positive, in the latter negative; in these latter two, low intensities of stimulation produce enhancement, and the higher the reverse.

When the logarithmic curves are plotted it is found that they are straight lines with two abrupt changes of slope. In their previous communication, Allen and Hollenberg (*ibid.*, vol. 14, p. 351, 1924) described only two instead of three branches in the curves of the tactile sensations. Allen and Weinberg have reinvestigated this point (*ibid.*, vol. 15, p. 377, 1925), and find that the superficial pressure sense certainly conforms with the other senses in showing three branches in its logarithmic curve, and that the deep pressure sense shows a curve of similar nature, though the lowest branch is missing, probably because the apparatus used was incapable of delivering a sufficiently rapid series of air-puffs to reach the critical frequency at low air pressures. It appears, then, that the sense of pressure agrees in its general characteristics with the other three senses investigated. To obtain results with low air pressures the authors found it necessary to use a more sensitive surface than the palmar aspect of the forefinger, and so carried out their experiments on the lip.

The similarity of the results obtained in the case of the four senses of sight, touch, hearing and taste, together with the shapes of the logarithmic curves, suggests that the sensitivity of the receptive end-organs is under the control of the nervous system in each case. This sensitivity can be increased or diminished by stimulation of any of the receptors, the enhancement or depression affecting not only the receptors stimulated but also, by reflex action, the others which are at rest.

International Ornithological Congress at Copenhagen.

THE sixth International Ornithological Congress was held in Copenhagen on May 24-29, Dr. Ernst Hartert being the president. It should have taken place in Sarajevo in 1915, but, this being impossible, Copenhagen was chosen, where local ornithologists, Herr Lehn Schiöler, Prof. Wesenberg-Lund, and Mr. Bovien, the secretary, made excellent arrangements. The meetings took place in the splendid rooms of the Parliament Building (in the Christiansborg castle), kindly put at the disposal of the Congress by the Danish Government. More than 200 members were announced, but only 164 actually attended. Nearly all European countries were represented, as well as the United States of America, Argentina, Canada, Brazil, Cuba, India and Japan. Next to Denmark, Germany was by far the most strongly represented country, and 18 British members were present.

More than 50 papers had been announced of which 47 were read; time being too short to read all, those authors who were present were given preference. The lectures were divided between the general meetings and five sections: Section (1): Systematic ornithology, geographical distribution, palæontology; (2) anatomy, physiology, heredity and evolution; (3) biology, including ecology and bird-migration; (4) oology, nidification; (5) bird-protection and aviculture. These five sections were amalgamated into two or three, as there were no or only single papers on several of the subjects.

The president opened the first general meeting with an address (in German) on the progress and development of ornithology since 1910 (the last congress). In another meeting he spoke (in English) on "A Plea for More Scientific Collecting and Labelling." Other systematic papers were, among others: Stresemann (Berlin) on distribution and grouping of some African groups of birds; Heim de Balsac (Paris) on the supposed identity of *Cinclus cinclus* L. and *Cinclus cinclus aquaticus* Bechst; Lönnberg (Stockholm) on the origin of the North American fauna; Sushkin (Petrograd) on hybrids of shrikes and of thrushes, and on a peculiarity of adaptive evolution in the insular faunæ; Chapman (New York) on the biological significance of altitudinal life zones; Rensch (Berlin) on the justification of ornithological systematic principles in other branches of zoology; Neumann (Berlin) on the genus Alisterus (New Guinea parrot); Murphy (New York) on the adaptive variation of the Tubinares. Of other papers might be mentioned Lucanus (Berlin) on the mental life of birds; Gröbbels (Hamburg) on various anatomical subjects; Verwey (Utrecht) on the biology of the heron in the pairing season, and on a fulmar with feathered feet; Boas (Copenhagen) lectured on the neck of birds.

