On some Diatomaceæ from the Island of Socotra. By F. KITTON,
Hon. F.R.M.S. (Communicated by Lieut.-Col. H. H. GOD-
WIN-AUSTEN, F.R.S., F.L.S.)

[Read March 20, 1884.]

(PLATE XLVIII.)

THE material in which the following Diatomaceæ were found was obtained by Prof. Bayley Balfour during a short visit to the island in the cold season of 1880, and consisted of a mass of water-plants containing small freshwater shells (the plants were I believe gathered and brought to England as botanical specimens, and the shells were living on them). Colonel H. H. Godwin-Austen, to whom they were sent, after picking out the shells, washed the plants, and placed a drop of the washing under the microscope and detected some diatoms in it; the remainder he sent to Dr. Bossey of Redhill, from whom I received it with a request that I would make "a list of the species contained in it; to report whether it contained any one species peculiar to the island, and whether the whole collection or any one species may indicate connexion with Africa or India by land- or water-carriage, or by former continuity of land."

After cleaning the crude material and eliminating the vegetable *débris* and coarse sand, sufficient diatoms and fine sand remained to fill about $\frac{2}{16}$ of a small homœopathic tube. This I divided into two densities: the heavier, containing the larger forms and sand, was minute in quantity, yielded a new species of *Cerataulus*, but by no means in abundance. I have probably seen about thirty specimens; but, from its delicate nature, most of them were broken.

The genus *Cerataulus* was constituted by Ehrenberg in 1843 to receive a single species, *C. turgidus*. Grunow, in 1863, amended the genus and added *Biddulphia lævis*, Ehr., and two new species of his own. All species of the genera *Cerataulus* and *Biddulphia* are marine. Although I do not think that there is sufficient generic distinction to warrant the constitution of the genus *Cerataulus*, I have retained it for the Socotran diatom from its great resemblance to *C. lævis*. Indeed the resemblance is so close, that a casual observer would at once refer it to that species. A careful examination and the employment of a high power show some important distinctions: the striae of the latter are

coarser, and the puncta of which they are composed are arranged in straight lines reaching from the centre to the circumference; the processes are also more conspicuous from being less marginal: it is, moreover, a truly marine species, frequently occurring in dredgings attached to marine Algæ. On the former the striæ are delicate, and the puncta form straight and slightly curved lines a short distance from the margin only, the larger portion of the valve being closely but irregularly covered with small moniliform granules, which sometimes appear to be arranged in rosette-like patterns. These differences, together with its freshwater habitat, are of sufficient value to constitute a new species, which I characterize under the name of:—

CERATAULUS SOCOTRENSIS, *F. Kitton*, n. sp.

Frustulo ventro adspectu cylindrico; cingulo dense punctato; valvulis circularibus vel late ellipticis, leviter bullato infra 2-4 processus marginales; striis delicatis, prope marginem radiatim, per reliquum superficies valvuli compacte sed irregulariter dispositis; setæ 3 vel pluræ, in medio sitæ. Diametro .0023-.0028 pollic.

Frustule in front view cylindrical, cingulum very finely punctate; valves circular or broadly elliptical, slightly bullate below the marginal processes, which vary from 2 to 4 in number; striæ delicate, radiating near the margin, closely but irregularly disposed on the remainder of the valve; three or more short setæ occur midway between the centre and circumference. Diameter .0023 to .0028 of an inch.

Island of Socotra; attached to freshwater plants.

The following form, although not a new species, has, I believe, only been found in two localities until detected in the Socotran gathering, viz. in material collected by Dr. Unger in the island of Cyprus, and described by Herr Grunow in 'Verhandl. der k.-k. zool.-bot. Ges.' Bd. xiii. 1863. It was subsequently found by Colonel Mason in Belgaum, forming large masses; in some he sent me I found filaments $\frac{3}{8}$ of an inch in length, and exceeding the $\frac{1}{10}$ of an inch in breadth: in a dry state it has a beautiful silvery green appearance. In single frustules it very closely resembles *Synedra Ulua*. The frustules cohere very firmly, and when treated with strong acids the filament usually separates at the connecting-zones rather than where the frustules adhere.

FRAGILARIA UNGERIANA, *Grun.*, l. c.

Frustules linear-narrow, with conspicuous marginal puncta,

firmly coherent, often forming filaments of considerable length; valves narrow-linear, suddenly narrowing near the rounded apices; margins punctate; the striæ become delicate as they approach the centre. Length of valve $\cdot 0090$ – $\cdot 0166$, breadth $\cdot 0003$.—Cyprus; Belgaum (India); island of Socotra.

The remaining forms observed are such as are usually met with in freshwater gatherings. It will be seen that, with the exception of two or three species of *Navicula*, they are all parasitic:—

<i>Cocconema lanceolatum</i> .	<i>Cocconeis pediculus</i> .
— <i>cymbiforme</i> .	<i>Cyclotella Meneghiniana</i> , var.
— <i>Cistula</i> .	<i>Eunotia pectinalis</i> .
<i>Cymbella bengalensis</i> .	<i>Navicula sphærophora</i> .
<i>Gomphonema intricatum</i> , var.	— <i>ovalis</i> .
— <i>affine</i> .	<i>Amphora ovalis</i> .
— <i>acuminatum</i> .	<i>Mastogloia Dansei</i> .
— <i>Turris</i> .	— <i>elliptica</i> .
— <i>constrictum</i> , var. <i>subcapitatum</i> .	<i>Epithemia gibberula</i> .
	<i>Achnanthes linearis</i> .

The Diatomaceæ above recorded do not afford any indication of connexion with India or Africa, either by bird- or water-carriage or former continuity of land. Diatomaceous gatherings from localities wide apart are sometimes difficult to distinguish from each other. This is not unfrequently the case with fossil deposits, particularly those of freshwater origin.

DESCRIPTION OF PLATE XLVIII.

- Fig. 1. *Cerataulus socotrensis*, Kitton, n. sp. $\times 600$ diam.
 2. Frustule of *C. socotrensis*. $\times 200$.
 3. *Cerataulus lævis* (Ehrenb.). $\times 400$.
 4. *Fragilaria Ungeriana*, Grun. Frustules, $\times 350$.
 5. Ditto. Part of valve, $\times 600$.
 6. *Cymbella bengalensis*, Grun. $\times 700$.

T. Kitton del.
G. Jarman sc.

SOCOTRAN DIATOMACEÆ.