

ON THE DIATOMACEÆ OF THE NEIGHBOURHOOD OF  
LIVERPOOL.

By Thomas Comber, Esq.

(READ 16TH DECEMBER, 1858.)

In laying before the Society the following contribution to the Liverpool Flora, I have been influenced by a wish to increase, in some degree, the knowledge of the Natural History of the neighbourhood, towards which so much has been done by other Liverpool naturalists; and although I have confined myself to a single order I trust the subjoined list will be of some use in this respect. I am also not without hope that it will assist those whose researches have been extended over a wider field than my own, in their investigation into the geography of the order, at present in a very unsatisfactory state.

I have adopted the limits established by Dr. Dickenson in his Flora of Liverpool, extending to the north as far as Southport. In this district there are found as many as 257 described species of Diatomaceæ, affording representatives of 51 genera. Of these 120 are fresh water, 64 brackish, and 73 marine species: these last numbers are however only approximate, in consequence of many species being sometimes found in both fresh and brackish, and others in marine and brackish, localities. For instance, I have gathered *Navicula Westii* and *Stauroneis salina*, both generally considered altogether marine species, in a living state in a pool to which no sea water could possibly have got for at least eight months.

Those species usually found in Alpine situations, such as *Navicula crassinervia*, *N. serians*, some of the *Pinnulariae* and *Odontidiae*, *Tabelaria flocculosa*, and several of the *Melosiræ* and *Orthosiræ*, are absent; but this is only what would be expected: another deficiency for which I cannot account occurs in the allied genera of *Podosphenia*, *Rhipidophora* and *Lichmophora*, containing in all ten species, of which the only representative found in this neighbourhood is *R. Dalmatica*.

I have used Professor Smith's nomenclature, as being the best known, even in many instances where it is opposed to my own views. Only twenty of the species, discovered since the publication of the second volume of that work, are not described in his synopsis.

My best thanks are tendered to three members of the Microscopical Club of this town, Messrs. G. M. Browne, T. Sansom and L. Hardman, who have very greatly assisted me; how much, their initials, attached to the localities given on their authority, will shew. For the other localities and for the naming of all, I am myself answerable.

EPITHEMIA, Kützing.

- E. turgida*, Sm.—Frequent. Well at Sefton, August, 1856, and July, 1857; Bidston marsh, October, 1856, and many other localities.  
*E. Zebra*, Kütz.—Bidston marsh, October, 1856.  
*E. Argus*, Sm.—Railway bridge at Spital, September, 1858, L. H.—Well in Brombro' wood, September, 1858.  
*E. alpestris*, Sm.—Well at Sefton, August, 1856, and July, 1857; railway bridge at Spital, April, 1857.  
*E. Sorex*, Kütz.—Sefton well, August, 1856, and July, 1857; Bidston marsh, August, 1858, &c.  
*E. Westermanii*, Sm.—Bidston marsh, October, 1856, and October, 1857—Birkdale marsh, G. M. B.  
*E. rupestris*, Sm.—Bridge at Spital, September, 1858, L. H., &c.  
*E. gibba*, Kütz.—Frequent. Bidston marsh, October, 1856, &c.  
*E. ventricosa*, Kütz.—Railway bridge, Highfield, L. H.

EUNOTIA, Ehrenberg.

- E. Arcus*, Sm.—Pit at Rock Ferry, June, 1856.

CYMBELLA, Agardh.

- C. Ehrenbergii*, Kütz.—River Alt, near Sefton, July, 1857.  
*C. cuspidata*, Kütz.—Always occurs sparingly. Thornback pool, Crosby, September, 1856—Southport, June, 1857, G. M. B.  
*C. maculata*, Kütz.—Patrick's Well, Spital, March, 1857.  
*C. Helvetica*, Kütz.—Well at Sefton, July, 1857.  
 ————— *Var β*.—Thornback pool, Crosby, September, 1856.

AMPHORA, Ehrenberg.

- A. ovalis*, Kütz.—Frequent. Canal Bridge over R. Alt, &c.  
*A. affinis*, Kütz.—Not uncommon. Bidston Marsh, July, 1856, and October, 1857, &c.  
*A. salina*, Sm.—Bidston Marsh, July, 1856; Great Float, April, 1858.

COCCONEIS, Ehrenberg.

- C. Pediculus*, Ehr.—Lock at Sefton, July, 1857; stream near Shotwick, Cheshire, June, 1858.  
*C. Placentula*, Ehr.—Very common; in fact in almost all fresh water gatherings.

