COMMUNICATIONS AND DISCUSSIONS.

THE RELATION OF BREATHING TO ORAL READING.

Some of the recent investigations in reading, such as Dearborn's work in eye movements, have emphasized the physiological side of the subject. The view held by such investigators is that the reading activity is a highly specialized habit, and that any scientific study of the habit requires, first, a careful analysis of the habitual activity into its elements, and second, a very careful study of these elements.

If reading is viewed from this standpoint, one phase of it which stands out prominently is, as stated in the title, the relation between breathing and oral reading. More specifically our problem is concerned with the difficulties which children have in adjusting their breathing to oral reading and the effect of daily practice upon this adjustment. The relation of this problem to the growth and development of the child is also of much importance. The effect of the training given by teachers of music or elocution is also of interest to us.

The apparatus used in the present investigation was a kymograph, which carried the smoked paper on which the record was made, and a simple form of the pneumograph, which was placed upon the upper part of the chest and connected by means of a rubber tube to a Marey tambour, the needle of which traced the record on the smoked paper. A time line was procured by means of a Jacquet chronometer.

Fifty subjects were used in the experiment. These were university men and women, as well as children from the third to seventh grades, inclusive. The work stopped with the third grade on account of the difficulty in getting children of the primary grades to come to the laboratory, since the distance was so great. No records were taken above the seventh grade, because as the schools are organized here the eighth grade is a part of the high school. Further work in the study will take up the high school phase of the subject.

The reading matter was the same for all the men. In this case a page from Bagley's *Educative Process* was used. The material for the women was a page from a standard magazine, and was the same for all. For the children the material was selected from the Baldwin series of readers. This was different for each grade, but was the same for the boys and girls of a given grade.

In taking the records very few of the men and women knew any-

thing of the experiment except that it was a test in reading. The apparatus was found to be a disturbing element for many of the children, so that it was thought best to make some explanation of it to them. All subjects stood with the back to the apparatus, so that the amount of attention given to it was reduced to a minimum. Caution was given in all cases that the reading should be done in a natural manner.

Some Tentative Conclusions.

There is a decided sex difference. The girls' curves show much more regularity than those of the boys. This is true when each curve is examined by itself or when those for different individuals are compared. The men's curves are much more regular than those of the women. It can be said that the curves for the men and girls are much alike in their regularity, and that the curves for the boys and women are much alike in their irregularity.

There is a decided improvement for the boys from the third to the seventh grade, although the improvement is more noticeable from the third to the fifth than from the fifth to the seventh. The height of the curves increases gradually.

The curves for the girls are decidedly regular until the seventh grade, when there is a break which evidently foretells the great irregularities found in the curves of the women. The height of these curves increases very much at the fifth grade.

The length of the reading period (time between breaths) is not usually more than four or five seconds, and in many cases it is less. This time can be increased to nine or ten seconds, as is shown by the curves of those who have had considerable training in public speaking.

Some curves show that the subjects are abdominal breathers. This is the type of breathing insisted upon by teachers of elocution and vocal music, and children who have this co-ordination already established have thus a distinct advantage over those who have not.

Some Tentative Suggestions for the Teaching of Reading.

This work indicates a kind of co-ordination which children must acquire in their reading, and it certainly should be taken into account by teachers of the subject.

Girls are in many cases better readers than boys. This has usually been thought due to indifference on the part of the boys, but the sug-

gestion here given is that the boys do not have certain co-ordinations of the respiratory organs which are essential for good reading. This suggestion will apply equally well in the teaching of music.

The increase in the height of the curves for both the boys and girls indicates that the kind and amount of expression to be expected of children will vary from year to year.

The statement is made by certain critics of methods of teaching primary reading that the subject as now taught produces a great amount of stuttering among children. The irregularities in the breathing of the boys while reading indicate a tendency toward stuttering, which good teaching should take into consideration.

Future Work.

The work in the future will be done with two pneumographs. One will be placed on the upper chest and a second on the abdominal region, so that both types of movements may be considered. All the children tested last year will be tested again this year to see what effect a year's physical development and practice in reading has had upon their breathing. A correlation between tone of voice, accent, inflection, etc., and different types of breathing will be attempted.

Some curves have been made for silent reading. It appears that such reading has a decided effect upon the breathing curves, in that the large waves are made up of a continuous series of smaller waves. This phase of the work will receive careful attention.

High school pupils will be studied so that the two parts of the present study may be connected. It will also be possible to carry the investigation into the grades below the third.

It is realized that the manner of dress has a certain effect upon the breathing of both adolescent girls and women. An attempt will be made to determine the nature and the amount of this effect.

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THREE PHASES OF THE FIFTEENTH INTERNATIONAL CONGRESS ON HYGIENE AND DEMOGRAPHY.

At the Fifteenth International Congress on Hygiene and Demography, held at Washington, September 23-30, three sections were of especial importance to the educational world. Even the most impatient reformer must have felt the keenest satisfaction in the representations there of eugenics, sex hygiene and mental hygiene. So