apologies to Gray) perhaps equal to the Franciscan in all save opportunity. And for the opportunity and the protection afforded Friar Bacon the name of Pope Clement IV deserves to be held in grateful remembrance.

In Roger Bacon we see a man of natural ability fettered by the limitations of his time, a mind struggling toward freedom but handicapped by hereditary modes of thought. We should emphasize what he attempted to do rather than that which he failed in doing. Still upon every one of us tradition, convention, circumstance, lays a restraining hand.

> Thou little child . . . . .
> Full soon thy soul shall have her earthly freight,
> And custom lie upon thee with a weight
> Heavy as frost, and deep almost as life.

PAUL R. HEYL

AMERICAN ASSOCIATION OF PHYSICAL ANTHROPOLOGISTS

THE recent meeting of Section H of the American Association for the Advancement of Science (December 29–30, 1928) has resulted in an event of much importance to the future of physical anthropology in the United States and the neighboring countries. This event was the definite organization, on this occasion, of the American Association of Physical Anthropologists.

The need of such an organization has been felt increasingly for several years. An initial proposal for its realization was made in 1924 by Hrdlička, but to some of the workers the time then did not seem to be quite ripe. Since then developments in this country in physical anthropology, in its research, personnel, publications and its prospects, have steadily advanced, and it was felt more and more clearly that, as in the history of all other branches of science, the time had arrived when an organization of the workers in this line was becoming a necessity.

In view of these conditions Hrdlička presented the whole matter once more before the well-attended meeting of Section H, in New York, and it met with a favorable reception. As a result there met, following the session of December 28, about twenty anthropologists and anatomists, and each of these individually and unreservedly expressed himself in favor of the founding of a special association for physical anthropology. There was then elected a committee of organization with power to act, composed of Drs. Fay Cooper Cole, Charles H. Danforth, George A. Dorsey, William K. Gregory, Ernest A. Hooton, Aleš Hrdlička and Robert J. Terry; and this committee, assembled after the final session of Section H, December 29, adopted unanimously the following resolutions:

> *Resolved:* I. That there should be, and hereby is, founded an organization of American and allied scientific men and women active or interested in physical anthropology, to be known as the American Association of Physical Anthropologists.
>
> II. That the general object of this organization will be the promotion, by all legitimate means, of the interests and serviceability of physical anthropology.

Thereupon all present, as constituent members of the new association, proceeded to the election of the officers; the results were: *Chairman,* Dr. Aleš Hrdlička; *secretary-treasurer,* Professor Dudley J. Morton.

In the detailed organization it was decided to follow, in the essentials, the American Anthropological Association.

It was further decided that the new association shall cooperate, to the limit of possibilities, with the American Anthropological Association, with Section H of the American Association for the Advancement of Science and with the American Association of Anatomists.

A still further basic principle of the new organization will be the fullest possible support of the *American Journal of Physical Anthropology,* which will be its official medium.

The eight initial members were then charged with the preparation of a detailed platform of the new association, the understanding being that its activities will be directed, in main, to the following objects:

(1) To the promotion of contacts, of cooperation and of service in this and other countries, with all branches of anthropology; with the anatomists and physiologists; with the biologists, and with medicine and dentistry.

(2) To the promotion, in the broadest sense, of research and publication in physical anthropology.

(3) To the promotion of sound anthropological teaching in universities, colleges, medical schools, art institutes and all other establishments of learning where such instruction, in suitable forms, would be useful.

(4) To the preparation of proper text-books, charts and other aids to anthropological instruction.

(5) To the promotion and harmonization of anthropometric instruction, and to that of standardization and production of anthropometric instruments in this country.

(6) To the extension of standard methods of measuring, with proper metric instruments, into all

colleges and other establishments where measurements of many subjects are being taken, such as institutions for children, institutions for special classes of defectives and abnormals, insurance companies and the recruiting stations of the army and navy.

(7) To the furtherance of the same methods, instruments, etc., in other countries.

(8) To the development of physical anthropology as a well-organized branch of science in order to insure its greatest practical value and educational benefits for future generations.

(9) To the popular dissemination of the results of scientific research in physical anthropology.

(10) To the furthering and assisting, in our museums, universities and colleges, of the best possible exhibits in human phylogeny, ontogeny, variation and differentiation.

(11) To the aid of advanced and worthy students to original research and field work. And,

(12) To the eventual establishment, in the most favorable location, of the "American Institute of Physical Anthropology," which would serve both as the home and library of the association, and as the center of anthropometric instruction and of dissemination of anthropological knowledge.

The association will consist of active and associate members.

The condition of active membership will be sound original work in or closely related to physical anthropology. Associate members will be all such persons from collateral sciences, or at large, who may, through sympathy with the objects of the association or a desire to benefit from its activities, wish to join its ranks; they will have the privilege to participate in the meetings of the association, without voting.

The annual membership dues, for both active and associate members, are fixed at $2.00 per year. There will also be patrons and life memberships. Applications for membership should be addressed to Professor D. J. Morton, secretary-treasurer, Department of Anatomy, College of Physicians and Surgeons, Columbia University, 630 W. 168th St., New York City.

ALEŠ HRDLIČKA
Chairman p. t. A. A. P. A.
U. S. NATIONAL MUSEUM

SPECIAL ARTICLES

CIRCUIT TRANSMISSION AND INTERFERENCE OF ACTIVATION WAVES IN LIVING TISSUES AND IN PASSIVE IRON

THE material in which the primary chemical reactions of stimulation take place in living irritable tissues, such as nerve and muscle, is evidently not in homogeneous solution; the indications are that it is situated (*e.g.*, adsorbed) at the protoplasmic phase-boundaries, *i.e.*, forms part of the thin, electrically polarizable surface-layers of the protoplasmic structures concerned. This is implied by such general facts as the universal responsiveness of these reactions to the electric current and their sensitivity to the presence of surface-active compounds (narcotics). According to the chief prevailing conception (membrane theory) of the primary stimulation process, the material in question is a component of a thin, continuous interfacial film or membrane which undergoes both chemical and structural change during stimulation. Two constant features in the response of an irritable tissue to stimulation are (1) that the reaction never remains localized but tends automatically to spread, often rapidly and to an indefinite distance, as in nerve, and (2) that the tissue is always inert and irresponsive for a brief period after excitation (refractory period). The recovery which occurs during this period is an index of the restoration of the reactive surface-layer to its original structure and composition. It is as if one had a thin sheet of explosive material which is completely broken down in each reaction ("all-or-none" behavior) and is then immediately renewed. Evidently in a system so constituted the reaction occurring at any point is temporary, and maintained activity is necessarily intermittent or rhythmical. In the muscle or nerve the state of chemical and other activity resulting from a single localized stimulation travels along the irritable element in the form of a wave. When the excitation process at any point is rapid, as in nerve, only a limited area is occupied at any instant by the reaction; this active stretch constitutes the excitation wave (contraction wave, nerve impulse); in a vertebrate motor nerve it is at most only a few centimeters in length.

If the anatomical relations are such that the excitation wave can return to its starting-point, as by passing around a continuous circular path, it may continue its motion indefinitely, provided the tissue has recovered sufficiently in the interval between successive circuits. Such circuit transmission is not normally found in the intact animal, but it can readily be obtained experimentally in certain instances. Hitherto it has been studied chiefly in circular strips of neuromuscular tissue cut from the hearts of the larger cold-blooded vertebrates and the subumbrellar tissue of medusæ. A contraction wave started in one direction in such a strip will often continue its circular motion for hours or even days. These tissues are alike in having relatively slow rates of transmis-