*C. Thwaitesii*, Sm.—Rock in Dingle, March, 1857.

*C. Scutellum*, Ehr.—New Brighton, March, 1857, L. H.

*C. eccentrica*, Donk.—New Brighton sands, September, 1858.

COSCINODISCUS, Ehrenberg.

*C. radiatus*, Ehr.—Common. New Brighton in several gatherings, &c.

*C. eccentricus*, Ehr.—Common. New Brighton, &c.

*C. concinnus*, Sm.—R. Fender, Bidston marsh, June, 1856; New Brighton, April, 1858—Southport sands, August, 1858, G. M. B.

EUPODISCUSS, Ehrenberg.

*E. fulvus*, Sm.—Bidston marsh, October, 1857.

*E. crassus*, Sm.—New Brighton—Southport sands, August, 1858, G. M. B.

*E. radiatus*, Sm.—Southport marsh, June, 1857; New Brighton, April, 1858.

*E. Ralfsii*, Sm.—Southport marsh, June, 1857; New Brighton, April, 1858.

ACTINOCYCLUS, Ehrenberg.

*A. undulatus*, Kütz.—Common. New Brighton, &c.

*A. duodenarius*,  
*A. sedenarius*, } New Brighton, April, 1858; Bidston marsh, Oct., 1857.  
*A. octodenarius*,

TRICERATIUM, Ehrenberg.

*T. Favus*, Ehr.—New Brighton, April, 1858—Southport sands, August, 1858, G. M. B.

*T. undulatum*, Ehr.—New Brighton, April, 1858—Southport sands, August, 1858, G. M. B.

CYCLOTELLA, Kützing.

*C. Kützingiana*, Thw.—Aintree pit, June, 1857; Bidston marsh, Aug., 1858.

————— *Var β*.—Thornback pool, Crosby, September, 1856.

*C. operculata*, Kütz.—R. Dee, near Queensferry, June, 1858.

CAMPYLODISCUS, Ehrenberg.

*C. costatus*, Sm.—R. Alt, Sefton, July, 1857; well in Brombro' wood, May, 1857.

*C. spiralis*, Sm.—Bidston marsh, October, 1856.

*C. cribrosus*, Sm.—Bidston marsh, October, 1857.

*C. parvulus*, Sm.—Head of Wallasey pool, May, 1857; great float, April, 1858.

SURIRELLA, Turp.

*S. biseriata*, Bréb.—Hoylake, October, 1856, G. M. B.

*S. linearis*, Sm.—Patrick's well, Spital, March, 1857; pit at Aintree, June, 1857.

*S. constricta*, Sm.—Bidston marsh, October, 1857.

- S. lata*, Sm.—New Brighton, September, 1858.  
*S. splendida*, Kütz.—Bidston marsh, October, 1856.  
*S. striatula*, Turp.—Frequent in brackish water. Bidston marsh, &c.  
*S. Gemma*, Ehr.—Primrose Hill, New Ferry, July, 1856; Bidston marsh, October, 1857.  
*S. fastuosa*, Ehr.—New Brighton, April, 1858.  
*S. Craticula*, Ehr.—Bidston marsh, October, 1856.  
*S. ovalis*, Bréb.—Frequent. Railway bridge, Spital, May, 1857, &c.  
*S. panduriformis*, Sm.—Rock at Storeton, March, 1857.  
*S. ovata*, Kütz.—Common in fresh water.  
*S. salina*, Sm.—Sands at Great Meols, May, 1857.  
*S. pinnata*, Sm.—Pit at Rock Ferry, March, 1857—Railway bridge, Highfield, L. H.  
*S. angusta*, Kütz.—Rock at Storeton, March, 1857.  
*S. minuta*, Bréb.—Lock at Sefton, July, 1857.  
*S. Crumena*, Bréb.—River Fender, June, 1856; near Wallasey pool, Seacombe, April, 1857; river Alt, July, 1857, &c.

TRYBLIONELLA, Smith.

- T. gracilis*, Sm.—Not uncommon in brackish water. Frequently from Bidston marsh.  
——— *Var β.*—Primrose hill, New Ferry, July, 1856.  
*T. marginata*, Sm.—Not uncommon in brackish water. Bidston marsh, October, 1857; Seacombe, April, 1858, &c.  
*T. punctata*, Sm.—Primrose hill, New Ferry, July, 1856.  
*T. acuminata*, Sm.—Frequent in brackish water. Bidston marsh, &c.

