue, it is impoſſible not to lament the imperfect ſtate of knowledge reſpecting marine plants, which ſeems to prevail even where the greateſt pains have been taken. The almoſt endleſs variety of habit in different ſpecimens of the ſame Species is in a great degree the cauſe of it, as concluſions are formed from a very few, and frequently from ſingle ſpecimens, remote from the place of their growth. I cannot take leave of this ſubject without expreſſing a well-grounded hope from my attention to this *Genus* at the ſea-ſide, and through all the changes of ſeaſons, as likewiſe from my having viſited all the conſiderable collections of *Fuci* in this Iſland, and compared ſpecimens and drawings of ſpecimens with each other; that this Work will prove a means of fixing Marine Botany on a more ſecure Baſis, as ſcarcely a ſingle ſpecimen has been deſcribed without adverting to its Fructification, which has been ſubmitted either in a recent, or moiſtened ſtate to an inveſtigation under the Microſcope.

BATH, May 10th, 1801.

* See P. v.

LECTORI.

INSPECTIS Herbariis antiquis, et hodiernis ferè omnibus, quæ in ANGLIA reperiuntur, FASCICULUM hunc tertium FUCOS omnes littorum noſtrorum Indigenas complectentem in lucem emitto. Intervallum temporis, ex quo FASCICULUS ſecundus prodierit, minimè perfectioni operis obfuturum, imò quam maximè profuturum, ex inveſtigationibus et itineribus hâc de causâ ſuſceptis ſpero equidem ac confido. Quæ in hoc temporis intervallo patefacta ſunt in Præfatione Anglicâ paullò fuſiùs annotavi; flagrante adhuc Bello, auctoque ſuper modum Chartæ pretio eadem hæc Latinè explicare ſuper-vacaneum forè duxi: quamquam quis eſt apud exteras gentes vel modicè Rei Botanicæ peritus, qui Anglicè neſcit?

FUCUS CERANOIDES.

FUCUS. fronde planâ, integerrimâ, æquali, dichotomâ; nervo intermedio; fructibus oblongis, acuminatis. *Herb. Linn. Buddle. p.* 6. *n.* 3.

RADIX, diſcus, explanatus, plures emittens furculos.

CAULIS compreſſus, ſolidus; membranâ laterali verſus baſim laceratâ, vel abrasâ.

RAMULI dichotomi, punctulis, ſive porulis aſperſi, nervo intermedio: apicibus in foliis junioribus, furcatis; in maturis, fructificatione mucronatâ terminatis.

FRUCTIFICATIO in apicibus ramulorum lateralium; plures ſimul veſiculæ, oblongæ, mucoſæ, acuminatæ.

OBSERVATIONES.

Auctoritate cl. virorum D. D. Goodenough et Woodward, inſpectoque a me nuperrimè Herbario Linneano, ſpeciem hanc ſiſto, texturâ frondis tenuiore, fructûſque formâ a *F. ſpirali* planè diverſam. Auctorum diſcrepantiam reſpectu nominis trivialis in Faſciculo poſteriore memoravi.[a] Habitus Plantæ ex icone liquet; variat aliquando latitudine foliorum. Fructificatio non niſi in apicibus biennibus conficitur. Fructificationis methodus, prout Microſcopio ſubjecta conſpicitur, *F. veſiculoſi* ſupra memorati affinis. Gmelini *F. filiformem*, icone inſpectâ, haud auſim, pro Synonymo admittere. In Herbario Linneano, extat ſpecimen *F. filiformis* Iconi Gmelini ſimile, et a *F. ceranoide* planè diverſum. *F. filiformem* ſtatu recenti nunquam adhuc vidi, neque in Herbariis anglicis a me inſpectis exemplar ejus exſiccatum vidi.[b]

Hab. Ch. Church, *in Agr. Hants.*

[a] Vid. p. 50. 51. 63. Minimè dubium eſt Linneum Speciem ſuam pro F. ceranoidi Raij accepiſſe, ut ex Synonymis conſtat; mirum tamen videtur D. Lightfoot, Ch. Spec. viz. "Fructificationem bifidam tuberculatam" a Linneo F. ceranoidi attributam minime F. ceranoidi Raij convenire ſenſiſſe, utpote etiam ex loco in Catalogo Linn. proxime F. veſiculoſo conjicere par erat.

[b] In herbariis majoris notæ Fuci vulgares vix obtinent locum vel ſaltem unum alterumve conſpicitur ſpecimen. In Herb. tamen D. Velley F. veſiculoſi formis variis, quibus illudit, copia mira cernenda eſt, ſed nec ibi F. filiformis Gmel. F. linearis Hudſ. F. diſtichi Lightf. apparet exemplar.

FUCUS CERANOIDES.

FUCUS. frond flat, very entire, of an uniform breadth, dichotomous, midribbed, with oblong acuminated Fructifications.

(*No Plate.*)

ROOT an expanded Diſc ſending up numerous ſhoots.

STEM compreſſed, ſolid, with the *alæ* of the midrib either ragged or quite worn off, below.

BRANCHES dichotomous; each ſurface punctured over with ſmall apertures: the ſummits in the younger ſhoots forked, in the elder terminated with oblong acute Fructifications.

FRUCTIFICATION generally lateral, conſiſting of cluſters of ſharp-pointed veſicles.

OBSERVATIONS.

The arrival of the Herbarium of Linneus in this Country has clearly aſcertained the Species called by him, at leaſt in his later publications, by the trivial name of *F. ceranoides;* and though with reluctance at transferring a name long rendered familiar to my ears from a well known to a more rare ſpecies, and being likewiſe confident that the transfer originated in error,[a] yet to prevent further confuſion between ourſelves and foreign Botaniſts, I follow the example of the learned Authors who have ſo ably deſcribed the Britiſh *Fuci*.[b]

Many doubts are entertained by reſpectable Botaniſts about the propriety of ſeparating the coriaceous midribbed Fuci. Gmelin compriſes them all under the common trivial name of *F. veſiculoſus*. Lightfoot has made four different ſpecies, and Meſſrs. Goodenough and Woodward have reduced them to three. I am convinced however from actual obſervation, that there are many kindred ſpecies ſtill undeſcribed, which, being propagated from ſeeds, continue unchanged, and occupy extenſive portions of the Sea Coaſt, in the ſame manner as it is obſerved of ſome Land Plants, which though nearly allied in habit, never, or rarely intermix, and produce hybrid plants. This fact muſt wait till more accurate inveſtigation under the microſcope ſhall furniſh proper *data* to decide on. I add a new ſpecies in the article immediately ſubſequent to this—a native of the S. W. Coaſt.

The Species juſt deſcribed is always nearly of an equal breadth throughout, but that breadth varies from half an inch to nearly that of a ſtraw. Its habit of growth, however, which at top is divaricating and Antler-like, is very different from the *F. filiformis* of Gmelin, if one may judge from his Pl. Tab. 1. A. This however has been referred to as a Synonym by Lightfoot and Hudſon, and recently in the Linn. Tr. Unfortunately no ſpecimens of the two former Authors are extant, from whence they have taken their deſcriptions, and the ſpecimens furniſhed me by Mr. Woodward, from one of which the Drawing is taken, do not at all reſemble Gmelin's Plate, or the Linnean Specimen.

Hab. Chriſt Church, Hants.

[a] Linneus quotes the Synonym of Ray. See my Obſerv. p. 50. 51. 63. [b] Linn. Tr. v. 3.

FUCUS SHERARDI.

FUCUS. fronde dichotomâ, coriaceâ, punctatâ, coſtatâ; foliis brevioribus ad apicem congeſtis; fructificatione in ſummis foliorum, formâ immutatis. *Herb. Sherardi. Ox. N.* 1.

RADIX, callus expanſus.

RAMULI dichotomi, infernè, planè nudi.

FOLIA in capitulum collecta; apicibus obtuſis, vel furcatis; margine undulato.

FRUCTIFICATIO. Granula intus ſeminifera, papillis extùs perforatis, ut in [a] F. veſiculoſo; ſparsìm tamen, vel in orbem collecta, minimè in fructum intumeſcentia.

OBSERVATIONES.

Dignissimus Vir, D. Williams, qui Cathedram Botanices apud Oxonienſes occupat, ſpecimen Fuci hujus Sherardi manu ſubſcriptum nuperrimè mihi oſtendit. Titulus "F. ſeu Quercus marina latifolia, humilis, ſine "veſiculis." Apud Raium in Syn. p. 41. Species, cui præfigitur Titulus hic, ut var. F. veſiculoſi diſtinguitur in

[a] Vid. Proæm. P. XIX. itemque T. 9. ABC.

notulâ

notulâ editoris ſubjunctâ, his verbis, " Ineffabilis ſane eſt in hoc genere varietas ratione ætatis et loci, aliorumque accidentium" MORISONUM adiens Species tres humiles, ſeu altitudinis palmaris, invenio P. 647. n. 10, 11, 12. quorum mediam in CORNUBIA repertam *F. canaliculatum* capitulis ante fructificationem intumeſcentibus, ut ſæpiſſimè vidi, deſignare judico. Icon etiam poſterioris, t. 8. n. 12. *F. canaliculatum* maturum ſatis accuratè exhibet; prior vero t. 8. n. 10. qui omnium conſenſu *F. ſpirali* refertur, minus feliciter ſpeciem aliquam adhuc a me repertam adumbrat. Apices minimè intumeſcentes, ſed, ut in *F. ſerrato*, compreſſi exhibentur. Notum tamen omnibus eſt *F. ſpiralis* fructûs contractione frondis ab apice quaſi ſeparari, binoſque in ſingulis apicibus, ternoſve (ut ait rectè MORISONUS,) ibi efformari. Omiſſis ergo ambobus. Speciem hanc, cum SHERARDI ſpecimine ex omni parte congruentem et ex CORNUBIA ſtatu recenti, ut in Icone exhibetur, tranſmiſſam, ſub nomine Botanici illius celeberrimi ævi poſterioris, ſiſto.

Character ſpecificus, necnon partium deſcriptio, ut ſupra, unà cum icone magnitudinis naturalis ſatis accuratè Speciem hanc ab affinibus ejus, ut ſpero, diſcriminabit. Species plures coriaceas ſub nomine *F. veſiculoſi* adhuc latere mihi perſuaſiſſimum eſt.

Hab. Pridmouth Bay, juxta Fowey in Cornubiâ.

VAR. a.

SPECIMINA fronde anguſtâ lineari, una cum ſpecie mox deſcriptâ ex Cornubiâ miſſa ſunt. Altitudo et ramificatio ſimiles. Iconem omitto: ſpecimen tamen in Tab. XIII, figurâ 2, notatum libet delineare: annon ſpecies diſtincta ſit, vel junior Planta, neſcio; quanquam nebulas in furcis, granulorum, ut ſuſpicor, rudimenta, obſervavi. Ex deſcriptione D. LIGHTFOOT, hîc potius referendus eſt *F. diſtichus* Fl. Scot. quam *F. ceranoidi.*

Hab. juxta FOWEY in CORNUBIA.

FUCUS SHERARDI.

FUCUS. fron dichotomous, leathery, punctured, midribbed; leaves ſhortiſh, crowded at top; fructification in the ſummits of the leaves, not ſwelling into diſtinct fruit veſſels.

(No Plate.)

ROOT an expanded diſc.

BRANCHES dichotomous, quite naked below.

LEAVES forming tufts at top; either obtuſe or forked; edges undulated.

FRUCTIFICATION analogous to that of *F. veſiculoſus;* but not forming a ſeparate Fruit.

OBSERVATIONS.

HAVING long ſuſpected the exiſtence of a Species differing eſſentially from *F. ſpiralis*, though hitherto confounded with it, I inſpected with this view the *Herbaria* of SHERARD and BOBART at the Phyſic Garden, Oxford, having experienced the greateſt attention in this reſearch from the preſent learned Profeſſor of Botany, Dr. WILLIAMS. I accordingly met with one exactly agreeing with a ſpecimen from Cornwall, which is repreſented in the annexed Plate. Its Title in the hand-writing of Mr. Sherard is " *F. ſeu Quercus marina latifolia, humilis ſine veſiculis.*" Ray has introduced this as one of the varieties of *Alga latifolia vulg.* the *F. veſiculoſus* of later writers, taking no notice of air-bladders as a ſpecific character. The varieties of this *Fucus*, his Editor

tor in a note ſays (Syn. p. 41.) are not to be enumerated.[a] MORISON omits this Synonym, but enumerates 3 ſpecies, *humiles*, or *palmares*, of humble growth, (Hiſt. Ox. p. 647. No. 10, 11, 12.). The firſt, though referred to by Lightfoot and Meſſrs. Goodenough and Woodward, as *F. ſpiralis*, ſeems to be different from it in the drawing,[b] t. 8. f. 10. and much more ſo in the deſcription; as *F. ſpiralis* is certainly more than a "hand's breadth in height." I ſhould imagine it was intended to deſcribe a near affinity of the two following, No. 11, 12, which in my opinion are only different ſtates of *F. canaliculatus;* No. 11. inflated at the tips previous to fructification, No. 12—in fruit. My opinion of the impropriety of confounding ſo many Plants eſſentially differing in habit and fructification under one common ſpecies is hinted in the preceding article, and was before under *F. veſiculoſus*, p. 3. 12. A more accurate inveſtigation under the microſcope will furniſh ſpecific diſtinctions. I entertain no doubt, on comparing it with my ſpecimens, that Sherard's Plant was ſent from Cornwall. Being thus ſeparated as a new ſpecies, I have named it in honour of that eminent Botaniſt, in whoſe collection the original Specimen has been handed down to us.

VAR. α.

I here notice a narrow-leaved Variety with the fructification confined to the little forked tips. Its frond is of an equal breadth, not exceeding one-eighth of an inch: the height ſimilar to the Plant above deſcribed. I have given no engraving of this Var. but in its place I inſert a ſmall Specimen, fig. 2. which is either this Plant in a junior or dwarf ſtate, or a different Species, as fructification ſeemed to be incipient at *b*. May not this be *F. diſtichus* of Lightfoot?

Hab. near FOWEY, CORNWALL.

[a] Gmelin enlarges ſtill further this Species, including in it *F. ſpiralis* of Ray.

[b] The Drawing, t. 8. f. 10. has not the ſlighteſt ſpiral habit.

FUCUS PINASTROIDES.

FUCUS. fronde tereti, ramoſiſſimâ; ramis denſè imbricatis; ramulis brevibus, obtuſis, furſùm tendentibus; ſimplicibus, vel furcatis. *Herb. Buddle. p.* 18. 3. *p.* 19. 4.—*R. Syn. p.* 50. *n.* 46—*Gmel. p.* 127.—*L. Tr. v.* 3. *p.* 222.

RADIX fibroſa, ſaxis agglutinata.

CAULIS lignoſus, validus.

RAMI irregulares, ex omni parte.

RAMULI incurvi, breviſſimi, quanquam inæqualis longitudinis; ſimplices, vel ramoſi; apicibus obtuſis, apertis, vel fractis.

FRUCTIFICATIO—in quibuſdam veſiculæ ſummâ parte convolutæ; ſeminum ſerie intus ſimplici vel binâ; in aliis, racemi globulorum.[a]

OBSERVATIONES.

SPECIES hæc ubique ferè in littoribus noſtris occurrit. "Pinus maritima vel F. teres" a Rajo nuncupatur, unde nomen *Pinaſtroides* ſumptum. Structura interna ſeptis ad intervalla diſtinguitur: tubulus quoque capillaris

[a] "Globuli ſeſſiles, vel pedunculati" ait D. Gmel. forſan veſiculæ ſupradictæ, ut ſtatu ſicco apparent; aliàs trimorpha ſit fructificatio.

in

in centro caulis et ramulorum extenditur; cortice tamen opaco obvoluta hæcce oculos planè fugiunt. Quocirca a Botanicis formâ externâ inductis Species hæc, utpote et *F. diffusus*, et *F. Lycopodioides*, inter Fucos recenſetur Habitum Fuci hujus, prout ab HUDSONO deſcribitur "foliis ſc. fecundis" negat ſe unquam vidiſſe D. GMELIN: ſemina tamen vel globulos creberrimos in ſpecimine ſuo deſcribit, adeo ut neceſſe eſt varietates duas conſtituere.

VAR. α. *Pinaſtroides*—frondе denſiſſimè obvolutâ ramulis ſetaceis, breviſſimis, ex omni parte: apicibus Pini in modum obtuſis.[a]

VAR. β. Incurvus—*ſubtùs*, frondе veſtitâ ramulis undique, rariùs tamen: *ſuprà*, ramulis duplici ordine ſecundis, et forficis in modum curvatis.

[a] Habitum male exprimit Gmelini Icon; verba tamen ſatis aptè deſcribunt imbricationem Pinique habitum frequenter à me in Devoniâ viſum.

SEA PINE. PL. XIII.

FUCUS. frond cylindrical, much branched: principal branches cloſely tiled with ſhort crooked ſpinous ſhoots; ſimple or forked; obtuſe, or broken at the tips; pointing upwards.

(PLATE. *Gmel. t.* 11. *f.* 1.)

ROOT fibrous, matted, agglutinated.

STEM woody, cylindrical.

BRANCHES irregular, on every ſide of the ſtem.

TILING BRANCHLETS crooked; ſhort, but unequally ſo; ſimple or branched; with blunted, open tips.

FRUCTIFICATION. Either in catkin-ſhaped veſſels, rolled in at the tips with a ſingle or double row of imbedded ſeeds:[a] or in ſome inſtances exhibiting a *raceme*, or ſhort branched tuft of granules.[b]

OBSERVATIONS.

I HAVE arranged this Species as a *Fucus* on the authority of Ray, Gmelin, and Hudſon, and latterly of Dr. Goodenough and Mr. Woodward, though with ſtrong marks of doubt.

The upper parts exhibit, when held to the light, internal *ſepta*; but in the lower branches and ſtem the thickneſs and opacity of the ſkin excludes the ſight. On examining, however, a tranſverſe ſlice under the microſcope, and paring off the ſkin of the ſtem longitudinally on each ſide, I have diſcovered that there is a capillary tube running through the centre of both ſtem and branches; a ſtructure which is ſufficient in my opinion to conſtitute an intermediate *Genus*.[c]

On conſidering Gmelin's deſcription, and comparing it with that of Mr. Hudſon, and likewiſe from my own actual obſervation, I ſhall divide the Species into two Varieties, viz.

VAR. α. Pinaſtroides. frond thickly tiled, and ſcabrous; with the ſummits of the ſhoots blunted like thoſe of the Pine-Genus.

VAR. β. Incurvus. frond not ſo thickly tiled at bottom: upper branches producing two rows of ſhoots on the inner ſides, with the tips forcipated.[d]

[a] See Pl. XIII. b. magnified ſummit: c. a catkin-ſhaped ſeed veſſel of this tip more highly magnified, with the two imbedded rows of granules. d. a ſummit of Var. β, with the rolled up catkins as ſeen under a microſcope by me, December, 1800, in a Specimen recent from Bognor Rocks. [b] See Pl. XIII. ff. [c] See Pl. XIII. c. [d] In Pl. XIII, both varieties are delineated.

This Species abounds on our ſhores; its height is about 6 inches; colour purpliſh, inclining to black. The extraordinary circumſtance reſpecting Fructification deſcribed above, and actually ſeen by me, as I have delineated it,[e] cannot fail to elucidate at ſome future time the theory of fructification of Marine Plants. There are ſimilar Anomalies obſervable in *F. coccineus*, *F. diffuſus*, and ſome others.[f]

Hab. on the S. W. Coaſt moſt plentiful.

[e] See Pl. XIII. b, c, d, f. ff.

[f] See Obſervations on this ſubject in the Preface.

FUCUS HYPOGLOSSOIDES. TAB. XIII.

FUCUS. caule ramoſo, foliis lineari-lanceolatis. alatis. planis, integerrimis, reticulatis; nervo prolifero. *Act. Linn. v.* 3. 115.

RADIX, callus minutus plures emittens caules.

CAULIS ramoſus: ramis ſubalternis.

FOLIA numeroſiſſima, pedunculata, anguſtiſſima, tenerrima.

FRUCTIFICATIO: granula in ſuperficie foliorum in maculis oblongis[a] diſpoſita.

OBSERVATIONES.

Fuci hujuſce, utpote Speciei diſtinctæ a me in Cornubia repertæ, Act. Linn. 3. 115. mentio fit. Fructificationem duplicem *F. hypogloſſi*, plantulæ huic noſtræ affinis, accuratè deſcripſerunt D. D. Goodenough et Woodward: in quibuſdam ſc. "tubercula parva ruberrima, in ipsâ coſtâ ſita:" in aliis, "granula minutiſſima, rubra, in membranis ad utrumque coſtæ latus ordinatim diſpoſita." Hiſce inductus, D. Solander in M. S^to. in Bibliothecâ Bankſianâ depoſito ſpecies duas olim conſtituit; "ſi non ſint reputanda, (ut ipſe ibi innuit) pro mari et fœminâ ejuſdem ſpeciei." In re tam difficili maxima adhibenda eſt cautio et pleniore opus eſt inveſtigatione, præſertim cum in allis ſpeciebus fructificationem duplicem, vel dimorpham obſervavimus.[b] Itidem, ſi verum eſt ſpecimina tuberculata et punctata in littoribus a ſe remotis reperiri[c] proculdubio Species reverà diſtinctæ ſunt.

Frons Speciei ſuprà deſcriptæ *F. hypogloſſo* totis partibus minor eſt: latitudo folioli vix ſeſquilinearis: ramuli confertiſſimi et ſine ordine. Color, haud ut in *F. hypogloſſo* lætè ruber, ſed pallidè roſaceus, et in plurimis ſpecimini bus apices lutei, vel luteo-virides cernuntur. Textura frondis, ſi microſcopium adhibeas, eleganter reticulata.[d]

Hab. Litt. Occident. Angl.

[a] Forſan ex pericarpio diſrupto ſed nimis regulariter videntur diſpoſita.

[b] Vide quæ notavi in *F. pinaſtroidi* ſupra.

[c] Act. Linn. 3. 116.

[d] Vid. Tab. XIII. g. Texturæ frondis *F. hypogloſſi*, Act. Linn. nulla fit mentio; adeoque, ut minimè credibile eſt in frondis inveſtigatione reſpectu fructificationis, reticulationem iſtam inobſervatam fuiſſe, ſpecies duas ſaltem ſtatuendas neceſſe eſt.

FUCUS HYPOGLOSSOIDES. PL. XIII.

FUCUS. ſtem branching; leaves linear-lanceolate, ſmooth, entire-edged; texture reticulated; midrib producing leafits.

(No Plate.)

ROOT

ROOT a minute knob, producing numerous ſhoots.

STEM branching: branches ſub-alternate.

LEAVES very numerous, pedunculated, very narrow, and tender.

FRUCTIFICATION—granules diſpoſed in oblong patches of a regular form.[a]

OBSERVATIONS.

I HERE introduce the minute delicate Species announced as a recent diſcovery of mine by Meſſrs. GOODENOUGH and WOODWARD.[b] It is much ſmaller, and the leaves are narrower than thoſe of *F. hypogloſſum*: the form of the leaves likewiſe is more oblong, and its colour much paler: but the principal ſpecific diſtinction is its beautifully reticulated frond. This we may ſafely conclude is peculiar to it, as under the examinations of the frond of *F. hypogloſſum* to detect its mode of fructification, which muſt have taken place with the aſſiſtance of a microſcope, this ſingular ſtructure would not have remained unnoticed. Meſſrs. Goodenough and Woodward deſcribe a dimorphous fructification in *F. hypogloſſum* firſt noticed in a M. S. of Dr. SOLANDER's, accompanying ſome Specimens in the *Bankſian Library*,[c] which the Dr. ſeems to think *Diœceous*. Many recent inſtances of a ſimilar nature will be found deſcribed and delineated in this work, together with ſome obſervations made on this curious ſubject,[d] which merits further inveſtigation. This double fructification has not however occurred to me in this Species.

It is a common Paraſitical plant on the ſtems and tips of other *Fuci* in the Weſt of England and at Poole and the Iſle of Wight, and grows in thick matted cluſters, very delicate and tender. The tips often variegated with greeniſh yellow. The ſtems and older branches grow opaque, and are of a dull brown.

