photo-synthesis and the assimilation of nitrogenous substances. This is to be regretted, for it fails to bring out the essential differences between these forms of chemical activity within the plant. This is especially true since the author follows the fate of the nitrogenous products up to the point of the final construction of albuminous material and even considers the processes of digestion before a word has been said about respiration and the accompanying phenomena. It is true that in the following section, on dissimilation, as the author terms it, the phenomena connected with respiration are spoken of from the standpoint of the release of kinetic energy, but the importance of this in the upbuilding processes in nitrogen assimilation is not sharply brought out. The first part, on nutrition, closes with a cleverly constructed diagram which brings out the origin and fate of the various substances connected with nutrition processes.

In the already noted division of the balance of the book into two parts, it is not altogether evident that there is much advantage over the more usual plan. The problems connected with the change in form, in short the growth of the plant, are in many ways intimately connected with growth curvatures, yet in the arrangement followed the former are included under 'Formwechsel,' the latter under 'Energiewechsel.' If this treatment tends to draw the attention of the student from the relation of expenditure of energy to ordinary growth phenomena, or if thereby growth curvatures—tropism—are separated too sharply from unmodified growth responses, it seems to hinder rather than help the proper appreciation of the question as a whole. Some subdivision is certainly an advantage, but it might have been better if the title 'Energiewechsel' had been used for both of the sections and suitable subtitles devised to indicate more adequately the different phenomena.

Aside from such points, which are, perhaps, after all, but matters of opinion, there can be no question but that the book is an excellent one. It is clear, concise, fairly up to date as regards the literature, and, moreover, written in a style which makes it attractive and interesting reading. One can but regret that there is not a book in the English language so suitable for the student; it is to be hoped that a translation will appear.

Columbia University. H. M. Richards.

Cleiocrinus. By Frank Springer. Memoirs Mus. Comp. Zoology, Harvard College, Vol. XXV., No. 2, January, 1905.

A few years ago the Museum of Comparative Zoology brought out Mr. Springer's beautiful and exhaustive account of *Uintacrinus,* and now we have before us a similarly complete paper on one of the oldest of known Crinoid genera—*Cleiocrinus.* This genus was described by E. Billings in 1856, from specimens found in the Lower Silurian at Ottawa, Canada. It has been discussed by various authors, who have had great difficulty in placing it in the system of classification, owing partly to its anomalous character, and partly to the condition of the specimens. In 1886 Messrs. Wachsmuth and Springer wrote: 'If certain parts were better known, we should make it the type of a new family, but at present, having no positive knowledge of the basal regions, nor even of the arms, we are not in a position to give a satisfactory definition of the group.' Mr. Springer does not now establish the family Cleiocrinidæ, in so many words, but it is evident that the expectations of 1886 have been more than realized. The story of the discovery of the new characters is so dramatic that it is worth quoting nearly in full:

> It was apparent, however, that no further information was to be obtained, unless we could find some means of seeing what is underneath the column. My examination of the specimens gave no hope of being able to detach the column in either of them; but after a very careful study of specimen B [one of Billings's types borrowed from the Geological Survey of Canada], under a strong magnifier, I came to the conclusion that it might be possible to get at the inside of the base by removing a part of the plates above it. * * * * The small size of the specimen and the uncertainty as to how the fractures might run, rendered the operation a delicate and risky one to undertake with a type specimen; but I thought the benefit to be gained in case of success would warrant the risk. I accordingly laid the matter fully before Dr. Whiteaves, and requested his

authority to undertake it. This he gave without hesitation, and in the most liberal manner, leaving me free to act with the specimen as if it were my own. * * * The work of removing the necessary plates and debris from above the base of the specimen was tedious and difficult, being performed entirely under a ten-power microscope, with tools specially fashioned out of needles and fine steel pens. It was completely successful, however, without any mishap, and disclosed a structure most extraordinary and anomalous, unlike any of the previous suppositions, and wholly at variance with that of any other known crinoid.

It is finally concluded that the genus is intermediate between the great groups of Flexibilia and Camerata; nearest, apparently, to the Reteocrinidæ. The memoir is illustrated by a beautiful plate of drawings by K. M. Chapman and E. Ricker, showing not only all aspects of *Cleiocrinus,* but also *Reteocrinus* and *Glyptocrinus* for comparison.

T. D. A. C.

SCIENTIFIC JOURNALS AND ARTICLES.

THE *Journal of Experimental Medicine* established by Dr. W. H. Welch, of the Johns Hopkins University, will hereafter be published under the auspices of the Rockefeller Institute for Medical Research, and will be edited by Drs. Simon Flexner and Eugene L. Opie. The scope of the *Journal* will suffer no alteration by reason of the change of management, and it is hoped that it may continue to cover, as heretofore, the field of experimental medicine. It is proposed to issue numbers of the *Journal* at bimonthly intervals, six numbers to constitute a volume, which will contain not less than six hundred pages.

THE opening (January) number of volume 6 of the *Transactions of the American Mathematical Society* contains the following papers:

P. F. SMITH: 'On the linear transformations of a quadratic form into itself.'

E. V. HUNTINGTON: 'A set of postulates for real algebra, comprising postulates for a one-dimensional continuum and for the theory of groups.'

W. A. MANNING: 'On the primitive groups of class $3p$.'

L. E. DICKSON: 'The minimum degree τ of resolvents for the p-section of the periods of hyperelliptic functions of four periods.'

G. A. MILLER: 'Determination of all the groups of order 2^m which contain an odd number of cyclic subgroups of composite order.'

E. D. ROE: 'On the coefficients in the quotient of two alternants.'

E. J. WILCZYNSKI: 'General theory of curves on ruled surfaces.'

O. VEBLEN: 'Theory of plane curves in non-metrical analysis situs.'

The Museums Journal of Great Britain for January contains the second part of an article on 'School-Children and Museums,' by Henry Coates and Alex. M. Rodger, and 'The School Nature-Study Union,' under which is given a list of the museums, zoological and botanical gardens, in and about London and the facilities they afford teachers and students. There are a description of the Liverpool Museum as now arranged and a large number of notes about museums. Like *Nature* the *Museums Journal* is particularly strong in its notes, which form a most important portion of any scientific journal.

SOCIETIES AND ACADEMIES.

THE NEBRASKA ACADEMY OF SCIENCES.

THE fifteenth annual meeting of the Nebraska Academy of Sciences was held in the Hall of Mechanic Arts, State University, Lincoln, January 27–28, and included a business session, sessions for the reading of papers and a social session on the evening of the latter date.

The following papers were presented:

PROFESSOR H. B. DUNCANSON: President's Address: 'The Relation of the State to Scientific Investigation.'

DR. H. H. WAITE: 'The Duty of the State to the Public in the Prevention of Certain Diseases.'

DEAN H. B. WARD: 'Some Observations on the Biological Conditions of Elevated Lakes' (with lantern).

PROFESSOR O. V. P. STOUT: 'An Economical Design for Measuring Flumes.'

DR. G. E. CONDRA: 'The Possible Development of Nebraska's Stone-quarrying Industries.'

PROFESSOR F. D. HEALD: 'Preliminary Note on a Black Rot of Apples.'

DR. R. H. WOLCOTT: 'A New Mite Affecting Greenhouse Plants.'

PROFESSOR B. E. MOORE: 'A Color Study of Cobalt Solutions.'