SCIENCE

FRIDAY, SEPTEMBER 14, 1900.

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MSS. intended for publication and books, etc., intended for review should be sent to the responsible editor, Professor J. McKeen Cattell, Garrison-on-Hudson N. Y.

ADDRESS OF THE PRESIDENT BEFORE THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

II.

FUNCTION OF CELLS.

IT has already been stated that, when new cells arise within pre-existing cells, division of the nucleus is associated with cleavage of the cell plasm, so that it participates in the process of new cell-formation. Undoubtedly, however, its *rôle* is not limited to this function. It also plays an important part in secretion, nutrition, and the special functions discharged by the cells in the tissues and organs of which they form morphological elements.

Between 1838 and 1842 observations were made which showed that cells were constituent parts of secreting glands and mucous membranes (Schwann, Henle). In 1842 John Goodsir communicated to the Royal Society of Edinburgh a memoir on secreting structures, in which he established the principle that cells are the ultimate secreting agents; he recognized in the cells of the liver, kidney and other organs the characteristic secretion of each gland. The secretion was, he said, situated between the nucleus and the cell wall. At first he thought that, as the necleus was the reproductive organ of the cell, the secretion was formed in the interior of the cell by the agency of the cell wall; but three years later he regarded it as a product of the

instruction, but will extend to the reference libraries of many professional zoologists.

Number II., by Mr. J. Johnstone, is on *Cardium;* and number III., by H. C. Chadwick, is on *Echinus*. The former contains 84 pp. and 7 pls.; the latter 28 pp. and 5 pls.

In *Cardium* the sections, 'General Organization, Mantle and Foot,' 'Shell,' 'Alimentary Canal,' 'Branchia,' 'Vascular System,' and 'Course of the Circulation,' are particularly well done. One rarely finds in works on the lamellibranchs of the general scope and purpose of this the crystalline style and the method of extending the siphons and foot better treated than here. The renal, nervous and reproductive systems do not fare quite so well, relatively. The histology of the nervous system, for example, is not touched upon at all, while it is entered into with some detail for all the other systems.

The treatment of the renal system is somewhat deficient in illustration, and consequently lacks to some extent in clearness. And here one wonders why the terms 'organ of Bojanus' and nephridia, so well established in lamellibranch morphology, are not even mentioned.

The absence of any reference to the cœlon, at least under that name, is strange.

A feature of this particular monograph, and one which will undoubtedly both extend and enhance its local value, is an appendix on 'The Economy of the Cockle, with special reference to the Lancashire Sea-Fisheries District.'

The *Echinus*, though perhaps not reaching at any point quite so high a level of descriptive excellence as does *Cardium* in a few sections, is more even. It is good throughout.

Both monographs contain much evidence that their authors have not only a large fund of first-hand knowledge of their subjects, but have also wide acquaintance with the original literature bearing upon them.

One constantly wishes that zoological treatises of this general type might contain more physiology and natural history with the morphology than they do; but here the desiderata are usually beyond the power of the authors to remedy. The three numbers of this series thus far put out are certainly less defective in this way than are many general works.

None of the numbers thus far issued have either tables of contents or indexes, and they should certainly have both; their value would be greatly enhanced thereby.

I would again express regret that the volumes cannot be more securely bound. A number of forms in the copy of *Cardium* that has come into my hands are now nearly ready to fall out, and the book has had no hard usage. The educational worth of the books certainly ought to insure them a place in many laboratories and reference libraries; and their usefulness ought not to be impaired by defective construction.

WM. E. RITTER.

SCIENTIFIC JOURNALS AND ARTICLES.

Popular Astronomy for August and September, published at Northfield, Minn., contains, as leading articles, views of some prominent astronomers, about the present opposition of the planet Eros as favorable for a study of this new planet's parallax. If its parallax can be obtained, micrometrically and photographically as accurately as is now believed, the result will help to a better knowledge of the solar parallax. Such knowledge would improve most of the constants of the solar system. S. J. Brown, Astronomical Director of the United States Naval Observatory, has prepared the first and second articles. The first is on the feasibility of obtaining the solar parallax from simultaneous micrometric observations of Eros, and the second is a translation from the French of two circulars issued by the International Astrophotographic Conference at its meetings in July and August last, giving instructions to all the astronomers of the world who are expected to co-operate in observing Eros during September and October. Director Brown gives useful comments on these circulars. Other articles are: 'Ptolemy's Theorem on the apparent Enlargement of the Sun and Moon near the Horizon,' by Dr. T. J. J. See, Washington, D. C.; 'Total Eclipse of May 28, 1900,' by Professor M. Moyé, University at Montpellier, France; an illustrated article on the same subject by the editor; 'The Propagation of the Tidal Wave,' by Dr. T. J. J. See; 'The Planet Jupiter,' by G. W. Hough, and an obituary

notice of 'Piazzi Smyth,' by Ralph Copeland. Notes as usual are published on variable stars, planets and current spectroscopic work.

