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COMPREHENSION OF RECORDED MATERIAL AND
MATERIAL DIRECTLY PRESENTED

by

Philip Joseph Kitley

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Philip J. Kitley

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Material Directly Presented

Research in radio education has been confined largely to surveys so far, and very little has been done to investigate listening, the general field of this study.

The purpose of the experiment was to discover the difference if any between the comprehension and retention of material presented to grade V and VI pupils directly and by means of transcriptions, as measured by both immediate and delayed recall tests.

The principal questions to be decided were whether the absence of "visual cues" would make any difference in favour of the direct presentation, or whether the absence of distractions would favour the recorded presentation.

In all, eight classes were used from four Vancouver schools, four from each of the two grades. Children were selected as a representative sampling of the Vancouver school population, and were found to have a mean I.Q. only slightly above that for the whole school population of the city. When absences had been taken into account, 192 cases were left from which complete results were obtained.

Eighteen paragraphs were used for the test, four of these "dummies" for trial purposes and the remainder in two parallel forms of the Dominion silent reading tests. This was simple factual material prepared for the use of grades V and VI. Tests were administered at the rate of two a day for five days, and five days later a delayed test on one set of seven paragraphs was given. The groups were then rotated and the same procedure followed for the other set of paragraphs. Tests were in the form of four simple multiple choice questions for each paragraph. Rotation of

time, class, material and type of presentation was made possible in the pattern of the experiment. One reading voice and one test administrator were used throughout. In this way such factors as novelty, fatigue and practice were cancelled out. Each of the four schools and all the classes were visited once each day, two schools in the morning and two in the afternoon, at regular times.

For the recorded part of the test, paragraphs were transcribed and portable playback equipment was taken from school to school. The experiment was arranged in such a way that at each school on each day one class was receiving "live" and one class recorded material. For the recorded part of the test, directions were also transcribed, so that in this section even the test directions were given by means of recordings.

The plan was carried out substantially as arranged, and with only one or two minor delays of not more than an hour or two.

Results may be summarized as follows:

- a. A general trend in favour of "live" presentation was definitely noticed.
- b. Scores for the total group were significantly in favour of the "live" presentation, but scores for the grade VI group were not significantly different either way.
- c. Boys' scores were not significantly different but girls' scores were. Boys' scores were noticeably higher than girls' scores.
- d. Upper and lower quartiles of the I.Q. distribution were examined, but there was no significant difference in either group.

Since this experiment was organized in such a way as to make the "live" and recorded presentations as similar as possible, it follows that in this case the record was merely duplicating the teachers. Such is not the case with radio, other factors operating to justify the use of school broadcasts.

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COMPREHENSION OF RECORDED MATERIAL AND MATERIAL DIRECTLY PRESENTED

CHAPTER I

The Problem in General

It has taken us less than a generation to forget that radio made its triumphant debut as an instrument of education rather than entertainment. Yet while research in commercial radio goes on apace, some of the fundamental educational questions raised by radio remain unanswered, or at most only partially settled.

The purpose of the experiment outlined in the following pages is to examine one of the most basic of these questions, and one to which the answer is still far from complete. How does the listener react to the mechanical reproduction of the human voice? Does he listen as well as he does when he can see the speaker? Do the words make as great an impact? Are they any better remembered? Or is there any significant difference at all? Much has been vigorously contended either way, and plausible arguments have been advanced from both sides, but in practically all cases they have been based on the usual type of casual observation.

It must be remembered first of all, that radio has helped restore listening to the important place it held in human communications before the printing press became common. As a speaker remarked in addressing a Chicago convention of teachers of speech,¹ "I hope it is only a pardonable exaggeration, to say that radio has rediscovered the ear as a receptor of sensory impressions".

¹ Ewbank, H. L., "Trends in Research in Radio Speech", Quarterly Journal of Speech, vol.26, p.282, June, 1940.

A corollary to this was picked up at random from an unidentified radio program recently, "Any fool can talk, but it takes a wise man to listen". Listening is a complex skill and its implications go far. Without doubt there are features about radio listening that vary distinctly from "normal" listening. One investigator has concluded² that "the radio has a somewhat dulling effect on the higher mental processes". The now famous "Men from Mars" broadcast produced by Orson Welles perhaps bears this out.³

Questions such as these concern what happens to the material of listening in the higher brain centres. And from such as these down to the relatively simple question of physical acuity there ranges a whole hierarchy of problems, which includes attitudes, ordinary language difficulties, vocabulary, fatigue, and so on.

In many ways, radio has served merely to underline the importance of listening. Almost twenty years ago Paul T. Rankin carried on a series of interesting experiments in which he showed that though we listen three times as much as we read, we study listening less than one sixth the time we study reading.⁴ He showed further that listening ability varies widely

2 McGregor, D., "The Psychology of Radio", Harvard Alumni Bulletin, vol.37, p.250, November 23, 1934.

3 Cantril, H., Invasion from Mars, Princeton, Princeton University Press, 1940.

4 Rankin, P. T., "Listening Ability, Its Importance, Measurement and Development", Chicago School Journal, vol.12, pp.177-179, 417-420, January, June, 1930. Quoted by Adams, H. M. in "Listening", Quarterly Journal of Speech, vol.24, p.209, April, 1938.

and stands in need of specific training if it is to develop in more than haphazard fashion. In spite of this, little real attack has been made on the problem since.

But the problems have not lessened. Indeed, the impact of radio has further increased them. As one more intrusion into the few remaining quiet places of life it has thrown a number of listening problems into prominence, and if it has not actually created any it has certainly aggravated them. To give one example mentioned in a radio publication,⁵ "An American Medical Association Journal reported recently that in 95% of the cases of hearing difficulty among children referred to doctors today the hearing difficulty was not due to any organic defect but to the children's habitually shutting out sounds they do not wish to hear".

These indicate something of the importance which should be given to the study of listening by modern educators. As one group of competent radio investigators has said,⁶ "The mere presence of a loudspeaker in a classroom is not going to result in miraculous educational changes in boys and girls". Or to state it more fully,⁷

"Listening skill does not come naturally, nor is it necessarily developed by constant radio attendance at school or at home. It can be acquired with the proper guidance of a wise teacher who knows how to diagnose the difficulties and careless listening habits of pupils who have been used to thinking of radio only as an instrument of entertainment. Listening skill is as important as reading, writing and speaking skills".

5 Solheim, A. K., "The School and Good Radio Listening Habits", Journal of the Association for Education by Radio, vol.5, p.67, January, 1946.

6 Woelfel, N., and Tyler, I. K., Radio and the School, Yonkers-on-Hudson, World Book Publishing Co., 1945, p.28.

7 Willey, R. de V., and Young, H. A., Radio in Elementary Education, Boston, D. C. Heath and Co., 1948, p.46.

However, before these problems can be adequately attacked, more must be known about the way children listen, particularly in regard to recent developments in the use of radio and recordings in school. Does the presence of a loudspeaker call up habits of inattention learned at home, or is it a greater incentive to listening? Is the absence of the person speaking a drawback through the inevitable loss in "personality" or does it remove such things as distracting mannerisms and therefore allow a greater concentration on the words themselves? Or after all, under reasonable conditions, is there any significant difference between the two types of listening? It is in an attempt to help answer the question that this experiment was conducted.

