fifty years, dwelling particularly on the work accomplished by Leidy, Goddard, Neill, Hyrtl and Gibbons Hunt before the recent improvements in methods and instruments were heard of. The communication was illustrated by a large number of instruments and slides and was fully discussed by Messrs. Goldsmith, Keeley, Calvert and Dixon.

Papers under the following titles have recently been presented for publication:

Some Cuban Species of *Cerion*. By H. A. Pilsbry and E. G. Vanatta.

Notes on the Growth of the Hobble-bush, *Viburnum lantanoides*. By Ida A. Keller.

The Occurrence of Marcasite in the Raritan Formation. By S. H. Hamilton.

Margarita Sharpii, a new Alaskan Gastropod. By H. A. Pilsbry.

The Bone-Cave at Port Kennedy, Pennsylvania, and its partial examination in 1894, 1895 and 1896. By Henry C. Mercer.

Observations on the Classification of Birds. By Dr. R. W. Shufeldt.

A Study of the Type Specimens of Birds in the Collection of the Academy, with a brief history of the Collection. By Witmer Stone.

Mr. Mercer's paper will be published in the *Journal* of the Academy, the others in the *Proceedings*.

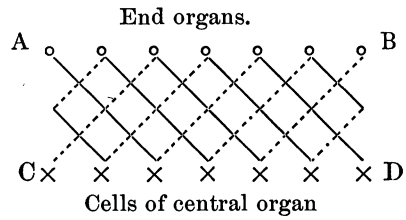
E. J. Nolan,
Secretary.

DISCUSSION AND CORRESPONDENCE.

THE SENSATION OF MOTION AND ITS REVERSAL.

To the Editor of Science: The writer has for a number of years noticed, during railway journeys, a very peculiar reversal of sensations of motion received through the eye, of which he has never seen any description or explanation. The following description and explanation may, therefore, interest the readers of Science. A sensation of reversed motion of stationary points in the field of vision is perceived by the writer after gazing fixedly out of a car window at a moving landscape. This sensation is quite intense when the eyes are first turned away from the window, dies away gradually, and is greatly weakened by attentive vision. For example, when looking out of the rear door of the train the various objects in the visual field appear to move towards the center of the field, and upon turning the eyes upon an object in the car everything seems to move away from the center of the visual field; if the train comes to a quick stop while the eyes gaze steadily out at a window the motion of the landscape and the inferred motion of the train appears to be momentarily reversed at stopping, etc.

The existence of this sensation of motion of stationary objects seems to indicate that neither the succession of stimuli nor the stimulation of successive nerve elements is the fundamental fact in the sensation of motion, but rather that the sensation of motion, like other specific sensations, depends upon a *state* of nervous commotion, a state which has, of course, resulted from and is the integral effect of a succession of stimuli. A concrete notion of the character of this state of nervous commotion is as follows:



Let the dots A B represent the end organs of sight—rods and cones—and the crosses C D the nerve cells of the central organ. We may imagine each end organ to be connected, either directly or through ganglion cells, with a number of the cells of the central organ. Let us consider the connections indicated by the diagonal full lines and dotted lines. A succession of stimuli of the end organs from A to B and a succession from B to A would result in radically different states of nervous commotion, especially if the cross connections are not entirely symmetrical or if the connecting nerve fibers are loaded with ganglion cells. Also during a succession of stimuli from A to B the fibers represented by the full lines might be fatigued, while the ones indicated by the dotted lines might be saved by inhibition due to the (outgoing) commotion to which they are subjected in advance of the moving stimulus, so that the effects of this moving stimulus reach

the central organs mainly through the full-line connections. A simultaneous stimulus of all the end organ from A to B would then reach the central organ mainly through the dotted connections just as would a stimulus moving from B to A.

W. S. FRANKLIN.

OCCURRENCE OF THE VIRGINIA OPOSSUM IN SOUTHERN CENTRAL NEW YORK.

DURING the present year several Virginia opossums (*Didelphis virginiana*) have been killed near Owego, Tioga Co., N.Y. Some twelve years ago a farmer residing near here told me he had killed one. Last fall a large female was killed on a mountain side two miles east of this village, and while myself hunting a mile farther east, on December 3d, I met a hunter who had just caught two. He had tracked them a mile or so through the snow, and finally dug them out of a woodchuck's hole. They were both dead when found, probably having starved, as their stomachs were empty. Their skulls are in my possession. Several days later he secured another, an old one, the sex I do not know. It was taken four miles west of where the two young ones were captured. The animal is alive and in his possession. This man is an old-time hunter and trapper, and considered truthful. He told me he had seen their tracks several times before. I have failed to learn of anyone who has liberated a pair of these animals or even had a pair in captivity. The capture of two, early in the fall, has come to me, but I cannot say if it is authentic.

I wish particularly to note that this record comes from Owego, N. Y., not Oswego, two widely separated places.

J. ALDEN LORING.

OWEGO, N. Y.

NOTES ON INORGANIC CHEMISTRY.

THE December number of the *Journal of the American Chemical Society* contains an extended review of the year's progress in applied chemistry by Dr. Wm. McMurtrie. Development along these lines is going on more rapidly than ever before, and it is encouraging to note that this country is taking its place as an important factor in chemical technology. While Germany will long hold the first place in those industries in which chemistry plays an important part, America has already become an important factor, especially in the field of electro-chemistry, and it requires little effort of the imagination to see, in the not-far-distant future, the supremacy crossing the water. Dr. McMurtrie's review is well worth careful perusal by the economist as well as the chemist. Only a few points can be noticed in this column. In Germany, at the close of 1896, 96 chemical works, with $64,000,000 capital, gave a return of nearly $8,000,000, an average of 12.3% as against 8.9% for 1897. Of these the coal-tar industries gave the highest returns, 24%, while the fertilizer industries gave the lowest. An interesting announcement has been made by Dupre that gold can be extracted from ores by an inexpensive solution containing sodium thiosulfate, ferric halids, with an acetate. The solution extracts fifteen to twenty times as much gold as a cyanid solution in the same time, and does not attack sulfids; hence, if the success of the process is confirmed, it may be expected to replace the cyanid and chlorination processes for low-grade and sulfid ores. Great progress has been made in the metallurgy of zinc, and there is every reason to believe that within a few years the old and unsatisfactory process will be entirely displaced, except for very pure ores. The use of the electric furnace is revolutionizing the preparation of phosphorus, and with the increased production in France and Russia, and prospective developments in Germany and at Niagara Falls, the English monopoly is seriously threatened. The advantages of the new processes are both the reduction of price and the increased protection of the health of the operatives. The electrolytic alkali industry is still in an experimental stage, but with the certainty of future success, indeed, it may be said that the great question to-day is the selection and development of the *best* electrolytic method. Already in the manufacture of potassium chlorate the electrolytic methods have taken the lead, with a consequent marked fall in price. The commercial production of liquid air and of oxygen on a large scale will render possible many new developments along many lines. The production of calcium carbid