Hab. S. W. Coaſt, from I. of Wight to Land's-End.

[a] Mr. Woodward in a Letter ſuppoſed that the patches might ariſe from the exploſion of a pericarp, but they are I think too regularly placed. See Pl. XIII. g.

[b] Linn. Tr. 3. p. 115.

[c] See Linn. Tr. 3. 114.

[d] See F. pinaſtroides, and Preface.

FUCUS LACERATUS. TAB. XIII.

FUCUS. fronde tenui, tenerrimâ, diaphanâ, aveniâ; ramis ſublinearibus, undulatis; apicibus obtuſis, irregularitèr furcatis.

RADIX, callus minutiſſimus.

CAULIS, o, vel breviſſimus.

RAMI ſeſe dilatantes, dein lineares; margines plani, vel foliolis pedunculatis inſtructi.

FRUCTIFICATIO; tubercula propè margines, vel in foliolis.

OBSERVATIONES.

F. Laciniati varietatem β. Act. Linn. a Synonymis ejus ſeparo. Ex perbrevi apud D. HUDSON *F. laciniati* deſcriptione, herbario ejus combuſto, dubium eſt an Species illa eadem ſit ac ſupra deſcripta.[a] Certum eſt tamen *F. criſpatum* ejuſdem Auctoris diverſum eſſe. Verbis aptiſſimis Speciem in occidentali Angliæ parte ſolummodò repertam ſub nomine *F. criſpati* in ed. 2dâ. deſcribit D. HUDSON. Margines totius frondis non ciliis aut

[a] Ex voce "dilatatâ" in ch. ſpecif. Hudſoni ſuſpicor *F. laciniatum* habitu ramificationis a *F. criſpato* minimè differre, ſed ſolummodo margine lævi, vel criſpato, et ſtructurâ frondis.

foliolis

foliolis ſtipitatis, inſtructi, ſed regularitèr admodum fimbriati et corrugati; etſi quò planius appareat marginis pulchritudo, microſcopio opus ſit. [b]

F. endiviæfolius Lightfoot. cujus exemplar penes me eſt, non niſi habitu ramificationis [c] a noſtro differt. Icon a ſpecimine D^ni. TURNER delineata, partiumque, ut ſuprà, deſcriptio Speciem hanc diſcriminabunt. Magnitudo frondis variat paullulùm; media in tabulâ repreſentatur; color dilutè purpureus, non ſaturè ruber, ut in *F. criſpato.*

Hab. in orientali Angliæ littore.

[b] Vid. marg. F. caiſpati auctam, Tab. XV.

[c] Frondis habitus multò magis dilatatus quam in F. lacerato; apices quoque convoluti, non criſpati.

LACERATED FUCUS. PL. XIII.

FUCUS. frond thin, ſlender, pellucid, without veins; branches ſublinear, undulated; ſummits obtuſe, irregularly forked. *F. Lacerat. var β. Linn. Tr.* 3. 155.

(No Plate.)

ROOT, a minute callous Knob.

STEM, o; or very ſhort.

BRANCHES dilated near the baſe, afterwards linear; margins plain, or garniſhed with pedunculated leafits.

FRUCTIFICATION. Tubercles near the margin, or in the leafits.

OBSERVATIONS.

MESS^rs. GOODENOUGH and WOODWARD unite *F. criſpatus* and *laciniatus*, Hudſ. *F. endiviæfolius*, Lightf. and *F. laceratus*, Gmel. [a] under one Species. "This has not been done," they ſay, "without repeated exami-"nations of their ſeveral properties." It is difficult to decide on ſpecific characters in any ſituation where recent Species do not abound, as is the caſe near the Sea-ſhore. So many experiments of paring off the external coats, cutting of ſlices, &c. which cauſe the deſtruction of ſpecimens, muſt be repeatedly tried, that in no other ſituation can it be poſſible to aſcertain with preciſion the nice points of diſcrimination between kindred plants. I have for ſeveral years cautiouſly attended to the beautifully fringed *Fucus*, which abounds in the Weſtern part of Cornwall, which I have no doubt, as his Specimens are not in exiſtence to ſettle the diſpute, was the *F. criſpatus* of Hudſon, 2d. edit. and collected on the ſpot where I find it abounds. [b] That younger Specimens of this *Fucus*, with plain margins, may not have furniſhed him with the Species which he denominates *F. laciniatus* in his 1ſt. edit. and continues in his ſecond, I will not aver. The beautifully *godrooned* edge, which will bear examination under a microſcope, does not come out in the early ſtages of the plant, but there ſeem ſo many ſportive forms of this Species and its affinities on every coaſt, that we may hereafter expect to ſee them ſeparated into diſtinct Species. Internal ſtructure, as I ſhall deſcribe under *F. criſpatus* clearly ſeparates that ſpecies from the one under deſcription. *F. endiviæfolius*, Lightf. in texture reſembles our Plant, but it has a much more widely expanded ramification. I have a ſpecimen, which I may delineate for the Appendix, leaving future Botaniſts to ſettle whether it ſhould be a Species, or Variety. The Specimen delineated Pl. XIII, is of a Plant about the middle ſize; the colour, pale purple.

Hab. N. E. Coaſt.

[a] *F. laceratus*, Gmel. t. 21. f. 4. is a trailing ſpecies: the edges are repreſented with ſmall irregular ſtellated appendages, much longer than any I have ſeen, and giving no idea of the beauty and regularity of the edges of *F. criſpatus*. It appears to be a foreign ſpecimen, though, as the E. Indies and the Town of Harwich are united in the Habitat of Gmel. p. 179, this fact cannot be aſcertained.

[b] *Mounts-bay*, Cornwall, *F. criſpatus* is figured, Pl. XV.

FUCUS ALATUS. TAB. XIII.

FUCUS. fronde ſubdichotomâ, membranaceâ, tenerrimâ, anguſtâ; nervo intermedio; ramulis decurrentibus. *Buddl. p.* 12. *n.* 2. 6.—*Petiv. p.* 25. *n.* 4.—*Gmel.* 187.—*R. Syn.* 44. *n.* 20.—*Mantiſſ.* 135.—*Hudſ.* 587.—*Light.* 951.—*With.* 4. 95.—*L. Tr.* 3. 142.—*Eſp. Ic. p.* 20.

RADIX, callus minutus.

CAULES plurimi ex eâdem radice, compreſſi, infrà nudi.

RAMULI diſtichi, alterni; apicibus acutis, vel furcatis.

FRUCTIFICATIO trimorpha; tubercula parva ſeſſilia ad ramos; veſiculæ obovatæ axillares, ſeminiferæ; congeries granulorum ordinatim diſpoſitæ in apicibus furcatis. [a]

OBSERVATIONES.

PERELEGANS textura Fuci hujus, et color amœniſſimè roſaceus eſt, quanquam ſæpiſſimè viridi et flavo in eâdem plantâ variegatus ſit, et nervus quandoque, alis albeſcentibus, ruber evadit. Frons tota in plano ramoſa eſt. Margines membranæ undulati. Latitudine ramulorum multùm variat, ſi modo ſint varietates. Tria Specimina a ſe invicem multùm diſcrepantia delineavit D. GMELIN. t. 25. [b] tria etiam ex herbario noſtro in tab. XIII, ſiſto. Fructificatio, ut ſuprà, modo quidam prorsùs ſingulari, ut in Piræmio obſervavi. Varietates duas, ut ipſe ait, *F. alati* nuperrimè ſtatuit D. ESPER. tab. 3. quarum fig. 1ma *F. dentato* affinior multo eſt quam *F. alato*, fig. 3tia, habitu frondis et fructificatione nihil cum *F. alato* commune habet. *F. alatum* apud exteros rariſſimè inveniri ſuſpicor. D. GMELIN ait in Cornubiâ frequentiſſimum eſſe.

Hab. in CORNUBIA frequentiſſimè.

[a] Vid. Tab. XIII. g, gg. h, hh. i, ii.

[b] Fig. 1. tab. XXV. Gmel. malè repreſentat habitum F. alati reſpectu ramificationis, et craſſitudinis ramorum, membranæque lateralis per totam frondem protenſæ. Fig. 2, var. latifoliam ſatis benè exprimit. Fig. 3. var. filiformem (non juniorem Plantam) reſpectu tenuitatis ramulorum accuratè exhibet, non tamen reſpectu ramificationis.

WINGED FUCUS. PL. XIII.

FUCUS. frond membranaceous, ſubdichotomous, tender, narrow; with a midrib pervading the membrane, and decurrent branches.

PLATES.

Gmel. 25. 1, 2, 3.—*Fl. Dan.* 352.—*Eſp. t.* 3?

ROOT, a minute callous knob.

STEMS, many from the ſame root, compreſſed, naked below.

BRANCHES, diſtichous, alternate, with the ſummits various; plain, forked, or leafy.

FRUCTIFICATION, of different kinds: ſeſſile tubercles adhering to the lower branches; axillary, obovate, pedunculate fruit veſſels with ſeeds immerſed; granules in rows in the ſummits.

OBSERVATIONS.

THIS minute Species, for delicacy of texture and brilliancy of tint, conſtitutes one of the principal ornaments of our Sea-ſhore; and, if we may believe Profeſſor GMELIN, it is almoſt excluſively found on the Cornwall

Coaſt.[a] It is of various breadths, from a quarter of an inch to that of a coarſe thread; though even in the latter caſe, it has a proportional membrane on each ſide of the branch.[b] The membrane is waved at the edges.

Its neareſt affinity is *F. hypogloſſum*, a ſpecies which like this varies much in breadth: but the margin of that Species is plain, and it always ſends off leafits from the nerve in the middle of the leaf. The decurrent habit of the branches is the conſequence of the lateral membrane, and is not peculiar to this Species.

GMELIN has given three figures of different ages, as he ſays; but they are varieties, if not ſpecies. Fig. 1. Pl. 25, gives no idea of its ſlender branches, and of the membrane, which pervades the whole frond, either lacerated, or entire: fig. 2, is a tolerable repreſentation of the broad-leaved varieties: fig. 3, exhibits the very ſlender filiform habit of our narrow-leaved varieties, excepting in the upper parts, but affords no idea of its mode of growth. Nor does the Profeſſor, either in his deſcription, or by a marginal repreſentation of a ſmall bit, eſtabliſh the curious fact, that theſe branches of the breadth of ſmall packthread, exhibit the perfect appearance of a midrib and two lateral membranes.[c]

Profeſſor ESPER has very lately figured what he calls *F. alatus*, in two Specimens: fig. 1. A ſpecies more nearly related to *F. dentatus* than to *F. alatus*: fig. 2. ſomething reſembling our wide-leaved var. but differing in its mode of growth and fructification. This Publication convinces me, that the genuine *F. alatus* is confined to this Iſland, and probably to the Weſtern part of it.[d]

[a] No *habitat* is given in Linn. Tr. v. 3. 142. [b] See Pl. XIII. k.

[c] See Pl. XIII, k.

[d] For the threefold fructification mentioned in the detailed deſcription above, ſee Pl. XIII. g, h, i.

FUCUS FIBROSUS.

TAB. XIV.

FUCUS. fronde filiformi, ramoſiſſimâ: ramis primariis ſubdiſtichis: veſiculis innatis, ovatis, concatenatis; inferioribus majoribus. *Budd. p.* 18. *n.* 4, 5.—*Petiv.* 40. 5.—*Morif.* 646.—*R. Syn.* 49. 45.—*With.* 4. 87.—*L. Tr.* 3. 137.

F. abrotanoides—*Gmel.* 89, 90.—*Eſper.* 67.

RADIX; callus, ſtatu recenti ſub-ſpongioſus, mollis.

CAULIS, ligneus, nodoſus, ſolidus.

RAMI irregulares, ſurſùm attenuati.

VESICULÆ aëriferæ, ramulis innatæ, ſolitariæ; vel binæ, treſve, ordine moniliformi.

FRUCTIFICATIO. Veſiculæ mucoſæ, ſeminiferæ, in apicibus ramulorum; papillis perforatis extùs.

OBSERVATIONES.

SPECIES hæc, ſcopulorum perfundiorum incola, haud rarò altitudinis tripedalis reperitur, etſi in ſtatû juniori puſilla ſit et planè ſetacea; unde a D. HUDSON in ed. 2dâ. ut Species diſtincta ſub nomine *F. ſetacei*[a] enumeratur. Apprimè tamen Botanicis cavendum videtur ne in errores incidant ſi fortè ſpecimina ſterilia, aut ſtatû juniori, fructificatione nondum incipiente, in manus inciderint.[b] Bullæ aëriæ ſupradictæ juxta baſes ramulorum quaſi concatenatæ naſcuntur, idque ſolummodò in adultis: ſuperficies earum glaberrima et nitens; ſtructura interna, ut in *F. nodoſo*, &c. Notandum eſt deſcriptionem in Hiſt. Ox. *Fuci* hujus "ramulis tenuitatem Abrotani maris

[a] Fl. Angl. 575. [b] In junioribus plantis veſiculæ aëriæ deſiderantur.

æmulantibus,

" æmulantibus, et veſiculis lentis magnitudine " minimè plantulæ noſtræ convenire, ut ex icone liquet. Juxta baſin caulis in adultis, et per totam frondem in junioribus plantis folia linearia nervo longitudinali cernere eſt. Unde libet conjicere ramulos per totam frondem maturâ ætate in ſeſe convolutos formam cylindricam ſumere. [c]

Veſiculorum magnitudo necnon totius plantæ, ut in occidentali Angliæ parte reperitur, characterem diſtinctivum exhibet, quò a ceteris facillimè dignoſcatur. [d]

Hab. in occidentali Angliæ parte.

[c] Idem evenit in *F. tamariſcifolio, abrotanifolio, &c.* ſed maximè omnium in *F. diſcordi.*

[d] F. baccatus, Gmel. p. 89, in Act. Linn. Speciei hujus ſynonymus eſt: accuratiore tamen indagatione ab illuſt. SCHMIDEL qui fortè poſt procellam copiam ejus ſatis largam propè DIEPPE in NORMANDIA invenit, *Gorgoniæ* potiùs quam *Fuco* annumerandus videtur. Icon Speciminis Schmideliani apud D. ESPER tab. 54 repreſentatur unà cum integumento ſubtùs carnoſo necnon ſtirpe durâ et corneâ *Gorgoniis* propriâ Icon Gmelini ſecundum SCHMIDEL ramum breviſſimum exhibet; quum naturalis Plantæ magnitudo 4 vel 5-pedalis ſit.

FIBROUS FUCUS.

PL. XIV.

FUCUS. frond thread-ſhaped, much branched; primary leaves ſub-diſtichous; air-bladders innate, of an oval ſhape, ſtrung on the branches, decreaſing in ſize upwards.

PLATES.

Moriſ. t. 8. *f.* 17.—*Eſp. Ic.* 29. 29 A.

ROOT, a tough ſpongy callous baſis, when freſh from the ſea.

STEM woody, knotted, ſolid.

BRANCHES irregular, branching upwards.

AIR-BLADDERS, ſtrung on, like the beads of a necklace, two or three in a row; ſometimes ſolitary.

FRUCTIFICATION: mucous veſſels with ſeeds in the inſide, and perforated, external *papillæ* coming out in the tufts which crown the upper air-bladders, ſimilar to that of *F. ericoides.* [a]

OBSERVATIONS.

THIS is one of the moſt beautiful of the larger Species of *Fuci*, on account of its elegant ramification, and its very conſpicuous ſhining air-bladders which appear on every branch. The ſtem and branches all taper upwards, and the latter gradually ſhorten towards the top, ſo as to form a pyramid. The bladders do not appear in younger plants: the Specimens at that period are either ſtraggling, and ſetaceous, or very much huddled. In the former caſe, if indeed it is not a variety, it was miſtaken by Mr. HUDSON for a diſtinct ſpecies, and arranged as *F. ſetaceus.* In the latter it might be miſtaken for *F. fæniculaceus.* [b] Meſſrs. GOODENOUGH and WOODWARD had obſerved [c] linear leaves with a delicate midrib near the bottom of ſome Specimens: this I have found to be generally the caſe, and if the plant is held before a ſtrong light, it will appear that the cylindrical leaves on the reſt of the plant are formed by the rolling in of the edges, many appearing in this ſituation to be only imperfectly rolled in; a ſimilar obſervation may be made with reſpect to *F. tamariſcifolius* [d] and its affinities, and has been obſerved lately more remarkably to happen in *F. diſcors.*

[a] See Pl. XI. ii. k, k.

[b] I once found a Specimen like this near WHITSUN BAY, PLYMOUTH, which puzzled me; but ſome others gathered with it, more expanded, and with a few bladders appearing, ſerved to clear up my doubts.

[c] Linn. Tr. 3. 147.

[d] F. ericoides, L. Tr. 3. 130.

The

The fructification has not been noticed by any Author. In the ſummer I believe it is rarely, if ever, met with. A Specimen brought me from St. Ives, February 19th, 1800, was the firſt I ever found in a fructified ſtate. The ſituation is in the tufted ſummits which crown the uppermoſt air-bladders. The ſtem and baſes of the leaves ſwell into mucous veſicles containing the ſeed, and are furniſhed with exterior, perforated *papillæ* for their diſcharge. [e]

Meſſrs. Goodenough and Woodward ſuppoſed *F. baccatus*, *Gmel.* to be a battered Species of F. fibroſus. It had to me ſomewhat of that appearance, though its habit ſtill appeared ſingular and *ſui generis*. However, ſince the publication of that volume, the celebrated Botaniſt Profeſſor Schmidel met with large quantities of this marine Production caſt on the Coaſt of Normandy. Profeſſor Esper has figured a Specimen, Pl. 54. From this Plate, and the Deſcription, [f] it proves to be a ſpecies of *Gorgonia*, which grows to the height of four or five feet. Esper's Plate ſhews the fleſhy integument of that *Genus*.

F. fibroſus is an inhabitant of deep, ſtill waters, and does not abound except towards the Weſtern extremity of this Iſland.

Gmelin mentions the Engliſh Sea as one of its *habitats:* it is ſurpriſing that he did not delineate it. Profeſſor Esper confines it to the Mediterranean, and particularly the Adriatic Sea.

Hab. See above.

[e] See Pl. xiv. b. c. c. and compare Pl. xi. i, i. k, k. It is pleaſing to ſee ſuch analogies in kindred ſpecies.

[f] "Extùs ad notabile ſpatium caudex obductus cruſtâ piloſâ, fuſcâ, punctis in orbiculi formam: an igitur Spongiæ cujuſdam primordium . . an alicujus Zoophyti ſtructura eſt?"—Schm. It. Helv. et Germ. p. 78.

FUCUS CORONOPIFOLIUS. TAB. XIV.

FUCUS fronde ſubcartilagineâ, compreſsâ, ramoſiſſimâ; ramulis obtuſis, multifidis, incurvatis; tuberculis, globoſis, marginalibus. *Herb. Buddle.* 12. 1.—*Petiv.* 25. 3.—*R. Syn.* 45. *n.* 23.—*L. Tr.* 3. 185.

RADIX diſcoides, complanata.

CAULIS compreſſus; nervo quaſi intermedio.

RAMI ſine ordine, ſurſùm attenuati; ramulis ex utroque latere numeroſſiſimis, breviſſimis, incurvatis.

FRUCTIFICATIO; tubercula pedunculata, vel ſeſſilia, inter ſpinulas molles, ramoſas, in marginibus ſita. [a]

OBSERVATIONES.

Fucus coronopi-facie Raij, inſpectis Buddleii et Petiveri herbariis, ut ſpecies diſtincta in Catalogo D. D. Goodenough et Woodward collocatur. *F. cartilagineus* Hudsoni forſan ſynonymus ejus audit; in dubio tamen ſunt Auctores ſupradicti (L. Tr. 3. 186.) ſpeciminibus ejus igni combuſtis. [b] Ramuli per totam frondem flexuoſi et incurvati, anguli etiam ramificationum obtuſiuſculi. Habitus Plantæ quodammodò affinis *F. coccinei*, ſed multis numeris major. Variat colore rubro, roſaceo, luteo, viridi, ut frequentèr obſervavi in *F. coccineo* et maximè omnium in *F. cartilagineo*. In ſpecimine ex inſulâ Vecti [c] extremitates congeſtas, utpote in Synopſi Raij memorantur, modo ſingulari et pulcherrimo obſervavi. Specimen perfectiſſimum olim mihi de Acton Castle [d] poſt procellam mandatum fuit: tres frondes, ſi ita dicam, ex unâ baſi provenientes ad altitudinem ferè pedalem aſſurgebant. Color plantæ iſtius minimè roſaceus, ſed fulvus, qui tamen exſiccatione in coccineum mutatus eſt.

Hab. in occidentali Angliæ parte.

[a] Tubercula aliquando pediculis inſiſtunt abſque ullo ſpinularum interventû.

[b] Vide quæ notavi de F. cartilagineo penes D. Witherıng in Præfatione. [c] Specimen mihi a D. De Luc monſtratum.

[d] In ſinu Mountsray in Cornubia.

FUCUS

FUCUS CORONOPIFOLIUS. PL. XIV.

FUCUS. frond ſomewhat cartilaginous, compreſſed, much branched; branches, obtuſe, multifid, curved; tubercles, orbicular, marginal.

(*No Plate.*)

ROOT diſcoid, flatted at bottom.

STEM compreſſed, wide; with a thick prominence in the middle.

BRANCHES without order, tapering upwards: branchlets very numerous and ſhort, curving upwards.

FRUCTIFICATION; marginal tubercles, either ſeſſile or pedunculate, ſituated in a fringe of forked, branching, ſoft ſpinules.

OBSERVATIONS.

THE examination of BUDDLE's and PETIVER's *herbaria*, where STEPHENS's original Specimen of the *F. coronopi facie* of Ray is preſerved, has enabled Meſſrs. GOODENOUGH and WOODWARD to aſcertain this Species. It is more than probable that HUDSON's *F. cartilagineus*[a] was the ſame, though he has introduced a confuſion of ſynonyms. Doubts, however, have been entertained about this fact in the Linn. Tr. 3. 186. and I think they are ſomewhat ſtrengthened by Dr. WITHERING's Specimens, aſſerted by him to have been "gathered at the Iſle of "Wight," and which are undoubtedly belonging to *F. capenſis*.[b]

The habit of this Species is ſomewhat reſembling *F. coccineus*, but the ſize is much larger: in many inſtances equalling that of the *Cape Fucus;* it is ſubject, like *F. coccineus*, and more particularly the *Cape Fucus*, to beautiful variegations. The ſtem and principal branches are elliptico-angular, with the middle part projecting on each ſide ſharp, like a nerve. I once received from ACTON CASTLE an entire plant after a ſtorm, which conſiſted of three principal ſtems riſing from a common baſe to the height of nearly a foot. Its colour was yellowiſh brown, when freſh from the ſea, or rather a ſorrel, but it dried to a pink colour.

The fructification of this Species is ſubject to vary; in its luxuriant ſtate the margin is fringed with ſoft forked, branching ſpinules, among which the orbicular ſeed-bearing tubercles are intermixed like berries. It ſeems, however, at times to have ſimple pedunculate tubercles on the margins.[c] Theſe tubercles are almoſt black when ripe.

Hab. S. W. Coaſt, from I. of WIGHT to the LAND'S-END.

[a] Dr. WITHERING has deſcribed this Plant under the name of *F. cartilagineus* from Specimens ſent from CORNWALL, but he has made GMELIN's *F. capenſis* a Synonym.

[b] See the detail of this fact under *F. cartilagineus* in the Preface.

[c] Meſſrs. Goodenough and Woodward from their deſcription of the fructification ſeem to have ſeen only battered, or at leaſt imperfectly fructified ſpecimens.

FUCUS BARBATUS. TAB. XIV.

FUCUS. fronde filiformi, flexuoſâ, ramoſiſſimâ; fructificatione obovatâ, ſimplici vel congeſtâ, in ſummitatibus ramulorum. *L. Tr.* 3. 128.

F. fæniculaceus. *Gmel.* 86.—*Hudſ.* 575.

F. granulatus? *L. Tr.* 3. 131.—*Fl. Dan.* 571.

RADIX, callus expanſus?

CAULIS teres, ſurſùm attenuatus.

RAMULI, teretes, flexuoſi; ex omni parte.

