

## LUNDY—FRESHWATER DIATOM FLORA

This paper begins a new chapter in the natural history of Lundy, for it is highly improbable that any former attempt has been made to find and identify the freshwater diatom-flora of the island. The material was collected by Professor Harvey and his pupil, Mr J. H. Hemsley, to whom thanks are due for the copious amount of material that they have supplied. The present work, however, is relative only to various pools and streams, the season having been wholly unsatisfactory for the collection of material from other places ; yet it is felt that the bulk of the material thus obtained will justify publication in its present form.

It is possible that one will have the greater interest in finding and identifying diatoms that will give us new recordings, either for the county or the country in general ; but there are various other fields of interest that are at least equally pleasing to the diatom student, and Lundy has afforded many of these pleasures.

In a locality like Lundy the novice might hope to find a characteristic diatom-flora, but the experienced diatom collector knows that there is no such thing. What he really does hope to find, however, is a good variety of habitats where particular species are likely to be found ; and it is just possible that in a special locality there may be a situation and an environment where a diatom may be found that is extremely rare or even not known to exist elsewhere. Such a hope has so far been realized in the discovery of nine diatoms new to British recordings and twenty that with only two exceptions have only been found once before in Britain, and that in Devon.

The wide distribution of *Stauroneis producta* has been noticed (until recently called *S. parvula* v. *prominula*), as well as *Navicula vitrea* and *Surirella Moelleriana*.

The genera *Eunotia*, *Navicula*, *Nitzschia* and *Pinnularia* are all well represented ; but *Achnanthes*, *Cocconeis* and their allied genera are all very poor indeed. There is little doubt, however, that these will show up better in future gatherings.

The many and various types of *Surirella Moelleriana* that are present have tempted one sorely to differentiate ; but a careful study of them all reveals no natural distinctions. *Surirella linearis* is also very frequent and appears with various contortions, a notable one being its variety *constricta*, constricted on one side only.

*Surirella ovata* is very strongly pedicled and affords a characteristic. It is rather surprising that on an island so small, and so subject to severe battering from waves and storms from the sea, only three brackish forms have been noticed.

The salinity of the waters varies between 0.1 and 0.3 <sup>2</sup>/100. This of course is on account of height above sea-level. Two of the waters were found to contain an abundance of iron, which did not seem to be detrimental to diatom growth.

Special mention must be made of *Melosira Dickieii*, which came in large quantities from some liverwort on fern-root. Much has been written about this subaerial diatom on account of its abnormal forms, the reasons for which are very difficult to understand. Every possible stage of the abnormality seems to be present in this gathering; so that it has been possible to make a detailed study of it and to comment on the various theories that have been advanced. It seems highly probable that the explanation given by O'Meara (Report on the Irish Diatomaceæ, 1875) is correct, and that the abnormal growth arises from a defective girdleband, through which the protoplasm develops in one half of the cell only. One scarcely hesitates, therefore, to agree with O'Meara in renouncing the theories advanced by W. Smith and Thwaites, that the abnormal growth is a developing sporangium. This diatom does not appear to have been noticed in Britain since their day; yet all the forms of the abnormality as drawn by Tufton West in 1856 are present in the gathering. Hustedt (1949) records it from the Belgian Congo.

A brief description is given of the places from which gatherings have been made, together with the number of species of varieties found to exist in each. Then follows a list of the diatoms that have been found, and in the nomenclature of Dr Fr Hustedt (die Susswasser-Flora Mitteleuropas, Heft 10 in Pascher, 1930).

The probable number of other known British localities is also stated in Roman figures, an asterisk denoting Devon only.

*Localities of gatherings made by Mr J. H. Hemsley:*

*Pondsbury*—(West side).

A. Short stream, starting from a peaty pool and ending down the cliff.

1. The peaty pool itself : 13.
2. Outflow on granite stones : 9.
3. The stream flowing over peat and granite : 31.
4. Pool on the steep side of cliff : 25.

B. *Old Quarry*. (East side).

1. Peaty pool used by horses, sheep and deer : 10.
2. Swampy region of reeds and willow : 32.
3. Well sheltered and only partly illuminated Quarry Pond : 40.
4. Pool in steep cliff-side : 21.
5. Stream near cliff base : 27.

C. *North End*.

1. Shallow and exposed pool on granite : 15.
2. Shallow and exposed pool on granite further eastward : 17.
3. Pool and stream on peat and granite bed : 29.

D. *South end*.

1. Fairly deep pool with sandy bed : 12.
2. Pool by gate of Millcombe House, deep trough, low light intensity, flowing water : 29.
3. Pool in meadow used by geese : 29.

