though the latter be kept for weeks in a sealed cell filled with water. It is even possible to make very satisfactory photomicrographs of living embryos within the mother larvæ, while there is not the slightest difficulty in observing the movements of those nearly fully developed before their escape from the mother integument. With our present knowledge we see no reason why artificial colonies of this insect might not be established in the vicinity of a zoological laboratory and maintained with very little or no attention from year to year, if not for a decade or more. A detailed account of this species, with a number of illustrations will appear shortly in the writer's report for last year. E. P. FELT

TREMATODES OF THE DRY TORTUGAS

MY friend Albert Hassall has called my attention to two of the new generic names which I employed in a recent paper on the Trematodes of the Dry Tortugas.[1]

The generic names *Didymorchis* and *Mesorchis* are preempted, thus making it necessary to invent other names to take their place. I therefore propose for *Didymorchis* the name *Pycnadena* (πυκνὸς packed close, and ἀδὴν a gland), and for *Mesorchis* the name *Antorchis* (ἀντίος opposite, and ὄρχις).

These two specific names hence become *Pycnadena* (n. g.) *lata* (Lt.) and *Antorchis* (n. g.) *urna* (Lt.).

At the suggestion of Mr. Hassall I take advantage of this opportunity to state that *Deradena ovalis, Hamacreadium mutabile* and *Genolopa ampullacea* are the type species of their respective genera.

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January 23, 1911

QUOTATIONS

COMMERCIALISM IN EDUCATION

THAT the methods of higher education are in a state of transition in this country appears evident from the pedagogic innovations made and the many more proposed during the past several years. On the one hand, colleges of higher standing are elevating their curricula to a real professional plane, apparently having at length found it too difficult, to say the least, to instruct in the same course men for such different callings as dynamo tender and consulting engineer. On the other hand, some schools are frankly revealing that their aim is to serve, not the interests of the student, but solely those of the employer of technical graduates, even though education directed primarily to this narrow purpose may unfit the subject for obtaining the most out of life spiritually, through lowering his ideals and curbing his ambitions, and financially, through making him a mere serf to an industry. A concrete illustration of the haphazard condition of thought concerning technical education is afforded by a recent report of the Carnegie Foundation for the Advancement of Teaching on "Academic and Industrial Efficiency," prepared by a well-known and doubtless capable "efficiency engineer," whose business is concerned with the economical administration of manufacturing establishments.

While we have no quarrel with the efficiency engineer as such, nor with his efforts in the course of business to report upon any problem which his clients may desire investigated, we can not refrain from expressing astonishment at the frame of mind of one who would direct the application to instruction in science of the canons appropriate for running a purely money-making business. The possibility of such a distortion of view is the most serious criticism that could possibly be launched against American educational methods. As well put a skilful and successful sausage maker at the task of criticizing the manufacture of astronomical telescopes. An institution for training young men in science, whether pure or applied, is not a money-getting concern. Its product is not sausages, but the advancement of human intelligence, which may or may not be applied to gainful objects. Even in the narrowest technical sense it does

[1] "Helminth Fauna of the Dry Tortugas, II., Trematodes," Papers of the Tortugas Laboratory, Carnegie Institution of Washington, Vol. IV., pp. 11–98, plates 1–28; issued December 16, 1910.

not turn out a standardized product of salable packages of information, but an infinitely variable and intangible thing the importance of which to the world can not be measured by the demand for it reckoned in dollars and cents. The world ultimately owes far more to the institution which produces men who guide the world's destinies in any department of activity than it does to the graduate factory that adds yet more to the rank and file of the mediocre. This at least is the situation regarding the very class of institutions the investigation of which was undertaken in the report before us. Its whole tenor was to lay emphasis upon the destruction of the academic freedom and initiative that is necessary to the advancement of human intelligence and to promote that kind of organization which, under the disguise of uniformity and system, effectively suppresses progress. It is an application to educational institutions of the methods too common in American manufacture, which insure a large output of the tolerable rather than a small output of the desirable.—*The Electrical World and Engineer.*

SCIENTIFIC BOOKS

Théorie physico-chimique de la vie et générations spontanées. Par Stéphan Leduc, professeur à l'école de medicine de Nantes. Paris, A. Poinat. 1910.

Life as a physico-chemical process, and the analogy between living and lifeless, would possibly have been a better heading for this little book of Professor Leduc, for it does not consider spontaneous generation in the fashion which the reader is apt to expect from its title. On the other hand, it may well be that the post-Pasteurean biologist is over-sensitive as to the words "spontaneous generation," and he is apt to give them in latter days a cabalistic meaning: he inclines to dismiss the rare papers which deal with the theme as anachronisms—and he is careful not to recommend them to publishers. Even the French Academy has become so modern that it will not admit to its shelves any treatise which deals with this "exploded theory"!

Nevertheless, a whisper comes occasionally out of the wilderness and reminds us that this is the problem of all biological problems and that it is still neglected. Perhaps our conscience is touched by the feeling that if we are consistent evolutionists we must have some manner of faith that the living came from the lifeless, and that, in the pursuit of biological happiness, we have been drifting in past years towards vitalism in some type or another. We recall too, that in the last decade, steps have been taken in the analysis of biochemical phenomena, in matters of enzymes, catalyzers, ions, tonicity and similar physical facts which have all an intimate bearing upon organisms and are paving the way for a new biological era. After all, many of us are convinced mechanists, and there should therefore be no reason why a book like Leduc's, title and all, should not be welcomed. It is certainly the first work to bring up to date the documents upon which a synthetic biology—as distinguished from descriptive and analytical—may be founded.

Let us see how his theme is handled: There is as yet no satisfactory definition of life: in spite of the efforts of many biologists, we know it by its presence or absence, by phenomena of nutrition, sensibility, growth, organization, reproduction, processes all of which are known in some degree in the inorganic. Moreover, as Leduc declares, life is in itself different in quality in its different manifestations in various organisms; thus he leads us to infer that the life of man differs more widely from the life of a protozoan than the life of the protozoan from the "life" of liquid crystals, for example. Life is to be studied as the transformer of matter and energy, it is a specialized phase of matter, the organic as opposed to the inorganic, and like a current it changes ephemerally. Its expression can best be studied in nutrition and in morphogenesis. And these are the lines of study which the author has developed. Nutrition is in essence chemico-physical, especially concerned with the phenomena of contacts between fluids of different characters, whether electrolytic, osmotic, colloidal, crystalloidal. In this connection he considers the laws of solutions,