

not above 15 or 18 per cent. of antimony. An alloy employed for metallic packing contains Pb. 80 ; Sn. 12 ; Sb. 8.

(7) The copper-lead-antimony alloy should not contain above 10 per cent. copper. One tested alloy of good character is Cu. 10 ; Sb. 25 ; Pb. 65. It has been used successfully on railway axles.

(8) The copper-tin-lead alloys are the usual bronzes of anti-friction metal makers. The lead is probably a necessary constituent for highest efficiency. They contain from 75 to 90 per cent. copper ; 8 to 12.5 per cent. tin, and 0 to 15 per cent. lead. Fluxing with arsenic or phosphorus is usually advantageous, the amount found in such alloy averaging about 0.8 per cent.

R. H. T.

ANNUAL MEETING OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION.

THE American Psychological Association held its seventh annual meeting at Columbia University, New York City, on December 28-30, 1898. Over fifty members were in attendance at the various sessions, this being the largest number at any meeting since the organization of the Association.

Owing to the number offered, the sessions were entirely given up to the reading and discussion of papers, but the members were present at the discussion before the American Society of Naturalists in 'Advances in Methods of Teaching,' being represented in the discussion by the President of the Association, Professor Münsterberg. Many of the members also attended the reception given by Professor and Mrs. Henry F. Osborn to the Affiliated Societies on Wednesday evening, and were present at the dinner of the Societies at the Hotel Savoy on Thursday evening. At the business meeting Professor John Dewey, of the University of Chicago, was elected President for the ensuing year ; Dr. Livingston Farrand, of Columbia University, Secretary and

Treasurer ; and Professors J. McK. Cattell, of Columbia University, and H. N. Gardiner, of Smith College, members of the Council.

Besides other business transacted, there was appointed, on motion of Professor J. M. Baldwin, a Standing Committee of Psychological and Philosophical Terminology, consisting of Professors Münsterberg, Cattell, Sanford, Creighton, Royce, Minot and Baldwin. The duties of this committee are to recommend from time to time new terms and choice of alternative terms in psychology and philosophy ; to recommend foreign equivalents for translation both into English and into foreign languages, and to keep the Association informed as to the growth of terminology in other departments, especially in neurology.

Professor J. McK. Cattell, Chairman of the Committee on Physical and Mental Tests, reported on the work of the Committee during the year and described the progress in this field in the different laboratories.

Professor Münsterberg, who presided at the meeting read his presidential address on Wednesday afternoon, taking as his subject 'Psychology and History.' Professor Münsterberg argued that the psychological and historical views of human life are necessarily in conflict ; for the one the personality is a complex of elements and causally determined ; for the other it is a unity and free. He held that claims of recent writers that psychology and history are two coordinated ways of dealing with the same problem are untenable ; that the difference between the two is not methodological, but ontological. The materials are different. The material of psychology consists of objects which as such can be described and explained ; the material of history consists of subjective will acts which can merely be interpreted and appreciated. Our interest in the two is different. The investigation

of the material of history brings us to a teleological system in which every will act is linked with every other will act and the general fact is not a causal law but a will relation.

The subject of the 'discussion' which followed the address of the President was 'The Relations of Will to Belief.' Professors James and Miller, who were to have taken part, were unavoidably detained from the meeting, and the discussion was carried on by Professors Ladd, Hibben, Caldwell and Armstrong. The first three speakers presented their views on the question, especial reference being paid to Professor James' essay, 'The Will to Believe,' while Professor Armstrong closed the debate with a historical summary of the subject.

Of the regular meetings of the Association for the reading of papers the first was on Wednesday morning and was opened by Mr. E. A. Kirkpatrick on 'The Development of Voluntary Movement.' After describing the case of a young child upon which he based his views, the speaker argued that movements, such as walking, that seem to be learned are in reality largely inherited, and that other nervous and muscular connections are less a matter of experience than is usually thought.

