

condition, then the different otolith organs the maculae of which face in different directions would give contradictory information, and a feeling of 'space-sickness' might exist. However, it has been shown by both Adrian and Lowenstein that some nerve fibres of the otolith organs do not carry impulses when the head is in certain positions. In the weightless condition, therefore, it seems improbable that any impulses would be present. Some forms of deafness are due to both middle ears being out of action. No impulses can be transmitted under these conditions, and yet no ill-effects are felt. It is therefore thought that weightlessness also would bring no ill-effects. The main function of the otolith organs is almost certainly that of adapting the body to the effects of gravity by controlling the tone of the muscles used for balancing, and causing instant adjustments of muscular tension whenever necessary.

J. HUMPHRIES

¹ Hohmann, "Die Erreichbarkeit der Himmelskörper" (Oldenbourg, Berlin, 1925).

PAN-AMERICAN INSTITUTE OF GEOGRAPHY AND HISTORY

AMONG the specialist agencies set up by the Governments of the American Republics is the Pan-American Institute of Geography and History (PAIGH). Much of the work of the Institute is carried out by the three Commissions which were set up at the fourth general assembly held at Caracas in 1946. These three Commissions deal, respectively, with cartography, geography and history.

The first meeting of the Commission on Geography or, as it has come to be called, the Pan-American Consultation on Geography, was held in Rio de Janeiro during September 1949; the second in Santiago, Chile, during October 1950; and the third in Washington, D.C., during July 25–August 4, 1952. Future plans are to hold meetings of the Commission every two years. The twenty governments which are members each send official representatives, and interested international organizations, such as Unesco, participate in an observer capacity; the Canadian Government also sends observers.

The chairman of the Consultation meeting at Washington, D.C., was Prof. Preston E. James (United States). All the proceedings were in English, Spanish or Portuguese, with simultaneous translation available for all meetings, which were held in conference rooms provided by the United States State Department. As an official gathering, attendance was limited to delegates officially appointed or special invitees.

Some indication of the wide range of subjects covered by the conference is indicated by the existence of five sections which carried on their meetings simultaneously, and which dealt, respectively, with physical geography and biogeography, human geography, regional geography, geography of the Americas, teaching and methodology.

Between Consultations the action programme of the Commission is entrusted to five permanent committees, which deal, respectively, with basic natural resources, settlement and colonization, land classification and survey of land use, geography of the Americas, and teaching and methodology.

The American republics are acutely aware of the need for a comprehensive study of their geographical

resources as a prelude to schemes of land planning and conservation of resources. Not only are land-use surveys planned and in progress in many areas, but also active steps are being taken to set up a training centre or training centres where those with a basic university training can be given the necessary instruction to enable them to take their place in the survey teams which are planned. It is proposed to set up a government-sponsored college for this purpose, probably in Rio de Janeiro.

L. DUDLEY STAMP

REACTIVITY OF PROTEIN FIBRES

DURING the annual conference of the Society of Leather Trades' Chemists, held at the University of Leeds during September 19–20, the fifth Procter Memorial Lecture was delivered by Prof. J. B. Speakman, professor of textile industries in the University of Leeds, his subject being "The Reactivity of Protein Fibres: Some Analogies between Keratin and Collagen".

After paying tribute to Prof. Procter, and those members of the staff of the Department of Leather Industries in the University of Leeds—Mr. F. C. Thompson and Prof. W. R. Atkin—who had worked with him, Prof. Speakman began to develop his comparison of keratin and collagen in terms of the amino-acid composition. Because of the close similarity in the proportions of basic and (free) carboxylic acid side-chains, close similarity in the reactions with acids and alkalis is to be expected, apart from complications due to the presence of cystine in keratin. The titration curves of the two proteins were compared and their reaction with acids discussed in detail. Prof. Speakman suggested that differences in the acid titration curves of different forms of collagen are due to neglect of differences in swelling, and to errors in the calculated amount of combined acid when no account is taken of the difference in concentration of acid inside and outside the collagen. In terms of the Donnan theory of membrane equilibrium, methods of calculating the 'true' titration curve were outlined, the 'true' curve representing the correct amounts of acid combined at different internal pH values.

Prof. Speakman next turned his attention to the action of neutral salts on keratin, potassium chloride and lithium bromide being chosen as examples of two main types. It was shown that the former causes breakdown of salt linkage through the association of potassium and chlorine ions with the oppositely charged ions of the linkage. Lithium bromide has the same effect but, in addition, causes breakdown of hydrogen bond at concentrations below about 5.8 M. Above this concentration, co-ordination with hydrophilic groups in neighbouring chains leads to some measure of cross-linking.

Close analogy between keratin and collagen is also found in the supercontraction of the former and the hydrothermal shrinkage of the latter. Although the molecular structure of keratin is more stable than that of collagen, because of cystine linkages in the former, breakdown of hydrogen bond by means of a 50 per cent solution of phenol promotes the contraction of wool fibres at high temperatures. By determining the temperature at which 20 per cent contraction occurs in 20 minutes, in accordance with