that "the" South and "the" North are no concepts of medical science.

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A CRITICISM OF THE ARTICLE "ENZYMES, VITAMINS AND THE ZONE OF MAXIMUM COLLOIDALITY"

I FEEL obliged to write in protest against the article, "Enzymes, Vitamins and the Zone of Maximum Colloidality,"[1] by Dr. Jerome Alexander, published in SCIENCE last summer. The article discloses a lack of familiarity with enzymes. Alexander speaks of the possibility of decrease of enzyme activity through too great a degree of aggregation and then says: "On the other hand, too great a degree of dispersion of the enzyme might lead to a particulate kinetic activity so intense that the number of *successful* encounters between enzyme and reactants would be reduced to the level of inefficiency." This is an improbable supposition which has no experimental evidence to support it.

Alexander says that his views regarding the necessity for a maximum zone of colloidality for an enzyme are confirmed by an experiment where pepsin coagulates a suspension of denatured egg-white and where the coagulum is dispersed by adding hydrochloric acid. Here it seems to me that there is no connection between hypothesis and experiment.

He states: "Recent work of Professors Richard Kuhn, Otto Warburg and their collaborators indicates that the newly isolated water-soluble lyochromes, the flavines, which apparently constitute vitamin B_2, exhibit enzymic activity when brought into the colloidal state, presumably by fixation on a colloidal carrier." At the time of publication of Alexander's paper an *in vitro* formation of the yellow oxidation enzyme had not been demonstrated. Shortly afterward appeared a paper by Theorell[2] describing the crystallization of the enzyme, its inactivation through splitting into its pigment and protein components and its partial reformation upon adding the pigment to the protein.

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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

MINUTES OF THE EXECUTIVE COMMITTEE

THE meeting of the executive committee was held in the office of The Science Press, Grand Central Terminal, New York City, on October 21, 1934, with the following members present: Drs. Cattell, Compton, Conklin, Curtiss, Fox, Livingston, Thorndike, Ward, Wilson and Woods. Dr. Hildebrand was excused for absence.

(1) The minutes of the last meeting, held at Berkeley in June, had been approved by mail.

(2) The financial report of the treasurer was discussed, accepted and ordered audited.

(3) The executive committee expressed its appreciation of the valuable services rendered by the treasurer.

(4) The treasurer's budget was approved as adjusted.

(5) The permanent secretary's financial report was discussed, accepted and ordered audited.

(6) The budget of the permanent secretary's office was approved.

(7) The budget for the Pittsburgh exhibition, prepared by the director of exhibits, was approved.

(8) The permanent secretary's office was authorized to sell surplus copies of the 1929–1934 Summarized Proceedings volume to non-members at $4 per copy in paper cover, and $5 in cloth binding.

(9) The executive committee voted to express to the executive assistant its appreciation for the fine work done on the volume of Summarized Proceedings just issued.

(10) The permanent secretary reported on his conference with the local committee for the forthcoming Minneapolis meeting. The dates of June 24 to 29, 1935, were approved as suggested by the local committee. A Maiben lecture was authorized to be given by a prominent worker in medicine, if feasible. Other topics were suggested for general addresses. The permanent secretary announced that the Minnesota Medical Society would meet in connection with the association at Minneapolis, from June 24 to 26.

(11) The dates of the St. Louis meeting were fixed for December 30, 1935, to January 4, 1936.

(12) The quadrennial convocation of 1936 was definitely scheduled for Washington, D. C.

(13) A brief report was presented on meetings to be held at Rochester (June, 1936), Denver (June, 1937) and Indianapolis (December, 1937).

(14) The permanent secretary was authorized to investigate the matter of extending the list of future meeting places to include 1940. The committee favored especially a summer meeting for 1938 in Canada and the following winter meeting in a southeastern city. This item was made a special order for the Pittsburgh meeting.

(15) The executive committee reaffirmed the recom-

[1] Jerome Alexander, SCIENCE, 80: 79, 1934.

