power to aid in this accomplishment by inducing institutions which they can influence to subscribe. All correspondence relating to subscriptions should be addressed to M. G. Severin, Musée Royal d'Histoire Naturelle, 31 Rue Vautier, Bruxelles, Belgium.

PHILIP P. CALVERT
UNIVERSITY OF PENNSYLVANIA

CROSS-SECTION LINES ON BLACKBOARDS AND THEIR ILLUMINATION

THOSE who wish cross-section rulings on blackboards temporarily, thus leaving the board free for other work after the curve-plotting is finished, can do so by a simple device. On a sheet of white paper make a ruling of lines, 2 cm. apart, the whole grid being 16×24 cm., and the lines not quite one mm. thick. Take a photograph of this, making the camera image the size of a lantern-slide. Mount the negative in a lantern, projecting the image on the blackboard. A lantern equipped with a 400-watt Mazda lamp will make the lines sufficiently visible for plotting even in a well-lighted room. The lines are erased by turning off the lamp.

FLOOD-LIGHTING FOR BLACKBOARDS

A SIMPLE system of lights should be added in dark recitation and lecture rooms, so that no light reaches the eye, either from the illuminant, nor from the board by direct reflection. A 40-watt lamp suffices for 4 ft. of blackboard, and need not project from the wall more than 18 inches.

PAUL F. GAEHR
WELLS COLLEGE

CONCERNING THE MANUFACTURE OF SULPHONIC ACIDS

THE Department of Agriculture announces that the color laboratory of the Bureau of Chemistry, of this department, has developed, on a laboratory scale, a new process for the manufacture of certain sulphonic acids. This process, as carried out in the laboratories, appears so promising that it is thought that some manufacturers of chemicals and dyestuffs in this country may be able to supply their demands for these and other valuable compounds by this process, provided the process can be reproduced upon a technical scale so as to obtain results commensurate with laboratory investigations. The process refers particularly to the sulphonation in the vapor phase of benzene, naphthalene, and other hydrocarbons.

With a view to helping the chemical industry of this country, the Department of Agriculture hereby announces that it is ready to assist manufacturers who wish to produce these compounds. The expenses of the technical installation and of the labor and materials necessary will of necessity be borne by the firm, individual, or corporation wishing to manufacture the products. The chemists of the Color Laboratory will assist with expert advice, etc. The department reserves the right to publish all the data obtained from the technical experiments.

This offer of assistance will not be held open by the department for an indefinite period.

D. F. HOUSTON,
Secretary
DEPARTMENT OF AGRICULTURE,
WASHINGTON, D. C.

SCIENTIFIC BOOKS

British Antarctic (Terra Nova) Expedition, 1910. Natural History Report, Zoology, II., No. 8. *Brachiopoda.* By J. WILFRID JACKSON, F.G.S. 4to, pp. 177–202, 1 pl., July 27, 1918, London, British Museum.

The various Antarctic expeditions in the years immediately preceding the war, obtained material greatly extending our knowledge of the fauna of the regions about the Southern Pole. This to a considerable extent reached the scientific world by means of publication, but a certain portion was delayed and, owing to war conditions, seemed likely indefinitely to continue so. It is therefore with peculiar pleasure that we have received the present contribution issued during the past summer by the trustees of the British Museum.

The Brachiopoda obtained by the Terra Nova party form an interesting and valuable series adding considerably to our knowledge of the characteristics and geographical distribution of the Antarctic species. One of the forms

collected seems to show differences from its Rhynchonellid relatives which have induced the author to propose for it a new genus *Compsothyris,* though no new species were obtained. The paper is illustrated by an excellent plate and has a bibliography of the more important literature.

Australasian Antarctic Expedition, 1911–14, Scientific Reports, Series C.—Zoology and Botany, Vol. BI., pt. 1, 4to. "Calcareous Sponges," by Professor Arthur Dendy, pp. 1–17, 1 pl.; Vol. III., pt. 2. "Pterobranchia," by W. G. Ridewood; 26 pp., 1. pl.; Vol. V., pt. 5, "Euphausiacea and Mysidacea," by W. M. Tattersall; 16 pp. and 1 pl.; Vol. IV., pt. 3. "Brachiopoda," by J. Allen Thomson, pp. 76, and 4 pl.; Vol. V., pt. 6, "Cumacea and Phyllocarida," by W. T. Calman, pp. 12 and 1 pl. Sydney, N. S. W. Government Printing Office, 1918.

The continued publication of these purely scientific papers before the cessation of active military operations and in despite of financial stresses, reflects credit upon the government of Australia. The citizens of that commonwealth have naturally taken great pride in the success of their expedition and its valuable results for science, and these handsomely published memoirs are an expression in part of that pride.

The number of calcareous sponges from the Antarctic is small, but to them are added a number collected off Tasmania and at Macquarie Island. The collection includes two new species of *Leucetta* and one of *Leucandra.*

Dr. Ridewood's memoir contains no new species but forms a useful review of the austral species of *Cephalodiscus* with a bibliography of the rather scanty literature.

Dr. Tattersall treats of four species of Euphausians and two of Myacids, one of the latter from the Auckland Islands being new is described as *Tenagomysis tenuipes.* Dr. Calman describes a new species of *Diastylis* and reviews forms of *Nebalia* and *Cyclaspis,* which fill a wide gap in our knowledge of their geographical distribution. Dr. Thomson's memoir on the *Brachiopoda* is of particular importance, comprising a review of the group in the southern hemisphere, the description of new forms, and an interesting discussion of the relations of the existing forms to their fossil precursors and their distribution in connection with theories of previous land connections between the different continents in earlier geological time. His conclusion is that the present distribution lends probability to the hypotheses of von Ihering and others which assume such linking up of the various bodies of land in the later Mesozoic epoch. The paper has an excellent bibliography, but it is to be regretted that the phototyped figures in many cases are insufficiently clear to show the details mentioned in the text.

W. H. Dall

SPECIAL ARTICLES

ROTARY VERTIGO IN THE TAIL-SPIN

In the tail-spin, an evolution that is standard among military and exhibition aviators and into which any flier is apt to fall accidentally, a marked rotary and post-rotary vertigo may be induced. As the maintenance of the correct flying attitude of the airplane is largely dependent upon the pilot, this disturbance in his idea of attitude may lead to serious consequences and its significance and characteristics merit definition. A true appreciation of the phenomenon should increase the confidence of the young pilot just becoming acquainted with the evolution and decrease the risk attached to this feature of aviation training.

Purkinje in 1820 (quoted from McKendrick[1]) directed attention to the well-known vertigo of rotation. In brief, *when the movement of the body is arrested after undergoing rotation*—

(1) *an after-sensation of rotation in the same direction is experienced.* In coming out of the spin and levelling off, the pilot experiences a sensation of rotation after that has actually ceased. He therefore, tends to overcontrol, with the consequent danger of falling into another spin in the opposite direction.

(2) *The axis of this imaginary after-sensation of rotation is that axis of the head about*

[1] Schäfer's "Text-Book of Physiology," 1900, II., p. 1196.