FRUCTIFICATIO; veſiculæ ovatæ,[a] mucoſæ ſeminiferæ; tuberculis externis; folio ſubulato, terminali.

OBSERVATIONES.

Species hæc, *Fucus fæniculaceus* D. D. Gmelin et Hudson, non tamen Linnei, rariſſimè in littoribus noſtris projicitur. Frons ramoſiſſima, ramulis caulem undique cingentibus; ſuperioribus brevioribus. Ramulos terminant veſiculæ mucoſæ ſeminiferæ, tuberculis, vel papillis perforatis extùs. Veſiculæ hæ reverà ex tuberculis binis vel ternis in unum congeſtis conficiuntur, figuram nudo oculo ovatam formantibus. Ex apice veſiculæ prodit folium ſimplex ſubulatum. Notulis hiſce a *F. fibroſo*, *fæniculaceo*, et *abrotanifolio* diſtinguitur.

Errorem Act. Linn. 3. 131. ineſſe ſuſpicor, ubi *F. granulatus*, Linn. ut Species Anglica recenſetur. In ſpecimine a me obſervatis ramuli nonnulli tubercula remota, et quaſi concatenata in folio ſubulato, terminali gerunt.[b] Hinc inducti, utpote et char. ſpec. Linnei "veſiculæ innatæ ſed tamen remotæ" Speciem diſtinctam ſtatuere D. D. Goodenough et Woodward; quum tamen in eodem ſpecimine characteres hi reperiantur.

In *Herbario Linneano F. granulati*[c] occurrit ſpecimen fructificatione minimè congeſtâ, et ovatâ (ut in *F. barbato*), ſed tuberculis ejuſdem magnitudinis, contiguis, concatenatis; ſeptem vel octo in eodem ramulo, ſpecies certè exotica. D. Profeſſor Esper quoque nuperrimè *F. granulatum* ſibi a D. Schmidel a mari Mediterraneo miſſum, tab. 61. icone donavit. Tubercula, in hoc ſpecimine, ut ex deſcriptione, et figurâ auctâ conſtat, in apicibus ramulorum duplici ſerie ex adverſo poſita cernuntur.[d] Habitus etiam totius plantæ planè diverſus.

Hab. in Devonia.

[a] Si microſcopium adhibeas veſiculis hiſce ſeminiferis, bina vel tria tubercula congeſta vel connata ut in Tab. XIV. z. z. zz. zz. deteges.

[b] Vid. Tab. XIV. a, a, aa. [c] Granularis vocatur.

[d] Esperi deſcriptio verbis hiſce continetur "Die Blaſchen ſind einzeln aneinander gereyhet. p. 120. Sie ſtehen theils an einer Seite des "Zweiges, theils dazwiſchen —— gewohnlich aber liegen ſie in mehreren Reihen ubereinander. ib."——

FUCUS BARBATUS. PL. XIV.

FUCUS. frond filiform, flexuoſe, much branched: fructification; ovate, terminal tubercles.

PLATE.

Gmel. t. 2. A. *f.* 2.

ROOT, a callous knob?[a]

STEM cylindrical, tapering upwards.

BRANCHES crooked, and waving; coming out on all ſides of the ſtems.

FRUCTIFICATION; mucoſe veſicles, huddled together in a ſort of oval ſhape, with internal ſeeds and external *papillæ*, terminated with an awl-ſhaped leafit.

OBSERVATIONS.

This Species is rare, and has occaſioned miſtakes among our Engliſh Botaniſts, who, after the example of Gmelin, have given it the trivial name of *F. fæniculaceus*, which appears by the Linnean *Herbarium* to be a very differ-

[a] It has not been found as yet perfect, but it is conjectured to be like its affinities in this reſpect.

ent

ent Species.[b] The detection of this error we owe to the great attention in the collation of Specimens of the Authors of the Dissertation on *Fuci*, L. Tr. p. 135. Its habit and the terminal congeries of mucous seed-bearing tubercles, if viewed with a common eye-glass, will distinguish it from its affinities, and it likewise is much smaller in its dimensions. Its colour is olive, which dries black.

On many branches of this Species you will observe one, sometimes two smaller tubercles strung on the subulate leaf: probably in some specimens it may obtain pretty generally. Messrs. GOODENOUGH and WOODWARD induced by this circumstance, and likewise by an expression in the Linnean specific character, have introduced *F. granulatus* as a British Species.[c] Professor ESPER has however lately given an accurate representation of a Specimen of *F. granulatus* from the Bay of NAPLES, Pl. 54, with a magnified twig which certainly is a distinct Species, and of which I have seen a Specimen.[d]

Hab. DEVONSHIRE, and S. W. Coast.

[b] *F. fæniculaceus*, Linn. is *F. concatenatus* of HUDSON, LIGHTFOOT, WITHERING, and VELLEY: the latter has figured it, and according to the Plan adopted by me it will not be engraved. See Appendix. It differs from *F. concatenatus*, Linn. which is a Mediterranean Plant, and improperly referred to by Mr. HUDSON.

[c] I incline to think there may be a variety of *F. barbatus* from the descriptions of HOUTTUYN, 293. n. 23. and GUNNER. Fl. Norv. 2. 139. n. 1071. ESPER's *F. granulatus* from his Description and Plate is certainly a distinct Species. This may be cleared up when more British Specimens are discovered, or by communications from Northern Botanists.

[d] Mr. WOODWARD's own Specimens have the Summits as at a, aa, Pl. XIV.

FUCUS ABROTANIFOLIUS. TAB. XIV.

FUCUS. fronde filiformi, compressâ, pinnatâ: ramulis extremis vesiculosis; foliolis è vertice vesicularum, multipartitis, obtusis.—*D. Læsling, Herb. Linn.*—*L. Sp. Pl.* 1629.—*Hudſ. Flor. Ang.* 575.—*L. Tr.* 3. 126.

RADIX, discus explanatus?

CAULIS cylindrico-compressus, crassitie pennæ corvinæ, sursùm attenuatus.

RAMI sub-pinnati, vel sine ordine; superiores breviores.

RAMULI, multifidi, flexuosi, obtusi.

FRUCTIFICATIO in vesiculis et apicibus—tubercula minuta seminifera?[a]

OBSERVATIONES.

HERBARII Linneani possessioni usufructuariæ, si ita dicam, necnon curis D. D. GOODENOUGH et WOODWARD debetur quòd Species hæc, præcedenti, adhuc rarior, in Catalogo Anglicano locum suum obtineat. Specimen D^ni LŒFLING ibi conservatum et Cl. LINNEO ex ANGLIA missum accuratè descripserunt Auctores supradicti, L. Tr. 3. 126. Specimen istud nuperrimè examinavi, veniâ mihi liberalitèr admodùm a D^no SMITH concessâ, et descriptionem Act. Linn. l. c. cum plantâ siccâ collatam comprobavi. Specimen item penès D. WOODWARD, aliudque, sed id cursìm, penès D. LAMBERT titulo Hudsoniano[b] subscriptum examinavi. Descriptioni Act. Linn. 3. 126. vix quidquam addendum videtur: icon certè desiderabatur; hanc ex specimine D^ni WOODWARD magnitudinis naturalis in Tab. XIV, fisto.

Maximè affinis videtur *F. fæniculacei*, Linn. vesiculæ in utroque mucosæ potiùs quam aëriferæ; in posteriore tamen in axillis, et in medio ramulorum concatenatæ cernuntur. Vesiculæ hæ quoque *F. tamarisci folii* similes sed minores.

[a] Vid. Tab. XIV. β. γγ.

[b] Ibi *F. barbatus* perperàm nuncupatur.

Fructificatio

Fructificatio ſecundùm D. Goodenough et Woodward, tuberculis minutis conficitur; licet ex analogia conjicere fas ſit, tubercula iſta ſolummodò papillas eſſe, ſeminaque intùs muco obvoluta generari. In ſpecimini-bus tanti pretii minimè experiri licuit: viderint ergo Poſteri.

Hab. in occidentali Angliæ parte rariſſimè.

[c] In *F. fæniculaceo*, Linn. et in *F. diſcordi* ſemina *intùs* ſita ſunt, papillis conicis *extùs*. Vid. Tab. XIV. *β*, 777.

FUCUS ABROTANIFOLIUS. PL. XIV.

FUCUS. frond thread-ſhaped, compreſſed, pinnate; bladders near the extremity of the branches terminating in a multipartite leaf, obtuſe, pointed.

(No Plate.)

ROOT, ſuppoſed to be a callous knob.

STEM cylindrico-compreſſed of the thickneſs of a Crow-quill, tapering upwards.

BRANCHES ſub-pinnate, or without order; decreaſing in length towards the ſummit.

BRANCHLETS multifid, flexuoſe, blunted at the tips.

FRUCTIFICATION in the veſicles and on the terminating ſhoots—conſiſting of minute ſeminiferous tubercles.[a]

OBSERVATIONS.

We are indebted for the accurate knowledge of this Species to the careful examination of the *Linnean Herbarium* by Meſſrs. Goodenough and Woodward. The original Specimen of Lœfling is there preſerved. I have lately, by favour of our excellent Preſident,[b] examined the ſame Specimen, and compared it with the deſcription in the Linnean Tranſactions. I have likewiſe examined the only exiſting Specimens of this rare Species that I know of. Mr. Woodward kindly intruſted me with his, for the purpoſe of preſenting the Reader with the annexed delineation. No ſpecimen that I have ſeen has the callous baſe from whence it is ſuppoſed to grow. Mr. Lambert's ſpecimens, the remains of the late Mr. Hudson's Collection, which I ſaw three years ago in company with Mr. Turner, were in a very battered ſtate, and imperfectly expanded. I think there can be no difficulty in diſcriminating this Species from its affinities, by attending to the ſpecific and detailed character as above, with the aſſiſtance of the engraved Repreſentation. Its neareſt affinity is *F. fæniculaceus*, Linn. The fructification is deſcribed in the L. Tr. from the dried Specimen. It could not be expected that inveſtigation by ſoaking, and the application of the knife, would have been permitted in the caſe of ſo rare a Specimen, but from analogy I ſhould conclude that the ſmall external tubercles would prove to be *papillæ* ſhrunk up by drying, and that the ſeeds lay in maſſes involved in *mucus* within the ſkin.[c]

Hab. On the S. W. Coaſt: the preciſe Spot is not mentioned.

[a] See Pl. XIV. *β*. γ. γ. γ.

[b] James Edward Smith, M. D. Preſident of the Linnean Society.

[c] See the Fructification magnified, *β*. γ.γ.γ. tab. XIV. and compare the magnified Drawings of *F. tamariſcifolius* and *F. fibroſus*. N.B. I did not venture to macerate the Specimen.

FUCUS AMPHIBIUS. TAB. XIV.

FUCUS fronde filiformi, ramoſiſſimâ; ramis ſub-alternis; ramulis capillaribus apice convolutis.—*R. Syn.* 38.—*Hudſ.* 471.—590.—*With.* 4. 116.—*Act. Linn.* 3. *p.* 227.

F. ſcorpioides.—*Gmel.* 135.

RADIX

RADIX è fibrillis compoſita.

CAULIS, filiformis, cartilagineus, ad baſin ramoſus.

RAMI capillares, implicati, apicibus convolutis.

FRUCTIFICATIO in cirris terminalibus, qui maturâ ætate in racemum explicantur,[a] fructibus acutis.

OBSERVATIONES.

HABITUM Fuci hujus ſingularem exactè exprimit Icon RAIJ SYNOPSEOS, t. 2. f. 6. in parvo tamen, et caule, reſpectu plantæ magnitudinis, craſſiuſculo. Satiùs tamen fore judicavi ſpecimen penes me contra inſtitutum meum,[b] delineare de novo. In editione 1^ma^ D^ni^ HUDSON, utpote in Hiſt. Fuc. D^ni^ GMELIN, Species hæc nomine ſatis apto *Scorpioides* audit: nomen triviale "amphibius" a D. HUDSON in ed. 2^da^ et in Act. Linn. 3, p. 227. inditum, quoniam in foſſis mari vicinis, aquâ ſalsâ et dulci vicibus alternis repletis, proveneat.

In Act. Linn. varietates duæ recenſentur, var. α, Rajana, var. β, noſtra; neſcio tamen an ita ſe res habet. Fructificatio a D. GMELIN, et in Act. Linn. deſcribitur quaſi tuberculoſa, et muco in apicibus cirrorum obvoluta; accuratior tamen inveſtigatio a D^no^ TURNER nuperrimè habita probavit apices iſtos mucoſos, ætate evolvi, fructu racemoſo, ovato, acuto, terminali, ut in icone repreſentatur, t. XV. z, z. *F. ſcorpioides*, D. ESPER, Speciem plane diverſam exhibet; ſuſpicor etiam ex deſcriptione *F. ſcorpioidem* D. GMELIN minimè eundem ac *F. Scorpioidem* noſtratem eſſe.

Hab. prope YARMOUTH.

[a] Vid. Tab. XV. y, z, zz. [b] Vid. Præf. Angl.

AMPHIBIOUS FUCUS. PL. XIV.

FUCUS. frond thread-ſhaped, much branched; branches ſub-alternate; branchlets capillary with their ſummits rolled in.

PLATE.

Ray, Syn. t. 2. f. 6.

ROOT compoſed of ſmall fibres.

STEM thread-ſhaped, cartilaginous, branching from the bottom.

BRANCHES capillary, interwoven; with curled ſummits.

FRUCTIFICATION in the terminal rolls which when advancing to maturity become ſtrait, and exhibit a raceme with oval ſharp-pointed fruit.[a]

OBSERVATIONS.

THE Repreſentation of this Plant in RAY's Synopſis is accurate, but I ſuppoſe it to be reduced, as it is ſo much leſs than I ever ſaw it: Dr. GOODENOUGH and Mr. WOODWARD have however called it a Variety. At all adventures I am induced to give a delineation of it from a Specimen furniſhed by my Friend Mr. D. TURNER. HUDSON's original name *Scorpioides*, taken from Profeſſor GMELIN is deſcriptive of its habit, and better in my opinion than *F. amphibius*, which appears in his 2^d^ Ed. and which has been copied in the L. Tr. 3. 227; a name given from its growing in ditches near the ſea, whoſe waters are alternately ſalt and freſh. Its habit of ramification diſtinguiſhes it from every other, and requires no farther detail. The fructification in its mature ſtate has not been noticed. It has been lately ſent to me by Mr. TURNER, and exhibits a Raceme as figured in the Plate XV. y, zzz.

[a] In Linn. Tr. ſeminiferous tubercles are ſaid to be contained within the rolled ſummits: this is the ſtate prior to the evolution of the raceme, and is extremely analogous to Scorpioides among Land Plants.

Profeſſor

Profeſſor ESPER has lately figured *F. ſcorpioides*, Pl. XXXIII. His n. 1, is an exact repreſentation, as to habit, of *Conferva polymorpha*; but the detached Plant, n. 2. is different, and the magnified Repreſentation, n. 3, ſhews a ſort of Fructification, differing from any Species I have yet met with.

Hab. S. E. Coaſt near YARMOUTH and WISBECH in Ditches.

FUCUS FASTIGIATUS, *Linn.* TAB. XIV.

FUCUS. fronde ſub-dichotomâ, ramoſiſſimâ; ramis faſtigiatis obtuſis; tuberculis lateralibus apice complanatis. *Moriſon.* 649?—*Petiver.* 31. *n.* 4.—*Linn. Tr.* 3. 199.

RADIX; callus minutus ſtatim è baſi furculoſus; furculis ramoſiſſimis, radicantibus.

CAULIS ad baſim furculis veſtitus, ſuprà nudus; prælongus.

RAMULI primò dichotomi, dein ſine ordine; ad apices confertiſſimi.

FRUCTIFICATIO; tubercula ſub-conica, depreſſa; verſus medium ramorum.

OBSERVATIONES.

BOTANICORUM noſtratium [a] ſecutus exemplum *F. lumbricalem* Dⁿⁱ GMELIN ſub nomine *F. faſtigiati* in priore Faſciculo deſcripſi, hactenùs inedità Diſſertatione de Fucis D. D. GOODENOUGH et WOODWARD. Horum tamen auctoritate, inſpectiſque nuperrimè a me Herbarii Linneani ſpeciminibus, Speciem hanc ſub nomine *F. faſtigiati, Linn.* iſto. Etſi è callo minimo oriatur Fucus hic, caulis tamen ad baſim maximè omnium furculoſus. Habitus Plantæ ad apices minimè dichotomus, ſed irregularis, ramulique quam in affinibus tenuiores. De MORISONI figuris n. 4 et 9. tab. IX, vix auſim affirmare; variam *F. lumbricalis* ramificationem præ ſe ferre videntur. Ut ut ſe res habet Specimina omnia *F. lumbricalis, faſtigiati,* et *radiati,* penès me ad examen nuperrimè revocavi, et characteribus ex fructificatione ſub microſcopio minimè ambiguis in ſpecies plures ſeparavi. [b]

Hab. paſſim.

[a] HUDSON, LIGHTFOOT, and WITHERING.

[b] Vide notulam (d) deſcriptioni Angl. ſubjunctam.

FUCUS FASTIGIATUS, *Linn.* PL. XIV.

FUCUS. frond ſub-dichotomous; [a] ſummits faſtigiated with blunt tips: tubercles lateral, ſcattered, flatted at top.

PLATES.

Moriſon, t. 9. f. 9?—Flor. Dan. 393.—*Eſper. Ic. t.* XVI.

ROOT, a very ſmall knob immediately becoming covered with ſhoots.

STEM, naked at bottom.

BRANCHES at firſt inclining to dichotomy; then irregular; much crowded at top.

FRUCTIFICATION: conical tubercles, flatted at top, ſituated low down or towards the middle of the Plant.

[a] Linn. Tr. 3. 200, ſays the ſummits are often trifid: in fact, the dichotomy is extremely irregular towards the tips, 2 or 3 branches often coming out on one ſide.

OBSER-

OBSERVATIONS.

I DESCRIBED in a former Article,[b] *F. lumbricalis* of GMELIN and LINN. TRANS. under the trivial name of *F. faſtigiatus*, following the example of our Engliſh Authors,[c] the Diſſertation above alluded to being then unpubliſhed. I here inſert *F. faſtigiatus*, as I obſerved it in the *Linnean Herbarium*, the figure, Pl. XIV, being taken from a ſpecimen in my poſſeſſion. Its deſcription as above will ſerve to diſcriminate it. Its ſtem and branches are finer than thoſe of any of its affinities. I have lately examined various ſpecimens in my poſſeſſion, by cutting tranſverſe ſections through the ſummits, where the fructification appeared, and have diſcovered by means of the microſcope inconteſtible marks of diſcrimination ſufficient to arrange ſeven Species. Theſe I have ſubjoined in a note with references to the magnified Drawings of theſe tranſverſe ſections in Pl. XIV.[d]

Hab. not uncommon.

[b] P. 15.

[c] *Faſtigiatus* and *Furcellatus* have been made different Species by HUDSON and LIGHTFOOT, and Var. α and β by WITHERING; though they are clearly the barren and fructifying ſummits of the ſame *Fucus*.

[d] When I deſcribed *F. faſtigiatus* in a former Faſciculus, I delineated two ſpecimens under the idea of their being varieties. *F. lumbricalis*, L. Tr. which is the lower figure of my Pl. VI, has the fructification there repreſented in oblong decurrent veſicles, which is inaccurate, and muſt have been occaſioned by miſtaking ſome indurated *mucus* for a ſeed-veſſel. Theſe oblong veſicles are however the ſpecific characteriſtic of my upper figure in the ſame Plate, which is arranged below as n. 5. I have ſince had opportunities of examining various ſpecimens of this latter Plant which is frequent in Cornwall, and it certainly is a diſtinct Species. The reſult of my examinations on the different Specimens in my poſſeſſion is given in the ſubjoined Liſt. The method taken by me was by cutting acroſs with a fine inſtrument the fructified parts. Where the tubercle, or decurrent ſeed-veſſel, is external, the ſeeds are ſituated *without* the frond; where the fructification is effected by an inflation of the ſummits, the ſeeds are *within*.

Seeds kidney-ſhaped or curvi-linear, often barred acroſs.

* within the external cuticle.

1. F. lumbricalis. frond dichotomous ··· ſeeds in orbicular maſſes, perforations inviſible, but without any external papillæ. N.B. When mature, the ſummits curve inwards. t. XIV. f. g. g. h. iii.

2. F. furcatus. frond dichotomous ··· ſeeds naked, arranged in regular rows juſt within the cuticle; no viſible perforations. t. XIV. n. o. p.

3. F. faſtigiatus of Gmel. frond dichotomous ··· ſummits ſwelling into a veſicle with furrows in the outer coat; ſummit by decay diſcharging the ſeeds. N.B. In this ſpecies the ſeeds ſeem to be imbedded at the bottom of the Furrows. LIGHTFOOT I think has deſcribed this Species. T. XIV. k, kk. l, ll. m, mm. different appearances.

* * without the external cuticle.

4. F. radiatus. frond dichotomous ··· ſeeds in echinated tubercles, either lateral or ſurrounding the ſtem; collected in oval maſſes. t. XIV. s, ss. t, t, t.

5. F. lateralis. frond dichotomous ··· ſeeds in oval maſſes, in ſmooth longitudinal veſicles, with a ſmooth outward coat. t. XIV. u, u, v, v.

6. F. furcellatus—Faſtigiatus, Linn. Tr. (the ſubject of this article) frond dichotomous *** ſeeds in the inſide of flat conical tubercles.* t. XIV. q. qq. r. r.

7. F. capitatus. fronde dichotomâ. ··· ſeeds in the inſide of warty tubercles, ſituated among the tufted branches of the ſummits. Species from Bognor. w. x.

* I am not certain that theſe tubercles contain ſeed: they are found on the Dover Specimen of *F. faſtigiatus*, n. 3, which has likewiſe fructified ſummits.

FUCUS RADIATUS. TAB. XIV.

FUCUS. fronde filiformi, dichotomâ; ramis ſub-æqualibus; ſummitatibus acuminatis; tuberculis ſeminiferis, verrucoſis, ſcabris; lateralibus, vel amplexicaulibus. *Linn. Tr.* 3. 202.

RADIX, callus expanſus, plures emittens furculos.

CAULIS nudus, cylindricus, ſubdiaphanus.

RAMULI dichotomi, intervallis æqualibus; angulis rotundiuſculis.

FRUCTIFICATIO; verrucæ ſubrotundæ purpureæ, echinatæ, formam fructûs mori in parvo exhibentes; ſeminibus in maſſis ovalibus, formâ reniformi vel curvilineâ.

OBSER-

OBSERVATIONES.

F. radiatum, auctoritate D. D. GOODENOUGH et WOODWARD, nec non ex ſpeciminibus mihi è NORFOLCIA tranſmiſſis, ſiſto. Speciem hanc accuratè admodum deſcripſere viri doctiſſimi, Act. Linn. 3. 202. Icon adhuc deſiderabatur, nam de ſummitate *F. rotundi* apud D. GMELIN, t. VI. f. 3. utpote Speciei hujus ſynonymi, vix auſim affirmare. Fructificatione verrucosâ, ſcabrâ, capitulos Sphæriæ entimorrhizæ adumbrante [a] ab affinibus diſtinguitur. Tres ſolummodo enumeravere ſpecies D. D. GOODENOUGH et WOODWARD; characteribus tamen a fructificatione ſub microſcopio ſumptis, ſeptem ſtatuo.[b]

Hab. YARMOUTH et in Orientalis ANGLIÆ littoribus.

[a] Act. Linn. 3. 203. [b] Vid. notulam ſuprà, F. faſtigiato, Linn. Tr. ſubjunctam.

RADIATED FUCUS. PL. XIV.

FUCUS. frond thread-ſhaped, dichotomous; intervals between the angles of dichotomy nearly equal; ſummits acuminated; tubercles rough and warty; either lateral, or embracing the ſtem.

(No Plate.[a])

ROOT, an expanded callous Diſc, ſending up ſeveral ſhoots.

STEM, naked, cylindrical, ſemi-tranſparent.

BRANCHES dichotomous, equal, forming roundiſh angles.

FRUCTIFICATION: echinated warts with oblong maſſes of ſeeds, which are kidney-ſhaped, or ſlightly curvilinear.[b]

OBSERVATIONS.

