

### Aeroplane Survey of Peru.

*Peru from the Air.* By Lieut. George R. Johnson. With Text and Notes by Raye R. Platt. (Special Publication No. 12). Pp. xii + 159. (New York: American Geographical Society, 1930.) 5 dollars.

THE value of aeroplane photography and surveying has been well demonstrated in archaeology and forestry, and its special service to the geography of rugged and waterless countries is illustrated by the volume of photographs of Peru, taken by Lieut. G. R. Johnson, when chief photographer to the Peruvian Naval Air Service, and issued by the American Geographical Society. The volume includes 150 well-selected photographs, each  $8\frac{1}{2}$  in. by  $6\frac{1}{2}$  in., and six sketch maps. It has an excellent introduction by R. R. Platt, head of the Department of Hispanic-American Research of that Society.

The geographical structure of Peru is still inadequately known, owing to the difficulties imposed by the waterless nature of most of the coastal plain and the almost chronic rains and the labyrinth of deep and densely forest-clad valleys in the Eastern Andes. It consists of three geographical units: the coastal belt, the Andes, and the upper valleys of the Amazon. The essential structure of each of them is still imperfectly known or has been, until recently, misunderstood. The Andes form the backbone of the country and they were regarded as composed of two fold-mountain chains separated by the great basin which contains Lake Titicaca. The Western Cordillera have been found to be a high plateau, of which the surface is a peneplane cut across the folded strata; the western front is dissected by profound canyons, the irrigated floors of which include the most productive areas in Peru. Some of these valleys are continued across the coastal belt and their crops of cotton and sugar are exported from the thirty ports that occur isolated in the coastal desert. The southern coast is bordered by an ancient mountain chain which has been called by Steinmann the Chimu-Andes.

As the photographic survey was conducted by the Peruvian Naval Department, the coastal belt is naturally the best illustrated, with numerous views of the deeply indented northern coast, the guano-capped islets and peninsulas, the ports and the valleys they serve, and the dunes and deserts that sever overland communication along the coast. The peneplane of the Western Andes is graphically portrayed and there are striking photographs of the lofty extinct volcanoes that rest upon it.

The eastern valleys are relatively neglected.

The illustrations are of the riverside hamlets and the hydroplane stations on the upper tributaries of the Amazon. They show that the development of eastern Peru has made less progress than might be inferred from the ordinary maps. The volume does not illustrate the structure of the Eastern Andes, as it does that of the coastal belt. The nature of the front of the Andes above the Amazon is uncertain: it has been often regarded as a dissected fault scarp, but that view is denied by Dr. Bowman. A series of aeroplane photographs of the area might afford the easiest solution of this problem, but the few views of the Eastern Andes were selected to illustrate the settlements in the valleys and not the genetic structure of the country. The volume will be a most useful companion with current literature on Peruvian geography.

### Short Reviews.

*Contributions to Marine Biology: Lectures and Symposia given at the Hopkins Marine Station, December 20-21, 1929, at the Midwinter Meeting of the Western Society of Naturalists.* Pp. viii + 277. (Stanford University, Calif.: Stanford University Press; London: Oxford University Press, 1930.) 35s. net.

THE growth of marine stations on the Pacific coast of the United States has induced much experimental research on the biology of organisms and the nature of their environment. The Western Society of Naturalists has instituted mid-winter meetings where this is discussed, and the present volume contains 23 papers presented in 1929. They commence with a most thoughtful lecture by C. A. Kofoid on the "Evolution of the Tintinnoinea", a group of pelagic ciliates, which he has monographed. They possess an external chitinous shell, formed perhaps by both daughter cells after fission. The species in a genus are characterised by increase in size, duplication of structural features, elongation, and differentiation of surface pattern. Undigested faecal residues may be built into the shells, and there is a beautiful picture of the utilisation of coccoliths for this purpose. The known species in polar waters is 101 and in the tropics 515, which approximates to the requirements of Van't Hoff's law. It is suggested that solar radiation is the one outstanding factor capable of inciting genetic change in these animals. Another lecture was given by T. Wayland Vaughan on "The Oceanographic Point of View". Then follow 21 papers divided into oceanography, permeability, photosynthesis, early development, marine Algæ and growth.

We admire the quality and keenness of the writers, while in some cases desiring that the research had been further extended before publication. We are pleased to see researches on the living green and brown Algæ from Stanford and Seattle Universities, and a thoughtful article by A. R. Moore, in which it is claimed that cell-bridges are