The Problem

It was aimed therefore at discovering what difference if any lies in the comprehension and retention of simple factual material by intermediate grade students, when this is presented face-to-face and when it is presented through the medium of the loudspeaker. Are the so-called "visual cues" necessary for a full understanding of the material? Does the loss in the speaker's personality, when his voice is reproduced mechanically, cause a loss in understanding? Does the loudspeaker, by singling out the aural stimuli, allow more perfect concentration, without the distractions that visual stimuli might introduce? Will the impact of one means of presentation, as compared with the other, result in any appreciable difference in retention of the material, after a lapse of several days? And finally, might we expect any real difference in results between grade V and grade VI, between boys and girls, or between high and low I.Q.'s?

CHAPTER II

A Brief Outline of General Radio Research

Although the actual experiment described here was conducted by means of transcriptions rather than radio, since its purpose relates closely to the latter a brief mention of researches into the problems of radio may be appropriate here.

The bulk of radio investigation has centred about three universities, Columbia (continuing an investigation which began at Princeton between 1937 and 1940), Ohio, and Wisconsin. The first, under the direction of Dr. P. N. Lasarsfeld, was reported in three volumes.⁸ In scope the project covered the more lasting social and psychological effects of radio listening on general ideas, habits and attitudes. At Ohio, the most effective utilization of radio programs in schools was studied and some interesting evaluating techniques were worked out. The whole is reported in some fifty bulletins.⁹ Wisconsin made an elaborate statistical investigation of the effectiveness of educational radio programs.¹⁰

There has also been a considerable amount of work done in comparing the effectiveness of audio and visual methods of presentation. For example, Cohen, at New York, using several hundred children and a recall

8 Lasarsfeld, P. F., Radio and the Printed Page, New York, Duell, Sloan and Pearce, 1940.

Lasarsfeld, P. F., and Stanton, F., Radio Research, 1941, New York, Duell, Sloan and Pearce, 1941.

Lasarsfeld, P. F., and Stanton, F., Radio Research, 1942-1943, New York, Duell, Sloan and Pearce, 1944.

9 Evaluation of School Broadcasts, Columbus, University of Ohio Press, 1942.

10 Reported in Barr, A. S., Ewbank, H. L., McCormick, T. G., editorial committee, Radio in the Classroom, Madison, University of Wisconsin Press, 1942.

interval of three weeks, compared silent reading and the radio, with inconclusive results. Goldstein at Columbia, comparing eye and ear found that in some cases at least, aural comprehension was better. However, he himself recognized the highly artificial nature of his experiments, and later commentators have been inclined to discount his findings somewhat for that reason.¹¹

Most of these studies have been criticized for one reason or another. The Columbia project actually makes no mention of listening as such. The Ohio study by its very nature was almost entirely the survey type, and at Wisconsin investigators fell into the error of trying to compare the effectiveness of a mechanical device with the effectiveness of the teacher. The report itself comments sufficiently:

"In general the experimental studies carried on as a part of this investigation yielded decidedly mixed results. The comparisons consistently favored the radio group only in the field of music, and even here several of the differences were not large enough to be statistically significant".¹²

An arresting statement was made in 1940, in an article called "The Status of Research in Education by Radio":

"Research in radio education....is immature because the methods of gathering and treating data are still in a period of experiment. Persons interested in radio research have had little time to develop adequate techniques for determining the effects of programs upon various audiences.... Major sources of data now available deal with the

¹¹ Both referred to by Reid, S., and Day, D., in "Bibliography of Radio and Records", The Review of Educational Research, vol.12, p.305, June, 1942. The authors of the article comment on the general mediocrity and insignificance of most researches to that date.

¹² Barr, A. S., Ewbank, H. L., McCormick, T. C., op. cit., p.194.

relatively superficial...problem of audience preferences.¹³

Reference may be made to one or two other studies. Working with lists of words presented aurally, Calhoun¹⁴ found that children showed a high degree of listening errors, even under the most favorable circumstances. The radio presentation ran second to the face-to-face presentation in an experiment by Wilke¹⁵ and this, together with such work as Gaskill's¹⁶ seemed to indicate a difference between material that presented facts and material that attempted to argue or persuade. Another experiment measured "pleasantness" of voices heard by radio, and concluded that some pleasantness was lost through mechanical reproduction.

In general, Ewbank, speaking in 1940, was forced to conclude that research in the purely speech aspect of radio was lacking.¹⁷ He outlined needs for study of (a) listening ability, (b) radio effects on English usage, (c) radio speech, (d) the intelligibility of the spoken word, (e) types of radio scripts, (f) manner of radio presentations, (g) length, amount of material and other miscellaneous topics.

Before going on to consider experiments more closely related to the one being reported here, it would be well in recapitulation to point out

13 Wrightstone, W. J., in Education on the Air, Columbus, University of Ohio Press, 1940, vol.11, p.319.

14 "Auditory Impressionability", Education on the Air, op. cit., vol.4, p.320.

15 Quoted in Cantril, H., and Allport, G. W., The Psychology of Radio, New York, Harper, 1935, p.141. (W. H. Wilke, "An Experimental Comparison of Speech, the Radio, and the Printed Page as Propaganda Devices".)

16 Gaskill, H. V., "Research Studies Made at Iowa State College", Education on the Air, op. cit., vol.4, p.322.

17 op. cit.

that a great deal of radio research has so far been either pointless or ineffectual. It has leaned strongly to the survey or questionnaire type of study, and probably justifies the criticism Stenius has made:

The time has come when we may accept [as a principle the fact that] any teaching aid is more effective when a child is properly introduced to it, and when the teacher does not conclude the "lesson" with turning off the projector or radio. Study on a point of this nature amounts to an investigation of whether an instructional aid is more or less valuable when properly used. Perhaps more profit will accrue if we accept the findings on such points as conclusive and give our time and effort to studying other problems of greater import.¹⁸

Several other more closely related studies should now be mentioned. Lumley¹⁹ found less loss in delayed recall from radio material than from directly presented material, but also noted considerable variation with types of material. Heron and Zeibarth²⁰ took 98 college students in two groups and had them listen to lectures by radio and by the usual classroom method, reversing the groups in mid-term. Examination results disclosed no significant differences, but subjectively most of the group seemed to prefer the traditional style of lecture.

By far the most comprehensive study of this sort was conducted under the supervision of Cantril and Allport.²¹ One of their most interesting reports is of a "natural" experiment where an observer was able to watch almost simultaneously the reaction of two Boston audiences to a popular

¹⁸ "Auditory and Visual Education", Review of Educational Research, vol.15, p.252, June, 1945.

¹⁹ "Research in Radio Education at Ohio State University", Education on the Air, op. cit., vol.4, p.361.

²⁰ "A Preliminary Experimental Comparison of Radio and Classroom Lectures", Speech Monographs, 1946, vol.13, p.54.

²¹ op. cit.

evangelist. One group heard him directly, the other, an overflow, through a public address system in an adjoining room. Apparently a good job had been made of dividing the sheep from the goats for the overflow audience was notably less enthusiastic when it came to singing, offering, and penitence. It is pointed out, however, that the speaker had not prepared himself to address an unseen audience. With experience of the psychology of radio humour gained over the past few years, we should not wonder that the evangelist's jokes, for example, went a little sour over the loud-speaker.

This incident provides for the authors an introduction to the question of whether visual cues are necessary for full appreciation of the speaker. One of their elaborate experiments tested the audience estimate of an unseen speaker's physical, mental and personality characteristics. A surprisingly high degree of correspondence was obtained.

Work was also done on speed of presentation, and it was discovered that the optimum varied with the listener and the type of material. One of the most elaborate experiments used 36 college students in three series of six to eight one-hour sessions, subjecting them to all types of material from simple facts to mathematical problems, and rotating from lecture room to radio-type presentations. Another compared results in a social psychology class over eight lectures presented both in the classroom and via the radio. Conclusions from both of these experiments show that the radio was slightly better for factual material, and that the radio was "less amusing". The general conclusions in the question of "Speaker Versus Loud Speaker"²² were that radio is more of a "closed whole", less

²² Cantril, H., and Allport, G. W., op. cit., pp.139-158.

personal, less social and not so conducive to higher thought process as is face-to-face listening.