[2] Hugo Theorell, *Biochem. Zeit.*, 272: 155, 1934.

mendation made at the Berkeley meeting that the council adopt the following amendment to the constitution, which was also considered favorably by the council at Berkeley: In Article 2, line 4, omit the words, "The admission fee for members is five dollars; the annual dues are five dollars," and add in their place, "The Council shall fix the admission fees and dues."

(16) A report from the committee on source books in science was read and accepted.

(17) The permanent secretary reported progress for the committee on grants, but no action was taken.

(18) It was recommended to the council that $3,000 for grants be appropriated from treasurer's funds available for appropriation.

(19) A brief report of progress from the committee on adult education was read and accepted.

(20) The permanent secretary presented a report on recent publications of the association, namely, the book on "Nationalism" and the two Occasional Publications issued this year.

(21) A statement from Dr. Duren J. H. Ward summarizing the organization of the Far Reaching Foundation was accepted for record. The permanent secretary was requested to correspond with the secretary of the special committee appointed in 1931, requesting it to continue its work.

(22) Dr. W. A. Noyes was appointed the association's representative in the division of foreign relations of the National Research Council.

(23) A special committee was appointed to study the problems of organization recently raised and to report to the executive committee and council at the Pittsburgh meeting. The chairman appointed as members of the committee Drs. Caldwell (*chairman*), Cattell, Compton, Livingston and Ward.

(24) The committee adjourned to meet in Pittsburgh at 8 P. M., on Wednesday, December 26, 1934, following the committee dinner at 7 o'clock at the Hotel Schenley.

HENRY B. WARD,
Permanent Secretary

SCIENTIFIC APPARATUS AND LABORATORY METHODS

SIMULTANEOUS RECORDS OF EYE-MOVEMENTS AND THE VOICE IN ORAL READING

ALTHOUGH silent reading and oral reading are recognized as being essentially different processes, many clinicians in this field make frequent use of oral reading as a diagnostic tool in the treatment of poor silent reading. Also, recent studies have shown that poor silent readers are also inferior in oral reading and make essentially the same kinds of errors in both silent and oral reading.[1] Phonograph recordings of oral reading show definitely the frequency and nature of these errors, but they fail to indicate how the errors are related to the sensory processes of vision employed in reading. One important phase of these sensory processes is eye-movements. Accordingly, it seems that an apparatus which will record eye-movements and speech simultaneously will make it possible to examine the validity of the former as a diagnostic tool in reading difficulties from an entirely new angle, *i.e.*, in the light of the errors actually made by the reader.

The technique proposed consists of three parts: (a) a standard eye-movement camera,[2] (b) a commercial cutter for recording aluminum disk phonograph records and (c) an oscillograph which photographs the sound wave from the voice on the film which receives the eye-movement record. The oscillograph used for this purpose is a Dorsey Phonelescope[3] with the diaphragm activated by a standard headphone. Although the phonelescope does not record wave-form accurately, it is inexpensive and durable and is thus ideal for the present purpose, where it is desired only to locate the various words and syllables. The reader's voice is picked up by means of a ribbon microphone, amplified and sent into the electrical phonelescope. The ribbon microphone is very suitable in this set-up because it is directional in its sensitivity and this makes it possible to eliminate most of the noise of the eye-movement camera.

A record taken on the apparatus assembled as described is shown in Fig. 1. The letters A, B and C indicate the points on the film at which the eyes begin new lines of print. The numbers 1, 2, 3, etc., show the saccadic movements of the eyes in moving across the page. The small letters a, b and c indicate the beginning of vocalization of the lines which correspond respectively to points A, B and C on the eye-movement record. It will be noticed in this sample passage that the eyes are preceding the voice by approximately one second as well as by two or three saccadic movements. The amount of this "eye-lead," as it might be called, seem to be a definite and constant reading habit and is probably functionally

[1] By "oral reading" is meant vocalizing to oneself rather than reading interpretatively, as if to some one else. The vocalization is simply an exaggeration of the ordinary subvocal speech which is frequently, if not always, present in silent reading.

[2] H. H. Jasper and R. Y. Walker, "The Iowa Eye-movement Camera," SCIENCE, 74: 291–294, 1931.

[3] Sold by C. H. Stoelting, Chicago, Ill.