CYMATOPLEURA, Smith.

- C. Solea*, Sm.—Bidston marsh, October, 1856, and October, 1857.  
*C. apiculata*, Sm.—Frequently met with, R. Alt, &c.  
*C. elliptica*, Sm.—Bidston marsh, October, 1857; R. Alt, July, 1857, &c.

NITZSCHIA, Hassall.

- N. sigmaoidea*, Sm.—Not uncommon. R. Alt at Sefton, July, 1857, &c.  
*N. Brebissonii*, Sm.—Bidston marsh, July, 1856, and March, 1856.  
*N. Sigma*, Sm.—Not uncommon in brackish water. Bidston marsh, frequently.  
*N. linearis*, Sm.—Rather common. R. Alt, &c.  
*N. angularis*, Sm.—New Brighton, March, 1857, L. H.  
*N. Amphioxys*, Sm.—Frequent, though generally but few in a gathering. Moss from Rock Ferry, October, 1857.  
*N. minutissima*, Sm.—Patrick's well, Spital, March, 1857.

*N. vivax*, Sm.—Bidston marsh, October, 1857—Birkdale marsh, June, 1857, G. M. B.

*N. virgata*, Roper.—Sands at Great Meols, May, 1857; New Brighton, September, 1858.

..... Sp. (*Epithemia marina*, Donk.) Sands at New Brighton, September, 1858.

*N. dubia*, Sm.—Eastham marsh, Sept., 1858; Skew bridge, Bebington, May, 1856.

*N. bilobata*, Sm.—Bidston marsh, October, 1857.

*N. plana*, Sm.—Not uncommon. Bidston marsh, &c.

*N. birostrata*, Sm.—Eastham Marsh, September, 1858.

*N. Closterium*, Sm.—Not uncommon. Southport sands, August, 1858; Eastham marsh, September, 1858; Bidston marsh on several occasions.

*N. Tænia*, Sm.—Southport sands, August, 1858.

#### AMPHIPRORA, Ehzenberg.

*A. alata*, Kütz.—Not uncommon in brackish marshes. Eastham marsh, September, 1858, &c.

*A. Ralfsii*, Arnott.—New Brighton sands, September, 1858.

*A. paludosa*, Sm.—Near Wallasey pool, Seacombe, April, 1857.

*A. duplex*, Donk.—New Brighton sands, September, 1858.

*A. vitrea*, Sm.—Eastham marsh, September, 1858; New Brighton sands, September, 1857.

*A. pusilla*, Greg.—New Brighton sands, September, 1858.

*A. complexa*, Greg.—Great Float, April, 1858.

#### AMPHIPLEURA, Kützing.

*A. sigmoidea*, Sm.—Great Float, April, 1858—Canning Graving Dock, August, 1857, R. Daw.

#### NAVICULA, Bory.

*N. rhomboides*, Ehr.—Bridge at Spital, May, 1857.

*N. lanceolata*, Kütz.—Bidston marsh, May, 1856.

*N. cuspidata*, Kütz.—R. Fender, Bidston marsh, June, 1856.

*N. Liber*, Sm.—Great Float, April, 1858—Canning Graving Dock, August, 1857, R. Daw.

*N. firma*, Kütz.—Not unfrequent, but always occurs sparingly. Rock in the Dingle, March, 1857, &c.

*N. astiva*, Donk.—New Brighton, September, 1858.

*N. elliptica*, Kütz.—Common.

*N. pygmaea*, Kütz.—Seacombe, April, 1851; Primrose hill, New Ferry, July, 1856.