In spite of the fact that this was one of the most satisfying investigations of the subject, the intervening fifteen years have shown more than one defect in the approach. Since classroom listening is certainly a "social situation", the investigators could not have been seriously considering this type. Further, even in 1935 one might have suspected the statement that "the radio is ill-adapted for producing unpremeditated crowd behaviour".²³

One other study must be reported, since it comes probably closest to the one under consideration. At Wisconsin, R. M. Phillips²⁴ used four sets of ten-minute speeches, two formal and two informal, giving completion tests and weighting scores for practice effect. It was found that for the informal passages, the radio group averaged significantly higher, significantly lower for the formal type. Although not actually stated in the article mentioned, a group of adult subjects is definitely implied. Comments indicated that most of the group favoured the platform type, but those favouring the radio gave as their reason that it was less distracting.

In another article Ewbank refers to the differences introduced by

23 Cantril, H., and Allport, G. W., op. cit., p.140.

24 Quoted by Ewbank, H. L., "Studies in the Techniques of Radio Speech", Quarterly Journal of Speech, vol.18, p.560, November, 1932. The study is an unpublished thesis on "The Relative Instructional Values of Radio and Platform Speaking".

varied types of material, quoting from a British documentary film report,²⁵

Fact demands non-projection of the speaker; fact plus idea demands projection; fact plus idea plus persuasion demands creative presentation--presentation that evokes imaginative or emotional response.

Ewbank's inference is that the last type of material is the most suitable for loudspeaker presentation, probably since it calls for the sort of artistic interpretation that the experienced radio speaker knows how to give.

All the studies mentioned have dealt with adult groups, and the nearest any of them have come to the classroom is the college rostrum. However, they have made an important beginning on the investigation of listening differences which may occur between direct and recorded methods of speaking. In the problem to be described, some of these same questions will be applied to intermediate grade classroom listening.

In addition, the foregoing should indicate how complex and ramified is the matter of radio research and how little has actually been done outside of the commercial type of survey. It would seem that while the "survey" type is increasing, the spate of radio research which appeared in the late 'thirties and early 'forties is now actually slackening if anything. One of the most recent writers on the subject must still say,²⁶ "There is urgent need for more information about that important yet relatively unknown member of the language arts--listening".

²⁵ Ewbank, H. L., "Trends in Research in Radio Speech", Quarterly Journal of Speech, vol.26, p.286, June, 1940.

²⁶ Brown, J. I., "A Comparison of Listening and Reading Ability", College English, vol.10, p.105, November, 1948.

CHAPTER III

The Experiment

In order to see what the minimum classroom effect would be with the simplest of material, this experiment was rigidly controlled and the investigation was limited to immediate understanding and memory.

The experiment was designed to provide a comparison between material presented directly and by recording, using immediate and delayed recall tests. A rotation pattern was contrived which eliminated the effects of novelty, fatigue and practice. Further, sufficient tests were spread over a long enough period to offset the effect of novelty and equalize fatigue and practice factors for both modes of presentation.

For the experiment a grade V and VI class were chosen from each of four representative Vancouver schools, Lord Kitchener, General Gordon, Lord Nelson and Hastings. The first is in one of the better class districts, the last in one of the poorer districts, and the middle two represent upper and lower middle class districts. From figures on file by the Vancouver School Board, the median I.Q.'s of the schools were respectively 112.7, 111.3, 108.9, and 107.2, thus averaging slightly better than the Vancouver median of about 107. In general, the grade VI group was given the Otis intelligence test during the past school year and the grade V group the National intelligence test within the past two years. In some cases tests were specially administered so that figures for the groups used should be complete.

The I.Q. range of the pupils whose test results were finally used was from 79 to 150, with a mean of 111.41 and a standard deviation of 13.69. The grade V group had a mean I.Q. of 109.82, the grade VI group a mean of 112.88. A total of 297 pupils in the eight classes took

the tests, but the scores of only 192, those with perfect attendance, were included in the results.

Material for the experiment was found in the Dominion Achievement Tests in Silent Reading for Grades V and VI, Type II, Forms A and B.²⁷ Either form has seven factual paragraphs, each of about 150 to 200 words, and each with four multiple choice questions designed to test grasp of general significance and detail, and ability to make inferences. Experiment has shown these forms to be equivalent in difficulty, so that they provide an opportunity for rotation. In addition paragraphs may be neatly handled and the tests are appropriate and simple to administer.

In addition to this, four paragraphs were chosen from appropriate supplementary readers not being used by the schools, to provide two dummy "warm-up" paragraphs for each form used. Classes did not know that record was not being kept of these.

Prior to the experiment, several types of material were tried out with a class at Dawson School, and when the final choice had been made, a rehearsal test was given to a grade V class at Queen Elizabeth School.

It was planned to present the nine paragraphs of each series (seven significant plus two initial "dummy" paragraphs) at the rate of two a day for five days. On the last day (Friday), only one paragraph would be given. In each case the test was given immediately the paragraph had been presented. The same tests were then presented in a battery of seven, five days later. The first set was given from May 16 to 20 inclusive, with the delayed recall test the following Wednesday, May 25. The second set was given from May 30 to June 3 inclusive, with the delayed recall the following Wednesday, June 8. In each case there intervened a school

²⁷ See Appendix E.

holiday in addition to the week end between the immediate and delayed recall tests (May 24 and June 6).

Arrangements were made to visit each school at set times, two in the morning, two in the afternoon. It was not always possible to keep time and place of individual classes consistent though in most cases this was done. In effect, a reasonable variety of situations existed. For example, in two schools one room upstairs and one downstairs were used consistently, in the third school a variety of rooms was required and in the other a single room was used for all classes throughout. In two schools the grade V class was consistently visited first, and in one school the grade VI class was first. In the fourth school, room changes made an alternative plan of visiting necessary.

The general pattern of the experiment may be gathered from the accompanying table, where "V" and "VI" indicate the grades, "a" and "b"

TABLE I
General pattern of the experiment

the two test series "L" and "R", the "Live" and recorded modes of presentation respectively, and "i" and "d" the immediate comprehension test and the delayed recall tests.

Set directions for the test were given, and none but a few essential questions were answered until after the final test at the end of the experiment. The directions were recorded for the recorded part of the experiment so that as far as possible the "live" element was eliminated from it. For the first three days these instructions were given at the start:

Today we are going to have some exercises to see how well we listen. You will hear a paragraph read to you, and then you will answer some questions about it. Listen carefully and see how much you can remember.

and then at the conclusion of the first paragraph:

Now you will be given some test papers to answer. Read your papers carefully, and do the best you can. Be sure to put your full name, age, and grade on the paper first.

After papers had been distributed this direction was given:

Now look at each of the four questions, and in each one draw a line under the best answer. If you make a mistake, cross out your line with a wiggly line and then underline the answer you think is correct. Take what time you need for your answers, and begin now.

On subsequent days the instructions were abridged thus:

Today we shall listen to a paragraph as we have done before. As soon as the paragraph is finished, you will be given your test papers. Start work on them as soon as you get them. Remember to listen carefully.

The preliminary try-outs showed the need to revise some of the instructions and those given here are in the final form used.

