

THE UNIVERSITY OF MANITOBA

AN ANALYSIS OF RESULTS OF STANDARDIZED  
PSYCHOLOGICAL AND ACHIEVEMENT TESTS OF  
THE NINTH AND TENTH GRADE MANITOBA PUPILS  
FOR THE YEARS 1947, 1948 AND 1949

BEING A THESIS SUBMITTED TO THE COMMITTEE  
ON POST-GRADUATE STUDIES IN PARTIAL  
FULFILMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF MASTER OF  
EDUCATION

BY

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## CHAPTER 1

### SECONDARY SCHOOL ORGANIZATIONS IN MANITOBA

The pupils in the Province of Manitoba receive their high school education in various types of schools: Collegiate Institutes, Collegiate Departments, Two-Room High Schools, One-Room High Schools, Continuation Schools and Junior High Schools. Collegiate Institutes are organized in many parts of Manitoba. This type of school employs four teachers or more who hold university degrees and may teach Grades IX to XI or Grades IX to XII. Collegiate Departments are similar to Collegiate Institutes except that in the former three teachers may be employed to teach Grades IX to XI or Grades IX to XII. Next in order comes the Two-Room High Schools where two teachers are employed to teach three or four Grades, IX to XI or XII and the principal is required to be a university graduate and hold a principal's certificate for a Two-Room High School or higher. The assistant must hold at least a First Class A certificate. In the One-Room, High Grades IX to XI may be taught and the teacher in charge must hold at least a First Class B certificate and a principal's certificate for a One-Room High School. In addition to these types, Continuation High Schools may be found in many rural points where Grades VII to XI may be taught in the same room and the teacher qualifications are the same as those for a One-Room High School. Where the enrollment in a One-Room rural school is low and the

teacher has the necessary qualifications, instruction in Grade IX work may be given. Pupils in remote parts of the Province and in areas where they are unable to receive regular classroom instruction, may receive their education in Grade IX and X subjects under the direction of the Correspondence Branch of the Department of Education. Another type of school organization found in the city and a few small town systems is the Junior High School. In this type Grades VII, VIII and IX are taught and the school is recognized as a Junior High School when there are at least three teachers or more employed for the teaching of these Grades.<sup>1</sup>

Throughout rural and urban Manitoba all schools are organized as continuous schools having all grades under the direction of one elected board of trustees for each school district. In rural and smaller urban centres elementary and secondary education are provided within the one school building. Only in the larger rural towns or cities is secondary education provided in separate buildings and under separate staff instruction. More important is the fact that complete departmentalization is possible in the collegiate institute and to a lesser degree in the collegiate departments and two-room high schools. Collegiate Institutes and Collegiate Departments only are required to employ a staff each member of which holds a university degree. Under these conditions it