- N. Jennerii*, Sm.—Bidston marsh, October, 1857; Seacombe, April, 1858; Southport sands, August, 1858, &c.
- N. Westii*, Sm.—Seacombe, April, 1858.
- N. convexa*, Sm.—New Brighton sands, September, 1858.
- N. elegans*, Sm.—Pretty frequent in brackish water. Wallasey pool, Seacombe, April, 1856; Bidston and Eastham marshes, &c.
- N. palpebralis*, Bréb.—New Brighton sands, September, 1858.
- N. Semen*, Kütz.—R. Alt, near Sefton, July, 1857.
- N. affinis*, Ehr.—Wall on Dingle shore, March, 1857; railway bridge, Spittal, May, 1857.
- N. inflata*, Kütz.—R. Alt, near Sefton, July, 1857.
- N. gibberula*, Kütz.—Frequent, but always much mixed with other diatoms.
- N. amphirynchus*, Ehr.—R. Alt, near Sefton, July, 1857—Storeton, June, 1856, L. H.
- Var β*.—Frequent, generally in brackish water.
- N. sphærophora*, Kütz.—Hoylake, October, 1856, G. M. B.
- N. tumens*, Sm.—Bidston marsh, July, 1856; October, 1856; and October, 1857.
- N. punctulata*, Sm.—Primrose hill, New ferry, July, 1856; Eastham marsh, September, 1858.
- N. pusilla*, Sm.—Sands at Great Meols, May, 1857; Bidston marsh, Oct., 1856, and October, 1857.
- N. tumida*, Sm.—Moss at Rock Ferry, October, 1857.
- N. dicephala*, Kütz.—Birkdale marsh, June, 1858, G. M. B.
- N. cryptocephala*, Kütz.—Bidston marsh, May, 1857; rock at Storeton, March, 1857, &c.
- N. lineata*, Donk.—New Brighton sands, September, 1858.
- N. didyma*, Kütz.—Frequent, Bidston marsh, October, 1857, &c.
- N. binodis*, Ehr.—Thornback pool, Crosby, September, 1856—Hoylake, October, 1856, G. M. B.
- N. levissima*, Kütz.—Thornback pool, Crosby, Sept., 1856—Southport, June, 1857, G. M. B.
- N. pectinalis*, Bréb.—Sands at Great Meols, May, 1857; R. Fender, Bidston marsh, August, 1858; Dee marsh, near Queen's Ferry, June, 1858.
- N. retusa*, Bréb.—New Brighton sands, September, 1858; Southport sands, August, 1858, G. M. B.
- N. Lyra*, Ehr.—Seacombe, April, 1858; Southport sands, August, 1858.
- N. humerosa*, Bréb.—Sands at Great Meols, May, 1857; New Brighton sands, September, 1858; Southport marsh, June, 1857.
- N. Trochus*, Greg.—Hoylake, October, 1856, G. M. B.

*N. lacustre*, Greg.—River Alt, Sefton, July, 1857.

—var.  $\beta$ , with var.  $\alpha$ .

*N. quadrangularis*, Greg.—New Brighton sands, April, 1858; Leasowe sands, October, 1858—Southport sands, August, 1858, G. M. B. Generally much elongated, with a curved median line.

*N. apiculata*, Bréb.—Southport sands, August, 1858.

PINNULARIA, Ehrenberg.

*P. major*, Sm.—Storeton, June, 1856, L. H.

*P. viridis*, Sm.—Common. Patrick's well, Spital, &c.

*P. oblonga*, Sm.—Well in Brombro' woods, May, 1857; well at Moreton, Cheshire, May, 1857.

*P. distans*, Sm.—New Brighton sands, April and September, 1858.

*P. peregrina*, Ehr.—Very common in brackish water.

*P. acuta*, Sm.—Bidston marsh, October, 1856; Rock Ferry, March, 1857.

*P. directa*, Sm.—New Brighton, October, 1858.

*P. radiosa*, Sm.—Frequent. Bidston marsh, &c.

*P. gracilis*, Ehr.—Common in Bidston marsh, and other brackish water localities.

*P. viridula*, Sm.—Bidston marsh, July, 1856.

*P. Cyprinus*, Ehr.—Common in many localities subject to marine influence.

*P. Johnsonii*, Sm., var.  $\beta$ .—Bootle shore, December, 1858, G. M. B.

*P. stauroneiformis*, Sm.—Hoylake, Oct., 1856, G. M. B. Highfield, L. H.

*P. mesolepta*, Ehr.—Patrick's well, Spital, March, 1856; well at Moreton, Cheshire, May, 1857, &c.

*P. interrupta*, Sm.—Storeton, June, 1856, L. H.

—var.  $\beta$ .—Storeton, June, 1856, L. H. Bidston marsh, October, 1856.

*P. borealis*, Ehr.—Thornback pool, September, 1856; Moss at Rock Ferry, October, 1857.

*P. integra*, Sm.—Not uncommon. Thornback pool, September, 1856; R. Alt, near Sefton, July, 1857, &c.

STAURONEIS, Ehrenberg.

*S. Phænicenteron*, Ehr.—Not uncommon. Well in Brombro' woods, May, 1857, &c.