Gatherings made by Professor Harvey during prolonged drought in August.

E. *Long Ruse* (North End).

From algal slime on dripping rock, 12.

F. *Punch Bowl Valley*.

Moss from dried up stream bed : 26.

G. *Brazen Ward*.

From liverwort growing on fern root by water drip : 34.

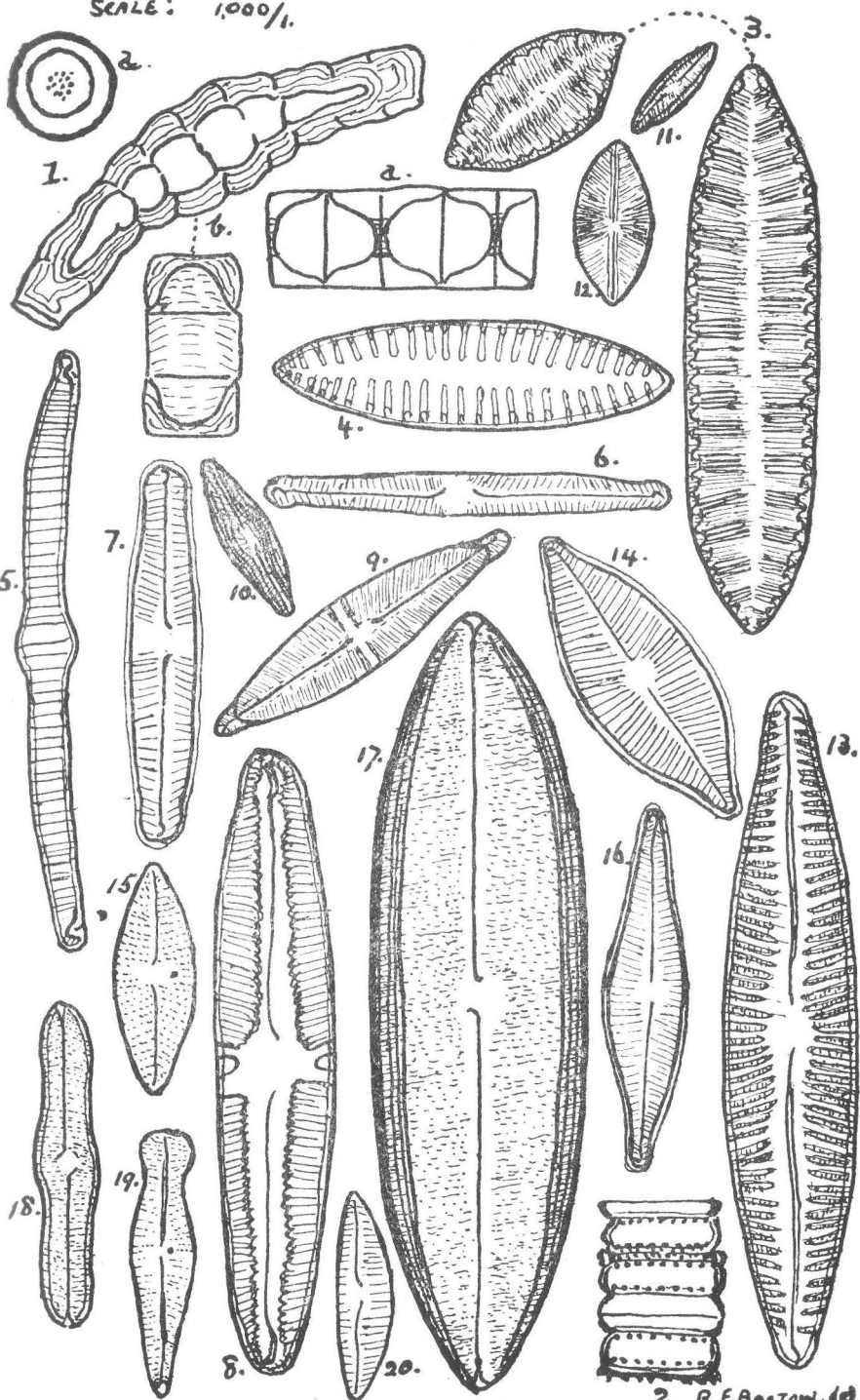
The following Freshwater diatoms from Lundy appear to be new to British recordings :

<i>Achnanthes</i>	<i>Hauckiana</i> v. <i>elliptica</i>	Schulz
<i>Anomæoneis</i>	<i>exilis</i> v. <i>lanceolata</i>	Mayer
<i>Cocconeis</i>	<i>disculus</i>	Schum
<i>Frustulia</i>	<i>rhomboides</i> v. <i>saxonica</i> fo. <i>capitata</i>	A. Mayer
<i>Melosira</i>	<i>distans</i> v. <i>lirata</i> fo. <i>seriata</i>	O. Muell
<i>Navicula</i>	<i>vitrea</i>	(Cleve) Cleve
	<i>viridula</i> fo. <i>capitata</i>	Mayer
<i>Neidium</i>	<i>bisulcatum</i> fo. <i>undulata</i>	O. Muell
<i>Synedra</i>	<i>minuscule</i>	Grunow

REV. R. FRASER BASTOW, F.R.M.S.

