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.

which the actual rotation took place. This suggests a precaution—during the spin, hold the head down so that it is rotated about its long axis; on coming out of the spin, raise the head. Any disturbance experienced then will be in directional (*i. e.,* horizontal) stability, and the more dangerous falling reaction will be avoided.

The superior reliability of visual criteria of attitude should be recognized. "Follow the horizon, if it ties itself up in a knot," is a good rule to remember.

A very illuminating incident that occurred at Mineola when the writer was stationed there, first suggested this analysis of the rôle the rotary vertigo may play in the tail-spin. On June 29, 1918, a pilot, while flying in a formation, lost his balance and fell off into a tail-spin. He got out of the spin, but fell off into another spin *in the opposite direction.* And he got out of the second spin also, but only to fall into a third, *again reversing.* He crashed and was seriously injured.

The pilot in question was acquainted with the tail-spin, but had never done one "solo" before. It immediately occurred to the writer that the accident was a case of overcontrol due to a falling reaction and the precaution under (2) suggested itself. At the same time it was recalled that Lieutenant Simon,[2] instructor in acrobatics at the school at Pau, France, cautioned his pupils to hold the head down under the cowl during a spin. Evidently the French aviator had arrived empirically at the same rule that the writer had deduced from his acquaintance with a physiological phenomenon. No knowledge of the precaution has been met with among American trainers.

The observations were at the time (July, 1918) informally brought to the attention of several members of the staff of the Medical Research Laboratory at the field. Subsequent observations and experiences as a pilot in acrobatic flying have confirmed the conclusions.

M. A. RAINES

DEPARTMENT OF PHYSIOLOGY,
COLUMBIA UNIVERSITY

[2] Quoted from Nordhoff in the Atlantic Monthly for April, 1918.

THE GALTON SOCIETY FOR THE STUDY OF THE ORIGIN AND EVOLUTION OF MAN

THE objects of the society are the promotion of study of racial anthropology, and of the origin, migration, physical and mental characters, crossing and evolution of human races, living and extinct.

The charter members of the society are as follows: Madison Grant, Henry Fairfield Osborn, John C. Merriam, Edward L. Thorndike, William K. Gregory, Charles B. Davenport, George S. Huntington, J. Howard McGregor, Edwin G. Conklin.

The organization of the society was suggested and initiated by Messrs. Davenport and Grant on March 6, 1918. On April 2, after several previous conferences, Messrs. Davenport, Grant, Osborn and Huntington adopted the charter and the name of the society. The first meeting of the charter fellows was held in New York on April 7 at the residence of Professor Osborn, who outlined the object of the society and emphasized the importance of a union of effort on the part of specialists, working in close cooperation and harmony with one another but from widely diverse lines of approach. Professor C. B. Davenport was elected chairman and Dr. W. K. Gregory secretary. The following men were elected as fellows: Drs. Ernest A. Hooton, Peabody Museum; Gerrit Smith Miller, United States National Museum; Raymond Pearl, United States Food Administration; L. R. Sullivan, American Museum of National History; Frederick Tilney, New York; Professor Harris H. Wilder, Smith College; Dr. Clark Wissler, American Museum of Natural History. Two patrons were elected: Mrs. E. H. Harriman and Mr. M. Taylor Pyne, New York.

A meeting of the society was held in the Osborn Library at the American Museum of Natural History on May 14. At this meeting Professor McGregor demonstrated his reconstruction of the skull of a typical adult Crô-Magnon man, based on all known remains of the race.

Dr. Wissler sketched the rise of anthropology in Europe and America, and contrasted the two concepts of this study: the first as including all lines of investigation on the origin and evolution of human races and of their cultures, and the second as limiting anthropology to the study of physical characteristics. He said that the museum had tried to develop all branches of anthropology in the broader sense, and referred to the methods of exhibiting these lines which were to be illustrated by Mr. Sullivan's paper.