THIS Species is ſaid by Meſſrs. GOODENOUGH and WOODWARD to be the *F. rotundus* [c] of GMELIN, but the deſcription is not ſufficiently detailed to eſtabliſh a ſpecific difference, and the ſmall ſummit, t. VI. f. 3, repreſents a ſmooth wart divided by a cleft. The ſingular rough-headed echinated wart is ſufficient to diſtinguiſh it, added to the Diſc which ſpreads wider than its affinities. There are only three Species enumerated in the Linn. Tr. and I accordingly inſert no more in the body of the Work; but my Obſervations under the microſcope authorize me to increaſe the number to ſeven including only thoſe on which I have made actual Experiments.[d]

Hab. on the Eaſtern Coaſt.

[a] The Linn. Tr. quotes GMELIN's Pl. VI. f. 3. but that is only a ſummit, and the tubercle is double with a ſmooth ſkin; and as the echinated ſurface is always obſervable in *F. radiatus*, I do not admit this ſynonym. See note on *F. faſtigiatus*, containing a new and accurate Arrangement of the affinities of this Plant, which from ſhape of ſeed and other circumſtances ſhould form a new *Genus*.

[b] The ſeeds are the ſame in *F. lumbricalis, faſtigiatus, &c. &c.* See Pl. XIV. g, g.

[c] ESPER has figured a very different Plant for the *F. rotundus* of GMELIN. [d] See Note under *F. faſtigiatus* Linn.

FUCUS CILIATUS. TAB. XV.

FUCUS. fronde aveniâ, ramoſâ,[a] marginibus ciliis, vel ligulis inſtructis; radice fibroſâ. *Herb. Buddle.* 26. 4.—*Petiv.* 19. 2. 3.—*R. Syn.* 47. *n.* 33.—*Gmel.* 176? (ligulatus, 177. holoſetaceus, 178.)—*Hudſ.* 580.—*Lightf.* 934.—*With.* 4. 104.

RADIX fibroſa.

CAULIS ſubrotundus, brevis.

FRONS ſimplex vel ramoſa, marginibus ligulis inæqualis longitudinis inſtructis; grandioribus ciliatis.

[a] Act. Linn. l. c. ita vocatur. Habitus autem frondis in Specimine primo, ligulatus eſt potius quam ramoſus, ut in Icone videre eſt.

FRUC-

FRUCTIFICATIO dimorpha—tubercula ſub-pedunculata, in apicibus ciliorum, vel ſeſſilia in margine—granula minutiſſima in cute nidulantia in maculis irregularibus diſpoſita. [b]

OBSERVATIONES.

Species tres D. Gmelin, *F. ciliatus*, *ligulatus*, *holoſetaceus*, ſub uno communi triviali nomine, Act. Linn. v. 3. 160, includuntur. Varietates duas ſtatuit D. Lightfoot; rectiùs forſan D. Withering ſpecies totidem ſc. *F. holoſetaceum* et *lanceolatum*. Species hæc ſtatu præſenti maximè omnium Proteiformis eſt. Miror equidem Auctores ſupradictos Gmelini oſcitantiam in *F. ciliato* deſcribendo minimè exprobaſſe. Deſcriptio equidem claudicat inſignitèr, et quid ſibi vult Auctor qui in fronte tituli Morisoni characterem, p. 646. n. 10. [c] "ca-"pillis longis fimbriatum" oſtendit, planè neſcio. Icon ejus t. xxi. f. 1. *F. laciniatum* adumbrat, prout obſervarunt D. D. Lightfoot et Withering. Varietates tres, grandifoliam, lanceolatam, et filifoliam levi immutatione (Var. prima enim *F. ciliatum* et *holoſetaceum*, Act. Linn. includit) iconibus ſeparatim donatas ſiſto.

Var. α. ··· fronde, ut ſuprà, latitudinem quatuor unciarum attingit, ligulæque primariæ pari modo ſeſe ampliantes molem ſatis largam ſtruunt, ſuperficie utrâque ciliis mollibus, eodem modo ac ſecundariarum margines, inſtructâ.

Var. β. ··· fronde ramoſâ; caule et ramis cylindricis ſub-impreſſis, foliis ex apicibus ramulorum lanceolatis, ciliatis. *With.* 4. 104. Tab. xv.

Varietas hæcce in occidentali Angliæ parte occurrit, et quidem copioſiſſimè, ſuperficie quoque in provectioribus ciliatâ, ſed præcipuè verſus unam frondis paginam. Color, ut in ſuperiore, ſaturè ruber vel olivaceus. Planta Paraſitica ut plurimum; magnitudo, ut in Icone repreſentatur.

Var. γ. ··· fronde ramoſiſimâ cylindrico-compreſsâ ramulis extremis compreſſis, ciliatis. Tab. xv.

Juxta Padstow, Cornubiæ, verſus Boreale littus oppidum varietas hæc copioſè occurrit. Statu recenti frons ferè cylindrica eſt, et ciliis ad extremitates ramulorum obſita. Cumulatim creſcit. Structura frondis in omnibus eadem, cuticula colorata glaberrima mucum album vaſculoſum operiens. Species certè edulis.

Var. δ. ··· fronde ramoſâ, ramis lineari-lanceolatis, ciliis æqualibus rectangulis, pectinatis. *F. Ptilotus*, Gunn. et Esper. Tab. xv.

Specimen in Icone delineatum cum *F. corneo*, tab. xii, immixtum inveni.

Hab. Var. α, paſſim—β, γ, in Occidentali Angliæ parte—δ, Polkerris, Fowey, Cornubiæ.

[b] Vid. duplicem fructificandi methodum t. xv, a, b. Proculdubio plures ſub eodem triviali nomine continentur ſpecies, accuratiore fructificationis inveſtigatione ſeparandæ. Tubercula prout obſervavi in var. β ſæpius occurrunt.

[c] Character hic fine dubio *F. jubatum* deſignat.

Ciliated FUCUS. PL. xv.

FUCUS. frond ſmooth, veinleſs, branching into flat *laciniæ*, or proceſſes; having the margins beſet with *cilia*, or ſmall ſoft ſpines, often ſwelling into leaves which are likewiſe ciliated.

PLATES.

Gmel. t. xxi. *f.* 2, 3.—*Eſper. Icon. t.* iv.

ROOT fibrous.

STEM ſhort, cylindrico-compreſſed.

FROND, ſimple, or divided; margins ciliated, and the ſurface likewiſe in aged ſpecimens.

FRUCTIFICATION *dimorphous* [a]—tubercles ſwelling out on the tips of the *cilia*, or nearly ſeſſile on the edge—naked ſeeds very minute, of the colour of the frond, imbedded in irregular patches.

OBSERVATIONS.

I FOLLOW the example of the reſpectable Authors of the Diſſertation on *Fuci*, Linn. Tr. v. 3. in including ſeveral ſpecies of different Writers in one; not from conviction, but from inability as yet to diſcriminate them by Fructification. In the varieties I conſtitute, I deviate however, in a ſlight degree, from my Predeceſſors, and admit none that are not ſtrictly ciliated. [b]

VAR. α. ··· My firſt variety deſcribed above includes *F. ciliatus* and *holoſetaceus*, *Gmel.* as the broad-leaved ſort always at an advanced period, throws out more or fewer ſoft ſpines from the ſurface. Its breadth and bulk is often conſiderable, as the marginal proceſſes ſwell to emulate the ſize of the parent Frond, which are again ciliated at the edges, and thoſe ſecondary *cilia* continue widening, and are ciliated likewiſe at the edge.

Var. β. ··· frond branched: ſtem and branches cylindrical; the latter flattening and ſwelling into a lanceolate acute leaf with a ciliated edge. PL. XV.

This variety is very plentiful in the Weſt of ENGLAND; it grows in thick cluſters, frequently as a Paraſite on the ſtems of larger *Fuci*. It is of the ſize delineated, and is found either of the full red colour of the former broad-leaved kind, or of an olive brown.

Var. γ. ··· frond very much branched; branches filiform, compreſſed, and ſlightly expanded towards the tip, furniſhed with very minute *cilia*. PL. XV.

This elegant variety, which nearly approaches *F. corneus*, Pl. XII, was ſent me by Mrs. Prideaux BRUNE of PLACE near PADSTOW, with many other curious ſpecimens from the BRISTOL CHANNEL: I have not yet found it in fructification.

Var. δ. ··· frond branched: branches linear, acute: *cilia* of equal lengths ſtanding regularly at right angles like the teeth of a comb. PL. XV.

This is the *F. Ptilotus* of GUNNER and ESPER. I found it mixed with my *F. corneus*.

The ſubſtance of all theſe varieties is the ſame, varying only in a greater or leſs degree of ſucculency; the full lake colour of the frond tinges water ſtrongly on maceration, in the ſame manner as *F. edulis*, and like it is eaten by the Scots and Iriſh.

ESPER has figured *F. ciliatus* like *F. laceratus* of GMELIN, the fructified branch, n. 3, is unlike any thing I have ſeen, and has no analogy with this ſpecies. He has likewiſe introduced *F. cauleſcens* as a Synonym, which is clearly a diſtinct ſpecies.

Hab. VAR. α, common—β, γ, W. of ENGLAND—δ, POLKERRIS, FOWEY, CORNWALL.

[a] This is a ſingular circumſtance, and evinces that there are Species nearly allied only diſcoverable by Fructification under the Microſcope.

[b] I have reprobated above the inaccuracy of GMELIN in his deſcription of *F. ciliatus* and reference to a Specimen, Pl. XXI. f. 1. with a fringed or ſlightly crenated edge, which both LIGHTFOOT and WITHERING, notwithſtanding his reference, have referred to *F. laciniatus*.

FUCUS CRISPATUS. TAB. XV.

FUCUS. fronde ſub-pellucidâ, glaberrimâ, nitente, aveniâ, laciniatâ; ſegmentis [a] profundè, et irregularitèr inciſis; angulis rotundis; marginibus elegantèr criſpatis. *Hudſ.* 580. F. laciniatus, VAR. 1. *With.* 4. 102.—F. laceratus, VAR. 2. *Linn. Tr.* 3. 155.

[a] Frons Act. Linn. et alibi ramoſa vocatur.

RADIX

RADIX, callus minutus.

CAULIS o, aut breviſſimus, ſub-compreſſus.

FRONS glaberrima, nitens, ſubrigida; ſtructurâ internâ, è globulis pellucidiſſimis; cuticulâ, ſtatu recenti, maculis diſtinctâ; margine elegantèr criſpato. [b]

FRUCTIFICATIO, congeries ſeminum in ſubſtantiâ frondis [c] nidulantium. Semina minutiſſima, rubra, orbicularia.

OBSERVATIONES.

F. criſpatum, D. HUDSON, cujus mentio ſit ſuprà, p. 77. (*F. lacerati*, D. GMELIN, in ACTIS LINNEANIS ſynonymon,) Tab. XV, icone donavi. "Inveſtigatione ſæpiùs repetitâ inducti," ut aiunt, D. D. GOODENOUGH et WOODWARD, "Species plures inter ſe affines in unum collegêre. Fructificatio eadem in omnibus; habitus Frondis diverſus." Reſpectu fructificationis *F. criſpati* tubercula nunquam vidi, quamvis juſto tempore, forſan, invenienda forent; ſed aliquando cuti adhærentes, ſæpe in illâ nedulantes, congeries ſolummodo ſeminum cernendæ ſunt. Structura frondis interna, ut ſupra deſcripſi, Speciem hanc a cæteris diſcriminabit. Frons ſtatim è baſi dilatatur, et quaſi palmata ſit, latitudine Plantæ altitudinem ejus exſuperante. Frondes plurimæ ex communi diſco minutiſſimo proveniunt; ex ſegmentis etiam aliquando novi diſci fiunt. Portio frondis, recens è mari, Microſcopio ſubjecta ſub Sole gemmis contiguis conſtare videtur. Species hæc edulis eſt et tinctoria. [d]

Hab. in CORNUBIA.

[b] Vid. Tab. XV. a. marginis portionem auctam. [c] Vid. Tab. XV. a. aa.

[d] Vid. *F. edulis* deſcriptionem, p. 57.—8.

FRINGED FUCUS. PL. XV.

FUCUS. frond ſemi-tranſparent, very ſmooth and ſhining, veinleſs; laciniated: ſegments deeply and irregularly cut in; angles circular, margins elegantly fringed.

(*No Plate.* [a])

ROOT, a minute callous knob.

STEM, o, or very ſhort. [b]

FROND, lacquered and ſhining; rather rigid in texture: its internal ſtructure conſiſting of pellucid gem-like globules in contact with each other, as it appears when magnified—ſurface blotched; the edges fringed.

FRUCTIFICATION.—Patches of very minute orbicular ſeeds imbedded in the ſurface near the margin.

OBSERVATIONS.

GREAT confuſion has ariſen among our marine Botaniſts in arranging ſome nearly allied Species. The reſpectable Authors of the Diſſertation on *Fuci*, ſo often referred to, have included this *Hudſonian* Species with three others under *F. laceratus* of GMELIN. They have evidently beſtowed great pains upon the ſubject, but unleſs a

[a] I do not quote GMEL. t. XXI. f. 4; as the Habit of his Plant differs much from ours, and the margin, unleſs the Engraver has been inaccurate, gives no Idea of the beauty of the fringe of this Species.

[b] Properly ſpeaking, *Ulvæ* and all membranaceous Plants have a ſtem, but it is extremely ſhort.

profuſion

profuſion of Specimens are ſubmitted for examination, as I before [c] obſerved, examinations into ſtructure and fructification will ever be incomplete. I cannot however aver that the Authors above-mentioned have examined the ſubject of this article, as this eſſentially differs from *F. laciniatus* in ſtructure. I have fully deſcribed this elegant Structure in the detailed Character. [d] This *Fucus* is produced in conſiderable maſſes, many ſhoots proceeding from the ſame callous knob, and it frequently takes root from the contact of the ſegments on the rock. It ſpreads wide, as may be ſeen in the figure; its breadth often exceeding its height. I have deſcribed above its mode of fructification. From ſimilarity of habit, Meſſrs. GOODENOUGH and WOODWARD have decided that the Species of other Authors are only varieties; but I hope the deſcription and figures given by me of this Species and *F. laceratus* will juſtify me in keeping them diſtinct.

Hab. MOUNTSBAY, CORNWALL.

[c] See p. 78.

[d] The frond of *Ulva umbiculata*, and *lactuca* appear compoſed internally of globules, when ſubmitted to a high magnifier in the ſun.

FUCUS ROSEUS. TAB. XV.

FUCUS. fronde cylindricâ, tenerâ, ſolidâ, ſurſùm attenuatâ, ſparsìm ramosâ: fructu laterali racemoſo.

(*Species nova.*)

RADIX callus, explanatus?

CAULIS longus, in medio intumeſcens, ſurſùm gracilis.

RAMULI pauci, irregulares, ſurſùm attenuati.

FRUCTIFICATIO, ut plurimum, in racemum congeſta, quandoque bi—vel ternatìm diſpoſita, pedunculata: fructus acutus.

OBSERVATIONES.

SPECIES hæc *non-deſcripta* eſt. Fructificatio non niſi hybernis menſibus, ut videtur, conficitur. Subſtantia tenera, et flexilis; color amœnè roſaceus: ſuperficies glaberrima, annulis ad intervalla, ut ſub Microſcopio cernere eſt, inſtructa; pars tamen interior mucoſa, non, ut in *genere* CONFERVA, tubuloſa. Specimen in herbario Societatis LINNEANÆ referendum curabo. Altitudo ſexuncialis.

Hab. POLKERRIS juxta FOWEY, CORNUBIÆ oppidum.

FUCUS ROSEUS. PL. XV.

FUCUS. frond cylindrical, tender, ſolid, tapering much upwards, branched; branches without order; fructification lateral, or axillary; often in *racemes*.

(*New Species.*)

ROOT, a diſc flat at bottom?

STEM long, much tapering, and ſwelling in the middle.

BRANCHES few, irregular, tapering.

FRUCTIFICATION in bunches, generally like *F. ſubfuſcus*.

OBSERVATIONS.

OBSERVATIONS.

This Species is a non-deſcript. I received it from Cornwall, Nov. 1800, in fruit, as repreſented in the Engraving. This is one inſtance among many of the neceſſity of inveſtigating marine Plants at all times of the year; particularly in the Winter months, as I had often met with ſpecimens of this Plant intermixed with others in the Summer months; but from its ſtraggling habit and general appearance, I always, being out of fruit, took it for *F. ſanguineus* after laceration by ſtorms. Its ſubſtance is ſoft, flexible, and tender; the outſide ſmooth; the colour bright pink. On examining it under a glaſs, the ſurface appeared to ſwell as it were into rings; and though from its opacity, and its having a coloured pulpy ſubſtance within, I could not diſcern its inward ſtructure, yet it may have partitions at the ſwellings. A Specimen of this rare Species is in the poſſeſſion of the Linnean Society.

Hab. Polkerris near Fowey.

FUCUS DENTATUS. TAB. XV.

FUCUS. fronde membranaceâ, aveniâ: dentato-pinnatifidâ, ramis linearibus alternis; apicibus truncatis; lacinulis in apice curvatis, acutis. *Herb. Linn.*—*Hudſ.* 582.—*Lightf.* 952.—*With.* 4. 102.—*Linn. Tr.* 3. 158.

RADIX; callus, minutus.

CAULIS compreſſus.

RAMI alterni, ſupra-decompoſiti, ſummitatibus truncatis, et acutè dentatis.

FRUCTIFICATIO paniculata, axillaris, fructû terminali, urceolato; ſeminibus quatuor intùs. [a]

OBSERVATIONES.

Species hæc in Angliæ Borealis littoribus, et in Scotia reperitur: ramificatio elegans et ſingularis; ſubſtantia tenuis, mollis, ſub-opaca; habitus creſcendi *F. corymbiferi* D. Gmelin. affinis adeo, ut ſuſpicor, eandem eſſe. Deſcriptio *F. corymbiferi*, p. 124, atque Icon ejus, Gmel. Fuc. t. x. fig. 1. minimè inter ſe conſentiunt. [b] Repreſentatio apicis fructiferi magnitudinis naturalis exhibetur, non, ut oportuit, aucta ſub microſcopio: vid. tab. x. a, b, c, d. Parvulæ iſtæ figuræ utrinque prope ſummitatem d collocatæ, ſi vitrum adhibeas, paniculam quodammodo repreſentant. Ut ut ſe res habet reſpectu *F. corymbiferi*, Specimina tamen, ſc. A, fructiferum et B, ſterile, tab. xv. accurate delineata, necnon fructificationes partes, prout ſub microſcopio apparent, *Fucum dentatum* facillimè diſcriminabunt.

Hab. Scarborough et in Scotia.

[a] Vid. Tab. xv. et compara cum *F. ſubfuſco*, Act. Linn. v. 1. p. 131.

[b] Gmelini verba hæc ſunt: "Fructificatio harum laciniarum in extremitatibus infinitè in denticulos ſub-faſtigiatos ſub-diviſis; terminales globuli creberrimi, nigri, opaci, et parenchymatoſi ſemine, Lycoperdi vix majores, decidui. Unde oritur ſpecies quædam corymborum minimorum." p. 124. Quid ſibi vult Auctor? anne Globulos iſtos in corymbum diſpoſitos eſſe?

INDENTED FUCUS. TAB. XV.

FUCUS. frond membranaceous, veinleſs; branches alternate, winged-clift; ſegments forked and trunciated, with terminating ſharp ſpinules.

Plates. —— *Moriſ. t.* 8. *f.* 5 ?—*Gmelin*, F. corymbiferus, t. x. *f.* 1 ?—*Fl. Dan.* 354 ?

ROOT

ROOT, a callous knob.

STEM compreſſed.

BRANCHES doubly pinnatifid, and alternate—ſummits truncated and acutely dented.

FRUCTIFICATION panicled, axillary; the capſules of the panicle membranaceous, of the ſhape of the flower of the *Arbutus*; exhibiting to the light 4 ſeeds in each.

OBSERVATIONS.

THIS is a Northern Species: I have not heard of its having been found S. of SCARBOROUGH. It was gathered by LIGHTFOOT in the FIRTH of FORTH, and by Mr. M^c. LEAY near JOHN O' GROATS Houſe. It may readily be diſtinguiſhed from all others by the peculiarity of its habit, deſcribed above, and delineated, Pl. xv. The Frond is very thin, tender, and ſemi-tranſparent; colour, a dull red: it ſpreads wide at bottom. MORISON's figure [a] does not in my opinion poſſeſs that degree of excellence which has been aſcribed to it. It reſembles *F. dentatus* in the ſummits only, but has not the ſize, nor the branching habit of this Species, which much more nearly reſembles *F. corymbiferus, Gmel.* This latter indeed is ſo much like a luxuriant ſpecimen of *F. dentatus*, that nothing but the deſcription of the Profeſſor deters me from inſerting it as a Synonym; but it is neceſſary to add that neither the Deſcription, p. 124, nor the fructified ſummits, a, b, c, d, Pl. x, are ſufficiently perſpicuous to eſtabliſh a Species. [b] I have been fortunate enough to meet with a fructified branch, which has not been the caſe with my Predeceſſors in their *Summer* Excurſions. It is panicled, and ſomething reſembling that of *F. ſubfuſcus* deſcribed by Mr. WOODWARD. I have accurately delineated it, as it appeared under the Microſcope. It is ſingularly beautiful, and furniſhes every requiſite for aſcertaining this Species.

Hab. North of ENGLAND and SCOTLAND.

[a] Hiſt. Ox. iii. t. 8. f. 5.

[b] The ſummit a, Pl. x. GMEL. is not magnified, and the globules, if intended for orbicular bodies, as the name imports, are ill repreſented. There is an error, which all our cryptogamic Writers, the great DILLENIUS not excepted, have laboured under—viz. the omiſſion of magnified Drawings of Structure and Fructification.

FUCUS CONFERVOIDES. TAB. XV.

FUCUS. fronde cylindricâ, ſub-ſimplici, ſub-gelatinoſâ: tuberculis inæqualis magnitudinis, co-acervatis per totam Plantam. *Linn. Spec. Pl.* 1629.—*R. Syn. p.* 51. *n.* 53.

RADIX fibroſa.

CAULIS prælongus, extenſus, in medio paullulùm inflatus.

RAMULI breviſſimi, graciles, ſparſi.

FRUCTIFICATIO. Tubercula majora; et minora lateralia, glomerata, mucoſa: ſeminum congerie rubri coloris in medio poſitâ.

OBSERVATIONES.

F. confervoides, ACT. LINN. v. 3. p. 208. *F. longiſſimum*, D. GMELIN, *F. flagelliformem*, D. LIGHTFOOT, necnon *F. verrucoſum* noſtrum, p. 26, amplectitur. Unde autem nomen *Confervoides* apud LINNEUM, niſi ex tuberculis grandioribus ad inſtar Baccarum in monili collocatis? In *Fuco* tamen *longiſſimo* tubercula minima

nima ſunt, et vix apparentia; item in *F. verrucoſo* ſparsìm collocantur. Mihi perſuaſiſſimum eſt LINNEUM ſpecimen quoddam utpote in Icone repreſentatur penès ſe habuiſſe, unde nomen mutuatus eſt. Auctores ſupradicti rectè aiunt *Fuſos* varios affines ſub eodem nomine in *Herbario Linneano* reperiri. Inſpectis ſpeciminibus quam multis Speciem hancce ſub nomine *F. confervoidis* ſiſto, *F. longiſſimum*, GMELINI ſeparatìm deſcripturus. Deſcriptio RAIJ Syn. p. 51. n. 53. "minùs ramoſus, in longum protenſus" Speciei huic ſatis aptè convenit. Statu recenti ſubgelatinoſa eſt; exſiccata tamen globuli quaſi filo trajecto conjuncti apparent. Forma plantæ recentis in Icone exhibetur, nec quicquam addendum videtur, quo a congeneribus diſtinguatur. Color dilutè purpureus, maturâ ætate pænè evanidus; unde forſan *F. albidi* nomen apud HUDSONUM; deſcriptio autem ramificationis in Act. Linn. toto cœlo diverſa eſt.

Hab. in Occidentali ANGLIÆ parte.

FUCUS CONFERVOIDES.

PL. XV.

