base of the log should have been conducive to its desiccation and that certain abrasions of the bark were self-varnished by a lac-like exudate. This gum might well have been a factor in preserving within the bark much of the supply of water needed for the life of the sprouts.

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CORRECTION

I AM indebted to Eugene S. McCartney for calling attention to an error in my article on "The use of generic names as common nouns," SCIENCE, Vol. 96, p. 252. *"Pelomyxa carolinensis,"* line 13, should be omitted, for "carolinensis" is not a noun in the genitive case, but an adjective in the nominative case.

S. O. MAST

SCIENTIFIC BOOKS

ASTRONOMY, MAPS AND WEATHER

Astronomy, Maps and Weather. By C. C. WYLIE. x + 449 pp. Harper and Brothers.

AT the request of the Army Air Corps Flying Training Command, Professor Wylie has written this book for use in college pre-flight training courses. Because of the special demands of war-time training, the general plan differs radically from that of any of the older texts. After a general introduction to positional astronomy and to some of the basic precepts of meteorology and weather forecasting, the student is acquainted with the whys and wherefores of map-making. Then follow chapters on time and on celestial navigation and the book closes with a 150-page condensation of the material usually treated in our pre-war courses in descriptive astronomy.

In judging this book, the reviewer must bear in mind that, because of war needs, the writing was done under pressure. Among the good points of the book are the fine series of fourteen star maps and the very readable and instructive chapters on meteorology. One may congratulate the author on his well-balanced summary of astrophysics and stellar astronomy in the concluding chapters. But because this book is one of the first of the texts for a college course in science especially adapted to war-time needs it becomes necessary for the reviewer to do more than pass it by with a brief notice.

Does the book provide the student who is about to enter the Army Air Corps with such training as should prove especially beneficial to him? I fear that it only succeeds part way in this respect. In such a text the main emphasis should be on the celestial sphere; on the basic principles of optics employed in the construction and design of the sort of equipment that the student will use later; on the motions and shape of the earth and the art of map-making; on the principles of weather forecasting; on the measurement of time; and on the theory and practice of celestial navigation. Professor Wylie treats of most of these subjects, but there is in addition so much extraneous material that many a student will probably feel that he is wasting his time. For example, the space devoted to telescopes (Chapter III) could have been used to greater advantage if the author had confined himself closely to such simple optical instruments as are in daily use by aviators. Or again, in the chapter on maps one would have liked to see more than two and a half pages on map projections; this chapter would have gained much if a few typical Mercator charts and maps on the Lambert Conformal Projection could have been reproduced.

To this reviewer the least satisfactory chapter is the one on "Time." The subject of time is traditionally one that vexes the newcomer to the field. Professor Wylie's treatment of the subject fails in two respects. First, because much emphasis is placed on sidereal time. The whole trend in navigational practice is away from the use of sidereal time. The Nautical Almanac and the Air Almanac alike are both so arranged that it is unnecessary to use sidereal time in standard navigational calculations. We should not burden our beginning students with sidereal time; the subject had best be omitted entirely. My second objection is that far too little emphasis is placed on numerical applications. Our students need persistent practice in doing simple arithmetical problems. In the air, as well as on the sea, speed and accuracy in calculations are both essential. A student can not acquire good computing habits overnight. For the duration of the war simple and exact methods involving practical calculations must replace our former descriptive methods of the teaching of science.

The chapter on "Celestial Navigation" suffers from defects similar to those in the chapter on "Time." There is little reason why it should not have been expanded to three or four times its present length. One might object that this could have been done only at the expense of the concluding eight chapters on descriptive astronomy. All to the good, I would say. It is clearly the main function of a course in war-time astronomy to serve future aviators, naval officers and

many others who depend on celestial navigation. The time of these men is precious, and astronomers should not burden their minds with facts about stars and the universe. For future navigators the study of astronomy is now an extra-curricular activity.

Professor Wylie has taken a first important step in the development of a text on war-time astronomy. One can only hope that he will not consider the job finished with the first edition of the text. The second edition could stand drastic revision in the direction of better serving the immediate and important needs of the Army Air Corps.