Great interest was manifested in bird migration, and a number of papers dealt with this subject, especially Götz (Stuttgart) on relations between moult and migration, Drost (Heligoland) on migrations in the winter months, Geyr von Schweppenburg (Münden) on the migrations of *Sylvia curruca* (Lesser Whitethroat), Schenk (Budapest) on the value and elaboration of dates of migration, Weigold (Hanover) on bird migration on Heligoland, Jägerskiöld (Gothenburg) on bird ringing by the Gothenburg Biological Society. Hörtling (Finland) dealt with ornithological explorations in Finland, and Fleming (Toronto) with the Arctic collections in the Canadian National Museum.

A somewhat prominent feature of the Congress were the numerous lantern slides and the wonderful films, which were shown in the large and beautiful 'Palace Theatre.' Unforgettable will be the motion pictures from the Bird Islands of Chile and Peru by Drs. Frank M. Chapman and Murphy (New York), on the development of the young of Central European birds by Heinroth (Berlin), and, last but not least, on the last evening, Bengt Berg's films from the Upper White Nile, showing the wonderful bird life in those countries, among others the masses of migrants and the *Balæniceps rex* as well as large herds of elephants, etc. Gröbbels (Hamburg) attempted to explain the physiology of the flight of birds on a film. Lectures by Meinertzhagen (London) on bird life in the Himalayas, Jespersen (Copenhagen) on the frequency of birds over the High Atlantic Ocean, Jourdain (Ditchingham) and van Oordt (Utrecht) on the bird life of Spitsbergen, Krabbe (Copenhagen) on eider-ducks and Greenland falcons, by Helms and Hörtling and others, were accompanied by excellent lantern-slide projections. Lectures by Schoenichen (Berlin) and others dealt with bird protection.

Rather amusing and interesting were the imitations of birds' notes and song by Stadler and Preiss (Nürnberg), partially by mouth and partially with the help of instruments.

Much hospitality was shown to the members of the Congress. A half-day excursion took place in chars-à-bancs over a great part of Seeland, by the ancient renaissance castles Helsingör (Elsinore) and Frederiksborg to the estate of the enthusiastic bird-lover Herr Jarl, who is protecting his park and wood as a Nature reserve. Many members listened there for the first time to the powerful song of the 'Sprosser' or northern nightingale. The Minister of Foreign Affairs invited the Congress to a sumptuous tea in the rooms of the Royal Rifle Club and adjoining gardens. The

art-mæcenas Herr Jacobsen invited the Congress to his place at the Carlsberg Brewery. In the 'theatre' the lectures of Stadler and Preiss were delivered, a sumptuous Danish supper was served in one of the rooms of the Art Gallery, and the promenade through the extensive gardens, in the light of the full moon and lit up by numerous lanterns and torches, will long remain in the memories of those present.

Another feature of great scientific interest was the visit to the collections in Herr Schiöler's hospitable house. These collections, more or less limited to the Danish possessions, including Greenland and Iceland, are a masterpiece of completeness. All birds are represented by some beautifully mounted specimens and numerous skins, as well as very large series of skeletons, and anatomical preparations. The collection is in every way as it should be, though such completeness can at present only be reached in birds from a limited area, and is the work of a lifetime. A morning was spent in the Zoological Museum of the University, where lectures and discussions took place.

Invitations for the seventh International Ornithological Congress had come from Tunis, Finland, and Holland. A small number of the members of the International Committee voted for Tunis, others for Finland, but an overwhelming majority for Holland. The general meeting of the Congress adopted, therefore, Holland, where the next Congress is to take place in 1930, in the large and comfortable new Colonial Institute in Amsterdam.

The Lister Institute of Preventive Medicine.

THE annual report which was presented by the governing body of the Lister Institute to the meeting of members held on June 9 records another year of satisfactory progress. There has been only one substantial change in staff: Dr. A. T. MacConkey, who has been in charge of the serum laboratories at Elstree for twenty years, has retired, and is succeeded by Dr. G. F. Petrie. Dr. Muriel Robertson, after several years of absence through ill-health, has returned to work and will restore the protozoological laboratory to a working department. The activities of the staff are augmented by workers maintained by the Medical Research Council, the Foot-and-Mouth Disease Research Committee, the Rockefeller Foundation, the British Empire Cancer Campaign, and others who find in the Institute the facilities and atmosphere which they need.