FUCUS. frond cylindrical, very little branched: ſub-gelatinous, with tubercles of different ſizes huddled together without order through the whole length of the plant.

ROOT fibrous.

STEM, long, ſlender, biggeſt in the middle.

BRANCHES few, ſhort, and ſmall.

FRUCTIFICATION. Tubercles crowded, containing in the middle congeries of blood-red granules.

OBSERVATIONS.

GREAT confuſion prevails in this Species and its affinities, which I ſhall endeavour to clear up by a careful examination of the deſcriptions and figures of my Predeceſſors, and of the numerous Specimens I am in poſſeſſion of. *F. verrucoſus* has been already deſcribed by me, p. 26, and that has ſince been referred to *F. longiſſimus*, GMEL.* which is a Species ſo accurately deſcribed and delineated by GMELIN, that there can be no doubt entertained about it. The learned Authors, who have made this reference to my *F. verrucoſus*, Linn. Tr. 3. 208, have been guilty, I think, of an overſight, for they ſay that GMELIN's Plant is diſtinguiſhed by having "much "more numerous and *ſmaller* tubercles." This is certainly a proper diſtinction between *F. longiſſimus* and *F. verrucoſus*, GMEL. but I think the latter is not an Engliſh Species. However, with reſpect to my *F. verrucoſus*, p. 8, the tubercles are *very large* indeed for the ſize of the plant; much larger than thoſe of GMELIN's *F. verrucoſus*, Pl. XIV. f. 1. I have no heſitation in applying the trivial name of LINNEUS† to the Species, which I here preſent to the Reader, as, when it is dry, with the gelatinous part ſhrivelled up, it appears to be ſtrung with beads like a necklace, not unlike ſome of the larger *Confervæ* when ſhrivelled. A ſpecimen in my poſſeſſion in this ſtate will be preſented to the Society, and there is another fine one in the collection of COL. VELLEY. Its habit is very ſingular; it conſiſts generally of a long ſtem with weak trailing branches, very ſhort, and more like radicles: "*minus ramoſus, in longum protenſus*," the character of n. 53, R. Syn. p. 51, ſeems admirably ſuited to it.

F. longiſſimus, Gmel. is ſo accurately deſcribed, and the figure, Pl. XIII, ſo good, that there can be no doubt about that Species. It will form the ſubject of a ſucceeding Article.

Hab. on the W. Coaſt.

* Linn. Tr. v. 3, under *F. confervoides*.

† Meſſrs. WOODWARD and GOODENOUGH ſay, that in looking into the *Linnean Herbarium*, they find that he conſidered that *F. confervoides* and *F. albidus* as ſynonymous: but that is not extraordinary in the ſtate of knowledge of *Fuci* in his time. However there can be no doubt but a warted Specimen preſenting the appearance I have deſcribed, ſent him from ſome Friend, was the cauſe of his changing the appropriate name of *F. longiſſimus*.

FUCUS DIFFUSUS. TAB. XVI.

FUCUS. fronde filiformi, tubulosâ, ramosâ, in medio turgidulâ, sursùm attenuatâ; septis distinctâ; ramulis tenerioribus diffusis, apice acutis; fructificatione racemosâ. *Hudſ.* 589. —*Act. Linn.* 3. 197.—*With.* 4. 112.

RADIX callus, minutus.

CAULIS brevis, opacus.

RAMI diffusi; ramulis tempore fructificationis creberrimis, undique, erumpentibus, tenuissimis, granulatis.

FRUCTIFICATIO in apicibus; axillaris, vel lateralis; formæ variæ;—racemosa, seminibus in apicibus racemorum immersis;—utriculosa, seminibus per membranam diaphanam intùs conspicuis.

OBSERVATIONES.

Auctoritate D. D. Goodenough et Woodward Speciem hanc inter *Fucos* enumero. Structura interna septis instruitur, cortice tamen opaco obvoluta; et in ramis majoribus tubulus centralis, ut in *F. pinastroidi*, p. 75, frondem totam percurrit. In Cataleptis Botanicis, D. Albrecht Willh. Roth, Genus novum sub nomine Ceramium instituitur, cujus character "Filamenta membranaceo-cartilaginea, sub-geniculata. Capsulæ "sub-monospermæ ad superficiem Frondis sparsæ." p. 33. Huc referendi sunt, ut mihi videtur, Fucus hic et affines Species, *F. F. pinastroides* et *lycopodium*. Fructificationem dimorpham suprà descripsi ac delineavi.[a] Magnitudo Plantæ aliquando pedalis vulgò autem sex—vel quadr—uncialis. Habitus fructificandi tempore ramosissimus.[b]

Hab. passim.

[a] Vid. Tab. xvi. a, b, b, b—n, o, o, o.

[b] Vid. Tab. xvi. d, summitatem fructiferam.

FUCUS DIFFUSUS. PL. XVI.

FUCUS. frond thread-shaped, tubular, branched: branches geniculated, swelling in the middle, tapering much at the ends, garnished with numerous setaceous branchlets: fructification racemose.

(No Plate.)

ROOT, a small disc.

STEM short, thick, opaque.

BRANCHES, wide-spreading, ending in setaceous points;[a] at the time of fruiting crowded with numerous setaceous shoots.

FRUCTIFICATION near the summits, either axillary, or lateral; of different appearances; either forming a *Raceme* with congeries of imbedded seeds in the summits, or exhibiting transparent axillary Vesicles with the seeds visible through the skin.[b]

[a] This is its usual appearance, as the time of Fructification is in the Winter; see Pl. xvi. d. a fruiting summit. It sometimes fructifies in whorls, as is represented in the lower branch of the figure; and very frequently sends out axillary vesicles, as at o, o, o. fig. n. It occasionally is racemose, as at b, b, b. fig. a. which is drawn from a Specimen sent me by my Friend Mr. Pigott, being delineated by him under a very high magnifier.

[b] See both kinds, Pl. xvi. a, b, b, b—n, o, o, o.

OBSERVATIONS.

THIS Species, which has the *Septa* of a CONFERVA with the opaque ſkin of *Genus* FUCUS, I place in this Catalogue in deference to the authority of Meſſrs. GOODENOUGH and WOODWARD. It has been recently claſſed as a ſeparate *Genus* by ROTH together with *Pinaſtroides* and *Lycopodium*, and many others with external Fructification.[c] I obſerved under *F. pinaſtroides*, p. 75, that there was a central capillary tube pervading the ſtem and branches, which clearly ſhews there is a difference in the external ſtructure of theſe opaque Species. The Fructification, which had never been obſerved by the Gentleman above-mentioned, Linn. Tr. p. 3. p. 197, affords curious matter for ſpeculation, as I have deſcribed and delineated it.[d] It is of a very firm elaſtic texture, ſometimes nearly a foot in length, but more frequently from four to ſix inches. It varies at the time of fructifying, as may be ſeen by the ſummit, d, Pl. XVI, ſo as not to be known by thoſe who have not ſeen it at that ſeaſon of the year.

Hab. common.

[c] This Genus is called CERAMIUM. See ROTH's *Bemerkungen*, p. 33. [d] See Pl. XVI. a, b, b, b—n. o, o, o.

FUCUS LONGISSIMUS. TAB. XVI.

FUCUS. fronde filiformi, irregularitèr et ſparsìm ramosâ—ramis inæqualibus diſtichis: extremis prælongis: fructu minuto laterali orbiculari-depreſſo. *Gmel.* 134.—*R. Syn.* 51. *n.* 53.

F. confervoides. *Linn. Tr.* 3. 208.

F. flagelliformis. *Lightfoot*, 928.

RADIX, callus, minutus.

CAULIS, brevis, ſtatìm ramoſus.

RAMULI filiformes, irregulares, ſubſecundi; in medio grandiores; apicibus elongatis; ſpinulis breviſſimis.

FRUCTIFICATIO; globuli minuti, ſparſi, laterales; apice depreſſi.

OBSERVATIONES.

Fucum longiſſimum D. GMELIN, ut Speciem fiſto, habitu ramificationis ab affinibus diverſam. Ramis prælongis, ſparſis, quandoque binis terniſve ex eodem latere, inſtruitur. Species affines, Act. Linn. p. 58, 59. *F. confervoides* et *albidus* ex inveſtigatione ſpeciminum in catalogo noſtro in tres partiuntur, ſc. *confervoidem*, *longiſſimum*, et *albidum*. Vix quidquam notandum videtur quo Species hæc a *F. confervoidi* ſuprà deſcripto diſtinguatur. Icon per ſe, ut mihi videtur, ſufficit. In ſterilibus ſpeciminibus Plantæ habitus, in fructiferis tuberculorum magnitudo, characteres ſatis diſtincti ſunt. Magnitudo ſexuncialis aut ſuprà; color atro-ruber: ſubſtantia tenax, externè lubrica et nitens. Varietas aliquando occurrit, ſi non potiùs ſpecies ſit diſtincta, ramulis prælongis ſimplicibus ex caule brevi prodeuntibus, flagelli Romani ſimilitudine, *F. flagelliformis* vocatus. D. Profeſſor ESPER. *F. longiſſimum*, GMEL. tab. XX. adumbravit, habitu tamen ramoſiſimo, fructuque prægrandi, adeo ut ſpecies quædam diverſa videtur.

Hab. paſſim.

FUCUS LONGISSIMUS. PL. XVI.

FUCUS. frond thread-ſhaped, branched irregular; branches unequal, diſtichous; the extreme diviſions very long and ſtraggling: fructification minute, globular, lateral.

PLATES.

Gmel. t. 13.—*Eſper, Ic. t.* XX ?

ROOT, a minute callous knob.

STEM ſhort, branching from the bottom.

BRANCHES irregular, ſometimes ſecondary; ſwelling a little in the middle; garniſhed with ſlender ſhort ſpinules.

FRUCTIFICATION; ſometimes on the ſummits, ſometimes in the ſpinules; conſiſting of inflations, or confluent tubercles.*

OBSERVATIONS.

THE Authors of the Diſſertation on *Fuci* quote this as a Synonym of *F. confervoides* of LINNEUS. I have given my reaſons for adopting that name, as the trivial one for the ſubject of the Article, p. 97, founded on the appearance of the dried Specimen. I here preſent the Species which is called by GMELIN appoſitely enough from its ſingular habit *F. longiſſimus*, or long trailing Fucus. GMELIN's Tab. XIII, is an excellent Repreſentation, and the Specimen here delineated gathered at PADSTOW will be found to reſemble his Pl. XIII perfectly; but the Fructification in ſome ſorts differs. I have no doubt but many nearly allied Species will hereafter be diſcriminated by fructification. The Authors of the Diſſertation on *Fuci* enumerate two different Species nearly allied to each other—*F. confervoides* and *F. albidus*, Linn. Tr. v. 3. n. 58, 59. but as I have arranged *F. longiſſimus* and *F. confervoides* ſeparately, this Catalogue will conſequently include three Species. Their different habits, as preſented, Pl. XVI, will be ſufficient to diſtinguiſh them. The texture of this Species is very tough, and its ſurface ſlippery and ſhining: colour reddiſh, and ſemi-tranſparent. ESPER's Plate XX is much more crowded than I have ever ſeen it, and as the fructification likewiſe is larger than I have met with it, I take it to be a diſtinct Species. I have deſcribed the fructification as conſiſting of inflations: theſe are like imbedded veſicles.

Hab. PADSTOW, CORNWALL, and elſewhere not uncommon.

* GMELIN ſays minute lateral Tubercles: this may ſometimes be the caſe; but they are then very minute indeed. There is no appearance of any in his figure of it, Pl. XIII. I have drawn a repreſentation of it under the microſcope.

FUCUS GRACILIS. TAB. XVI.

FUCUS. fronde filiformi, ramoſiſſimâ, confertim prodeunte; fructu laterali, glomerato, minuto juxta apices.

F. albidus, *Linn. Tranſ. non tamen* HUDSONI.

RADIX, callus, expanſus, plures emittens cauliculos.

CAULIS, brevis; ſtatim ramoſus.

RAMULI, numeroſi, breviſſimi, cylindrici.

FRUCTIFICATIO: tubercula vix viſibilia juxta apices cuti adhærentia.

OBSER-

OBSERVATIONES.

F. F. confervoidi et *longiſſimo* ſuprà deſcriptis tertia hæcce accedit Species; quæ quodammodò *F. albido*, Act. Linn. v. 3. 210, affinis, mihi tamen ut videtur, diverſa eſt. Suſpicor enim Speciem adhuc diſtinctam, ab Auctoribus ſupradictis juxta WEYMOUTH et CHRISTCHURCH obſervatam, adhuc ſine icone reſtare. Haud equidem pro certo ſcio *F. albidum* D^ni^ HUDSON eundem eſſe, ac *F. albidum*, Act. Linn. color enim pænè evanidus *F. confervoidis* ſtatu maturo ſuſpicionem mihi injicit HUDSONEM nomen triviale "albidus" exinde *Fuco confervoidi* noſtro indidiſſe; quod ſi ita ſit, habitus iſte ramificationis ſingularis a RAIO notatus, Syn. p. 51. n. 53, quomodò ſagacitatem Botanici illius adeò celebris effugit non poſſum non mirari. Altitudo rarò triunciam ſuperat; magnitudo ramulorum fili emporetici minoris: ſurculi plurimi, uſque ad ſexaginta, ex baſi communi provenientes; color roſaceus, ſuperficies glaberrima et nitens. Fructificatio, ut ſuprà deſcribitur. Spinulas nullas ad latera ramorum, ut in *F. longiſſimo*, cernere eſt.

Hab. PADSTOW in Com. CORNUBIÆ et alibi.

FUCUS GRACILIS. PL. XVI.

FUCUS. frond thread-ſhaped, much branched; ſending out numerous ſhoots from a ſpreading baſe, not trailing: fructification, very minute lateral tubercles, near the ſummits.

(No Plate.)

ROOT, a ſpreading Diſc ſending up numerous tufts.

STEM ſhort, branching from the bottom.

BRANCHES, very numerous, ſhort, cylindrical.

FRUCTIFICATION: minute wart-like tubercles, ſcarcely viſible to the naked eye, near the ſummits.

OBSERVATIONS.

HAVING already deſcribed two Species, I now give the third according to the Obſervations I made under *F. confervoides*; not doubting but ſome more Species will hereafter be ſeparated from this filiform Family.* It ſeems to have ſome affinity with *F. albidus*, Linn. Tr. 3. 210: but there are many points in which it differs, and therefore I muſt leave it to future Botaniſts to aſcertain from their viſits to WEYMOUTH and CHRISTCHURCH, whether there is not a Species ſtill to be delineated. I hinted under *F. confervoides*, that the pale colour of that Species, and the ſize of the warts, may have given the hint to HUDSON for his *F. albidus*; but the ſtriking circumſtance of the ramification is ſufficient to diſcriminate them. The Drawing, Pl. XVI. repreſents a detached Plant, but the tuft frequently conſiſts of thirty or forty different ſhoots. Its colour is a bright red, and the ſize as repreſented in the figure. The Species is I believe not uncommon; at leaſt it is plentiful on the Coaſt mentioned below, from whence the Specimen delineated was ſent to me.

Hab. PADSTOW, CORNWALL, and elſewhere.

* *F. plicatus* and *F. longiſſimus*, already deſcribed and delineated, are affinities; as likewiſe *F. verrucoſus*, p. 26. Pl. VIII.

FUCUS

FUCUS PALMETTA. TAB. XVI.

FUCUS. fronde aveniâ, membranaceâ, multifido-palmatâ, ſub-pellucidâ: fructificatione orbiculari, immersâ.

RADIX, callus plures emittens cauliculos.

CAULIS, nudus, tenuis, ſub-compreſſus; in folium ſeſe dilatans, vix ramoſus.

FOLIA, ſtatim ſeſe dilatantia, extremitatibus ſubrotundis, in lacinias inciſis.

FRUCTIFICATIO: ſcutella concava, ſeu acetabula,[a] in fronde immerſa; ſeminibus rotundis nudis in fundo.

OBSERVATIONES.

SPECIMINA Speciei hujus jamdudum mihi oblata ſunt, frequentèr enim in CORNUBIA provenit. Fructificationem nunquam obſervavi, atque idcirco quid de eâ concludendum foret incertus hæſi. Icon D. GMELIN. t. XXII. n 3, habitu racemoſo[b] cum F. noſtro parum convenit, tabulatum 23^tis^, quæ vocatur "inſigni magnitudine," Hiſt. Fuc. p. 5, ideo minùs affinitates habet. Prodeunte nuperrimè D^ni^ ESPER Faſciculo ſecundo Speciem noſtram ibi tab. XL. exacti delineatam inveni. Miratus ſum equidem *F. ſinuoſum*, Act. Linn. v. 3. p. 111. utpote varietatem ſpeciei hujus, tab. XLII, enumerari. Fructificationem, ſuprà deſcriptam ac delineatam D. TURNER acceptam refero. Specimen litera d notatum in Epiſtolâ nuperrimè mihi mandavit quod, ut ſub Microſcopio apparet, fig. l. m, m, mm. tab. XVI, repreſentatur.

Hab. in CORNUBIA.

[a] Vid. Tab. XVI. l. m, m, mm. Fructificatio forsàn ex tuberculis conſtat in ſubſtantiâ frondis immerſis, quibus deſcriptis, cavitatem acetabuliformem, ſeminibus in fundo, ut in icone repreſentatur, ſub microſcopio apparere par eſt conjicere.

[b] Suſpicor ex deſcriptione D. GMELIN *F. palmettam* ſuum, præſertim varietatem majorem, tab. XXIII, exoticam eſſe.

FUCUS PALMETTA. PL. XVI.

FUCUS. frond without a nerve, membranaceous; with an expanded multifid leaf, ſemi-tranſparent: fructification orbicular, concave, imbedded.

PLATE.—*Eſper. Icon.* XL.

ROOT, a common Baſe throwing up many ſhoots.

STEMS many, naked, ſimple.

LEAVES, or expanſions of the ſtems obverſely conical, rounded at the top, and fringed with numerous *laciniæ*.

FRUCTIFICATION: ſeeds imbedded in cavities in the ſurface of the Frond.[a]

OBSERVATIONS.

I OWE the introduction of this new Species to the inveſtigations of my Friend Mr. TURNER, who, on examining a Specimen ſent by me as a Variety of *F. membranifolius*, detected the Fructification above deſcribed and delineated in Pl. XVI. Previous to my receiving this information, I had ſeen a Specimen exactly reſembling mine: but conſiderably larger, figured by Profeſſor ESPER, Pl. XL, and referred to *F. palmetta* of GMELIN. I do not however acquieſce in this Synonym, as GMELIN's Figure, both of the ſmall one Pl. XXII. f. 3, and the very large one XXIII, ſeem to have a very different habit of growth. I ſhall however retain this appoſite trivial name. It is rather ſingular that the learned Profeſſor ſhould have figured *F. ſinuoſus, Linn. Tr. (Rubens, Ner. Brit.)* as a variety, which is a ſinuous mid-ribbed Species.

Hab. on the CORNWALL Coaſt, frequently on the large ſtems of *F. digitatus*. FUCUS

[a] See Pl. XVI. l, m, m, mm.

FUCUS PALLESCENS. TAB. XVI.

FUCUS. fronde cylindricâ, ſolidâ, brevi: minùs ramoſâ; fructificatione oblongâ, ſcutelliformi; margine criſpato. *Species nova.*

RADIX, diſcus, explanatus.

CAULIS, brevis, flexuoſus.

RAMULI, pauci, juxta ſummitates, apicibus truncatis.

FRUCTIFICATIO oblonga, immerſa, lateralis, concava: marginibus elevatis ſeminiferis: ſeminibus minutiſſimis orbicularibus.

OBSERVATIONES.

Species hæc, ſubſtantiâ gelatinoſâ, paraſitica, ad ſummitates *F. lumbricalis* inventa eſt juxta Padstow in Cornubia. Fructificatio ſingularis admodùm, et ſi ita dicam ſui generis. Plantæ numeroſiſſimæ in eodem *F. faſtigiati* ſpecimine reperiebantur.

Hab. juxta Padstow, Cornubiæ oppidum.

PALLID FUCUS. PL. XVI.

FUCUS. frond cylindrical, ſolid, ſhort, not tapering, and blunt at the edges: few, if any branches, which are near the ſummit: fructification oblong, immerſed like a ſhield of a Lichen.

ROOT, a flat Diſc.

STEM, ſhort, crooked, of an equal thickneſs.

BRANCHES very few, if any near the Summits; tips crooked, blunted, or truncated.

FRUCTIFICATION ſingular, conſiſting of imbedded oblong cavities, with a rough tubercled margin, in which the ſeeds may be diſcovered by a microſcope which are very minute, orbicular, and dark coloured.

OBSERVATIONS.

This non-deſcript Species was ſent me during the laſt Winter (1801) in a Parcel of Sea Plants from Padstow by Mrs. Prideaux Brune; the Lady who ſo kindly contributed one of the varieties of *F. ciliatus*, p. 92. It is a paraſitical plant, and was found covering the ſummits of a Specimen of *F. lumbricalis*. They were numerous, of a tender gelatinous habit, not more than two or three inches long, perfectly cylindrical, and almoſt tranſparent. The fructification, which is deſcribed above, and delineated Pl. XVI, a, b, c, diſtinguiſhes it from every other, and probably ſeparates it from all the marine *genera* already eſtabliſhed.

Hab. Padstow.

FUCUS UNDULATUS. TAB. XVI.

FUCUS. fronde ramoſâ; foliis linearibus, undulatis, pedunculatis; aliquando, ſed rariùs, furcatis; verticillatìm, vel ex adverſo poſitis.

RADIX, callus, expanſus.

CAULIS, ſubtus, complanatus.

RAMULI, cylindrici.

FRUCTIFICATIO, in medio foliorum ſparsìm poſita: tuberculis internis, ſeminiferis, papillis externis, foratis, conicis.

OBSERVATIONES.

INTER innumeras *F. veſiculoſi* affinitates Speciem hanc, diſtinctam, ut mihi videtur, fiſto. Habitus multis modis diverſus eſt a *Fucis* cæteris fronde coriaceâ, punctatâ. Ramuli ſuperiores, cylindrici, et ſursùm attenuati. Folia reverâ diſtincta ſunt et pedunculata, non fronde unitâ, ut in affinibus. Margo foliorum elegantèr undulatus, ſuperficies papillis conicis foratis inſtructa. Icon ramulum ſolummodò deſignat. Planta ſtatu maturo altitudinem pedalem attingit ramulis crebris versùs apicem inſtructa, foliolisque innumeris ejuſdem magnitudinis, ac formæ, ut in icone repreſentatur. Fructificatio, etſi *F. veſiculoſi* analoga, ſparsìm tamen in foliolis producitur. Species hæc, utpote ramulis cylindricis donata, undique ramoſa eſt, non in plano, ut Fuci cæteri veſiculoſi.*

Hab. PADSTOW in CORNUBIA.

* Vid. Tab. XVI. a, ſectio tranſverſa folii cum fructificatione; a, a, eadem aucta.

UNDULATED FUCUS. PL. XVI.

FUCUS. frond branched; leaves linear, undulated at the margin, pedunculate; ſometimes, but rarely forked, growing in whorls, or two or more together.

ROOT, an expanded callous knob.

STEM, compreſſed downwards.

BRANCHES, nearly cylindrical, with diſtinct leaves on foot-ſtalks produced on all ſides, or in pairs.

FRUCTIFICATION not contiguous; in the middle, or bottom of the leaves,* conſiſting of internal ſeminiferous globules, and external perforated *papillæ*.

OBSERVATIONS.

THIS Species is another of the coriaceous *Fuci*, included by Authors under the comprehenſive title of *F. veſiculoſus*, ſo often ſuppoſed to be found without air-bladders. It is too ſingular to be any longer confounded with others, as the cylindrical branch, the diſtinct pedunculated leaves, and the fructification ſcattered in the baſes of the leaves, all which are deſcribed above, and which are accurately delineated, are ſufficient to eſtabliſh a ſpecific diſtinction. A ſpecimen is depoſited in the Herbarium of the LINNEAN SOCIETY.———*Hab.* CORNWALL.

* The fructification reſembles that of *F. Sherardi*, and it certainly approaches that Species; but its very wrinkled margin, diſtinct pedunculated leaves, and cylindrical ſtem, with branches and leaves on all ſides, ſufficiently diſcriminate it.