*S. gracilis*, Ehr.—Well at Moreton, May, 1857—Storeton, June, 1856, L. H.

*S. acuta*, Sm.—Well in Brombro' woods, May, 1857.

*S. salina*, Sm.—Seacombe, April, 1858.

*S. crucicula*, Sm.—Wallasey pool, April, 1856; and April, 1857; Southport marsh, June, 1857.

*S. anceps*, Ehr.—Not uncommon. Rock Ferry, March, 1857; well at Moreton, May, 1857, &c.

*S. linearis*, Ehr.—Thornback pool, Crosby, September, 1856; Moreton well, May, 1857.

*S. pulchella*, Sm.—New Brighton, September, 1858; Southport sands, August, 1858, G. M. B.

— var. (*Navicula angulata*, Bréb.) New Brighton sands, May, 1859.

PLEUROSIGMA, Smith.

*P. rigidum*, Sm.—Southport sands, August, 1858, G. M. B.

*P. elongatum*, Sm.—Bidston marsh, July, 1856, and October, 1857; Southport sands, August, 1858.

*P. intermedium*, Sm.—Boote, December, 1858, G. M. B.

*P. delicatulum*, Sm.—Bidston marsh, May, 1856, L. H.

*P. strigosum*, Sm.—New Brighton, April, 1858.

*P. angulatum*, Sm.—Frequent. Bidston marsh, several times; Primrose hill, &c.

*P. Aestuarii*, Sm.—Southport sands, August, 1858; New Brighton sands, September, 1858.

*P. obscurum*, Sm.—Bidston marsh, May, 1856, L. H.

*P. Balticum*, Sm.—Bidston marsh, October, 1857; Eastham marsh, September, 1858.

*P. Wansbeckii*, Donk. (*P. Balticum* var.  $\beta$ . Sm.)—Southport sands, August, 1858.

*P. strigilis*, Sm.—Bidston marsh, October, 1857.

*P. acuminatum*, Sm.—Primrose hill, July, 1856; Bidston marsh, October, 1857.

*P. Fasciola*, Sm.—Primrose hill, July, 1856; Bidston marsh, October, 1857; Eastham marsh, September, 1858, &c.

*P. macrum*, Sm.—Bidston marsh, October, 1857.

*P. tenuissimum*, Sm.—Wallasey pool, near Spital, April, 1858.

*P. littorale*, Sm.—Primrose hill, July, 1856.

*P. Hippocampus*, Sm.—Not uncommon. Bidston marsh; Ditton marsh, &c.

*P. attenuatum*, Sm.—Brook near Shotwick, Cheshire, June, 1857.

*P. lacustre*, Sm.—Not unfrequent. River Alt, near Sefton, July, 1857, &c.

*P. Spencerii*, Sm.—Storeton, June, 1856, L. H.—River Fender, June, 1856; Canal Bridge, over River Alt, June, 1857.

*P. lanceolatum*, Donk.—New Brighton sands, September, 1858.

*P. marinum* Donk.—New Brighton sands, September, 1858.

## TOXONIDEA, Donkin.

*T. Gregoriana*, Donk.—Southport sands, August, 1858, G. M. B.—  
Stomach of *Noctiluca*, Southport, August, 1858, T. S.

*T. insignis*, Donk.—Stomach of *Noctiluca*, Southport, August, 1858. T. S.  
SYNEDRA, Ehrenberg.

*S. pulchella*, Kütz.—Wallasey pool, April, 1857; Southport marsh,  
June, 1857.

*S. minutissima*, Kütz—“Birkenhead, Cheshire, G. Shadbolt,” *Sm. Synops.*

*S. radians*, Sm.—Almost universally present in fresh water gatherings.

*S. Ulna*, Ehr.—Common, though not so much so as the last.

*S. Oxyrynchus*, Kütz.—Bidston marsh, October, 1857.

*S. obtusa*, Sm.—Thornback pool, Sept., 1856; Moreton well, May, 1857.

*S. capitata*, Ehr.—Hoyle lake, October, 1856, G. M. B.—Bidston marsh,  
October, 1857.

*S. tabulata*, Kütz.—R. Fender, June, 1856; Dee marsh, near Queen's  
Ferry, June, 1858.

*S. affinis*, Kütz.—Bidston marsh, October, 1857.

*S. Arcus*, Kütz.—Dingle Bay, February, 1857—Rock Ferry slip, February,  
1857, L. H.