Under Prof. Ledingham, the bacteriological department has pursued a variety of researches. Particular notice should be made of the inquiries into the invisible viruses of smallpox, vaccinia, and foot-and-mouth disease, and of those, due chiefly to Dr. J. A. Arkwright and Mr. Bruce White, into the variation and biochemical structure of the food-poisoning and other bacteria—questions which have an important bearing on the conception and differentiation of 'species.' The systematic classification, nomenclature, and identification of bacteria, upon which all good physiological and pathological work with them ultimately depends, are cared for by the National Collection of Type Cultures, maintained at the Institute by the Medical Research Council.

The biochemical department in charge of Prof. Harden, who has also acted as director of the Institute during Prof. C. J. Martin's absence on sick leave, has been continuing its work on hexosephosphates and alcoholic fermentation and on the concentration and possible isolation of vitamins; Dr. Zilva is supervising the preparation of large supplies of concentrated lemon juice for the Antarctic whaling expedition. Dr. Robison is following up his important discoveries of the phosphoric esters in blood and tissues and their hydrolysis by specific enzymes.

The department of experimental pathology is energised by the director and Dr. Chick, and in various directions they have extended the investigations of accessory food factors for which the laboratory is now so well known. Refinements of knowledge have led to technical difficulties, and the distinction which must now be made between vitamin A (which promotes growth) and the antirachitic vitamin D has made a good deal of previous work unsatisfactory and new experiments more and more complex. Dr. Boas has made the significant discovery that dehydration, however it is carried out, makes egg-white quite unsuitable as a sole source of protein, and indeed seems to confer on it almost poisonous properties. Long and laborious observations on the nutritional qualities of cows' milk show that diet is the important factor in determining its content in vitamin A, while the amount of sunlight the animal gets is the chief thing which influences the antirachitic value of its milk.

The finances of the Institute are superficially in good order, the past year's work leaving a balance of 14,000*l.* But the position is actually far from what it should be, for of a total income of 51,000*l.* no less than 36,000*l.* was derived from diagnosis fees and the sale of sera and vaccines. The demand for these products naturally varies with the vagaries of epidemics in different parts of the world, and the precarious nature of the income so obtained must hamper the governing body in extending the activities of the Institute along lines which involve long or permanent commitments. A reduplication of Lord Iveagh's splendid benefaction is much needed.

University and Educational Intelligence.

LONDON.—The following doctorates have been conferred:—*D.Sc.* (*Applied Statistics*) on Mr. G. M. Morant (University College) for a thesis entitled "A Study of Egyptian Craniology from Prehistoric to Roman Times"; *D.Sc.* (*Biochemistry*) on Mr. J. H. Quastel (Imperial College—Royal College of Science) for a thesis entitled (1) "The Relationship of the Chemistry of Resting Bacteria towards Bacterial Growth," and (2) "A Theory of the Mechanism of Oxidations and Reductions *in vivo*"; *D.Sc.* (*Zoology*) on Mr. F. W. R. Brambell (University College) for a thesis entitled "Oogenesis of the Fowl (*Gallus bankira*)"; *D.Sc.* (*Engineering*) on Mr. E. Mallett (Imperial College—City and Guilds College) for a thesis entitled "Forced Oscillations, Electrical and Mechanical"; *D.Sc.* (*Geology*) on Mr. F. Raw for a thesis entitled "The Development of *Leptoplastus Salteri* and other Trilobites"; *D.Sc.* (*Physics*) on Dr. R. L. Smith-Rose for a thesis entitled "Some Recent Research in Wireless Direction Finding," and other papers; *D.Sc.* (*Zoology*) on Miss N. B. Eales for a thesis entitled "The Anatomy of the head of a Fœtal African Elephant," and other papers.

THE League of Nations' International Committee on Intellectual Co-operation held its eighth plenary session at Geneva on July 26–29 under the presidency of Prof. Lorentz. The British Empire was represented by Prof. Gilbert Murray and Sir J. C. Bose. Among the subjects discussed were: the means for securing profits for scientific workers in connexion with the industrial application of their discoveries, the organisation of an international system of scholarships for the promotion of science, the foundation of an international university for the training of