In order to present the delayed recall tests, the first significant words of each paragraph were repeated. This was necessary since the

paragraphs were not titled. It was noted also that topic sentences were straightforward in each case and that none of the questions hinged on this introductory material. As an example, in the case of the first paragraph of series A it was necessary to read these words, "Have you ever tried soap carving?" The initial words of the first paragraph were read, the class was then given sufficient time to complete the questions, and then the opening words of the next paragraph were read, and so on. In the recorded part of the experiment it was possible to cue up the disc while the class was working at the test so that the same opening words could be given in recorded form.

The recorded paragraphs were cut on two 16-inch transcription discs and played on portable RCA playback equipment. At first it was hoped that the equipment could be kept concealed but trial tests showed this to be impractical. Not only did the operator therefore lose some control of the group, but further the curiosities of the group were stimulated much more by a procedure they could not watch. With schools equipped with a public address system this problem could have been solved more neatly. However, the novelty of the equipment quickly wore off, as shown by the fact that there were actually few questions about the equipment at the end of the experiment when opportunity was given for discussion. The preliminary tests showed the need to control volume carefully, and this was kept at a uniform level throughout the remainder of the experiment. Differing classroom acoustics were noted and an attempt was made to counteract them. Differences in quality were noticeable between the outside^{and} the inside cuts, but these were distributed in such a way as to rotate out any variable comprehension factor they might have introduced. However, in all

cases there were indications that the loudspeaker characteristically favoured pupils in one part of the room over those in another part. Before the experiment got under way all classes were questioned carefully on ability to hear, so that any such selective factor was reduced to a minimum.

Speed of presentation was carefully maintained at 135-145 words per minute, a speed some 20 per cent slower than the average for adult listening. It was found to be much more difficult, however, to control speed of presentation in the classroom, than it was in the studio. If anything the direct presentation may have been slightly faster. Other investigators have noted the same point;²⁸ "From the lecturer's point of view it should be added that in spite of all attempts to keep the two types of lectures equivalent, the delivery of the radio lecture was inevitably slower, more precise and more emphatic". The reason seems fairly obvious. In the studio one works with a stop watch and is able to repeat the passage as often as is necessary to adjust speeds. In the classroom an occasional glance at a wrist watch is the only check one can use.

The setting up of the equipment varied considerably from school to school. In only one school were electrical outlets handily placed. In another the outlet was practicable though a long extension was needed. In one school a variety of situations existed, most of them calling for long extensions. In one school it was necessary for the equipment to be visible to the class which was being given the material "live". In two cases poor installation was the cause of blown fuses, but fortunately this did not interrupt the experiment.

²⁸ Cantril and Allport, op. cit., p.156.

Excellent cooperation was given throughout, and this together with a warning sign on the door meant that there were very few disturbances and virtually no interruptions. The whole experiment proceeded exactly on schedule, except in the case of one class where the test had to be delayed for two hours on account of a choir which ironically enough was performing at CBR, the station from which B. C. School Broadcasts originate. Inevitable distractions occurred from time to time, but the effects would seem to be equalized for the two modes of presentation. The usual differences in attitudes of teachers and classes were observable. Very little discussion was carried on with the teachers, but for their information a brief outline of this experiment was prepared.²⁹

All material was administered by one person, and his voice alone was used for both the recorded and "live" presentation. It was found advisable, however, to have the classroom teachers also present for purposes of control, though they took no part in the actual experiment.

²⁹ See Appendix A.

CHAPTER IV

Results and Interpretations

Final scores were obtained by taking totals of the scores made on the seven passages used. Scores were analyzed for grade V, grade VI and the whole group both with regard to the immediate and the delayed recall test. A further comparison was obtained by finding results for boys and girls and for the first and fourth quartiles of the I.Q. distribution (upper and lower 47 cases).

TABLE II

Means, standard deviations and critical ratios for
immediate recall tests

	Grade V	Grade VI	Total	Boys	Girls	IQ-Q ₁	IQ-Q ₄
Number	94	98	192	88	104	47	47
"Live"							
Mean	19.22	21.01	20.14	20.30	20.00	16.65	22.98
S.D.	4.73	3.86	4.40	4.47	4.34	4.59	2.17
Recorded							
Mean	17.33	21.13	19.27	19.61	18.98	16.10	22.52
S.D.	4.21	4.18	4.60	4.49	4.68	4.20	2.93
Mean difference	1.89	.12	.87	.69	1.02	.55	.46
S.E. Mean difference	.38	.34	.26	.38	.36	.44	.47
C.R.	4.97*	.35	3.35*	1.82	2.83*	1.25	.98

TABLE III

Means, standard deviations and critical ratios for
delayed recall tests

	Grade V	Grade VI	Total	Boys	Girls	IQ-Q ₁	IQ-Q ₄
Number	94	98	192	88	104	47	47
"Live"							
Mean	17.82	20.03	18.95	19.18	18.75	15.29	22.31
S.D.	4.91	4.17	4.68	4.78	4.43	4.43	1.97
Recorded							
Mean	15.93	19.91	17.93	18.20	17.71	14.48	21.70
S.D.	4.13	4.41	4.72	4.73	4.67	3.45	3.53
Mean difference	1.89	.12	1.02	.98	1.04	.81	.61
S.E. Mean difference	.39	.38	.27	.38	.40	.51	.45
C.R.	4.85*	.32	3.78*	2.58*	2.60*	1.59	1.36

*Significant at the 1% level. (None of the other ratios are significant at the 5% level.)

Results are shown in the above tables which give means, standard deviations and critical ratios.³⁰

It will be seen that though not all the results are statistically significant, the totals are, and in all except one case--that of the immediate comprehension test for grade VI--the "live" presentation was favoured over the recorded presentation. The one exception could quite easily be the result of chance factors. With grade V there is considerably less chance than one in one hundred that the obtained difference is not true and the same holds for the totals. While differences were not particularly significant for boys, the girls showed the same trend as the total. None of the results in the upper and lower quartiles of the I.Q. distribution yielded significant differences. This is not particularly surprising in the case of the top quartile, but it might have been expected that duller pupils would have shown wider differences. There were no significant differences as between the immediate and delayed tests.

The most interesting of the results come from the grade VI group where critical ratios were actually smaller than those obtained by the top quartile of the I.Q. distribution.

Although the general results form a reasonably coherent whole, there are one or two questions which arise, the most important being, why did the grade V classes show such a marked difference between the two methods, and the grade VI classes no significant difference at all.

³⁰ Obtained scores and further details of the statistical treatment are found in Appendices B, C and D.

Several reasons may be advanced. In the first place the median I.Q. of the grade VI group was three points higher than that of the grade V group and the pupils were also a year more mature and a year more accustomed to testing procedures. The grade VI groups as a whole were also noticeably less affected by externals, while the grade V classes were inclined to be more volatile. It may well be, also, that the material was more familiar to the grade VI group and therefore more completely remembered. In addition it was probably not sufficiently difficult to provide as critical a test as for the grade V's.

A further reason may be found in the nature of the material itself. It will be remembered that the two forms were parallel from the point of view of silent reading. There were some indications that this was not always true for aural presentation. Some of the questions showed that visual and aural vocabularies were not always identical. There were also apparent interest differences, and it has already been observed that it is in the intangibles such as interest, that radio presentation differs most from direct presentation.