1. *Melosira Dickieii*.
  - a. normal valves.
  - b. abnormal forms.
2. *Melosira distans* v. *lirata* fo. *seriata*.
3. *Surirella Moelleriana*.
4. *Surirella linearis*.
5. *Eunotia pectinalis* v. *ventralis*.
6. *Pinnularia appendiculata*.
7. *Pinnularia microstauron*.
8. *Pinnularia divergens*.
9. *Stauroneis producta*.
10. *Anomoeoneis seriata* v. *brachysira* fo. *thermalis*.
11. *Navicula vitrea*.
12. *Navicula cocconeiformis*.
13. *Navicula peregrina* v. *Kefvingensis*.
14. *Navicula placentula* fo. *rostrata*.
15. *Navicula mutica*.
16. *Navicula rhyncocephala*.
17. *Neidium iridis* v. *amphigomphus*.
18. *Neidium bisulcatum* fo. *undulata*.
19. *Gomphonema constrictum*.
20. *Cymbella hebridica*.

SCALE: 1000/ $\mu$ .



2. R.F. BASTOW, det.

[illegible]

<i>Diploneis</i>																			
<i>oculata</i>	2					+													
<i>ovalis</i> v. <i>oblongella</i>	6			+		+													
<i>Epithemia</i>																			
<i>Westermanni</i>	1		+	+				+			+								
<i>Eunotia</i>																			
<i>arcus</i>	25							+											
v. <i>bidens</i>	6			+															
<i>pectinalis</i>	36				+	+													
v. <i>minor</i>	2		+				+	+						+	+	+	+		
fo. <i>impressa</i>	1*								+										
v. <i>ventralis</i>	1*		+		+	+			+	+	+			+		+	+		
v. <i>undulata</i>	14									+									
<i>veneris</i>	6	+					+		+		+			+					
<i>monoden</i>	12								+										
v. <i>major</i>	7	+	+			+	+			+						+	+		
<i>paludosa</i>	2		+																
<i>lunaris</i>	30				+	+		+	+	+	+					+			
v. <i>subarcuata</i>	3					+		+											
<i>valida</i>	1*											+							
<i>Fragilaria</i>																			
<i>capucina</i> v. <i>mesolepta</i>	5									+									
<i>virescens</i>	28					+					+				+	+	+		
v. <i>elliptica</i>	1*														+	+	+		
v. <i>capitata</i>	1*				+										+	+	+		
<i>Frustulia</i>																			
<i>rhomboides</i>	26		+				+												
NBR v. <i>saxonica</i> fo. <i>capitata</i>	nil																+		
fo. <i>undulata</i>	1*		+													+			
<i>vulgaris</i>	16			+				+		+	+				+				
<i>Gomphonema</i>																			
<i>angustatum</i>	16	+																	
v. <i>producta</i>	4	+	+		+	+		+		+					+				
Number of Diatom Species etc.		10	31	26	29	33	16	10	28	25	40	24	17	16	13	31	12	23	28

		Other Brit. Locals	Flowing		Water		Swamp		Peaty			Pools		Granite					Dripping Rock		Moss	Spray
			5	5	8	6	5	4	5	5	5	5	5	7	5	5	5	8				
			28	33	35	27	26	33	18			35	24	33	19			29	33	E	F	G
Salt : pts. per 100,000			A	A	B	D	B	A	B	C		A	B	B	C	C	D	D				
p.H.		2	3	5	2	2	I	I	3		4	3	4	I	2	I	3					
	<i>gracile</i>	12																		+	+	
	<i>parvulum</i>	23			+	+					+		+				+			+		
	<i>v. micropus</i>	4		+																		
	<i>lanceolatum</i>	4									+											
	<i>constrictum</i>	37																				
	<i>longiceps v. subclavata</i>	8		+								+					+					
	<i>Hantzschia</i>																					
	<i>virgata</i>	3			+																	
	<i>Melosira</i>																					
	<i>Dickieii</i>	3																			+	
BR	<i>distans v. livata fo. seriata</i>	nil																			+	
	<i>Meridion</i>																					
	<i>circulare</i>	27	+								+	+	+				+					
	<i>v. constrictum</i>	13	+			+											+					
	<i>Navicula</i>																					
BR	<i>vitrea</i>	nil					+				+			+	+				+	+	+	
	<i>cocconeiformis</i>	7	+	+		+	+		+		+	+				+			+	+	+	
	<i>variostrata</i>	1*	+	+	+				+		+	+			+				+	+	+	
	<i>seminulum</i>	5	+																		+	
	<i>Rotaeana</i>	5		+							+	+										
	<i>pupula</i>	17				+								+								
	<i>v. capitata</i>	3				+																
	<i>v. rectangularis</i>	2				+																
	<i>v. elliptica</i>	2			+																	
	<i>atomus</i>	6										+										
	<i>rhyncocephala</i>	24				+																
	<i>perpusilla</i>	3		+								+					+					
	<i>mutica</i>	10		+									+						+			
	<i>gracilis</i>	24											+							+		