FUCUS OPUNTIA. TAB. XVI.

FUCUS. fronde cartilagineâ, ſub-compreſsâ, ſolidâ, concatenatìm articulatâ; ramis ſub-verticillatis. *Linn. Tr.* 3. 219.

U. articulata, β, *Hudſ.* 569.

RADIX,

RADIX, fibrosa.

CAULIS, perbrevis.

RAMULI verticillati, ternati, vel dichotomi; ramulis, vel potiùs radiculis minoribus, axillaribùs.

FRUCTIFICATIO: tubercula minima, immersa in articulis terminalibus, vel ad axillas.

OBSERVATIONES.

Speciem hanc rupibus adnascentem juxta Tenby oppidum in Wallia Australi, A. D. 1796, detexi. Specimina a me D. Woodward transmissa in Act. Linn. v. 3. p. 219, sub nomine *F. opuntiæ* descripta, primùm comparuere. Dillenii Tab. 10. f. 9. a, b, c, d, synonyma vocatur, itemque *Ulva articulata*, var. β, Hudsoni affinis certe est Species *F. articulati* nostri, p. 28, et forsan ut junior Planta, vel saltem varietas minor reputanda foret, sed habitus crescendi, articulorum rigiditas, necnon radiculæ axillares, characteres satis distinctivi sunt. *F. repentem* Dⁿⁱ. Lightfoot libentèr huc referrem ex nomine inductus, sed aliter censet amicus meus D. Woodward, nec ex descriptione nudâ sine specimínibus concludere licet. Icon magnitudinis naturalis plantam ex congerie sumptam exhibet.—*Hab.* in Wallia.

FUCUS OPUNTIA.

PL. XVI.

FUCUS. frond cartilaginous, somewhat compressed; solid; composed of joints bigger in the middle, and united together chain-like; branches sub-verticillate.

Plate.—*Dill.* 50. *t.* 10. *f.* 9. A. B. C. D.

ROOT, fibrous.

STEM, very short.

BRANCHES, resembling *F. articulatus*, in small whorls of four near the bottom, opposite, axillary, or dichotomous; branches with radicles at the joints.

FRUCTIFICATION: minute, immersed tubercles on the terminal joints, or on separate axillary ones.

OBSERVATIONS.

This elegant little Species was first discovered by me at Tenby in S. Wales, and communicated to Mr. Woodward, who has described it in the Linnean Tranfactions, v. 3. p. 219. It is a small, creeping species, growing on perpendicular bare rocks, and forming a thick matted mass. Each joint is quite solid in the middle, in which circumstance it differs from *F. articulatus*, as likewise in not being so tender and gelatinous; and it is also much more compressed. I should incline to think *F. repens* of Lightfoot was this Plant, from his trivial name. I am surprised to observe that the Authors of the Disquisition think it is only a variety of *F. articulatus*. Lightfoot says it is "quite distinct," p. 962. His Description very nearly accords with mine, which is detailed above, but without a Figure it is impossible to decide.* The "acute ligaments, or radicles like claws," by which it affixes itself to a perpendicular Rock, as a Lichen creeps on the bark of a tree, is a very remarkable characteristic.—*Hab.* in Wales.

* Messrs. Goodenough and Woodward refer to all Dillenius's Figures, t. 10. s. 9. but Lightfoot omits A.

FUCUS PLUMOSUS.

Frontisp. Operis. TAB. XVI.

FUCUS. fronde sub-cartilagineâ, ramosissimâ; ramis suprà decompositis, pinnatis; ramulis rectangulis, oppositis; tuberculis globosis, pedunculatis, foliosis. *Herb. Linn.*—*Buddl. p.* 29.—*Lightf.* 935.—*Hudf.* 587.—*With.* 4. 120.—*Linn. Tr.* 188.—*Esp.* (pectinatus, *Gunn.*) 97.

RADIX,

RADIX, callus, minutiſſimus.

CAULIS, ſub-compreſſus, opacus.

RAMULI ſuprà decompoſiti; primarii ſubalterni; ſecondarii oppoſiti: pinnulis etiam ſecondariis, vix viſibilibus.

FRUCTIFICATIO: globoſa folioſa 4-fariàm dehiſcentia per maturitatem.

OBSERVATIONES.

Apuſſimè Species hæc "*plumoſi*" nomen obtinuit fibrillis ramulorum plumæ fibrarum ad inſtar ex oppoſito poſitis. Frons atro-purpurea; altitudo maxima 4-uncialis. In diverſis ſpeciminibus habitus variat; neſcio tamen quid ſibi vult cl. LINNEUS *F. abretanifolium*, utpote varietatem *Fuci* hujus enumerans; Hypni ramificationis ſimilitudinem ſatis aptè tamen innuit. Maxima ramificationis affinitas inter ſpeciem hanc et *Confervam plumoſam*. Structura et color quidem characteres diſcriminantes. *F. plumoſus*, D. D. GMELIN et ESPER *Conferva plumoſa*, ut mihi videtur, referendi ſunt; ſtructuram "*ſubarticulatum*" deſcribit GMELIN, et ſimile quoddam in ramulo aucto ESPERI, t. XLV. n. 2. apparet. Habitus certè in iconibus amborum *Conferva plumoſa* non *Fuci* noſtri. Ramificatio è contra *F. pectinati*, GUNNERI, ab ipſo ESPERO, tab. XLVII, delineata ſpeciem noſtram exactè exhibet. Idem innuit Auctor ipſe, p. 94.*———*Hab.* paſſim.

* Affinitas hinc obſervanda videtur inter *F. plumoſum*, *F. pectinatum*, *F. ptilotum*, et *F. corneum*, Ner. Brit. non tamen ESPERI.

FEATHERED FUCUS. *Frontispiece.* PL. XVI.

FUCUS. frond ſub-cartilaginous, much branched; doubly pinnatifid: branches oppoſite, and at right angles. Tubercles of fructification globoſe, pedunculate, leafy.

PLATES.—*Ray's Syn. Pl.* 2. *Flor. Dan.* 350.

ROOT, a very minute callous knob.

STEM, ſomewhat compreſſed, opaque.

BRANCHES: principal ones alternate; ſecondary ones oppoſite, ſhort, nearly of a length, ſet at right angles like the teeth of a comb; theſe latter ſpinules likewiſe appearing when magnified to be garniſhed with briſtles.

FRUCTIFICATION: globular, ſet round with leafy appendages like a calyx, burſting as it were in valves.

OBSERVATIONS.

IF elegance of ramification is admitted as a criterion, this is one of the moſt beautiful of the *Genus*. Its colour however, unleſs held to the light, is dull, and it does not vary its tints like *F. coccineus*. This is by no means a common *Fucus*, and Profeſſor GMELIN, and ſince his time Profeſſor ESPER, have miſtaken ſpecimens of *Conferva plumoſa* for this Species.* Its general appearance is in denſe maſſes difficult to diſentangle. The publication of Profeſſor ESPER's work enables me to decide that *F. pectinatus* of GUNNER is a near affinity, if not the ſame as ours, differing a little in colour. Indeed the learned Author has himſelf obſerved it p. 94.

Hab. common.

* I cannot aſſert this of ESPER's Species, which he ſays is often more than a foot long. p. 95.

FUCUS COCCINEUS. *Frontisp. Operis.* TAB. XVI.

FUCUS. fronde compreſsâ, ſub-cartilagineâ, ramoſiſſimâ; ramulis triplicato-alternis: fructificatione polymorphâ. *Herb. Buddl.* 29.—*Petiv.* 26.—*Gmel.* (Plocamium.) 153.—*Lightf.* 957.—*Hudſ.* 587.—*With.* 4. 119.—*Linn. Tr.* 3. 187.

RADIX.

RADIX, fibroſa, furculis numeroſis.

CAULIS, ſub-compreſſus, cartilagineus.

RAMI, ſub-alterni, incurvi; ramulis ſerie ternatâ alternantibus.

FRUCTIFICATIO varia—tubercula adnata, globoſa, atro rubentia—ſiliquæ, vel capſulæ ſub-ternæ, pediculo conico inſiſtentes.—Racemi ſiliquarum ex axillis prodeuntes.[a]

OBSERVATIONES.

RAMULORUM diſpoſitione ſingulari a congeneribus facilè diſtinguitur Species hæc in littoribus noſtris ubique occurrens. Habitus, ut ſuprà deſcribitur, ſc. duo, vel tres ramuli ex uno ramorum latere, dein duo vel tres ex altero latere. Ex eâdem radice plurimi naſcuntur cauliculi, apicibus ramoſiſſimis, et inter ſe implicatis unde nomen (LIGHTFOOT, et GMEL.) *plocamium*. Nulla in *Syſt. Naturæ* Speciei hujus mentio. Fructificatio, ut ſuprà, deſcribitur.[b] Color amœnè roſaceus. Tria in ESPERO delineantur Specimina coloris varietate plus æquo luxuriantia, habituque ramificationis abſimilia.———*Hab.* paſſim.

[a] Vid. Tab. in Frontiſpicio Operis, a, b, c, d.

[b] Vid. quæ notavi in Præfatione, p. XXVI.

SCARLET FUCUS. *Frontispiece.* PL. XVI.

FUCUS. frond compreſſed, ſomewhat cartilaginous, much branched; branches alternating in a ſeries of three; fructification polymorphous.

PLATES.

Gmel. XVI. *f.* 1.—*Eſp. Ic.* ii.

ROOT, fibrous, with numerous ſhoots at bottom.

STEM, ſub-compreſſed, cartilaginous.

BRANCHES, alternate, crooked: branchlets in ſeries of three, on each ſide alternately.

FRUCTIFICATION of different ſhapes—large, round, dark-red adnate tubercles.—Pointed capſules or fruit-veſſels of 2 or 3 together, on conical footſtalks.—Bunches of fruit-veſſels in no regular order.

OBSERVATIONS.

THIS is the moſt plentiful of the ſmaller kinds on our Coaſts, and its ramification is ſingularly beautiful. It is found of different colours, and occaſionally is variegated, but not ſo much as it is repreſented in ESPER's Icons. It forms very thick maſſes, and is ſportive in its habit; but the ternate alternation is always to be found on ſome part of the plant. The impreſſion in the Frontiſpiece will convey a better idea than can be done by words. I have deſcribed the Fructification above, and delineated it. Profeſſor ESPER thinks the ternate capſule, a young ſhoot; but Mr. PIGOTT, with a microſcope of high powers, detected 2 rows of granules in each capſule; and he has at times ſeen theſe capſules after the diſcharge of the ſeed loſe their colour, and become yellow. Drawings a, b, c, d, e, repreſent the fructification. See my Obſervations in the Preface, p. xxvi.

Hab. every Part of our Coaſt.

FUCUS LYCOPODIUM. TAB. XVII.

FUCUS. frondi filiformi, tubulosâ, ramosâ; ramis undique foliolis ſquarroſis denſiſſimè coopertis. *Linn. Syſt. Nat.* 717.—*Retz Flor. Scandinav.* 1696.—F. Lycopodioides. *L. Tr.* 3. 223.—FL. DANICA,—*Conferva ſquarroſa.*

RADIX,

RADIX, callus, minutus.

CAULIS, infernè nudus, ad baſim contractus.

RAMI, pauci, obtuſi, ramulis hinc inde, *Lycopodii* ad inſtar, brevibus, obtuſis.

FRUCTIFICATIO incognita.

OBSERVATIONES.

SPECIES rariſſima, nec adhuc in ANGLIA, quoad ſcio, niſi YARMUTHI reperta. Frons ſexuncialis et ultra, filiformis, craſſitie pennæ corvinæ, radicem verſus nuda, foliolis breviſſimis filiformibus, obtuſis, rigidis, undique imbricata. Subſtantia dura, lignoſa, et ad *Fucum Pinaſtroidem* proximè accedens, cujus certè affinis Species eſt. Specimen penès amiciſſimum D. WOODWARD, unde Icon delineatur, nuperrimè vidi. Incola profundi maris, ut ſuſpicor, inter rejectamenta maris ſemel atque iterum reperta eſt.——*Hab.* in NORFOLCIA.

MARINE LYCOPODIUM. PL. XVII.

FUCUS. frond thread-ſhaped, tubular, branched; branches thickly covered or imbricated with ſhort ſubulate leafits, rigid, obtuſe.

PLATE.—*Fl. Danica. Pl.* 357.

ROOT, a minute callous knob.

STEM naked below, and contracted near the baſe.

BRANCHES, few, obtuſe; garniſhed ſparingly with ſhort obtuſe ſhoots, as in GENUS *Lycopodium*.

FRUCTIFICATION undiſcovered, but moſt probably reſembling that of *F. pinaſtroides*. *

OBSERVATIONS.

I HERE preſent a very rare Species, which has not been found above two or three times on the Britiſh Coaſt, and then among the wreck of Plants after blowing weather. To thoſe who are acquainted with the imbricated trailing moſs, which creeps among the Heath in mountainous places, and which is called by Botaniſts *Lycopodium*, no farther deſcription is neceſſary; and without that knowledge, the ſingularity of its habit, as it is accurately delineated in the Plate, will be a ſufficient mark of diſcrimination. Height and ſize, as repreſented Pl. XVII. I have ſlightly altered the trivial name.——*Hab.* YARMOUTH, thrown aſhore on the Beach.

* See my Remarks, p. 74. It is fair to judge from ſtructure and habit, that the three ſpecies deſcribed in this work, *Pinaſtroides*, *Diffuſus*, and *Lycopodium*, have ſimilar fructifications, and ſhould conſtitute a ſeparate *Genus*. They will arrange under *Genus* CERAMIUM of ROTH. See Pref. p. XXXI.

FUCUS DISCORS. TAB. XVII.

FUCUS. fronde ſub-tereti, ramoſâ; foliis pinnatis, lineari-lanceolatis, laciniatis; apicibus acutis, furcatis; fructu racemoſo terminali.

RADIX, callus, ex caule intumeſcens.

CAULIS, validus, ſub-compreſſus, ramentis, ſive aculeis inermibus veſtitus.

RAMI ſurſùm attenuati; foliis, vel alternis, vel oppoſitis, nervo intermedio; papillis foratis in ſuperficie, aliquando convolutis, et ſub-cylindricis.

FRUCTIFICATIO racemoſa, terminalis; fructû mucoſo, obovato; papillis foratis extùs. *

* Vid. Tab. XVII, a, nat. mag.—a, a, auct.—b; b, b, papillas.

OBSER-

OBSERVATIONES.

SPECIES hæc utpote BRITANNIÆ indigena, nunc primum recenſetur. A LINNEO ſatis apto nomine *F. diſcors* nominatur; in diverſis enim ſpeciminibus, et diverſo anni tempore nihil unquam "tam diſpar ſibi." Plantam ſterilem, ſi modo ſit Species eadem, delineavit D. ESPER. tab. XXVI. Foliis lanceolatis acutis, aliquando furcatis, ſæpiùs laciniatis, nec non acutè ſerratis inſtruitur, et haud rarò folia hæc convoluta, et quaſi cylindrica cernuntur. [b]

Hab. in INSULA VECTI, et juxta SIDMOUTH in DEVONIA.

[b] Vid. Obſ. in *F. fibroſo*, p. 81.

FUCUS DISCORS.

PL. XVII.

FUCUS. frond cylindrico-compreſſed: leaves pinnate, lanceolate, with lateral *laciniæ*, acute-pointed, ſometimes forked. Fruit in racemoſe ſpikes, terminating the principal branches.

PLATE.—*Eſp. Ic. Pl.* XXVI.

ROOT, a callous ſwelling out from the bottom of the ſtem.

STEM ſhort, the bottom of the ſtem thick, ſolid, covered with ſub-conical, or obtuſe appendages.

BRANCHES long, tapering, garniſhed with alternate leaves of the peculiar ſhape deſcribed as above; having a midrib, with ſharp ſummits, and perforated *papillæ* on each ſide, bifid, ſometimes rolled in, and cylindrical, punctured and midribbed.

FRUCTIFICATION terminating the branches; conſiſting of a branching ſpike of mucous ovate acute fruit.

OBSERVATIONS.

THIS Species is for the firſt time introduced into the Britiſh Catalogue. I gathered it in the year 1797 at SIDMOUTH, and ſent it as a non-deſcript to Mr. WOODWARD, who imagined it to be a variety of *F. fæniculaceus*. Theſe ſpecimens had the leaves rolled in, [a] and had few, if any fructifying tubercles. I ſent afterwards ſome to Mr. TURNER, who aſcertained them from inſpection of the *Linnean Herbarium* to belong to *F. diſcors, Linn.* Profeſſor ESPER has lately figured *F. diſcors* of LINNEUS, from a ſpecimen collected on the coaſt of ITALY: it differs in ſeveral reſpects, at leaſt it is not a fruited ſpecimen. He compares the covering of the large branches to coarſe Felt, [b] which is different from ours; but the peculiar ſhape of the leaves, and the whole habit, make me think they are the ſame ſpecies. Nothing is ſaid by Profeſſor ESPER of its racemoſe fructification, which is figured Pl. XVII. a, nat. ſize. a, a, magnified.——*Hab.* HAMPSHIRE, and DEVONSHIRE Coaſts.

[a] This property which I have noted before under *F. fibroſus*, p. 81, is more remarkable in this Species than in any other, and may cauſe them to be miſtaken for different ſpecies. Notwithſtanding the breadth of theſe leaves in the Figure Pl. XVII, I have ſeen them ſometimes quite cylindrical. This takes place at different ſeaſons of the year.

[b] "Die Aeſte in form eines dichten Filtz umgeben." Eſp. Ic. p. 59. In the microſcope, however, the appearance is of conical flat-headed appendages. See Pl. XVII. h. i, i, i.

FUCUS COSTATUS.

TAB. XVII.

FUCUS. fronde membranaceâ, diaphanâ: ramis anguſtis, linearibus, coſtatis. Fructû tubuloſo, terminali.

RADIX

RADIX incognitâ.

CAULIS, brevis, alatus.

RAMULI, alati; coſtâ centrali; membranâ anguſtâ, in utroque latere tenuiſſimâ, pellucidâ.

FRUCTIFICATIO, ob-ovata, utriculoſa, foraminulis extùs; ſeminibus intùs per membranam ad lucem conſpicuis.[a]

OBSERVATIONES.

SPECIES non deſcripta, et, ut opinor, rariſſima. Subſtantia, tenuitate et ſtructurâ, quam maximè *Generi* ULVÆ affinis. Membrana alæ, ut par eſt conjicere ex habitu fructificationis, duplex eſt, firmitèr tamen cohærens, ut in *Ulvâ compreſsâ*.——*Hab.* juxta FOWEY, CORNUBIÆ oppidum.

[a] Vid. Tab. XVII, c; d, d, ſummitat. auct.

FUCUS COSTATUS. PL. XVII.

FUCUS. frond membranaceous, tranſparent; branches very narrow, linear, midribbed; fructification veſicular, tranſparent.

(No Plate.)

ROOT unknown.

STEM, ſhort, winged.

BRANCHES winged with a tranſparent *ulvaceous* membrane on each ſide.

FRUCTIFICATION obovate, veſicular; with external perforations through the ſkin and congeries of ſeeds on the inſide.

OBSERVATIONS.

THIS is an entirely new Species bordering on ULVA; but from its being midribbed, and having terminal fructifications, it is arranged by me in this Catalogue of *Fuci*. I had the ſpecimen from whence the Drawing is taken, and which is preſented to the LINNEAN SOCIETY, from Mr. W. RASHLEIGH, who gathered it near FOWEY in CORNWALL. I conjecture from the tubular nature of the fructification,[a] that the lateral wings conſiſt of a double membrane cloſely adhering together, as is the caſe with *Ulva compreſſa*. It is I imagine very rare.

Hab. FOWEY, CORNWALL.

[a] See Pl. XVII. c. d, d, d.

FUCUS PEDUNCULATUS. TAB. XVII.

FUCUS. fronde tubuloſâ, filiformi, pinnato-ramoſâ; ramis ſetaceis, ſimplicibus; tuberculis oblongis, pedunculatis, undique erumpentibus. *Hudſ.* 587.—*Linn. Tr.* 3. 213.—*With.* 4. 120.

RADIX, callus, minutus?

CAULIS, tubuloſus, ſetaceus, cylindricus, flexilis.

RAMI, prælongi, ſimpliciſſimi, verſùs apicem breviores.

FRUC-

FRUCTIFICATIO: longis pediculis inſiſtens; primò ovata, filis tenuiſſimis, ex apice provenientibus; deinde ſeminibus maſsâ lanosâ circa ſtylum perſiſtens [a] involutis.

OBSERVATIONES.

FUCUS hic habitû ſingulari a cæteris facillimè diſcriminandus eſt. Radix adhuc incognita, ſi tamen GMELINI ſynonymon admittatur, "Styrps diſco rupi adfixa eſt." Fructificatio ſingularis admodùm totam plantam operit. Hujus nulla mentio in Act. Linn. excepto quod "tubercula pedunculata" vocantur. GMELINI verba in *F. Gærtnerâ* deſcribendo apprimè deſignant fructum *Fuci* hujus in ſtatu primo—"Fructificationes · · · erectæ, hyp-"ni antheram gracilem referentes, inferiùs pedunculatæ, apice in penicillum laxum, ſubviridem, fluitantem, facil-"limè deciduum, efflorescentes." Gmel. Fuc. p. 164. Deſcriptio ſanè apud GMELINUM ordinis, ramulorum et fructificationis, trifariam alterni, minimè cum *Fuco* noſtro convenit, ideoque ſtatuendum eſt ſpecies duas fructificatione affines, habitu tamen diverſas, apud nos, et in exteris regionibus occurrere.

Hab. WEYMOUTH et YARMOUTH.

[a] Vid. Fructificationem hancce valdè ſingularem. Tab. XVII. i, i; k, k.

[b] In ſpeciminibus noſtris penicilli filamentoſi ad ſummitates ramulorum conſpiciuntur, qui ſtructurâ geniculatâ generi CONFERVÆ proximè accedunt; etſi forſan fructificationis partes ſint.

PEDUNCULATED FUCUS.

PL. XVII.

FUCUS. frond tubular, thread-ſhaped; pinnato-racemoſe; [a] branches briſtle-ſhaped, ſimple: tubercles on long ſlender footſtalks.———*No Plate.*

ROOT, a minute diſc?

STEM, very ſlender, briſtle-ſhaped, cylindrical, flexible.

BRANCHES diſtant, gradually ſhortening towards the ſummit of the Plant.

FRUCTIFICATION on long footſtalks: conſiſting in the firſt ſtage of an ovate tubercle, crowned with a thick tuft of very fine threads ſeemingly jointed: [b] in the ſecond, of woolly maſſes of ſeeds, ſurrounding a long perſiſtent ſtyle. [c]

OBSERVATIONS.

THIS elegant Species is readily diſcriminated from every other by its habit, even when not loaded with its fructifying tubercles, which is the uſual ſtate in which it is found. Its root is ſuppoſed to be diſcoid. It is difficult to meet with it perfect, as the ſubſtance is very tender. Meſſrs. GOODENOUGH and WOODWARD have noticed green filamentous tufts at the edges of the branches, which they ſuppoſe to be a paraſitical *Conferva;* and from hence they ſuppoſe this to be *F. Gertnera* of GMELIN; but the tufts in GMELIN's deſcription are on the ſummits of the *fructification.* The fructification is deſcribed by them ſimply as "pedunculate tubercles;" from whence it is eaſy to infer that it was never examined under a microſcope. I incline to think *F. Gærtnera* an affinity, but not the ſame from the remarkable habit deſcribed by GMELIN, which ought not to have eſcaped the obſervation of the Gentlemen above-mentioned. The Profeſſor's words, in deſcribing *F. Gærtnera,* are "—— the fructification is on the branches, in a ſort of alternation by three and three, erect, reſembling the ſlender *anthera* of a HYPNUM, ſtanding on a footſtalk crowned with a lax, floating, greeniſh pencil of fibres quickly falling off." Gmel. Fuc. p. 164. This ſpecies is a native of deep waters, and only found caſt on the beach.—*Hab.* WEYMOUTH and YARMOUTH.

[a] Linn. Tranſ. 3. 213. This is literally tranſlated; but the plant is properly pinnate, having no ſecondary branches; but the *pinnæ* are lax and diſtant.