Although it has no bearing on the object of the present experiment, it is perhaps of value to note that results support the findings of previous experiments comparing listening and reading. For reading, grade norms for large Ontario schools are notably below the results obtained here for listening, as shown in the following table:

TABLE IV
A comparison of listening scores and reading norms

	Grade V (5.8)	Grade VI (6.9)
Ontario reading norm	14.	18.
Mean, recorded (immediate recall)	17.33	21.13
Grade, corresponding reading norm	6.7	8.3

Possible slight differences in reading rates have already been mentioned. In other ways also the narrator found it difficult to keep the studio and classroom situations equal. Class reaction is bound to have an effect on anyone with teaching experience, although of course the good radio speaker tries to visualize his audience, and in this case particularly the speaker kept the classroom situation almost painfully impersonal. In some cases audience distractions were responsible for slight hesitations on the part of the reader, whereas the studio reading was of course quite straightforward. However, since such points as these are inherent in the features to be measured, they will not affect the validity of the results. They are raised merely as a matter of interest.

Practice effects were controlled carefully, but the speaker himself was bound to gain somewhat in fluency as the experiment proceeded. By the time a paragraph had been read for the last time it had almost been committed to memory. Fatigue on the speaker's part also needed careful attention. Something akin to practice effect began to operate as the majority of the pupils soon came to realize that the recorded and the "live" voices belonged to the same person. At the conclusion of the experiment, a show of hands proved overwhelmingly that this was so.

It is a question just how far this knowledge influenced the results, since the speaker was present on all occasions. It would be well to repeat the experiment using some method of keeping the class from seeing the speaker at all, for the recorded part. Even there, however, if there were any suspicion that the owner of the recorded voice was known, visual cues could be supplied imaginatively.

CHAPTER V

Summary and Conclusions

The aim of the preceding pages has been to outline the field of research in school radio listening, and to deal in some detail with one aspect of modern school listening.

The increasing use of radio and recordings in today's schools has shown the need for more thorough investigation into the techniques, problems, advantages and disadvantages of listening to the mechanical reproduction of the human voice.

Research on this topic may be broadly divided into the commercial and the educational fields. The former is concerned with "consumer research" and seems irrevocably tied to polls and survey devices. In the educational field, research has followed three main trends: the best utilization of radio and other materials in the classroom, evaluation of the effectiveness of such devices, and the more fundamental and psychological problems of listening.

While the two former have been productive of a great deal of sound information, they have frequently been bedevilled by the peculiarly uncontrollable features inherent in classrooms and in radio programmes. There has actually been very little done in the last, the general field of this present investigation.

In order to discover whether there was any measurable difference between immediate comprehension and memory of simple material, when presented mechanically and directly, eight grade V and VI classes of average intelligence and social background were given fourteen passages from the Dominion Achievement Tests in Silent Reading. Groups and

materials were rotated in such a way as to eliminate practice, fatigue and other effects, and one voice was used throughout in order to keep this factor constant. It was also possible to have one person administer all the tests. Four multiple choice questions were given immediately after the presentation of each paragraph, and further, a delayed test was given for each series five days after the last paragraph was presented.

Conclusions

Findings of the experiment may be summarized as follows:

- (1) For the total group, the direct presentation yielded significantly better results than for the recorded presentation.
- (2) The grade V group showed the most marked difference in favour of direct presentation.
- (3) The grade VI mean for the recorded presentation, immediate recall, was slightly higher than for the direct presentation, but not significantly so.
- (4) While the girls' results showed a significant superiority for the direct method, the boys' results, while greater for the direct method, were not significantly so.
- (5) Neither the first nor fourth I.Q. quartiles showed any significant differences, though the same general trends were to be observed.
- (6) The same general differences were noticed for the delayed recall tests, except that in this case the difference was significantly in favour of the direct presentation for boys. In almost all cases the gap between direct and recorded presentation widened for the delayed tests. In other words materials directly presented seemed to be slightly better remembered.
- (7) No pattern of difference was to be noticed in critical ratios for the delayed tests as compared with the initial tests.

Are we to assume from the foregoing that the radio and recordings have no place in the school? Assuredly not, as long as these can supply needs the teacher cannot, and so supplement regular classroom work. What we may well conclude is what has already been stated, many times: that there is no substitute for classroom teaching. In the case of simple material at least, face-to-face presentation seems preferable where possible.

One thing is certain, that listening is a far more complex process than it superficially appears to be. Nichols has pointed out³¹ that listening may be related to hearing as comprehending is to apprehending. He goes on to say that a definition of listening might thus approach the definition of thinking itself. However that would come no closer to the truth than the child, who when told to think before she spoke remarked, "How can I know what I think till I hear what I say?" Nearly ten years ago Max J. Herzberg showed the need for training in listening,³² "We shall one of these days have books on 'listening' as well as 'reading' skills". The day has not yet arrived, but the need is no less urgent.

Previous experiment would seem to show that other types of paragraph material could yield different results. Townsend³³ mentions as one of a

31 "Listening, Questions and Problems", Quarterly Journal of Speech, vol.33, p.83, February, 1947.

32 Herzberg, M. J., Foreword to Education, vol.60, p.611, June, 1940.

33 "Psychological Aspects of Radio Speech", Quarterly Journal of Speech, vol.26, p.579, December, 1940.

set of differences between "radio and rostrum" speech, the fact that radio encourages imaginary completion in the mind of the listener. Some of his other observed differences point equally plainly to various types of material that might prove suitable for radio delivery: radio places a premium on voice, radio skeletonizes the speaker's personality, it frees the listener from conventional politenesses.

It would be valuable to have further reports on the reactions of elementary school children to the mechanical reproduction of the voice, particularly since the elementary grades are known to be the best radio "customers". Size of class, and classroom conditions, position of the loudspeaker, length of the presentation, will all bear investigation, as well as the various types of material to be used.

APPENDIX A
Information Prepared for the Benefit
of Interested Teachers

The following has been drawn up for the interest of teachers who are so kindly co-operating in the listening experiment.

Purpose of the experiment: To see if there is any significant difference in the comprehension of material heard by mechanical reproduction and heard "live".

General outline of procedure: Eight grade V and VI classes have been chosen and are each being given 18 paragraphs, nine recorded and nine "live". Five days after the conclusion of each "run" the classes will be given a delayed recall test on all the material. Tests are being rotated in various ways to try to eliminate variable factors. For example, four classes receive the "live" material first, four classes the recorded material first.

The first "run" is being given this week (May 16-20) and the first delayed recall test will be given May 25. The second "run" will be given May 30-June 3 and the second delay recall test June 8.

Evaluation: As far as possible a good cross section of the city is being tested. There will be no attempt made to compare one school with another, however. All pupils tested will be compared as to comprehension with the two media, and some attempt may be made to compare boys with girls or high with low I.Q.'s. It is not the purpose of the experiment to compare reading with listening comprehension, though this may be possible through reference to grade norms in reading, which are available

for the material being used.

This material has been drawn up for teachers' use only. Classes have been told that their questions will, so far as possible, be answered after the experiment has concluded. It will be appreciated if you do not attempt to discuss or refer to the experiment until after June 8. In particular you are asked not to announce the two delayed recall tests May 25 and June 8.

