

Students' fees, estimated	140,000
State tax of 23/100 of a mill.	215,000
Miscellaneous receipts from	
University and Experiment	
Station about	30,000
Total per annum	\$663,000
Total for the biennium	\$1,326,000
Balances carried forward for expendi-	
ture in 1907-8	35,000
Total for biennium	\$2,697,000

F. F. WESBROOK

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SCIENTIFIC BOOKS

THE SCIENTIFIC RESULTS OF THE ZIEGLER POLAR EXPEDITION¹

THE scientific work of the Ziegler Polar expedition to the Franz Josef Archipelago, 1903-5, commanded by Anthony Fiala, was placed in charge of Mr. W. J. Peters, the representative of the National Geographic Society and second in command of the expedition. Entering the employ of the Carnegie Institution of Washington shortly after his return, as commander of the Magnetic Survey yacht *Galilee*, he was unable to attend personally to the reduction and to the publication of the results. The completion of the work was therefore entrusted to Mr. John A. Fleming, of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, who has put it in its present form.

The principal observations were upon the earth's magnetism, with notes and sketches of the aurora, meteorology, the tides and the topography of the archipelago, supplemented by astronomical observations for precise geographical positions. It is to be regretted that the party was not prepared to attempt more in the study of the geology and biology of the region. Mr. Fiala notes in his introduction

¹"The Ziegler Polar Expedition, 1903-1905, Anthony Fiala, Commander." Scientific results obtained under the direction of William J. Peters, representative of the National Geographic Society in charge of scientific work. Edited by John A. Fleming. Published under the auspices of the National Geographic Society by the estate of William Ziegler, Washington, D. C., 1907, 4to, pp. viii + 630, with 43 inserts and 3 maps.

to the volume that some interesting fossils were seen, and numerous veins of coal discovered, the latter find proving of practical as well as of scientific interest.

More than one half of the volume is devoted to the results of the observations on terrestrial magnetism. A small magnetic observatory was erected at Teplitz Bay, in which observations were made from September, 1903, to July, 1904, very near the site of the magnetic station of the Abruzzi expedition of 1900. The observatory was left standing, with the probable expectation that it will be available for future use. In view of the very extended series of results obtained by this expedition, a future series at the same point would have a greatly increased value.

In the discussion of the declination results, some interesting conclusions are drawn as to the character of the daily movement of the needle, during the several seasons of the year. By dividing the entire time over which the observations extend into periods of four weeks each, and plotting the means of the hourly values, each value based on about 240 separate readings, a series of graphs has been constructed, very clearly showing the change in the amplitude of diurnal variation with the time of the year, the times of principal maximum and minimum positions, the epochs of mean declination, and the existence and form of the secondary maximum and minimum. In a further discussion the relation of the mean yearly amplitude of the diurnal variation to the magnetic latitude is again pointed out, and the change in this relation with the epoch in the sunspot cycle is shown.

A large amount of meteorological information was collected on the expedition, which will prove useful in future discussions; its full value, however, was unfortunately affected by deficiencies in the instrumental outfit used. Two very satisfactory series of tidal observations were made at points approximately 150 miles apart. These have been arranged and discussed by Mr. L. P. Shidy, chief of the Tidal Division of the United States Coast and Geodetic Survey, who concludes that the tide wave reaches the archipelago by the two channels on either side of Spitzbergen, the one

flowing west of that island arriving about four hours earlier.

An attractive feature of the book is a series of lithographic reproductions of sketches by Mr. Fiala, showing the successive appearances of the aurora on three separate occasions. The series made on the night of January 23, 1904, is particularly striking.

Not the least important part of the work is the series of maps which accompanies it. Mr. Gilbert H. Grosvenor, of the National Geographic Society, has compiled from the available sources a map of the polar regions above latitude 65° north, embodying the results, and showing the routes of the various expeditions. The map survey work of the Ziegler Expedition is delineated on an excellent set of maps by Mr. Russell W. Porter, who, under the direction of Mr. Peters, had charge of that part of the work in the field.

On the whole, the amount and value of the scientific work accomplished, notwithstanding the limitations in equipment, the accidents and exigencies incident to polar exploration and the severe attendant physical conditions under which work in polar regions must be performed, are greatly to the credit of all concerned in the observational work and in the reduction and publication of the results. It must certainly be a source of satisfaction that the second Ziegler expedition under Messrs. Fiala and Peters resulted in a substantial addition to our knowledge of terrestrial physics in the polar regions.

H. W. FISK

CARNEGIE INSTITUTION OF WASHINGTON,
DEPARTMENT TERRESTRIAL MAGNETISM,
November 27, 1907

The Proteins of the Wheat Kernel. By THOS. B. OSBORNE. Published by the Carnegie Institution of Washington, D. C. 1907. Pp. 119.

This monograph gives in a clear and concise form the results of the author's extensive work as well as that of other investigators. The importance of the subject is set forth in the introductory sentence: "Of the protein substances used as food none is more impor-

tant than those contained in the seeds of wheat." The proteids are discussed mainly from the analytical side, pure types are prepared, their properties studied and ultimate composition determined. The products of hydrolysis of the various proteids are also given. The "Experimental Part" is a unique feature of the work; the methods employed are described in detail, thus permitting future investigators to intelligently review the work and not remain in doubt as to the methods employed in the preparation of the various proteins. The individuality of the various proteins have not been sufficiently recognized by chemists. These compounds have all been considered of equal value from a nutritive point of view, an assumption which should be verified by exhaustive experiments.

That a molecule of gliadin can have the same nutritive value as one of casein would seem impossible if one molecule of food protein is transformed into one of tissue protein, for in the former lysine is wholly lacking, and glutaminic acid, ammonia and proline are in great excess over the amount required to form any of the tissue proteins of which we know. It would seem probable that either the animal requires a variety of food, so that the relative proportion in which the amino-acids are available for its use shall correspond more nearly to its requirements, or that only a small part of these amino-acids are converted into its tissue proteins and the rest oxidized as such.

This report will prove of special value in suggesting new lines of work and in the interpretation of the results of previous investigations. The extensive analytical work accomplished by Osborne, together with the synthetic investigation by Fischer and others, on proteins, bids fair to give us a more complete knowledge of the composition and structure of these complex bodies which have not heretofore been expressed by chemical formulæ. Professor Osborne and the Carnegie Institution are both to be congratulated upon the publication of this valuable work, "The Proteins of the Wheat Kernel."

HARRY SNYDER