also applies the motor theory to explain certain of the phenomena which have interested the Gestalt psychologists.[59]

Professor M. Ponzo has expressed his general view in the statement that there is not only a concomitance of motor phenomena and mental states, but an invariable participation of motor response in all forms of mental activity.[60] He has described the rôle of response in his account of the experimental work of the Turin laboratory. Several of his examples are the following: Illusions of size of objects occur through changes in the motor response;[61] we understand better what is said by internal repetition or murmur of the words,[62] an observation which was also made some time previously by O. Jespersen;[63] each individual expresses himself in motor terms in a fashion as characteristic as are certain of his anatomical features.[64]

Finally, we have a successful attempt by Dr. E. Jacobson to detect directly the muscular response during mental activity by means of the action potentials. He found that the action patterns during silent thought correspond to those obtained when the words were actually spoken. He concludes that "during imagination, recollection and concrete or abstract thinking involving words or numbers, muscular contractions characteristically appear as specific components of the physiologic process of mental activity."[65]

We have seen from this brief historical sketch that the rôle of motor response in consciousness has been emphasized by many thinkers throughout the centuries, either directly or by suggestion through the reference to kinesthesis. Much of the discussion has been theoretical, or at best what Titchener after Brentano has termed empirical, but this is true of most of the fundamental theories of psychology until the nineteenth century. Since then a number of experiments have yielded results which seem to support the theory. It is fair to predict that in the future there will be less theorizing and more research of a nature similar to that of Jacobson. The theory itself must wait upon further experimental findings for its development and more precise refinement.

# OBITUARY

## JOHN BELLING

JOHN BELLING died on February 28, 1933, in San Francisco. He was born at Aldershot, England, on October 7, 1866, and taught in private and public schools in England, taking instruction meanwhile at London and Birmingham. In the university at the former place he received the degree of bachelor of science. In later life he was given the honorary degree of doctor of science by the University of Maine in 1922.

He lectured in the Horticultural College at Swanley, England, and later at Llandidloes, Wales, in 1900–01. Shortly after this he migrated to the British West Indies, where he became investigator in the Department of Agriculture. In 1907 he came to the Florida Experiment Station as assistant botanist and published important researches there on hybrid beans.

Shortly after the war he came to the Carnegie Institution of Washington as cytologist in the department of genetics, and was associated with Dr. A. F. Blakeslee in the investigation of the chromosomes of Datura. Here his genius in microscopy and his philosophic insight opened up a new field in the study of the behavior of chromosomes and in the interchange of segments between non-homologous chromosomes. Belling was subject to periods of depression during which he did some of his most brilliant work. Believing that it was important for him to have a change of scene he was transferred by the institution to Berkeley, California, where he worked in a corner of Professor E. B. Babcock's laboratory, continuing his fundamental researches on the structure of chromosomes in hyacinths and various lilies. In these investigations, under superlative technique, he believed he was able to see structures, which on account of their number and size, he identified with genes.

Belling was the author of a book on the use of the microscope, which has been eminently successful. A book on the study of the chromosomes has been written, but not published. After the sixth International Congress of Genetics, held in Ithaca last summer, a number of foreign delegates traveled to Berkeley to examine Belling's preparations showing the structure of the chromosomes, and to discuss with him his interpretations of them.

He married Miss Hannah Sewall, who died in 1926

[59] F. M. Gregg, "Materializing the Ghost of Köhler's Gestalt Psychology," *Psychol. Rev.*, 39, 257–270, 1932.

[60] M. Ponzo, "Principes et Facteurs du Dynamism psychologie dans les Recherches de l'Ecole de Psychologie de Turin," *Jour. de Psychol.*, 27, p. 617, 1930.

[61] *Ibid.*, p. 630.

[62] *Ibid.*, p. 624.

[63] O. Jespersen, "Lehrbuch der Phonetik," p. 6, 2te aufl., Leipzig, Tuebner, 1913.

[64] M. Ponzo, *loc. cit.*, p. 641.