[b] The threads are ſo fine, that a Pillar Microſcope does not ſhew them larger than human hairs.

[c] See Tab. XVII. i, i: k, k. Theſe were drawn from 2 ſpecimens of different maturity: in the latter ſtate, the woolly maſs ſeemed to form ſpiral capſules; in ſome plants however, which were perfect on cutting them tranſverſely, orbicular ſeeds were ſeen to iſſue out.

FUCUS VIRIDIS.

TAB. XVII.

FUCUS. fronde tereti, tubuloſâ, ramoſiſſimâ; ramis oppoſitis; ramulis æqualibus, capillaceis, diaphanis; ſetis mollibus, tenuiſſimis.

RADIX ; callus, opacus, nigro-olivaceus.

CAULIS, cylindricus, tubulosus, fili emporetici magnitudine, coloris luteo-viridis.

RAMI, oppositi, prælongi, vel inæquales.

RAMULI, æquales, tenuissimi, densissimi ; spinulis oppositis, ramulis adhærentibus, obsiti.

FRUCTIFICATIO : vesiculæ ovatæ, in summis apicibus.

OBSERVATIONES.

Speciem hanc, sub nomine triviali *F. viridis* in Flora Danica descriptam, in littore Orientali propè Yarmouth oppidum detexit nuperrimè amicissimus nostri D. Turner, specimenque, cujus icon, Tab. xv, expressa est, mihi mandavit. Habitus totius frondis capillaceus, et sub aquâ amœnissimè fluitans. Altitudo quandoque pedalis. Color variat respectu ætatis : in junioribus luteo-viridis, ad lucem mutabilis; in adultioribus subfuscus, sed tamen diaphanus. In apicibus maturis tubulus, ut videtur, longitudinalis conspicitur, qui, tunc temporis solummodo contractione visibilis, totam frondem, ut conjicere par est, pervadit, pelluciditate tamen inconspicuus.[a] Fructificatio in apicibus conficitur. Vesiculæ ovatæ, terminales, maturâ ætate cernuntur (vid. b.); semina tamen parvitate suâ minimè visibilia sunt. In apicibus quibusdam casu aliquo abruptis, aut vesiculis seminalibus deciduis, fila alba, tenuissima conspiciuntur, fructificationi, ut videtur, inservientia. Plurimùm adjuvabit in re tam subtili Microscopii Solaris dextera accommodatio.[b]——*Hab.* Yarmouth, in Norfolcia.

[a] Microscopio Solari nuperrimè in floribus Filicum detegendis felicissimè usus est Jos. Fran. Marattius. Vid. opus ejus rarissimum Gottingæ apud Schoider. 1798.

[b] Minimè certus sum an tubulus ille solummodo idealis sit, et ex collapsu cuticulæ proveniens. Suspicor tamen structuram aliquam internam revera existere, septis diaphanis, ut suprà in *F. filo* annotavi, p. 41.

FUCUS VIRIDIS.

PL. XVII.

FUCUS. frond cylindrical, tubular, very much branched; branches opposite; branchlets of an equal length, capillary, transparent, garnished with very slender soft spines.

PLATE. *Flor. Dan.*

ROOT, a thick opaque callous knob.

STEM, the size of small packthread; colour, apple green, when young.

BRANCHES opposite, very long; the opposite ones unequal in length.

BRANCHLETS of an equal length, very slender, and much crowded; garnished with fine short, soft spinules, fitting close to the stem.

FRUCTIFICATION terminal; consisting of oval vesicles, but with no visible seeds within.

OBSERVATIONS.

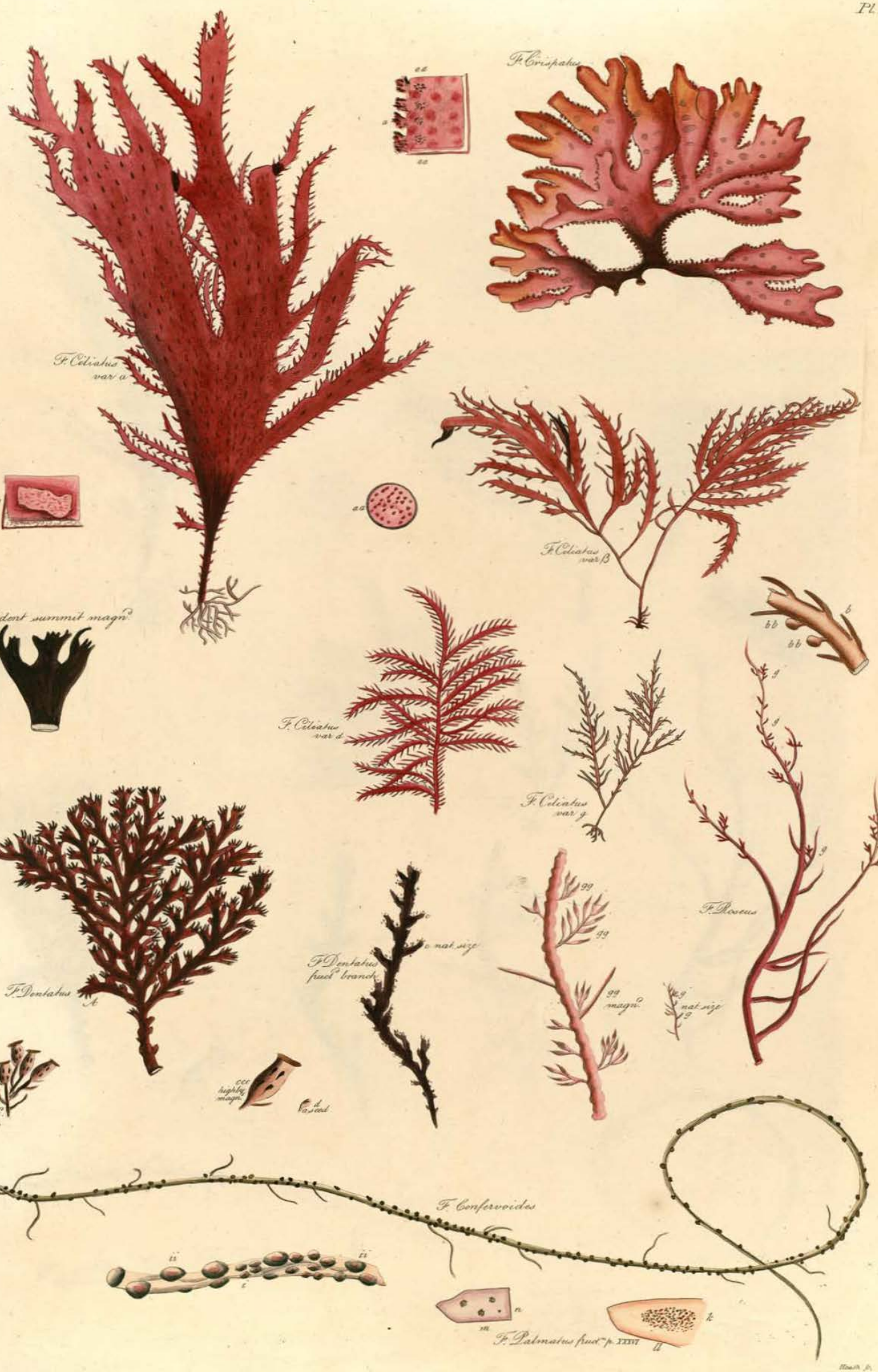
We owe the discovery of this elegant Species, figured in Flora Danica, to Mr. Turner, who sent me the specimen from whence the Drawing was taken, together with some others more advanced, from the Beach of Yarmouth. It has the capillary, floating habit of the most delicate *Conferva*, but no internal *septa* are discoverable by the microscope, though I suspect their existence. All tubular plants require some internal organization, to prevent their collapsing, as I formerly observed on *F. filum*, p. 41. I have hopes that the powers of the Solar Microscope may hereafter be applied in detecting the Theory of Fructification in these marine species, where the parts are too minute to be investigated by the compound in its present state.[a] No further description is necessary to identify this species, which, as will appear by the inspection of the Plate, differs so remarkably in colour and habit from every other. Its fructification is described above, and is delineated in the Plate : there are terminal vesicles, but the seeds are not conspicuous with a Pillar microscope; and in some summits, which appear broken off, there are pencils of whitish fibres, which probably have some connexion with Fructification.[b]

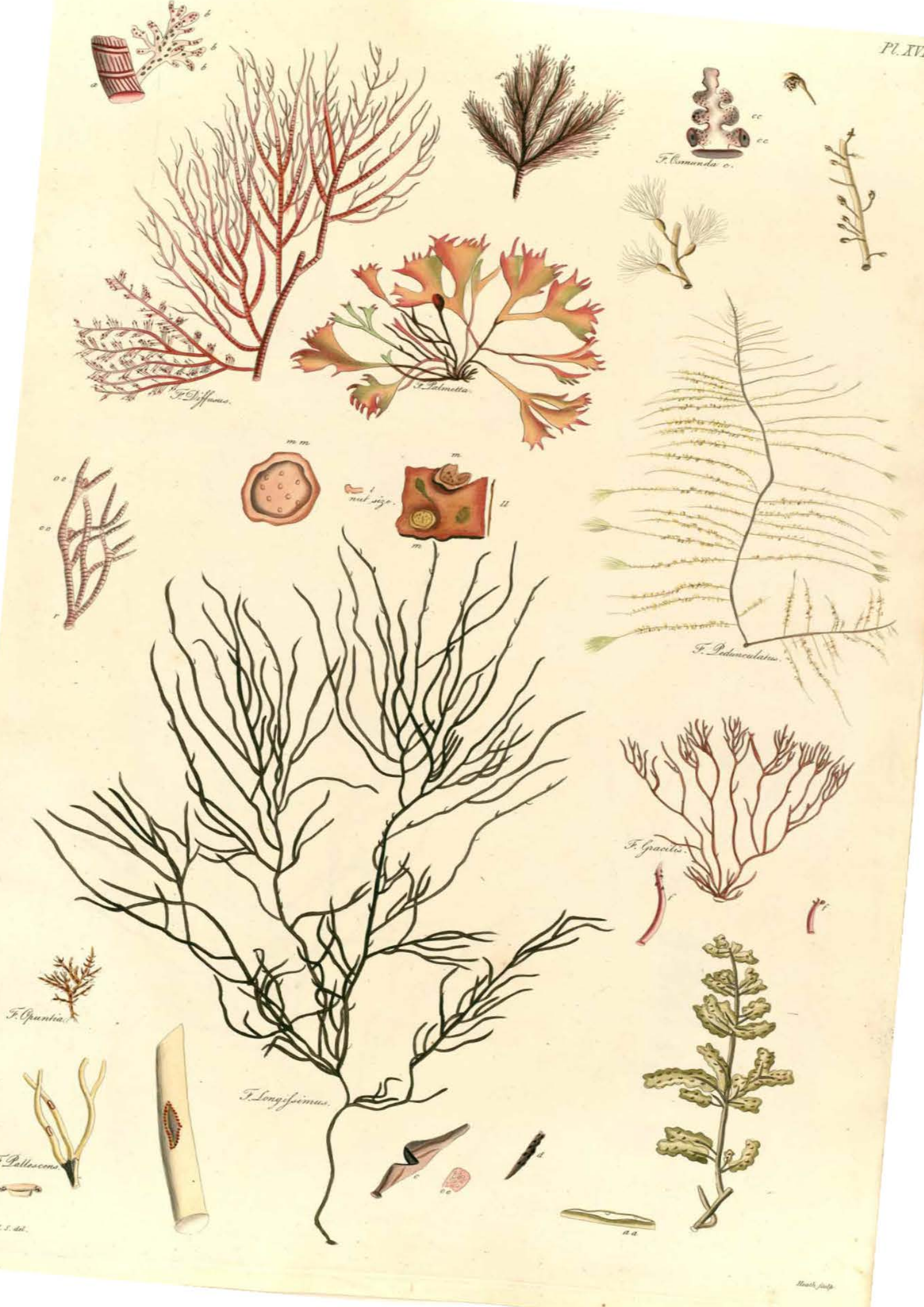
Hab. Yarmouth.

[a] See Note *b* above.

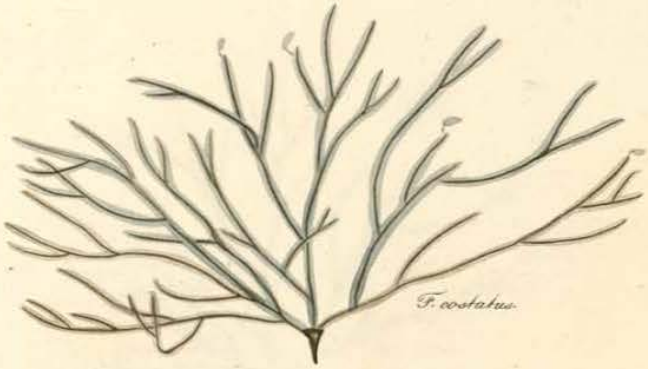
[b] See Pl. xvii. *a* nat. size. *a*, *a*, magnified. *b* a vesicle magnified. *c* a summit with the tufts of fibres.


F. Fibrosus
F. Coccinifolius
F. Fastigiatus
F. Abrotanifolius
F. Barbatus
F. radiatus
F. Tampibius
F. amphibius

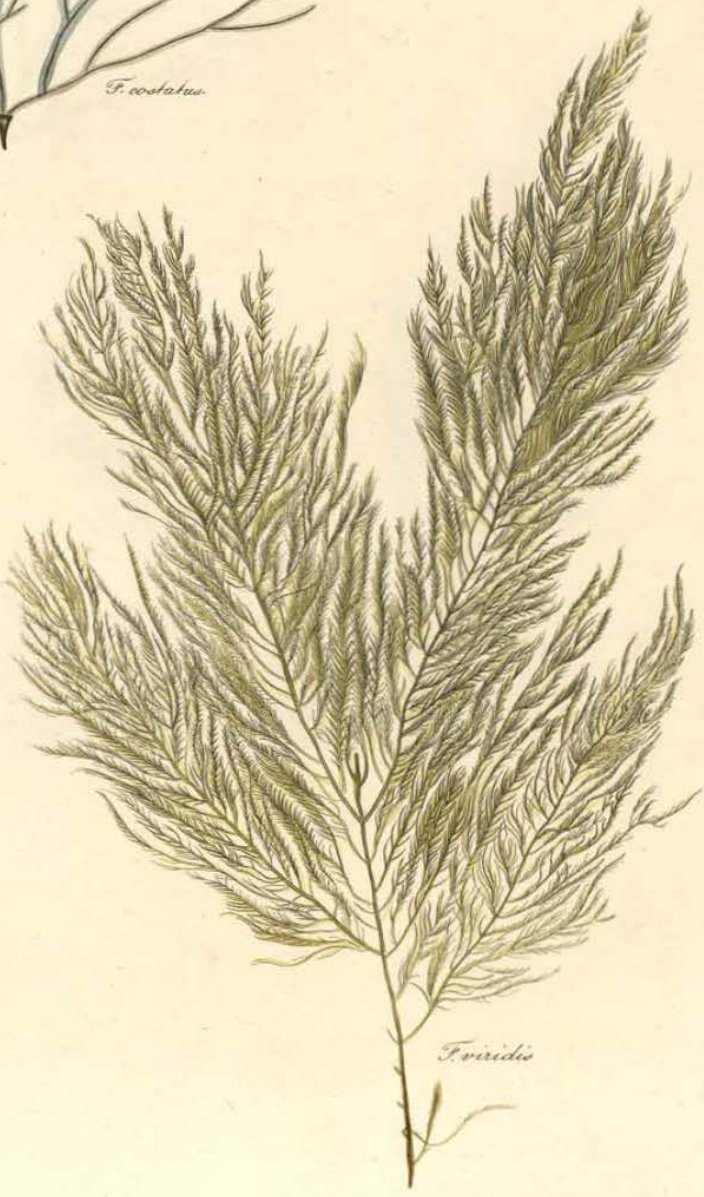

F. Crispatus
F. Ciliatus var a
F. dent summit magn.
F. Ciliatus var β
F. Ciliatus var δ
F. Ciliatus var γ
F. Dentatus A
F. Dentatus fruct. branch
F. Roseus
F. Confervoides
F. Palmatus fruct. p. XXXVI


F. Diffusus.
F. Palmetta.
F. Pedunculatus.
F. Gracilis.
F. Opuntia.
F. Longissimus.
F. Pallescens.


F. discors


F. costatus


F. lycopodium


F. viridis

AN

APPENDIX,

Containing Species recently delineated, which on that account are not engraved in this Work, arranged alphabetically.

F. ASPARAGOIDES. Linn. Tr. v. 2. t. VI. *Sheet A. n. 2.

Fronde filiformi, ramoſiſimâ; tuberculis globoſis pedunculatis; ramulis ſetaceis, ſubulatis, alternis reſpectu tuberculorum. *Linn. Tr.* 2. 29.—*With.* 4. 117.

OBSERVATIONS. This Species was firſt diſcovered by Mr. WIGG, and deſcribed and delineated by Mr. WOODWARD in the Linn. Tr. The Root is fibrous; frond thread-ſhaped, cylindrical; branches of the ſize of ſmall pack-thread; garniſhed with ſhort, ſharp, ſoft ſpinules in a ſub-alternate order, with pedunculate round ſeed-veſſels placed alternately between the ſpinules, of about half their length. Height 6 inches; colour pink, or bright red, though ſubject to variations. This ſpecies is not peculiar to the Norfolk Coaſt: it is to be met with in Devonſhire and Cornwall. Height 3 or 4 inches.———*Hab.* YARMOUTH and CORNWALL.

* This reference to Sheets has reſpect to Drawings, to be furniſhed by Mr. WHITE, the Publiſher, from originals of mine, to thoſe who are not in poſſeſſion of the Linnean Tranſactions, the works of LIGHTFOOT, and VELLEY, where theſe Species have been recently delineated, or who wiſh to have the work complete.

F. BIFIDUS. Linn. Tr. v. 3. t. 17. Sheet C. n. 3.

Fronde membranaceâ, dilatatâ, bifidâ: ſegmentis divaricatis obtuſis; tuberculis marginalibus, diſtantibus. *Hudſ.* 581.—*With.* 4. 103.—*L. Tr.* 3. 159.

OBSERVATIONS. Root fibrous, frond bifid, divaricating, very thin, and tranſparent. This ſpecies grows in matted cluſters, and is ſtrictly dichotomous,* though in appearance irregular, the dichotomy is often repeated 4 or 5 times. Fructification very particular; conſiſting of ſmall tubercles partly immerſed in the margin of the frond, but prominent, large, orbicular, and *diſtant*. Height from ½ inch to 2 inches, or more: colour purple red.———*Hab.* common.

* Though this appears to be its general habit, yet I have found it remarkably ſportive in its ſhape, if it in fact is not a ſmall one of a different Species. See a ſpecimen ſo marked in the Book preſented to the Society.

F. CANALICULATUS. VELLEY's Coloured Fig. of Marine Plants. t. 1. Sheet E. n. 4.

Fronde dichotomâ, integerrimâ, ſuprà convexâ, ſubtùs concavâ, lineari: tuberculis ſeminiferis fructu bifido, vel irregulari, incluſis. *Herb. Linn.—Syſt. Nat.* 812.—*Gmel.* 73.—*Morif.* 647.—*Hudſ.* 583.—*With.* 4. 99.—*Linn. Tr.* 3. 172.

OBSERVATIONS. This Species is diſtinguiſhed from others by a channel or furrow paſſing longitudinally along the under part of every branch, or more properly ſpeaking, it is convex above, concave below. Its root is a coriaceous diſc, which ſends up many ſhoots, which branch in a dichotomous order and are terminated, when in fruit, with ſwollen tubercled ſummits of a yellowiſh colour. It is generally diminutive, and grows ſometimes much above low water mark; but is greatly affected by ſituation, ſo as occaſionally to emulate the larger *Fuci*. Its frond is punctured with one or two ſeries of urceolate veſſels, in the upper ſegments diſcernible by an eye-glaſs, and with a ſtrong light even without that aſſiſtance.—*Hab.* common.

F. DASYPHYLLUS. Linn. Tr. v. 2. t. 23. Sheet E. n. 1.

Fronde tereti, ramoſâ: ramis filiformibus, ſub-ſimplicibus: foliis cylindricis obtuſis, baſi, attenuatis ſparſis. *L. Tr.* 2. 239. 3. 119.—*Eng. Bot.* 847.—*With.* 4. 112.

OBSERVATIONS. Root callous: frond tender, tranſparent, cylindrical; branches, a few long ones from the root: branchlets, or leaves, few, irregular; ſome of them ſimple, others branched again, or laciniated; ſmaller at the point of inſertion. The whole Plant tender and ſucculent. Fructification minute ſeſſile tubercles, without order, adhering to the coats of the principal branches, generally near the ſummits.*——*Hab.* YARMOUTH, and elſewhere.

* The ſtructure of this Species, according to my Friend Mr. PIGOTT, is curious; conſiſting of a net-work of diagonal lines croſſing each other.

F. ENDIVIÆFOLIUS. LIGHTFOOT, v. 2. t. 32. Sheet E. n. 2.

Fronde membranaceâ, laciniatâ; laciniis dilatatis, undulatis; marginibus criſpis tuberculatis, punctatis. *Lightf.* 948.—*Linn. Tr.* (F. laceratus.) 3. 155.—*With.* 4. 103.

OBSERVATIONS. Root, a minute callous knob, throwing out ſhoots, which immediately expand into a thin membranaceous ſubſtance, variouſly divided into deep undulating ſegments. It has its edges wavy and crumpled. Fructification, compreſſed circular tubercles near the edge on the ſurface of the frond. Meſſrs. GOODENOUGH and WOODWARD have claſſed this as *F. laceratus* of GMELIN, but its habit is totally different. LIGHTFOOT's Plate is not very characteriſtic of this Species, though his Deſcription is good. The Drawing above referred to is from an Iriſh Specimen. Inſtead of claſſing the Affinities of this Species as Varieties, after the example of Meſſrs. GOODENOUGH and WOODWARD, I have already engraved, in addition to the ſubject of this Article, *F. laceratus* and *F. criſpatus* as ſeparate ſpecies, and doubt not but 2 or 3 more will be hereafter diſcriminated from more accurate inveſtigation.——*Hab.* SCOTLAND and IRELAND.

F. ESCULENTUS. Lightf. Flor. Scot. v. 2. t. 28. Sheet B.

Fronde ſimplici enſiformi; ſtirpe infrà ſub-tereti; ſtipite denſo, compreſſo, folium percurrente. *Linn. Syſt.* 815.—*Mantiſſ.* 135.—*Gmel.* (F. fimbriatus.) 200.—*Gunn.* 4.—*Fl. Dan. t.* 417.—*Linn. Tr.* 3. 140. (F. teres and tetragonus.)—*Lightf.* 948.—*With.* 4. 93.

OBSERVATIONS. Root fibrous; ſtem round at bottom, compreſſed in the midrib, garniſhed juſt below the leaf with a tuft of leafits, ſucculent in the middle, pedunculate, and fringed at the edges. Leaf membranaceous, veinleſs, plaited near the midrib, very long, leſſening upwards, and always near the extremity in a ſtate of laceration. Midrib thick, and compreſſed, running the whole length. LIGHTFOOT's Plate is very much diminiſhed: the Drawing accompanying this Deſcription is only of a ſmall ſized Specimen. Meſſrs. GOODENOUGH and WOODWARD have divided this Species into two; but I think it has been owing to a miſtake; as the character of *F. teres* is taken from the lower part of the ſtem, which is cylindrical; and that of *F. tetragonus* from the continuation of the Stem as a midrib, when its thickneſs is compreſſed ſo as to become almoſt quadrangular. The membrane is veinleſs, tranſparent as that of *Ulva*, and of a beautiful clear brown; its greateſt ſize 4 feet by 9 inches.

Hab. SCOTLAND, IRELAND, the W. extremity of ENGLAND in deep waters.

F. FRUTICULOSUS. Sheet F. n. 3.

Fronde ramoſiſimâ: ramis cylindricis, flexuoſis; ramulis breviſſimis ad apices faſciculatis.

