

a particular cell-fluid, on the molecular condition of the cell-wall, &c., on temperature, and on the pressure of the air. But these conditions are continually varying, and the equilibrium continually disturbed." That a turgescence such as M. Royer describes occurs in many cases is well known. Space does not allow a detailed description of the physiological mechanism, but nearly all we yet know may be found in Sachs, who, however, attributes the phenomena directly solely to the passage of water and the elasticity of the cell-walls. Indirectly the cause may very possibly be heat acting as M. Royer supposes. It would be interesting to learn the effect of pollination on these plants, especially whether after it had taken place *Victoria regia* would re-open.

G. S. BOULGER.

S, Westbury Road

Dehiscence of the Capsules of *Collomia*

IN Mr. Duthie's very interesting account (vol. xii. p. 494) of the mode of dehiscence of the capsules of this plant, he suggests that the purpose of the projection of the seeds on to the viscid hairs of the plant itself may possibly be found in its enabling the plant to live on its own seeds. Surely this is a superfluous and needlessly improbable hypothesis. The violent discharge of the seeds is undoubtedly one of the modes adopted by nature for their dispersion to plots of ground where the mineral constituents of the soil which they mainly require have not been entirely used up by the parent plant. Their interception by the parent plant is no doubt accidental. The purpose served by the viscid hairs of this and other plants still remains to be discovered if we follow the clue afforded by Mr. Darwin's observations on insectivorous plants. The violent expulsion of the seeds from the ripe capsule is a much more common phenomenon than that which we have exhibited in *Collomia*, together with a few other plants, as *Acanthus*, *Ruellia*, *Eschscholtzia*, and *Geranium*, where the whole fruit is thrown off together. Mr. Duthie will find a good description of the phenomenon in Hildebrand's "Die Schleuderfrüchte und ihr im anatomischen Bau begründeten Mechanismus," in Pringsheim's "Jahrbuch" for 1873-74. The author draws an interesting comparison between the structure of *Collomia*, with its single seed in each division, and its apparatus for projecting these to a distance, and that of the allied genus *Gilia*, with its numerous seeds in each division, which possess no such mechanism, but which, being much lighter, are consequently more easily dispersed by the wind.

ALFRED W. BENNETT

Oceanic Circulation

MR. CROLL'S statement (vol. xii. p. 494), that the North Atlantic in lat. 38° is above the level of the equator, is based partly on the *Challenger* soundings and partly on Muncke's determinations of the thermal expansion of sea-water, which, however, were not made on sea-water at all, but on a saline solution prepared for him by Leopold Gmelin, according to data furnished by the incomplete analyses of Vogel and Bouillon La Grange. As Mr. Croll's statement depends on such very minute differences of volume, I am led to ask him to compare the rate of expansion of real sea-water, as determined by Prof. Hubbard, with Muncke's table; he will notice a discrepancy sufficiently wide to make it a matter of interest to ascertain how far the employment of the American observations may serve to substantiate or modify his conclusion.

Yorkshire College of Science, Oct. 11 G. E. THORPE

High Waves with a North-west Wind

YOUR correspondent Capt. Kiddle has again called attention (vol. xi. p. 386) to the greater height of waves raised by a north-west wind, over those raised by a S.W. wind. I have observed the fact twice in the mid-Atlantic, but also very often on the west coast of Scotland, from which it is evident the phenomenon can be due to no particular combination of currents.

An examination of synoptic charts, for the dates of many cases, has convinced me that the phenomenon is due to the nature of the circulation of the air in a cyclone.

In the south-east portion of a cyclone, where S.W. winds are found, the wind seems to blow along and almost off the surface of the sea; while in the south-west portion, where N.W. winds are found, the wind seems to bear down on the sea, and "harrow" it into streaks of foam.

A perfectly analogous phenomenon appears in dust whirls, where to the right front of the centre the dust is closely packed,

and tends to rise off the ground; while behind the centre the dust is "raked" into streaks by the more downward direction of the blast.

The portion of the Atlantic about 45° N. latitude, and between 40° and 50° W. longitude, where Capt. Kiddle has observed such high waves, has long been known as the "Roaring Forties." An examination of synoptic charts of the North Atlantic, for every day of the year 1865, shows that the bad weather in those parts is generally due to one of two conditions of the distribution of atmospheric pressure.

In the commoner case, the great area of high barometric pressure, which constantly covers the North Tropical Atlantic, stretches northwards to the east of Newfoundland like a wedge, on the east side of which cyclones are formed which go in an E. or N.E. direction.

In the rarer but more violent case, the great Atlantic area of high pressure rises into two heads or humps, one about Madeira, the other about Bermuda, stretching up to Newfoundland. Cyclones coming from Labrador work round this hump to the S.E., and die out in mid-Atlantic. In either case gradients for N.W. winds, often very steep, are formed between the fortieth and fiftieth parallels of longitude.

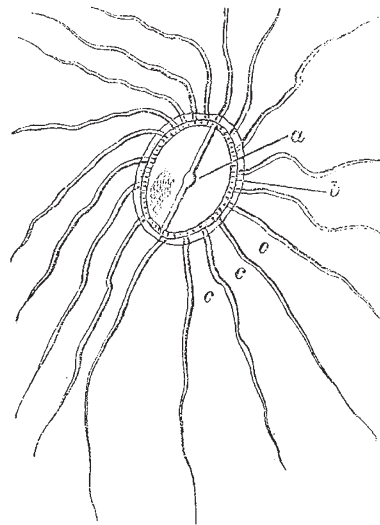
RALPH ABERCROMBY

21, Chapel Street, S.W., Oct. 1

Diatoms

I HAVE reason to think that I have made a discovery which may change the ideas of naturalists as to the nature of some *Diatoms*.

In collecting *Diatomaceæ* I have found a species of *Navicula* (?) which is invested with a gelatinous envelope, and from the edges of the frustule project a number of long processes or arms of the same soft nature. These vary much in number, in some specimens being eight or ten, and in others as many as twenty-five or even more. They are longer than the frustule, and radiate from it with much regularity. The *Diatoms* when detected (upon a floating *fucus* common in the sea hereabout) were dead, and I was unable to detect any movement's.



a, the frustule; b, the gelatinous envelope projecting beyond the margin; c, the processes, or pseudopodia.

I have examined so many individuals of this *Diatom* that I think it hardly likely that I have been deceived, as they are by no means very minute.

Dr. Carpenter, in the fifth edition of his admirable work on the microscope, speaks of some observations by Mr. Stevenson on the genus *Coscinodiscus*, which hint at the possibility of some *Diatoms* having appendages projected through apertures of the frustule. The highest power of my microscope is one of Messrs. R. and J. Becks, $\frac{1}{4}$ th, a very fine glass.

I propose to forward as soon as possible the sticks, dry and in balsam, as well as the "gathering" in spirits, to a competent diatomist, who will confirm my observations if correct, and I send this to NATURE to secure priority in case I have really made a discovery.

W. W. WOOD

Manila, July 20