## COCCONEMA, Ehrenberg.

*C. lanceolatum*, Ehr.—Frequently. Well in Brombro' woods, May,  
1857, &c.

*C. cymbiforme*, Ehr.—Frequent. Rock in Dingle, March, 1857.

*C. Cistula*, Ehr.—Canal bridge, over R. Alt, June 1857.

*C. parvum*, Sm.—Rock in Dingle, March, 1857.

## DORYPHORA, Kützing.

*D. Amphiceros*, Kütz.—Sparingly in many localities subject to marine influence. New Brighton sands, September, 1858.

## GOMPHONEMA, Agardh.

*G. geminatum*, Ag.—Patrick's well, March, 1856, L. H.

*G. constrictum*, Ehr.—Frequent. Rock Ferry, March, 1857, &c.

*G. acuminatum*, Ehr.—Frequent. Well at Moreton, May, 1857, &c.

*G. cristatum*, Ralfs.—Canal bridge over R. Alt, June, 1857.

*G. dichotomum*, Kütz.—Well at Moreton, May, 1857.

*G. tenellum*, Sm.—Frequent. Rock Ferry, March, 1857, &c.

*G. capitatum*, Ehr.—Var.  $\gamma$ . Well at Moreton, May, 1857.

*G. olivaceum*, Ehr.—Rock Ferry, March, 1857.

*G. intricatum*, Kütz.—Rock in Dingle, March, 1857.

*G. curvatum*, Kütz.—Frequent. Sefton lock, July, 1857, &c.

## RHIPIDOPHORA, Kützing.

*R. Dalmatica*, Kütz.—Dingle bay, February, 1857.

## MERIDION, Agardh.

*M. circulare*, Ag.—Not unfrequent, but always much mixed with other diatoms. Near Wallasey pool, Seacombe, April, 1856.

## BACILLARIA, Gmel.

*B. paradoxa*, Gmel.—In most brackish localities. Bidston, Eastham, Ditton, and Dee marshes.*B. cursoria*, Donkin.\*—Sands at New Brighton, September, 1858.

## HIMANTIDIUM, Ehrenberg.

*H. pectinale*, Kütz.—Frequent. Well at Storeton, March, 1857, &c.*H. undulatum*, Sm.—Well at Storeton, March, 1857.*H. Soleirolii*, Kütz.—Well at Storeton, March, 1857.*H. gracile*, Ehr.—Rather common. Bidston marsh, May, 1856; rock in Dingle, March, 1857, &c.

## ODONTIDIUM, Kützing.

*O. mutabile*, Sm.—Patrick's well, Spital, March, 1856; Skew bridge, Bebington, May, 1857; railway bridge, Spital, May, 1857.*O. parasiticum*, Sm.—Bidston marsh, October, 1857; in Rivington Pike water supplied to the town.

## DENTICULA, Kützing.

*D. obtusa*, Kütz.—Canal bridge over R. Alt, June, 1857.*D. sinuata*, Sm.—Railway bridge, Spital, May, 1857; rock in Dingle, March, 1857; canal bridge over R. Alt, June, 1857.

## FRAGILLARIA, Lyngbye.

*F. capucina*, Desm.—Rock Ferry, March, 1857; a curious variety from Bidston marsh, October, 1857.*F. virescens*, Ralfs.—Patrick's well, March, 1856.

## EUCAMPIA, Ehrenberg.

*E. zodiacus*, Ehr.—Rock Ferry slip, July, 1856—Stomach of Noctiluca, Southport, August, 1858, T. S.

## ACHNANTHES, Bory.

*A. longipes*, Ag.—New Brighton, March, 1857, L. H. Canning Graving Dock, July, 1857, R. Daw.*A. brevipes*, Ag.—Common in the Mersey. Rock Ferry slip, July, 1856; Dingle Bay, February, 1857, &c.*A. subsessilis*, Kütz.—Bidston marsh, May, 1856; July, 1856; and Oct., 1857.

\* In my specimens the F. V. is always presented to the eye when in the living state. I consequently name it with a little doubt; it is certainly not *B. paradoxa*.

*A. exilis*, Kütz.—Rock in Dingle, March, 1857; railway bridge, Spital, May, 1857; canal bridge over R. Alt, June, 1857.

ACHNANTHIDIUM, Kützing.

*A. lanceolatum*, Bréb.—Not uncommon. Rock near Storeton, March, 1857, &c.