OBSERVATIONS. I mentioned this *Fucus* in my Preface, as being recently about to make its appearance in the Linnean Tranſactions. It is admirably figured in JACQUIN's Collectanea. The delineation referred to above, is accurate as far as the Specimen authorized me to exhibit it; but it is a barren Specimen.——*Hab.* ACTON CASTLE, MOUNTS-BAY, CORNWALL.

F. GIGARTINUS. Linn. Tr. v. 3. t. 17. Sheet C. n. 4.

Fronde cartilagineâ, dichotomâ, ramoſâ; ramis æqualibus, acutis, ſpinoſo-dentatis; tuberculis lateralibus, globoſis. *Herb. Linn.*—*Murray. Syſt. Veg.*—*Linn. Tr.* 3. 183.—*With.* 4. 111.

OBSERVATIONS. Root an expanded Diſc, ſending out many ſhoots. Frond cylindrico-compreſſed, naked at bottom, branching upwards, rigid, ſemi-pellucid. Branches irregular, ſometimes alternate, at others ſub-dichotomous, tapering upwards: divaricating ſo as to form right, or obtuſe angles with the ſtem. Fructification, minute globules, generally ſeſſile, towards the extremities. This Species has been recently detected among ſome Specimens ſent by me to Mr. TURNER, from one of which the Drawing C. n. 4. was taken. It has the texture of *F. criſpus*, and may be taken for a Variety of the *mammilloſe* kind.

Hab. CORNWALL, St. IVES.

F. HYPOGLOSSUM. L. Tr. v. 2. Pl. VII. Sheet A. n. 3.

Fronde ramoſâ, alatâ; foliis lineari-lanceolatis, planis, integerrimis, proliferis. *Linn. Tr.* 2. 30. 3. 113.—*Herb. Banks.* (F. hypogloſſum et F. lingulatus.)—*With.* 4. 95.

OBSERVATIONS. This elegant Species differs from *F. alatus* and *ſinuoſus* in habit. Its root is a minute Diſc. Frond membranaceous, very delicate, tranſparent, of a pinky colour. Leaves lanceolate, ſeſſile, midribbed: Midrib proliferous, having numerous ſmall leafits. Fructification of 2 kinds; either globular tubercles of a deep red colour, fixed in the midrib, or minute imbedded punctures placed in regular rows. See my Obſervations on this *dimorphous* Fructification, Pref. p. XXVI.——*Hab.* common.

F. LIGULATUS. Lightf. Flor. Scot. v. 2. t. 29. Sheet D.

Fronde planâ, aveniâ, ſub-triplicato-pinnatâ: ramis ramuliſque diſtichis; foliis lineari-lanceolatis, ſpinoſo-dentatis. *Lightf.* 946.—*Hudſ.* (F. herbaceus.) 582.—*Linn. Tr.* 3. 123.—*With.* 4. 101.

OBSERVATIONS. Root, a fleſhy knob, flat at bottom: ſtem flat, thicker in the middle, throwing out its branches from the edge: principal branches ſupra-decompoſed; thoſe near the bottom the largeſt, ſhortening upwards; the laſt diviſion of branches having the edges ſet round with ſoft *ciliæ*, ſlender and acute pointed. Fructification, circular flat warts on the branches near the ſetting on of the Leaves. * Height often above a yard. Colour yellowiſh green. Native of deep waters. Mr. PIGOTT diſcovered a Plant of this Species at POOLE, with fibrous proceſſes at the margins of all the leaves: which, as it was late in the year, ſeems to have reference to fructification. I have likewiſe found in ſome large ſpecimens, flatted orbicular excreſcences on the Stem, which I take to be ſeminiferous.——*Hab.* common in deep waters.

* See my Obſervations and Figure of a fructified ſummit of *F. tamariſcifolius*, p. 45. t. XI. l, l. and of *F. pedunculatus*, t. XVI. ii; k, k. Theſe filamentous proceſſes merit ſtrict attention.

F. KALIFORMIS. Linn. Tr. v. t. 18. Sheet G. n. 1.

Fronde filiformi, ſubgelatinoſâ, tubuloſâ, ramoſiſimâ; ramis ſparſis; ramulis ſubverticillatis, ſubulatis, obtuſiuſculis. *Linn. Tr.* 3. 226.—*With.* 4. 89.

OBSERVATIONS. Root, a ſmall thick knob: frond cylindrical, tender and pulpy, round; often, if not always, having a ſmall cavity in the middle; not of an equable thickneſs, but ſwelling and contracting. Principal ſtem of the thickneſs of a Gooſequill. The habit of this ſpecies is ſubverticillate. This Species has many varieties, and is cloſely connected with *F. articulatus*. Fructification: ſmall ſeſſile tubercles; colour a dilute pink or purple. N. B. *F. verticillatus*, Lightf. t. 31, is ſo nearly allied, that I cannot from his Drawing eſtabliſh a diſtinct ſpecies; though one, if not more, will hereafter be diſcriminated, with all the parts more minute and filiform.——*Hab.* common.

F. LICHENOIDES. Lightf. Flor. Scot. v. 2. t. 22. Sheet E. n. 3.

Fronde dichotomâ, ramoſâ; ramis apice dilatatis: fructificatione in ſummitatibus concavis. (F. pygmæus) *Lightf.* 964.—*With.* 4. 100.—*Hudſ.* (F. pumilus.) 584.

OBSERVATIONS. Root, a minute callous Knob, throwing up many ſhoots matted together, forming diſcs by contact, ſo as to ſpread in patches. The little branches are obtuſe pointed, and in fruiting-time ſwell into a ſort of tubercles, with an aperture in the middle: theſe apertures are wide, and not unlike the ſhield of a *Lichen*. This is one of the connecting links between aquatic and land plants, as its ſituation pretty accurately marks the line of high water. It can hardly be deemed a ſubmerſed Plant, living in many ſituations the greateſt part of its time expoſed to the ſun and winds, and affords one among many inſtances of the wonderful power of Nature in accommodating herſelf to any ſituation. Height ¼ inch, colour on the rock, black; held to the light, olive.

Hab. common.

F. MEMBRA-

APPENDIX.

F. MEMBRANIFOLIUS. Linn. T. 3. t. 16. Sheet C. n. 1.

Fronde tereti, ramosâ: apicibus membranaceis, dilatatis, dichotomis, enerviis; tuberculis pedunculatis. *Linn. Tr.* 3. 120.—*With.* 4. 106.

OBSERVATIONS. Root, a minute Diſc; ſtem flatted, but nearly cylindrical, branching; ſummits of the branches terminated with an expanded leaf-like membrane, much crumpled and curled, with ſharp-pointed tips. Its membranaceous tranſparent ſubſtance renders it very nearly allied to ſome of the dilated varieties of *F. criſpus*. It differs from *F. criſpus* in fructification which is oval, ſub-pedunculate, and produced on the branches below the membranaceous leaf. I have drawn a ſpecimen from the I. of WIGHT, where the round branches are divided and ſubdivided before the leafy expanſion takes place in the ſummit. I imagine many Species are included among the four varieties enumerated in the LINNEAN TRANSACTIONS.

Hab. I. of WIGHT, and not uncommon, at leaſt ſome of the varieties, elſewhere.

F. OBTUSUS. VELLEY's Col. Fig. t. 3. Sheet G. n. 2. Var. n. 3.

Fronde cartilagineâ, filiformi, compreſsâ, ramosâ, pinnatifidâ; ſegmentis obtuſis; tuberculis in apicibus. *Velley. Ic.* 3. *With.* 4. 119.

OBSERVATIONS. Root, a ſucculent Diſc. Stem round, tender, pellucid, ſlightly compreſſed, much branched; branches ſometimes oppoſite, often irregular, covered with obtuſe and as it were truncated ſegments. On theſe are to be found the Seeds adhering to the inner ſide in cluſters. The figure of Col. VELLEY is admirably drawn as well in its natural as magnified ſize; but it ſeems to differ from the *F. obtuſus* of the LINNEAN TRANSACTIONS. This Species is perfectly gelatinous, and there has lately been diſcovered a Variety of a pea-green colour. Notwithſtanding the difficulty of preſerving it on paper, Col. VELLEY ſhewed me a beautiful Specimen collected at POOLE.——*Hab.* WEYMOUTH and I. of WIGHT.

VAR. α. I inſert a Specimen more nearly allied to *F. pinnatifidus*, whoſe fructification is extremely ſingular, conſiſting of globular veſicles of a large ſize, with ſeeds immerſed as at n. 3.

F. PALMATUS. Fl. Scot. t. Sheet F. n. 4.

Fronde palmatâ, planâ. *Lightfoot.* 933.—*With.* (U. palmata.) 4. 123.

OBSERVATIONS. Having fully deſcribed *F. palmatus* before, p. 54, I juſt inſert this, as my Figure was of a large Plant, with the margin throwing out pedunculate Shoots, and without having the palmated appearance of LIGHTFOOT's Plant, which however is not uncommon. Though the habit of the Plant, as delineated in Sheet F, is frequent, yet I incline to think from the baſe of Mr. LIGHTFOOT's Plant, added to the Deſcription he has given, that his *F. palmatus* is an *Ulva*, and Mr. WOODWARD is of the ſame opinion. In this ſtate the diſtinctive mark, viz. the pedunculate leaves at the edges, are ſeldom met with. I am convinced there are ſeveral Species nearly allied, one of which with narrow linear leaves I have preſented to the Society, with immerſed tubercled Fructifications very numerous.——*Hab.* common.

F. PURPURASCENS. VELLEY. t. 2. Sheet A. n. 4.

Fronde filiformi, ramoſiſſimâ; ramulis ſetaceis, ſparſis; tuberculis ſubrotundis, innatis. *Herb. Budd.*—*R. Syn.* p. 50. 51.—*Hudſ.* 589.—*Lightf.* 926.—*With.* 4. 113.—*Linn. Tr.* 3. 225.

OBSERVATIONS. This is a tender ſucculent Species, elegant in its ramification, but diſtinguiſhable from every other when in fruit by the ſize and colour of its innate tubercles, which are ovate and purpliſh. It has been called *F. tuberculatus* by LIGHTFOOT; but that name is applied to *F. bifurcatus* of VELLEY and WITHERING. The tubercles are not air-bladders, but mucifluous veſſels with imbedded granules of ſeeds. Col. VELLEY delineated a young Plant: the Plant which I have delineated was in maturity.——*Hab.* very common.

F. RUBENS. Lightf. v. 2. t. 30. Sheet F. n. 1.

Fronde ſub-membranaceâ, dichotomâ; ramis proliferis linearibus; ramulis apice dilatatis, bifidis; laciniis acutiuſculis. *Herb. Linn. Buddle.—Ginanni Op. Poſth.* 61.—*Buxbaum.* 60.—*Linn. Sp. Pl.* 1630.—*Hudſ.* (F. criſpus.) 580.—*Lightf.* (F. prolifer.) 949.

OBSERVATIONS. Root, an expanded callous Knob, with a ſhort ſtem. It branches at firſt regularly, but in its future growth it propagates itſelf by ſhoots ariſing from the ſummits of former ones, not produced at the margin, as in *F. palmatus*, but a little within the ſurface of the Frond. This habit, called by LIGHTFOOT, chainlike, * is generally obſervable even without laceration; but in ſome young plants it is not found; and there is, as has been obſerved, a faint midrib in the bottom of the older ſegments. Its Fructification is ſingular, as the ſeeds vegetate on the frond of the parent plant, and ſeedlings may be ſeen ſometimes ſimple with a minute round crooked ſtalk, and a flat oval or circular head; at other times, either in pairs, or 3 or 4 together, cauſing the appearance of "the rudiments of branches," mentioned Linn. Tr. v. 3. p. 166, and which as they rightly conjecture "ſeparate in time from the parent Plant." LIGHTFOOT's Plate is characteriſtic of it in its trailing ſtate, I do not meet with it ſo tall.

Hab. common.

* "Catenato-prolifer." Linn. Tr. 3. 166.

F. SUBFUSCUS. Linn. Tr. v. 1. tab. XII. Sheet F. n. 2.

Fronde filiformi, ramoſiſſimâ; ramis ſparſis; ramulis ſubulatis, alternis; tuberculis racemoſis. *Linn. Tr.* 1. 131.—*With.* 4. 115.—*L. Tr.* v. 3. 212.

OBSERVATIONS. This is one of the ſhrubby ſpecies diſcovered by Mr. WOODWARD in the year 1789, and publiſhed by him in the firſt Vol. of the Linn. Tr. The Root is fibrous, and covered with *gluten:* Frond cylindrical, very much branched; branchlets ſhort, and covering the ſhoots on all ſides. The Fructification is ſituated in the *axillæ*, on branching peduncles, each ſeed veſſel having the appearance of the calyx of a Flower under the microſcope. Colour reddiſh brown. Height 6 inches. Very common on the Beach at YARMOUTH. It is frequently found with large innate tubercles, which have never had any ſeeds diſcoverable in them, and are probably the *nidus* of an Inſect. In this ſtate, and under ſome of its varying appearances, it has been ſuppoſed to conſtitute a new Species, and as ſuch is arranged in the Catalogue of Meſſrs. GOODENOUGH and WOODWARD as *F. variabilis:* the error being ſimilar to that reſpecting *F. tamariſcifolius* and *ſelaginoides*.

Hab. on the N. E. Coaſt generally.

F. TENU-

APPENDIX.

F. TENUISSIMUS. Linn. Tr. v. 3. t. 19. Sheet C. n. 4.

Fronde filiformi, ramoſſiſimâ; ramis omnibus capillaribus alternis; ramulis acutis, tuberculatis. *Hudſ.* (U. capillaris.) 571.—*With.* 4. 117.

OBSERVATIONS. Root fibrous, matted, throwing up numerous ſhoots, though it is ſometimes ſolitary. Stem branching near the bottom. Branches alternate, capillary, ſubdivided: extreme branchlets ſhort, ſwelling in the middle, and ſmall at the ſetting on. Fructification, numerous adnate ſpherical granules, each containing one ſeed. Height from 3 to 12 inches. Colour, watery pale purple. Tranſparent veſicular proceſſes are at times obſervable in the branches. Theſe proceſſes are attempted to be delineated in Pl. 19. L. Tr. but I think they diſguiſe the Plant. The Drawing of Sheet E was furniſhed by Friend MASON of YARMOUTH, a very ſedulous marine Botaniſt; and it is, I think, a Maſter-piece of Art.——*Hab.* I. of WIGHT, WEYMOUTH, &c. &c.

F. TUBERCULATUS. With. Bot. Arr. v. 4. t. 17. f. 1. Sheet A. n. 1.

Fronde filiformi, dichotomâ; ramis inæqualibus obtuſis, apice tuberculatis; angulis ramificationum obtuſis. *Raii. Syn.* 43. n. 13.—*Hudſ.* 588.—*With.* (F. bifurcatus.) 4. 109.

OBSERVATIONS. Root, a callous Knob. Stem perfectly cylindrical, gloſſy, tranſparent, rigid; the ſize of a Raven's quill or larger; branching near the ſummit; often dichotomous, though ſometimes irregular, but always forming a roundiſh angle with the ſtem. The ſummits, which are furcated, and turn inwards, ſwell at the time of fructification, and throw out conical *papillæ*, under which are the orbicular ſeed-bearing Maſſes. This Species has been delineated in Dr. WITHERING's Botanical Arrangement under the expreſſive name of *F. bifurcatus*, with a Deſcription from Col. VELLEY. It is a very common Species in CORNWALL, and is very beautiful in fructification, as the granules are to be ſeen diſtinctly on the inſide through the tranſparent *mucus*.

Hab. CORNWALL: ACTON CASTLE, plentiful.

F. VERTICILLATUS. Lightf. v. 2. t. 31. No Drawing.

Fronde, tubulo â, ſub-articulatâ, ramoſâ; ramis verticillatis, ſubulatis, ſetaceo-ligulatis. *Lightf.* 962.—*With.* 4. 90.

OBSERVATIONS. I juſt notice this Plant, as it has been figured by LIGHTFOOT; but in his Plate, the inattention of the Engraver to its capillary parts, is ſo great * that I ſhall not venture to decide whether in any thing it differs from *F. kaliformis*. Many varieties of *F. kaliformis* are completely whorled.——*Hab.* SCOTLAND.

* See *F. kaliformis*.

F. PATENS. Sheet A. n. 3.

Fronde dichotomâ, lineari apicibus, obtuſiuſculis, planis; tuberculis ſub-globoſis, ſparſis.

OBSERVATIONS. This Species is eſtabliſhed in the Linnean Catalogue, but not in ſuch a manner as in my judgment ſeparates it from *F. criſpus*, I here give their ſpecific character, and the delineation is from a Specimen of Mr. WOODWARD's.

Hab. MARAZION, CORNWALL.

BOTANICAL REFERENCES,

Which occur under ABBREVIATIONS *in this Work.*

Act. Gall.	Acta Gallica ſecundum Annos Digeſta.		Herb. Linn.	Herbarium LINNEI penes Jac. Ed. SMITH, Norvici	
Bauh. Pr.	Caſpari Bauhini Prodromus	1646. 4to.	—— Sherard.	——— SHERARDI in Hort. Med. Oxon. ———	
—— Pin.	——— Pinax	———	Imp. Nat. Hiſt.	Imperati Hiſtoria Naturalis	
Baſt.	Baſteri opuſcula ſubſeciva	1762. 4to.	Linn. Syſt.	Linnei Syſtema Naturæ, cura Gmelin	1791. 8vo.
Buddl.	Buddlei Hortus ſiccus in Muſeo Britannico	——	—— Sp. Pl.	——— Species Plantarum	1747. 8vo.
Dod.	Dodonæi ſtirpium hiſtoriæ pemptades vi.	1616. fol.	Lightf.	FLORA SCOTICA; by the Rev. W. LIGHTFOOT	1777. 8vo.
Eng. Bot.	Engliſh Botany. Plates by J. Sowerby	———	Mantiſſ.	Mantiſſa Plantarum Linn. Fil.	1767. 8vo.
Eſp. Ic.	Icones Fucorum cum char. ſyſtem. Eug. I. Eſper	1798. 4to.	Moriſ.	Moriſoni Plantarum Hiſt. univ.	1680. fol.
Fl. Dan.	Icones Pl. Floram Danicam illuſtrant. In faſciculis.	——— fol.	Oed. Dan.	Flora Danica, ſupra	
Fl. Ang.	Hudſoni Flora Angliæ	1778. 8vo.	Petiv.	Ray's Engliſh Herbal illuſtrated by W. Petiver	1695.
Fl. Lapp.	Linnei Flora Lapponica	1737. 8vo.	Park.	Parkinſon's Theatrum Botanicum	1640. fol.
Gunn.	Gunneri Fl. Norvegica	1772. fol.	Pet. gaz.	Petiveri Gazophylacium Naturæ et Artis	
Gent. Mag.	The Gentleman's Magazine		R. Syn.	Raij Synopſis	1724. 8vo.
Ger. em.	Gerard's Herbal amended by Johnſon	1636. fol.	Roy. lugd.	Floræ Leidenſis Prodromus a Royen	1740. 8vo.
Giſck.	Giſeckii Index Linneanus cum fig.	1779. 4to.	Seb.	Sebæ Theſaurus	
Gmel.	Gmelini hiſtoria Fucorum. Petrop	1768. 4to.	Vell. Inq.	Coloured Figures of Marine Plants by T. Velley, Eſq.	1795. fol.
Hiſt. Ox.	Moriſoni Plantarum hiſt. univerſalis; Oxon	1680. fol.	With. or With. Bot. Arr.	Arrangement of Britiſh Plants by W. Withering, M. D.	
Hudſ.	Hudſoni Flora Anglica	1778. 8vo.			

OMITTED IN THE APPENDIX.

FUCUS FÆNICULACEUS. Fronde filiformi, ramoſiſſimâ; ramis ſub-dichotomis: foliis ſubulatis æqualibus; veſiculis oblongis, innatis, vel axillaribus, *Herb. Linn.*—*Buddl. p.* 15. *n.* 23.—*Petiv.* 34. *n.* 4, 5. 6.—*Act. Gall.* 1712.—*L. Sp. Pl.* 1629.

F. concatenatus. *Hudſ.* 574.—*Lightf.* 923.—*Velley. t.* 2. *f.* 1.

OBSERVATIONS.

This Plant has been aſcertained by the *Linnean Herbarium* to be the true *Fæniculaceus* of that Author; GMELIN'S *F. fæniculaceus* appears there as *F. barbatus*, and as ſuch I have deſcribed and figured it, p. 83. *F. concatenatus*, LINN. is a Species not yet found on our Coaſt. I follow the Authority of Meſſrs. WOODWARD and GOODENOUGH, the former of which Gentlemen, as likewiſe my Friend Mr. TURNER, have ſeen the Specimen delineated in the Sheet abovementioned, the original being in the poſſeſſion of the LINNEAN SOCIETY. I ſincerely hope the Deſcriptions and Drawings, which are to be met with in this Work, will finally ſettle theſe Species, which are ſo nearly allied to each other in habit of growth. The oval veſicles, when innate and ſtrung on the Branches, and the triangular axillary ones, diſtinguiſh this *Fucus:* they are filled with *mucus*, and have punctures for the diſcharge of the ſeed.

Hab. The Specimen, from whence the Drawing was taken, was ſent me by LADY ELIZ. NOEL, to whom the Science of Botany owes many obligations. It was gathered near POOLE, DORSETSHIRE, and is plentiful along the Southern Coaſt.

ERRATA.

Page 1. *for* amplectetur *read* amplectitur.
xx. *dele* flagelliformis.
xxiv *for* deſtinatis *r.* diſtinctis.
ib. teriti tereti.
ib. racemoſi racemoſæ.
xxviii in the note è è è e, e, e.
ib. propaginus propagines.
xxxii quotes quote.

F. veſiculoſus, Pl. II. the Frond ſhould be punctured in the ſame manner as Pl. I.
F. rubens, Pl. VII. a, ſtem nat. ſize; b, magnified leaf with the fructified veſicles; d, ſtem magnified with a ſimilar fructification.
F. ſanguineus, *ib.* a, b. laſt page, *r.* p. 30, being the laſt page of Faſc. I.
F. tomentoſus, *ib.* by an error of the Engraver it is drawn with black tubercles, and otherwiſe not ſo downy and velvety as it ought to be.

31 *for* efundetur *r.* effunditur.
71 to F. ceranoides, Sherardi, Pinaſtroides. *add* Tab. XIII.
75 *for* fecundis *r.* ſecundis.
79 modo quidam modo quodam.
80 marginal magnified.
95 trunciated truncated.
102 tabulatum tabula autem:
ib. exacti exactè.
ib. (in a note) deſcriptis diſruptis.
106 referendi ſunt referendus eſt.

F. plumoſus, *dele* Tab. XVI. F. coccineus, id.
F. dentatus, Pl. XV. c, fructified branch magnified; c, c, a ſingle veſicle; d, a ſeed.
F. roſeus, *ib.* g, a bit of the fructified ſtem; gg, ditto magnified; h, h, h, ſeminiferous veſicles.
F. conſervoides, *ib.* i, magnified bit; i, i, magnified tubercles.
F. longiſſimus, Pl. XVI. c, an inflated veſicle cut in two and magnified; c, c, ſeeds; d, a tip with lateral cluſtered tubercles.
F. gracilis, *ib.* f, f, ſummits with tubercles magnified.
F. pedunculatus, *for* Pl. XVII, *r.* Pl. XVI.

N. B. The Binder will obſerve to put all the Preliminary Obſervations of the three *Faſciculi*, which are paged with Roman Numerals, in the beginning of the Volume: the Plates are to face the Pages, as follows, Pl. i. p. 2. ii. p. 4. iii. p. 6. iv. p. 8. v. p. 12. vi. p. 16. vii. p. 20. viii. p. 28. ix. p. 34. x. p. 38. xi. p. 56. xii. p. 70. xiii. p. 78. xiv. p. 90. xv. p. 98. xvi. p. 106. xvii. p. 112.

S. Hazard, Printer, Cheap-Street, Bath.

A

GENERAL INDEX,

With Foreign Synonyms, omitted in the Body of the Work, arranged Alphabetically.

* N. B. The Roman Numerals ſhew the pages in the Preliminary Obſervations; the others refer to the Body of the Work.

† Houttuyn Nat. Hiſt.

FINIS.