Professor E. B. Delabarre reported certain experiments made upon himself with *Cannabis Indica*, and attributed the effects to the hyperexcitability of the nervous system induced by the drug. There was a gradual increase in sensory, intellectual, emotional and motor activity, lasting about half the total duration of the main influence, and followed by a gradual decrease to normal or below.

Professor George T. Ladd read a paper in which he held that psychology was not making the progress in this country which might reasonably be expected, and held that the hindrances are, in part at least, matters of *personnel* in the body of professional

psychologists. The particular hindrances mentioned by Professor Ladd were, in brief, the excessive scholastic spirit among psychologists and the consequent ignorance of the mental life of the great body of the people, the great number of publications by authors of insufficient training, the injury done to the science in the eyes of the laity by methods of discussion and controversy, the invasion of the commercial spirit and the maintenance of an improper attitude toward the other most closely allied sciences.

In a paper on 'Reason a Mode of Instinct,' Mr. Henry Rutgers Marshall argued that the objective mark of an instinct is that it determines in an organism typical reactions of biological significance to the organism; that opposition to instinct exhibits itself in variation from typical reaction, and is indicated by hesitancy and then choice. Reason is the psychic coincident of the physical process antecedent to choice. Variation and reasoning both appear as reactions of a part of a complex physical and psychical system. Variation is statable in terms of instinct, and hence reason itself must be looked upon as a mode of instinct, the observed opposition between the two being due to the complexity of the organic connections of the phenomena.

Professor Wesley Mills spoke on 'Animal Intelligence and Methods of Investigation,' emphasizing the importance of normal conditions in experimenting with lower animals, and objecting to the recent work of Dr. E. L. Thorndike, on the ground that he had violated this fundamental principle. The speaker further argued in general for greater caution in drawing conclusions from observations on animals.

Professor Mary Whiton Calkins read a technical paper on 'Psychological Classification,' dealing particularly with the attributes of sensation.

On Thursday morning, December 29th, the members of the American Physiological

Society who were meeting in New York were invited to hold a joint session with the Psychologists in the Psychological Laboratory in Schermerhorn Hall, for the reading, by members of both societies, of papers which might have a common interest. This joint meeting was successfully carried out, with President Chittenden, of the Physiologists, in the chair. Professor J. McK. Cattell opened the session with an exhibition of certain new instruments of his own designing, for the study of movement and fatigue, and a brief description of certain researches now in progress in the psychological laboratory at Columbia. Among other instruments was a spring ergometer, intended to replace the Mosso ergograph, and a dynamometer, in which the pressures are continually added and counted, making the study of muscular fatigue and the effect of mental conditions on fatigue possible without elaborate apparatus.

The other psychological papers presented at this session were by Professors Münsterberg, Patrick and Scripture. Professor Münsterberg spoke on the 'Physiological Basis of Mental Life,' pointing out certain fundamental objections to current physiological theories of brain processes, and suggesting several modifications which would account for more of the factors in psychophysiological activity than is now the case.

Professor G. T. W. Patrick reported experiments on tastes and odors made in the laboratory of the University of Iowa upon a subject with complete congenital anosmia. Among other conclusions he drew the following: That what commonly passes for taste sensations, so far as their discriminative or intellectual value is concerned, is the composite result of the mingling of sensations of smell, touch, temperature, sight and taste; the latter, however, playing little or no part in the discrimination of our common foods and drinks. Taste sensations

furnish rather the emotional element in the total conscious effect.

Dr. E. W. Scripture gave a lantern exhibition of his methods of demonstrating the physiology and psychology of color, and by special invitation Professor Ogden N. Rood, of Columbia University, demonstrated his 'Flicker Photometer.'

Physiological papers were read by Professor F. S. Lee on 'The Nature of Muscle Fatigue,' by Professor G. C. Huber on the 'Innervation of the Intracranial Vessels,' by Professor C. F. Hodge on 'Possible Amœboid Movements of the Dendritic Processes of Cortical Nerve-cells' and by Professor G. W. Fitz on 'A New Chronoscope.'