APPENDIX B

Statistical Data

Obtained Scores--Grade V classes

Lord Kitchener					General Gordon					Lord Nelson					Hastings				
L		R			L		R			L		R			L		R		
IQ	I	D	I	D	IQ	I	D	I	D	IQ	I	D	I	D	IQ	I	D	I	D
m 93	18	13	14	11	f150	27	24	26	28	m 90	13	12	20	20	m 92	18	14	17	12
m106	21	17	21	16	m122	24	24	21	17	f117	23	22	22	22	f118	19	13	12	8
f135	21	20	24	20	f112	20	19	17	18	f108	15	14	13	9	m 97	21	19	23	15
m101	9	8	12	11	m109	15	13	17	15	f124	24	25	20	22	m139	24	23	26	23
m123	23	26	22	18	m118	22	22	16	16	f100	10	11	17	14	f109	16	16	21	20
f118	24	23	21	19	f143	20	23	15	16	f112	18	18	19	19	f103	18	12	14	15
m107	24	24	21	20	f109	23	16	18	17	m 99	21	21	20	15	f102	20	16	16	15
m 90	21	17	16	13	m143	24	21	17	18	f122	25	24	22	20	m 79	12	13	16	9
f 98	19	18	20	18	f138	25	22	20	20	m 98	19	19	14	15	f 92	22	22	9	11
m106	27	25	21	18	f114	15	16	9	10	m110	24	24	26	20	m111	17	17	17	19
f125	26	26	22	24	f115	21	21	20	17	m 88	17	19	14	16	f111	17	10	15	11
f128	17	18	19	16	f117	19	15	13	14	m111	25	24	19	19	m 97	23	19	18	21
f110	17	6	15	15	f103	13	15	15	12	f115	23	25	20	19	m 92	16	12	15	11
m133	26	26	22	23	f104	16	16	16	14	f111	24	22	19	13	f110	13	15	11	14
m 89	19	15	19	18	m102	20	20	16	17	m105	16	14	15	13	m 95	10	14	10	9
m107	21	20	21	18	f117	14	16	10	12	m108	21	20	21	19	m 81	10	8	10	10
					f120	24	23	21	22	f120	25	24	22	24	m125	19	17	23	18
					f122	22	19	18	19	f125	18	23	21	17	f111	12	10	13	15
					f128	22	19	21	18	f 86	18	18	13	13	m 91	9	11	14	11
					m112	16	15	11	11	m 91	18	15	14	9	m 95	14	6	15	12
					f129	23	17	21	20	m 93	17	19	20	12	m113	20	18	16	18
					m104	26	24	20	21	f104	19	19	14	13	f112	17	15	19	9
					f126	25	24	21	19	m104	23	26	12	13	f 97	4	6	6	10
					m104	18	16	17	12	f113	14	14	13	12	m111	13	18	13	18
					m103	19	21	13	19						f108	28	17	12	10
															f100	25	17	19	17
															m120	22	22	23	21
															f113	24	22	20	13
															f 98	18	13	15	14

L - "live"
R - recorded
m - male

f - female
I - initial test scores
D - delayed test scores

Obtained Scores--Grade VI classes

Lord Kitchener					General Gordon					Lord Nelson					Hastings				
L		R			L		R			L		R			L		R		
IQ	I	D	I	D	IQ	I	D	I	D	IQ	I	D	I	D	IQ	I	D	I	D
f113	23	21	22	24	f108	27	26	24	18	m120	19	23	25	26	m 92	17	16	16	16
f105	19	17	16	14	f109	24	21	22	22	f 88	20	20	18	19	f108	19	20	18	14
f 93	16	14	20	16	f110	15	11	23	20	m104	20	17	24	26	f104	19	19	21	22
m131	26	26	28	23	f124	23	24	20	24	f 86	13	16	12	11	m113	24	23	21	16
m103	18	19	22	23	f122	18	21	20	21	m 91	19	20	21	19	f106	21	18	21	18
f 90	10	10	17	12	m127	25	26	28	25	f105	20	17	22	22	m111	22	21	20	17
f111	19	15	14	16	m139	25	25	25	24	m108	21	22	24	24	f131	25	25	25	26
m103	19	16	22	21	f115	25	24	23	21	m 97	20	17	19	13	f 83	10	12	3	6
f120	21	19	23	22	m116	26	22	18	16	f116	20	16	23	29	m123	23	20	20	22
f135	25	25	28	28	f109	24	22	24	22	m102	22	20	19	17	f105	14	17	17	13
m123	24	26	25	26	m103	20	22	21	21	m118	23	21	19	16	m114	21	20	24	24
f120	22	20	17	20	f123	22	24	22	20	f116	18	14	23	21	f125	17	16	14	14
f113	15	10	25	21	m116	21	22	24	23	m103	27	24	25	22	f113	24	24	22	18
f111	19	17	24	24	f133	25	22	27	26	f116	24	25	21	19	f127	24	23	21	18
f125	23	21	24	20	m111	24	24	22	18	f104	19	19	17	17	m 97	20	17	22	19
m100	25	23	21	23	m138	27	28	24	26	m 89	21	21	22	18	m119	23	21	20	19
m137	23	20	28	26	f119	18	16	17	14	m 82	18	13	14	10	f107	24	22	25	24
m111	27	26	24	24	f129	21	23	26	25	m100	19	17	20	18	m 97	19	16	19	19
m122	21	20	26	23	f120	27	23	25	20	m121	25	24	27	24	m109	23	23	26	26
f128	22	20	22	22	f120	20	14	22	21	f115	20	21	18	18					
m137	23	25	26	24	f123	21	18	20	17	f118	21	23	22	23					
m 83	11	9	10	12	f125	20	24	24	24	f121	25	23	27	24					
f 95	18	18	21	19						f115	18	19	16	12					
m118	26	26	24	24						f132	24	23	21	18					
m 95	10	10	17	14						m119	22	21	23	26					
f122	21	20	16	18						f117	19	20	15	13					
m133	22	23	26	24						f109	22	23	23	23					
										f119	21	17	16	17					
										f124	24	24	26	27					
										m 94	16	16	18	18					

L - "live"

R - recorded

m - male

f - female

I - initial test scores

D - delayed test scores

APPENDIX C

Medians and Standard Deviations for
I.Q. Distributions

	Means	S.D.
Grade V	109.82	13.84
Grade VI	112.88	13.38
Total	111.41	13.69
Boys	107.75	14.54
Girls	114.32	11.88

APPENDIX D

Computation of Critical Ratios

The mean of the score differences was first obtained $\left(\frac{\sum D}{N}\right)$ and the standard deviation of the distribution of the differences $\left(S_d = \sqrt{\frac{\sum d^2}{N}}\right)$

From this the standard error of the mean difference was obtained -

$$\sigma_{\bar{x}_d} = \frac{S_d}{\sqrt{N-1}}$$

This was used to obtain the critical ratio, using the formula

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sigma_{\bar{x}_d}}$$

Since the number of cases was fairly high in all groups except the upper and lower quartiles of the I.Q. distribution, $N-1$ degrees of freedom was not appreciably different from N degrees of freedom. In the case of the I.Q. distribution, critical ratios were far too small to be significant.

APPENDIX E

Material Used for the Tests

(The Dominion Achievement Tests in Silent Reading, Grades 5 and 6, Type II, Diagnostic Test in Paragraph Reading)

Form A

Paragraph 1:

Have you ever tried soap carving? Or do you, like so many other people, believe that soap is useful only in the kitchen and laundry? Some years ago a large soap manufacturing company held a carving competition, and since then many people of all ages have become keenly interested in the art, and remarkable carvings have been made. In beginning, do not attempt anything too difficult. You will need a fresh cake of white soap, a small kitchen paring knife, tracing patterns, a soft lead pencil, and thin tracing paper. Trace the pattern on the soap, then hold the cake and knife just like an apple you are peeling, and carve towards you. Keep your knife clean and scrape the carving to make it smooth. The finished article may be painted with water colours--do not scrub with the paints or soapsuds will be the result. Put the colour on smoothly and do not hurry. You will be surprised how easy soap carving is, and how many attractive objects you can make.