NBR	<i>viridula</i>	35												+	+					
	fo. <i>capitata</i>	nil		+	+									+	+					
	<i>pupula</i> v. <i>elliptica</i>	2			+															
	<i>placentula</i> fo. <i>rostrata</i>	1*			+															
	<i>anglica</i>	18														+				
	<i>pusilla</i>	16		+								+				+				
	<i>cryptocephala</i>	40														+				
	<i>bicapitellata</i>	1*														+				
	<i>contenta</i>	2																+		
		<i>lanceolata</i> v. <i>cymbula</i>			+															
	NBR	<i>Neidum</i>																		
<i>bisulcatum</i> fo. <i>undulata</i>		nil								+							+			
<i>hercynicum</i>		1*						+												
<i>iridis</i> v. <i>ampliata</i>		4								+										
v. <i>amphigomphus</i>		8				+														
fo. <i>vernalis</i>		1*		+	+	+	+													
<i>productum</i>		10				+		+												
<i>Nitzschia</i>																				
<i>palea</i>		35										+				+				
v. <i>tenuirostris</i>		4		+										+						
<i>vermicularis</i>		9		+						+				+						
<i>hybrida</i>	3		+	+					+				+				+			
<i>subtilis</i>	10		+										+							
<i>gracilis</i>	5								+			+	+							
<i>obtusa</i>	4					+			+			+	+							
<i>filiformis</i>	5							+	+		+	+	+			+	+			
<i>recta</i>	4			+			+	+		+		+	+		+					
<i>epithemoides</i>	1									+										
<i>fonticola</i>	6									+										
<i>sublinearis</i>	2										+									
<i>ignorata</i>	3											+								
<i>terrestris</i>	1																			
<i>Clausii</i>	6													+						
Number of Diatom Species etc.			10	31	26	29	33	16	10	28	25	40	24	17	16	13	31	12	23	28





	<i>stomatophora</i>	6*																+		
	<i>Stauroneis</i>																			
	<i>montana</i>	1*						+												
	<i>phoenicenteron</i>	33				+				+										
	<i>producta</i>	1		+	+	+	+			+			+		+		+			
	<i>Surirella</i>																			
	<i>Moelleriana</i>	4	+	+	+			+	+	+	+			+				+		
	<i>linearis</i>	5		+		+			+	+				+	+			+		
	<i>v. constricta</i>	4		+										+	+			+		
	<i>biseriata</i>	24	+						+									+		
	<i>ovata</i>	22			+	+		+		+	+			+		+	+			
	<i>v. crumena</i>	7													+	+				
	<i>angustatum</i>	8									+				+					
	<i>tenera</i>	6									+									
	<i>Synedra</i>																			
	<i>amphicephala</i>	7				+		+			+	+								
	<i>ulna</i>	50			+						+	+								
	<i>v. danica</i>	4									+	+								
NBR	<i>minuscule</i>	nil									+	+								
	<i>rumpens</i>	1*				+					+									
	<i>pulchella</i>	25				+														
	<i>Vaucheriae</i>	10				+														
NBR	<i>v. capitellata</i>	nil				+														
	<i>Tabellaria</i>																			
	<i>flocculosa</i>	51	+	+			+	+	+	+	+		+		+		+	+		
Number of Diatom Species etc.			10	31	26	29	33	16	10	28	25	40	24	17	16	13	31	12	23	28

The nomenclature is that of Hustedt : 'Bacillariophyta (Diatomeæ) 1930'.

1\* denotes British locality, *Devon only*.

The pH. and salinity values have been calculated from data obtained by Mr J. H. Hemsley.

NBR=New British Recording.