At the meeting on Friday morning Mr. J. E. Lough reported experiments made at Wellesley College, on the changes in rate of respiration during mental activity started by visual stimuli. There was in every case an increase in the rate during stimulation and a return to the normal afterward, the amount of the increase produced by a given stimulus corresponding in a general way to the degree of mental activity produced.

Dr. Robert MacDougall described researches now in progress in the laboratory at Harvard, and Dr. E. W. Scripture reported the work at Yale. Among other investigations Dr. Scripture reported interesting results from passing alternating currents of high frequency through the human body, producing practical anæsthesia and analgesia to touch and cold, though apparently not to heat. The speaker called attention to the possible value of this method in producing analgesia for surgical purposes. Dr. J. P. Hylan gave an account of the work in the laboratory of the University of Illinois, and was followed by Dr. G. V. Dearborn, who described experiments on recognition under objective reversal, using chance blots of ink on white cards, arranged in series of ten and reversed in each of the four quadrants and in the mirror, and

always in a plane at right angles to the visual axis. He found that an object is recognized more readily when inverted than when in either of the two intermediate positions, and more readily also than in the erect mirror reversal or in that position inverted.

Dr. Arthur MacDonald reported further measurements of pain and gave tables and results. Two purely philosophical papers were presented, one by Professor W. A. Hammond on the theory of the will in Aristotle's Ethics, and the other by Professor W. G. Everett on 'Ethical Scepticism.' These papers closed the morning session. In the afternoon Professor W. Caldwell read an appreciative criticism of Professor J. Mark Baldwin's recent work on Social and Ethical Interpretation. A paper on the genetic determination of the self, which had been announced by Professor Baldwin, he was forced to abandon on account of illness.

In a 'Study of Geometrical Illusions,' Professor Charles H. Judd upheld the thesis that the underestimation of acute angles and overestimation of obtuse angles, which is a common feature of many illusions, is not a fundamental fact, but is to be explained as due to the false estimation of the length of the sides of the angles.

Professor Margaret F. Washburn spoke on 'Subjective Colors and the After Image,' and Professor Ladd closed the meeting with a description of a new color illusion.

LIVINGSTON FARRAND.

SCIENTIFIC BOOKS.

The New Maryland Geological Survey. Volume I., 1897. Volume II., 1898. Johns Hopkins Press.

The plan and the organization of the Maryland Geological Survey are set forth in the introduction to the first volume of the reports. In many respects they present admirable examples of common sense in scientific work. The business of a State Survey, if successful,

must be conducted so that it nets the people a fair return for their money. It may neither soar to abstruse and doubtfully profitable speculation nor sink to politics for spoils only. Failing to avoid one or the other unbusiness-like extreme, many State Surveys have died. The Maryland Survey appears to have struck a course between Scylla and Charybdis.

According to the organic law the name is the State Geological and Economic Survey. The control is in the hands of a commission, consisting of the Governor and Comptroller of the State and the presidents of two principal educational institutions—of Johns Hopkins University and the Maryland Agricultural College. The commissioners shall appoint as superintendent a geologist of established reputation, who shall nominate for appointment by them such assistants as they deem necessary; and they shall determine compensation of employees and may remove them. The objects of the Survey are defined in six articles, of which three relate to appropriate investigations having practical bearing, two give authority to publish maps and reports, and the sixth confers special authority to consider 'such other scientific and economic questions as in the judgment of the commissioners shall be deemed of value to the people of the State.' Among other sections is one appropriating \$10,000 per annum for the purpose of executing the provisions of the act. This section must be repealed before the appropriations for the support of the Survey can cease.

By this law a board of commissioners, which is equally divided between the educational and executive or political leaders of the State, is given unrestricted authority to carry on appropriate observations for the benefit of the people. The scope is unlimited, their power is absolute, their responsibility is direct.

The Commission organized the Survey to insure practical and thorough work. Professor Wm. B. Clark, of Johns Hopkins, was appointed State Geologist. It was resolved that there should be no salaried officers, all services to be paid at per diem rates for the time employed.

The scope of the Survey was determined to be economic and educational. The economic character was sufficiently prescribed by the law;