*A. coarctatum*, Bréb.—Skew bridge, Bebbington, May, 1857; moss from Rock Ferry, October, 1857.

*A. microcephalum*, Kütz.—Canal bridge over R. Alt, June, 1857.

RABDONEMA, Kützing.

*R. arcuatum*, Kütz.—Woodside slip, May, 1857; New Brighton, February, 1857, L. H.

*R. minutum*, Kütz.—Dingle bay, February, 1857—Rock Ferry slip, February, 1857, L. H.

STRIATELLA, Agardh.

*S. unipunctata*, Ag.—Primrose hill, New Ferry, July, 1856.

DIATOMA, Dec.

*D. vulgare*, Bory.—Common. Canal near Aintree, June, 1858, &c.

*D. elongatum*, Ag.—Common. Generally in brackish water.

— Var.  $\beta$ .—Hoylake, October, 1856, G. M. B.

— Var.  $\gamma$ .—Aintree, June, 1857.

GRAMMATOPHORA, Ehrenberg.

*G. marina*, Kütz.—New Brighton, February, 1857, L. H.—Woodside slip, May, 1857.

*G. serpentina*, Kütz.—New Brighton, April, 1857.

TABELLARIA, Ehrenberg.

*T. fenestrata*, Kütz.—Well opposite Bebbington Church, July, 1856.

BIDULPHIA, Gray.

*B. aurita*, Bréb.—R. Fender, June, 1856—Southport sands, August, 1858, G. M. B.

*B. Rhombus*, Sm.—Common. New Brighton, frequently; Leasowe, Southport and Hoylake.

*B. Baileyii*, Sm.—New Brighton, April and Oct., 1858—Stomach of *Noctiluca*, Southport, August, 1858, T. S.

*B. turgida*, Sm.—Leasowe, September, 1858, G. M. B.

*B. granulata*, Rop.—New Brighton, April, 1858—Leasowe, September, 1858, G. M. B.

PODOSIRA, Ehrenberg.

*P. Montagnei*, Kütz.—Common.—Bidston marsh, Southport, &c.

*P. maculata*, Sm.—Not uncommon. New Brighton, &c.

## MELOSIRA, Agardh.

*M. nummuloides*, Kütz.—Common. R. Mersey, frequently; Dee marsh near Queensferry, June, 1858.

*M. Borrerii*, Grev.—Bootle shore, December, 1858, G. M. B.

*M. varians*, Ag.—Extremely common.

*M. Westii*, Sm.—Bidston marsh, October, 1857.

## ORTHOSIRA, Thwaites.

*O. marina*, Sm.—New Brighton, several times.

*O. orichalcea*, Sm.—Bidston marsh, October, 1856; well at Sefton, July, 1857; and June, 1858.

## MASTOGLOIA, Thwaites.

*M. lanceolata*, Thw.—Southport marsh, June, 1857; Birkdale marsh, June, 1857, G. M. B.

*M. Smithii*, Thw.—Birkdale marsh, June, 1857, G. M. B.

## ENCYONEMA, Kützing.

*E. prostratum*, Ralfs.—Sefton lock, July, 1857; canal bridge, over R. Alt, June, 1857.

## COLLETONEEMA, Brébisson.

*C. eximium*, Thw.—Bidston marsh, October, 1857.

*C. vulgare*, Thw.—Storeton well, March, 1857.

*C. neglectum*, Thw.—R. Alt, near Sefton, July, 1857; R. Fender, Bidston marsh, August, 1858.

## SCHIZONEMA, Agardh.

*S. cruciger*, Sm.—Bidston marsh, May, 1856; New Brighton, February, 1857; Canning Graving Dock, August, 1858.

*S. helmintosum*, Chauv.—Rock Ferry Slip, February, 1857, L. H.—Dingle Bay, February, 1857.

*S. Smithii*, Agardh.—Rock Ferry Slip, February, 1857—New Brighton, March, 1857, L. H.

*S. Grevillii*, Agardh.—New Brighton, March, 1857, L. H.; and October, 1858, G. M. B.

## HOMECLADIA, Agardh.

*H. filiformis*, Sm.—Canal bridge over R. Alt, June, 1857—Canal at Aintree, June, 1858, L. H.

*H. sigmaidea*, Sm.—Pit at Aintree, June, 1857; Bidston marsh, October, 1857.

## ASTERIONELLA, Hassall.

*A. formosa*, Hass.—In Rivington pike water supplied to the town.