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SPECIAL ARTICLES

ISOLATION OF ADRENOCORTICOTROPIC HORMONE FROM SHEEP PITUITARIES

A METHOD is herein described for the isolation of a protein from the anterior hypophysis which selectively stimulates the adrenal cortex and is free from other biologically active contaminants. Sheep pituitaries were ground and extracted with acidified 80 per cent. acetone. The extract[1] was precipitated in 90 per cent. acetone and dried. The dried powder was extracted with 0.1 M Na_2HPO_4 and the extract again precipitated by bringing it to half saturation with $(NH_4)_2SO_4$. The precipitate was then dissolved in water and dialyzed until salt-free. The dialyzed solution was adjusted to pH 3.0 and saturated NaCl was added to 0.54 M. The precipitate formed was saved for the isolation of lactogenic hormone and the supernatant was brought to half saturation with $(NH_4)_2SO_4$. The $(NH_4)_2SO_4$ precipitate was dissolved in water and half of its volume of concentrated NH_4OH was added and the solution allowed to stand at room temperature for 4 hours. The solution was then brought to 90 per cent. acetone. The precipitate formed was suspended in water and dialyzed, first against distilled water, then against pH 7.5 phosphate buffer of ionic strength 0.10. A slight precipitate that formed was discarded. Saturated aqueous $(NH_4)_2SO_4$ was then added to the dialyzed solution to 0.4 saturation. The precipitation with $(NH_4)_2SO_4$ was repeated two more times. The final precipitate was dialyzed and adjusted to pH 3.0 and saturated NaCl solution was added to 0.54 M. The precipitate was removed and discarded and the supernatant brought to 1.35 M. The precipitation with NaCl was repeated four times.

The final precipitate obtained by NaCl at pH 3.0 was examined by electrophoretic and solubility studies. Electrophoresis experiments were carried out in a Tiselius apparatus with the Longsworth scanning method. A 1 per cent. solution of protein was used at pH 6.87, 5.84, 4.60, 4.10. The potential gradient was about 6 volts per cm; the time of electrolysis was not less than 200 minutes. All these experiments indicated that the preparation contained only one component. From these experiments the isoelectric point was estimated to be approximately pH 4.7.

In the solubility studies, the solvent employed was 1.35 M NaCl, pH 3.0. The experiments were conducted in the cold room at 2 to 3° C. When five times the amount of the solid necessary for saturation was added the solubility remained the same. The experiment indicates that protein consists of a single component.

The hormone is exceptionally stable to heat. No biological activity was lost when a 1 per cent. solution in pH 7.5 phosphate buffer of ionic strength 0.10 was placed in a water bath at 100° C. for 2 hours.

The tryptophane content was very low, approximately 0.2 per cent. It will be remembered that the tryptophane content of lactogenic hormone was found to be 2.5 per cent. when the same method of determination (glyoxalic acid) was used.

Two methods of biological standardization of adrenocorticotropic hormone were used: (I) repair of the adrenal cortex of the immature female rat, 26 to 28 days of age at hypophysectomy, 14 days postoperative, when injected once daily for 4 days, autopsy on the 5th day, increase in width of the cortex and redistribution of the lipids being the criteria; (II) maintenance of the adrenal cortex (width and lipid distribution) in the male rat 40 days old at hypophysectomy, injected once daily for 15 days (13 injections). The dose of the homogeneous protein necessary to cause detectable repair of the adrenal cortex (Method I), was 0.05 mg total dose; the minimum daily dose for maintenance (Method II) was 0.05 mg. The hormone not only stimulates the adrenal cortex as judged by morphological but also by functional criteria. It increases the resistance of hypophysectomized and normal rats to cold, starvation and anoxia.

The chemical, physical and biological properties of the adrenocorticotropic hormone will be described in more detail elsewhere.

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[1] All subsequent procedures unless otherwise specified were performed at 2 to 3° C.