

Cryptogams, and to a host of minute analyses of higher vegetables. It is inapplicable only where, as in Algæ, the tissues alter so much in drying as to retain few of their characters, and where the application of moisture does not make the tissues swell out to their original size. It is, however, possible that this method may be modified, so as to comprise even this important class of microscopic objects.—*Gardeners' Chronicle*, April 26, 1851.

NOTICE OF A SEA-BEACH DURING THE SILURIAN EPOCH.

One of the localities where fossils are obtained amongst the Silurians of the southern highlands of Scotland, is at the eastern side of the entrance into Kirkcudbright Bay. At this locality they occur in several spots, and the deposits which afford them vary considerably in appearance. Several beds of dark-coloured flags containing abundance of Graptolites of the species *ludensis* and *sagittarius*, amongst which the *Orthoceras annulatum* occurs, are to be met with. A light grey shale is also found, having imbedded within it nodules, some of which abound in fossils named in the 'Quarterly Journal of the Geological Society,' vol. iv. p. 206, and which appear to have been transported from other fossiliferous beds, rather than to be concretions of limestone gathered around organic bodies, inasmuch as the fossils themselves are generally either on the surface of the nodule or occur in a line slightly within its margin; and the nodules often bear evidence of friction and rolling. Besides these beds, there are seen near Reaberry Head deposits consisting of fine-grained greywacke sandstone with intercalated shales, or rather indurated clays, which appear to be of considerable extent, and which, from the sandstones and clays being of nearly equal thickness, and also from their regularly alternating, offer characters which are uncommon amongst the Scotch Silurians. One of these clay beds has imbedded within it irregular lines of coarse sand, and amongst this sand fragments of shells occur. These fragments consist of portions of *Terebratula lacunosa* and *T. semisulcata*, *Orthocerata*, and minute pieces of other shells, together with crinoidal rings. In some of the cells of the *Orthocerata* the fragments of the other shells are seen mixed with sand; and the broken shells themselves are of a white colour, very different from what Silurian fossils commonly present; and on the whole their appearance is not far removed from that of the broken bleached and withered shells of our own shores.

The greywacke sandstone also affords some information concerning the origin and circumstances attendant on the beds which are intercalated with it. On the under surfaces of some of these sandstones lines of desiccation occur, indicating that the clayey deposits had been exposed to the influence of solar heat; and the nature of the deposits themselves shows that the circumstances under which they originated were somewhat similar to those which prevail on some of our coasts at the present time. On the whole the appearance of these thin beds of greywacke sandstone and indurated clay is such as to show that in this locality, during a portion of the Silurian epoch, there existed a sea-shore, on the rippled surface of which grains of coarse sand and fragments of shells were strewed. And as we find at the present time,

on many spots of our shores, the lower parts of the ripple-markings often affording coarse sand and broken pieces of shells, so likewise during the Silurian epoch we have circumstances prevailing, such as to show that the sun bleached the empty shells and cracked the dry mud on this ancient sea-beach as it does at the present time.

The evidence of the occurrence of land in formations antecedent to the carboniferous is exceeding rare, the deposits being exclusively of a marine character; and although this deposit at Reaberry Head only affords marine remains, yet the circumstances under which it occurs, and also the state of the fossils which are imbedded in it, leave no doubt that the sea, at the period when this littoral deposit was being formed, rolled over a shore which skirted some portion of land then above the surface of its waters. And it is probable that this land had its fauna and flora, which this withered shell-bed may possibly at some time afford us some knowledge of.—ROBERT HARKNESS.

On the Cell-membrane of Diatomaceous Shells. By J. W. BAILEY.

If hydrofluoric acid is applied to recent Diatomaceæ, the shell soon dissolves, leaving distinct, internal, flexible cell-membranes retaining the general form of the shells. These may sometimes but not generally be detected even in the fossil specimens. When present, they materially interfere with the examination of the true nature of the markings of the siliceous shell, and should be destroyed by nitric acid and heat, before the hydrofluoric acid is employed, unless it is desired to study the cell-membrane itself. There is a curious difference in the action of hydrofluoric acid of the same strength upon specimens of fossil Diatomaceæ from different localities. Some dissolve with even too great rapidity in an acid which is slow and tedious in its action on other specimens. The Bermuda and Richmond Tripoli, and some specimens of fluviatile origin resist the action much longer than is usual with most specimens, whether they are recent marine, or either recent or fossil fluviatile ones. This difference is probably due to different degrees of hydration.—*From Silliman's American Journal of Science and Art*, No. 33, May 1851.

A Comparative Examination of the Objective Glasses of Microscopes from Mr. Ross of England; Mr. Spencer of America; and M. Nachez of Paris. By J. LAWRENCE SMITH, M.D.

Having had an opportunity, a short time since, while at Paris, to examine the comparative merit of the lenses of these makers, it might not be uninteresting to microscopists to know the result of my examination, particularly as it was made under peculiar circumstances; namely, by adapting alternately the objectives to the same mounting, and regarding the same object under the same illumination.

The glasses used were considered by their makers as among their best. That made by Ross was in the possession of M. Rutherford of U. S. Spencer's was owned by Dr. Burnet of Boston, and had just been brought by him from Spencer. That of Nachez belongs to Dr. Bigelow of Boston, now in Europe engaged in microscopic research



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