[65] E. Jacobson, "Electrical Measurements of Neuromuscular States during Mental Activities," vii, "Imagination, Recollection and Abstract Thinking Involving the Speech Musculature," *Amer. Jour. Physiol.*, 97, p. 209, 1931.

without issue. He is survived by a brother, James Belling, of Cornwall, England.

CHARLES B. DAVENPORT

## RECENT DEATHS

EDWARD BRUCE WILLIAMSON, research associate in the Museum of Zoology, University of Michigan, died on February 28, at the age of fifty-five years.

DR. H. GREGG SMITH, associate in biochemistry at the State University of Iowa, died on February 26. He was thirty-four years old.

NATURE reports the deaths of Professor Johan van Baren, an authority on soil mineralogy, professor of geology and mineralogy in the Agricultural University of Wageningen, Holland, on February 7, aged fifty-seven years, and of Lieutenant-Colonel J. C. G. Kunhardt, formerly of the Indian Medical Service, who did valuable work on plague prevention in India and also in the advancement of the rubber industry, at the age of fifty-seven years.

# SCIENTIFIC EVENTS

## THE FACULTY OF MEDICINE OF PARIS

A CORRESPONDENT of the *Journal* of the American Medical Association writes that the Faculty of Medicine of Paris, having often complained of its cramped quarters, which in view of the constantly increasing number of students have became inadequate, received from the Rockefeller Foundation the offer of a gift of $6,000,000 for new buildings for the faculty of medicine, on condition that the French government furnish an equal sum. It was impossible to erect the new buildings on the present site along the Boulevard St. Germain, in the center of Paris, where real estate commands an enormous price. When a different site was sought, consideration was given to the site occupied by the Halle-aux-vins, on the bank of the Seine farther to the east. The Halle-aux-vins in that case would have been moved outside the city. The wine merchants refused to move. Attention was then given to a large unoccupied area south of the city, which was being used for a military aviation school. The suggestion of this site brought protests from the professors, students, medical libraries and the dealers in surgical instruments that had been grouped for centuries about the present buildings. This site was several miles away from the principal teaching hospitals. Attention was then given to a tract occupied by the Ste. Anne psychopathic hospital, located to the south in the vicinity of the University City. It was not long before protests were heard. Professors think the location is still too remote, and their opinion is shared by the merchants. Furthermore, it would be necessary to rebuild a much larger psychopathic hospital elsewhere; for it is now inadequate, owing to the increasing number of insane persons. The council of the faculty of medicine, according to the correspondent, is placed in an embarrassing position by the gift of the Rockefeller Foundation, especially in view of the state of the French treasury. The present buildings of the faculty of medicine are only fifty years old, and it would suffice to add further stories or erect annexes. In short, the council appears disposed to postpone until more propitious times the realization of the generous proposal of the great American philanthropist. Attention has been called also to the fact that the magnificent university buildings erected with the same aid but located too far from the center of the city are already revealing grave disadvantages by reason of their remoteness. The students are attending their lectures less regularly on account of the time required to go to and fro.

## REVISION OF THE INTERNATIONAL ELECTRICAL UNITS

THE Bureau of Standards reports that the third biennial meeting of the advisory committee on electricity and photometry established by the International Committee on Weights and Measures opened on January 31 at the International Bureau of Weights and Measures, at Sevres, near Paris.

The international committee has undertaken to revise the present international electrical units. It proposes to base the units directly upon absolute measurements in the electromagnetic centimeter-gram-second system, instead of defining them by means of the mercury-ohm tube and the silver voltameter. Redeterminations of the ohm and ampère by absolute measurements are in progress in several national standardizing laboratories, including the Bureau of Standards; at the meeting at which the bureau was represented by E. C. Crittenden, chief of the Electrical Division, plans were made for comparing the results found in different countries and for furnishing to all countries standards based upon the combined results.

The international committee likewise hopes to establish uniform units and standards throughout the world for the measurement of light. In this attempt it is collaborating with the International Commission on Illumination. A special committee on units and standards appointed by the latter commission, and consisting of representatives of France, Germany, Great Britain, Japan, the Netherlands and the United States, met in Paris on January 30 to prepare recom-