DISCUSSION AND CORRESPONDENCE.

NOTE ON THE SILURO-DEVONIC BOUNDARY.

IN the recently published bulletin of the U. S. Geological Survey, No. 165, entitled 'Contributions to the Geology of Maine,' Professor H. S. Williams has again defined his attitude on the question of the Siluro-Devonic boundary in America. Here the critical argument advanced with some emphasis for the construction of the Helderbergian as a Siluric fauna is given in the following words (p. 25):

"The boundary between the Silurian and Devonian systems was first made in the Welsh series, in which the transition was from calcareous sedimentation, with rich and purely marine faunas, into sandstones of great thickness containing land plants and fishes whose habitat was, presumably, fresh or brackish waters.

"The New York section, from the Lower Helderberg limestones through the Oriskany, Cauda-galli, and Schoharie grits back again into limestones, does not pass out of marine conditions. In the Gaspé region, however, there is a complete change (as there was on the other side of the Atlantic Basin) at the point where the Oriskany fauna was evolved. [NOTE A.] In these Silurian faunas of the eastern province there is also much closer resemblance to the Wenlock-Ludlow series than is found in the faunas of the Appalachian province in New York. The correlation of the passage beds at the top of the Silurian of Wales is clearly to be recognized in the passage from the limestones to the Gaspé sandstones of the eastern province of America. This Gaspé transition is also to be traced with precision to the horizon of the introduction of the Oriskany fauna into the basins farther west and southwest, in which no direct passage into Old Red sandstone condition is apparent.

"We have thus in America a means of determining where the Silurian boundary belongs in purely marine series of beds and among marine faunas of unbroken succession. The Lower Helderberg in the interior of the American continent, as the Koniprusien F_2 fauna in the Bohemian Basin of Europe, is closely related in its species to what succeeds, because there was no radical disturbance of the conditions of marine life. Nevertheless, it is not the Lower Helderberg species that mark the conditions corresponding to the beginning of the Old Red sandstone; but the changes which that fauna suffered during the passage into the Oriskany time are evidences of a general disturbance which resulted in the lifting of large areas of marine surface above the level of the sea." [NOTE B.]

Note A.—This statement is wholly inaccurate. In the Gaspé limestones the Oriskany fauna manifests itself pronouncedly with *Hipparionyx proximus*, *Rensselæria ovoides*, *Megalanteris*, *Camarotœchia pliopleura*, *Rhipdomella*, cf. *musculosa*, *Meristella* cf. *lata*, etc., at the base of Logan's limestone No. 8, and above this horizon is the great thickness of 500–600 feet of pure limestone beds with chert bands, surprisingly similar in lithologic aspect to the gray and chocolate-colored Onondaga limestones of New York, and throughout these beds such Oriskany species are found in association with a profusion of others not represented in the interior basin Oriskany and many of them closely comparable to species of the Helderbergian. The plane of reappearance of certain Oriskany species in the Gaspé sandstone above, was shown by Logan to be 1100 feet above the top of these limestones and to be restricted to a comparatively slight vertical range. The fossils of the sandstone are not abundant nor is the fauna diversified. To any one studying these relations on the ground it is clear that they represent a brief return of the fauna of the limestone with evidences of progression and the further intermixture of species from the interior province (*Rensselæria* cf. *ovoides*, *Chonostrophia dawsoni* and *Chonetes melonica* (both of the latter in the New York Oriskany), *Leptostrophia blainvilli*, cf. Oriskany species, *Orthothetes becraftensis*, *Phacops* probably identical with *P. anceps*). The evidence from the Gaspé series is potent and conclusive that the introduction of the Oriskany fauna was accompanied by the deposition of pure calcareous sediments which were continued for a protracted period and nearly equal in actual thickness, the sum total of the Helderbergian and Onondaga limestones in the New York area of the interior basin. The species cited are in themselves evidence of the wide transgression during Oriskany time which is especially noticeable in the distribution of the sediment in New York. No tectonic change disturbs the succession in the 2000 feet of Gaspé limestones.