1. The best name for this story is

How Soap is Painted	How Soap is Used	A Child's Hobby
How Soap is Prepared		An Interesting Hobby

2. The first thing to do is

trace the pattern	clean the knife	carve towards you
mix the paints	scrape the carving	

3. The first carving you attempt should not be

too large	too difficult	too easy	too simple	too fancy
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4. All the tools used in soap carving are

made of metal	expensive to buy	strong
easy to get	valuable	

Paragraph 2:

"Doodle-bug" is the funny name someone gave to dl-finding instruments. There are now many kinds of these instruments which are quite difficult to make, but the first one was very simple. It was copied from an instrument first used long ago to try to find the places where water or minerals were hidden underground; and it was called a "divining-rod", because with it a person was supposed to be able to divine or tell where oil was hidden. This rod was made of a forked

branch cut from a peach or willow tree, much like a wish-bone in shape. First the point of the rod was dipped into oil, then the two prongs were held one in each hand, letting the oily point stick upwards. The point would appear to twist and jerk, and in some places point down to the earth. These were chosen as the likely spots to drill for oil. Sometimes the drilling was successful and oil was found, but if this happened it was quite by accident. Even modern oil-finding instruments do not have such powers of choosing one spot rather than another spot nearby.

1. The best name for this story is

History of Oil	The Values of Oil	Searching for Oil
Machinery Needs Oil	Drilling an Oil Well	

2. A divining-rod looks like

an oil-can	a fishing rod	a piece of wire
a garden fork	a wish-bone	

3. People decided to drill where the divining-rod

twisted its point down to earth	bent in the middle
turned its point straight up	twisted in all directions
touched the oil	

4. The divining-rod was really

valuable	difficult to make	useless	powerful	necessary
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Paragraph 3:

Sometimes at night you may see what looks like a bright star shooting across the sky and then disappearing. It often leaves a tail almost like a comet's tail behind it, which fades out in a few seconds. The real name of these "shooting stars" is "meteors". They are not stars at all, they are just bits of rock or iron which have been floating through space and which have suddenly been caught by the pull of our earth's gravitation. When they hit our air and go rushing through it they are moving so fast that the air rubs them into a flame, and they usually burn up before they reach the ground. Once in a while they may be so big that they do not completely burn up but crash to earth and plunge deep down into the ground. When they do this they are called "meteorites". By the time they get to the ground they may not be much bigger than a nut, though sometimes they are large, even as large as a small house. You can see many meteorites in museums.

1. The best name for this story is

Floating Through Space	Why Stars Fall to Earth
Meteors and Meteorites	The Sky at Night . Famous Comets

2. Meteors burst into flame because

they are floating through space	
they fall to earth	they are like comets
they rush through the air	they are made of rock
3. Meteorites are different from meteors because

they have tails like comets	they are in museums	
they burn up	they are made of iron	they fall to earth
4. The meteors come towards the earth

because the earth attracts them		
because they are travelling so fast		
because they are burning	because of the earth's position	
because of the earth's movement through space		

Paragraph 4:

Coal became the chief manufacturing fuel about 1800; but before the close of the nineteenth century its place in many industries was challenged by mineral oil or petroleum. Before 1850, mineral oil had been known in small quantities and was used chiefly as a liniment, a rubbing oil for sprains, known as "Seneca Oil". But with the discovery of the first oil well in Western Pennsylvania in 1859, the use of oil for light, heat, and power began. "To strike oil" soon became another word for success—just as a "Ship come home" meant success in the days of the early traders. With the discovery of other oil fields there followed an increase in the number of ways in which oil could be used, and as a result it has now become a very important product in our daily lives. As supplies in the older fields are used up, the great industrial nations have been thinking more and more about the future supply of this greatly needed product. They expect that more will be found in the rich but relatively undeveloped districts of Mexico, Roumania, and Mesopotamia.

1. The best title for this story is

The Discovery of Petroleum	The Loss to Our Coal Mines
The Oil Market	The Pennsylvania Oil Wells
The Growth in Importance of Oil	
2. The first oil well was discovered in

Texas	Roumania	Mexico	Alberta	Pennsylvania
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3. This story says that the great industrial nations are most interested in

the oil districts of Texas	the decline in our coal production
the future supply of oil	making liniment from oil
new uses for oil	
4. According to this story it is likely that there is a greater quantity of oil in

England	Mesopotamia	Belgium	Norway	Pennsylvania
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Paragraph 5:

Canada as a vacation land has scope and variety not met with elsewhere in the New World. Its greatest charm lies in the differences from the ordinary run of attractions. Canada has not as many of the historic stories that have made Europe and Asia the storehouses of civilization's records from ages before America was discovered, but the four hundred years that have passed since Jacques Cartier first landed on its shores have been filled with stirring events. These are recalled by the habitant life of Quebec, and by the old fortifications, monuments, and historic buildings that are scattered from coast to coast. The tremendous expanse of the country, its variety of physical features, its comparatively thinly scattered population, the ease and speed with which almost all parts can be reached, make the Dominion one of the world's greatest and least crowded playground areas. Tourists can enter at numbers of points along its boundaries by highway, rail, air, or water. Even the most distant hunting and fishing areas can be reached with the help of a guide in a way that does not involve too great hardship.

1. The best title for this story is

The Tourist Trade in Canada	Canada's Tourist Attractions
Canada's Hunting Grounds	The Fishing Areas of Canada
The History of Canada	

2. This story tells us that Canada has

many high mountains	a large number of people
a vast amount of territory	many forest fires
very few attractions	

3. Canada delights the traveller most because

it has an ancient history	its attractions differ from the ordinary
it is a storehouse of civilization	it has a large number of guides
it has many monuments	

4. Tourists can enter Canada

at only one point	by travelling first to Quebec
only by becoming citizens	only to visit relatives at many points

Paragraph 6:

We all know that the natives of America are not really Indians. We know that that name was applied to them by Columbus by mistake when he reached these shores and supposed he had found India by sailing west. Then who are they? Scientists generally give us the best answer possible with the evidence they now have, that the ancestors of these American Indians were Mongoloid. This does not mean that these Indians are Chinese nor that they came from China--for the excellent reason that at the supposed period of their arrival in America, China and the Chinese were not yet in existence. Old as they are, the Chinese, by comparison, are recent. It is more nearly true to say that these early

Indians probably have ancestors in the far distant past in common with other Asiatic peoples of today. But we do not know what part of Asia was the original home of all these peoples. It was all so very long ago and the various races of mankind--which probably all developed from the same ancestors--have become so different from one another that no one knows what racial mixtures may have occurred during the long ages.

1. The best name for this story is

The Ancestry of the Indians	The Arrival of the Indians
The Coming of Columbus	The Chinese and the Indians
The People of Asia	

2. This story says that the early Indians probably came from
India China Asia America Egypt

3. Scientists say that the racial origin of the Indians is
American Mongoloid Chinese Anglo-Saxon Japanese

4. This story tells us that the various races of mankind passed through periods during which they have become
more alike mixed and alike unlike and unmixed
mixed and less alike just like their common ancestors

Paragraph 7:

The tourist who has made the St. Lawrence River trip will not soon forget the thrill aroused by the sight of Quebec City from the River. This city is the capital of the Province and in it we can find evidence of all the daring deeds surrounding the struggle for the possession of British North America in the eighteenth century. Lanes paved with cobblestones, winding stairway streets, old houses, and fortifications combine with the modern in Quebec. A short distance below the city are the famous Falls of the Montmorency River, and a few miles above the city is one of the amazing engineering triumphs of man--the Quebec Bridge. Its central ironwork span curves one hundred and seventy feet above the water. Both trains and automobiles can cross the bridge. The waters narrow considerably after Quebec City is passed but the river is still one of noble proportions. Cathedral spires and church towers bear witness to the importance of religion in the daily lives of the inhabitants.

1. The best title for this story is

A City in Quebec	A Canadian City	The Capital of Quebec
The Cathedrals of Quebec City		A View of Quebec City

2. This story says that Quebec City
contains many factories has large proportions
combines the old and the new has wide streets
is an engineering triumph

3. This story tells us that the people of Quebec City
 spend most of their time in churches never go to church
 are religious like to make spires are a lively people
4. This story tells us that the Quebec Bridge
 was very difficult to build is the largest in the world
 was made by the first settlers was made by Montmorency
 is built over the city

Form B

Paragraph 1:

The parents of Florence Nightingale were disappointed when she refused to live the idle life of a young lady of fashion. She had a keen mind and unbounded energy and was determined to devote her time to studying nursing. It was a long, hard way, but she worked hard and so became the most famous nurse in the world. During the Crimean War she was certain, after hearing the tales of the suffering of the wounded British soldiers, that she was needed among those sufferers. She left England for the Crimea with thirty-seven assistants and a shipload of supplies. She found confusion, suffering, and unsanitary conditions in the hospitals, but with courage and ability she succeeded in bringing order out of the disorder. After the war she returned to England, where she founded schools for the training of nurses, and wrote many books on hospital organization. Probably no other woman in the history of the world has done so much to relieve suffering and distress.

1. The best name for this story is
 Schools for Nurses Nursing in Wartime
 A Young Lady of Fashion How a Nurse Became Famous
 Army Hospitals
2. Military hospitals at the beginning of the Crimean War were
 carefully organized well kept peaceful
 unsanitary unknown
3. Florence Nightingale founded many training schools for nurses
 while in the Crimea during the war for the army
 all over the world after the war
4. Florence Nightingale was
 capable lonely wounded idle fashionable

Paragraph 2:

Every parachute has five parts--canopy, shroud lines, pilot chute, harness, and pack. Each part must work properly if the parachute is to be efficient. The canopy, or main chute, which is like an umbrella, is made of specially chosen untreated silk. It must be strong and light

3. St. George was put to death because he was
 a Portuguese a Russian an Englishman
 a Crusader a Christian
4. In most countries St. George is
 loved tortured disliked hated protected

Paragraph 4:

Science tells us that the native Americans came from northern Asia and that they may have arrived here from ten to twelve thousand years ago. But they were not the first inhabitants of this continent. From scientific evidence we know that man-made implements or tools, made of stone, were left beside ancient campfires fifteen to eighteen thousand years ago; some say even twenty thousand. Man-made implements have also been found deep in the earth, together with the skeletons of a prehistoric kind of bison. It is known from such remains that these earlier peoples lived by both hunting and seed-gathering. We cannot know what became of them--whether they had all vanished before the ancestors of the modern Indians arrived, or whether some were still wandering about and were absorbed by the newcomers. One guess is nearly as good as another, for we can never be sure of what really took place.

1. The best title for this story is
 The First Inhabitants of America The Arrival of the Indians
 The History of Early Implements The Prehistoric Kind of Bison
 How to Gather Scientific Facts about Indians.
2. In this story scientific evidence shows that
 Indians came 5000 years ago The Indians travelled all the time
 Indians were the first settlers in America
 The Indians were absorbed by the first settlers
 There were other people here before the Indians came
3. The studies of scientists tell us that the early peoples lived by
 the food left by the previous settlers herding cattle
 hunting and seed-gathering manufacturing implements
 farming with metal implements
4. To say that the newcomers absorbed the first settlers
 is not true is true is certain is uncertain
 is a poor guess

Paragraph 5:

In 1807 Robert Fulton successfully showed that steam power could be used to drive boats; but could steam be used to drive coaches on land? Horse tramways had been used in England for many years to carry coal from a mine to a canal, and soon after 1800 a Cornishman used a stationary steam engine to furnish the power for a short tramway. But the problem

was to get a travelling engine. In 1814 George Stephenson succeeded in building a "locomotive" able to haul coal carts on tramways, and in 1825 a passenger line (twelve miles long) was opened in England. In 1833 a steam railway carried passengers from London to Liverpool in ten hours (a four-hour ride now), while the stage coach took sixty hours. Four years later a Canadian company imported a locomotive from England to draw two tiny cars from La Prairie, just outside Montreal, to St. Johns at the head of Lake Champlain. The railway age had begun.

1. The best title for this story is

The Birth of the Railway The Decline of the Horse and Carriage
 The Life of George Stephenson How to Make Railways
 The Beginning of the Canadian Railway System

2. The first locomotive came to Canada in

1807 1837 1825 1833 1814

3. A stage coach ride from London to Liverpool used to take

a full day one half day four hours
 one week two and a half days

4. The stationary steam engine was invented before

the stage coach the horse tramway the locomotive
 the push cart the horse and carriage

Paragraph 6:

The fungi, plants of the fungus family, have no green colouring matter to help them absorb food, so they live on other plants or animals, either dead or alive. These fungi grow everywhere--in the soil, above the soil, and in the water. They are flowerless plants, some growing tall like the toadstools and others so small that one can scarcely see them except under the powerful glass of a microscope. Some fungi, like the mushrooms, can be eaten; others are used in medicines, and all are useful in that they turn plant-matter back into soil. But many, like the mildews, rusts, and molds, are destructive, for they harm plants, and collect on foods, clothing, and furniture. There are some that even cause diseases in men and animals.

1. The best name for this story is

Plant Diseases Varieties of Fungi The Making of Soil
 Use of a Microscope An Enemy of Mankind

2. Fungi always grow

only on plants only in the soil without flowers
 very tall without water

3. All fungi

can be eaten live on other things have green colouring
 are destructive are poisonous

4. Mildew is a
 toadstool germ sickness fungus medicine

Paragraph 7:

Large areas of Western Canada's wheat lands are much closer to Hudson Bay than to Vancouver or to eastern Canadian ports. The Hudson Bay route is their most direct sea-route to Europe. This is particularly so in the case of Saskatchewan. From Saskatoon to Liverpool, by way of Churchill, is, for instance, eleven hundred miles shorter than by way of Montreal. Moreover, a car of wheat going westward from there has to cross several mountain barriers. If going eastward, to the Atlantic coast, the contents of the car are transferred twice before the grain finally goes aboard an ocean freighter: the wheat is transferred to a boat when the car reaches the lakehead at Port Arthur or Fort William and is transferred again on the upper St. Lawrence River. But the way to Hudson Bay is level and direct. No wonder, then, that when these western lands were settled the wheat growers turned their eyes to Hudson Bay! Sixty years ago they were talking of a railway to Hudson Bay and a seaport on its coast. The one thing against it is that ice closes the route for ten months of the year. In time, though, the farmers hope that ships may be able to use it for at least three months.

1. The best title for this story is
 The Importance of Canada's Wheat Lands
 Barriers to Travel in Canada
 The Hudson Bay Railway How Wheat is Sent to England
 The Western Farmer and the Hudson Bay Route
2. The Saskatchewan farmer prefers the Hudson Bay route because
 it provides a less direct route to Europe
 it is open most of the time it is a shorter route
 it is a longer route
 more wheat can be transported through it
3. Wheat growers in the west do not like the regular eastern route because
 there is danger of losing some wheat
 the wheat freezes on the boats
 they get less money for their wheat
 the wheat is transferred too often
 the wheat is taken over mountains
4. This story tells us that the most direct sea-route from the Prairie
 Provinces to Europe is
 through the upper St. Lawrence through Hudson Bay
 through Port Arthur by way of Montreal
 over the western mountains

APPENDIX F

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