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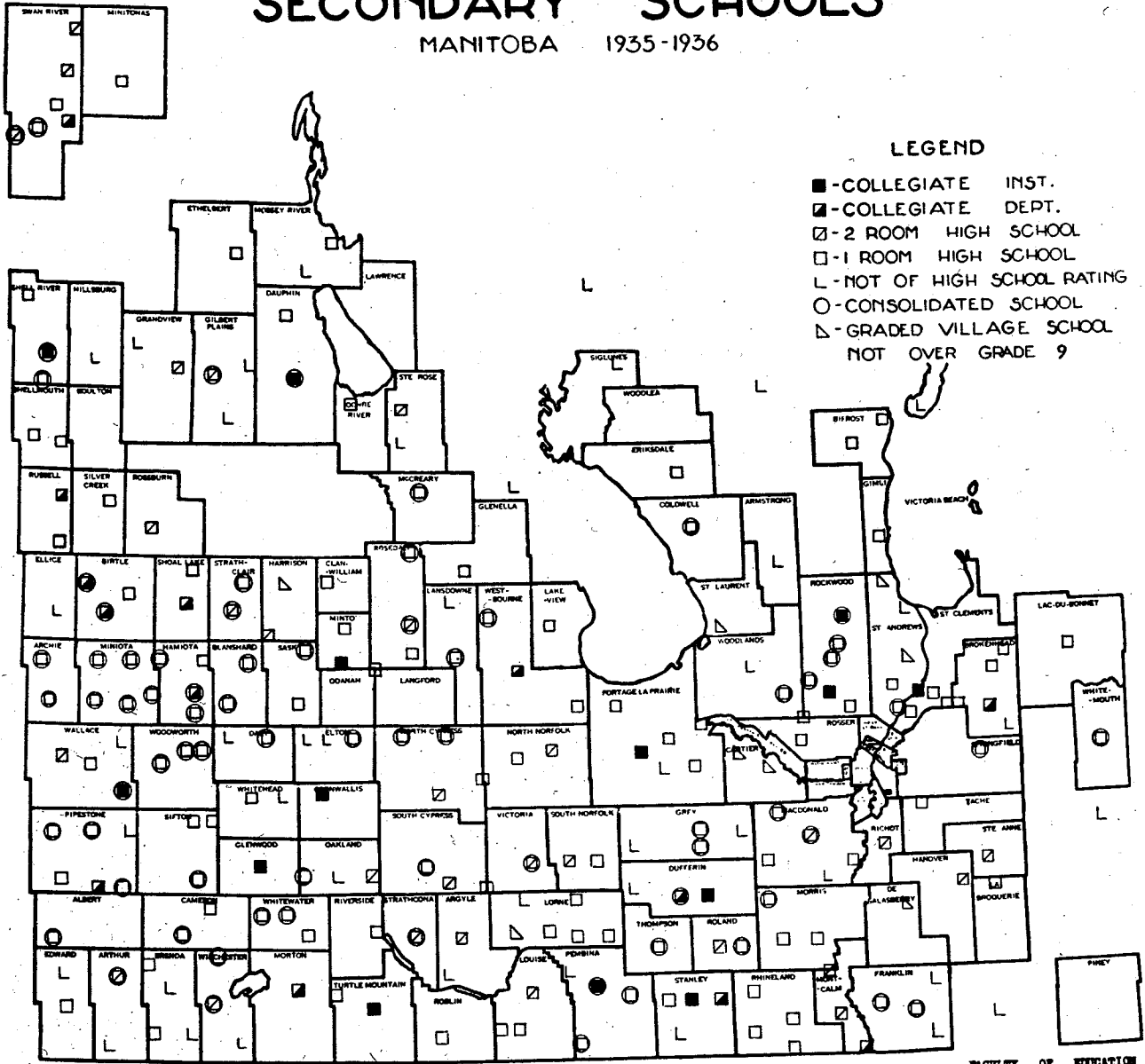
<sup>1</sup> Regulations, Manitoba Department of Education, 1949 p.5

has been difficult to insure a reasonably uniform measure of instruction or to rely upon local estimates of pupil fitness for entrance to or promotion within the secondary school. This practical difficulty has been the implied justification for a provincial system of centrally administered secondary school examinations and has been a much debated problem for years.

Additional factors have complicated the problem of maintaining school standards. There are racial groups in whose homes a language other than English is spoken. There exists a wide variation in economic ability measured in terms of sub-marginal to wealthy land, the former frequently occupied by non-Anglo-Saxon peoples. Coupled with both is the educational perspective or ambition of the individual school district. The problem of variation in ability and effort is indicated roughly in Figures 1 and 2. Figure 1 is a map showing the distribution of all types of secondary schools in the Province and Figure 2 a map indicating the distribution of wealth in relation to the assessment per teacher in each municipality of the Province.



# SECONDARY SCHOOLS MANITOBA 1935-1936



**LEGEND**

- - COLLEGIATE INST.
- ▨ - COLLEGIATE DEPT.
- ▩ - 2 ROOM HIGH SCHOOL
- - 1 ROOM HIGH SCHOOL
- L - NOT OF HIGH SCHOOL RATING
- - CONSOLIDATED SCHOOL
- ▴ - GRADED VILLAGE SCHOOL NOT OVER GRADE 9

DIAGRAM NO. 21 #

FACULTY OF EDUCATION  
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Figure 1.

# Woods, D.S., Education in Manitoba, Part 1, Preliminary Report. Published by Economic Survey Board, Province of Manitoba, February, 1938.

# SCHOOL DISTRICT ASSESSMENT

RANGE IN ASSESSMENT PER CENSUS PUPIL (5-19 YRS)  
MANITOBA 1936

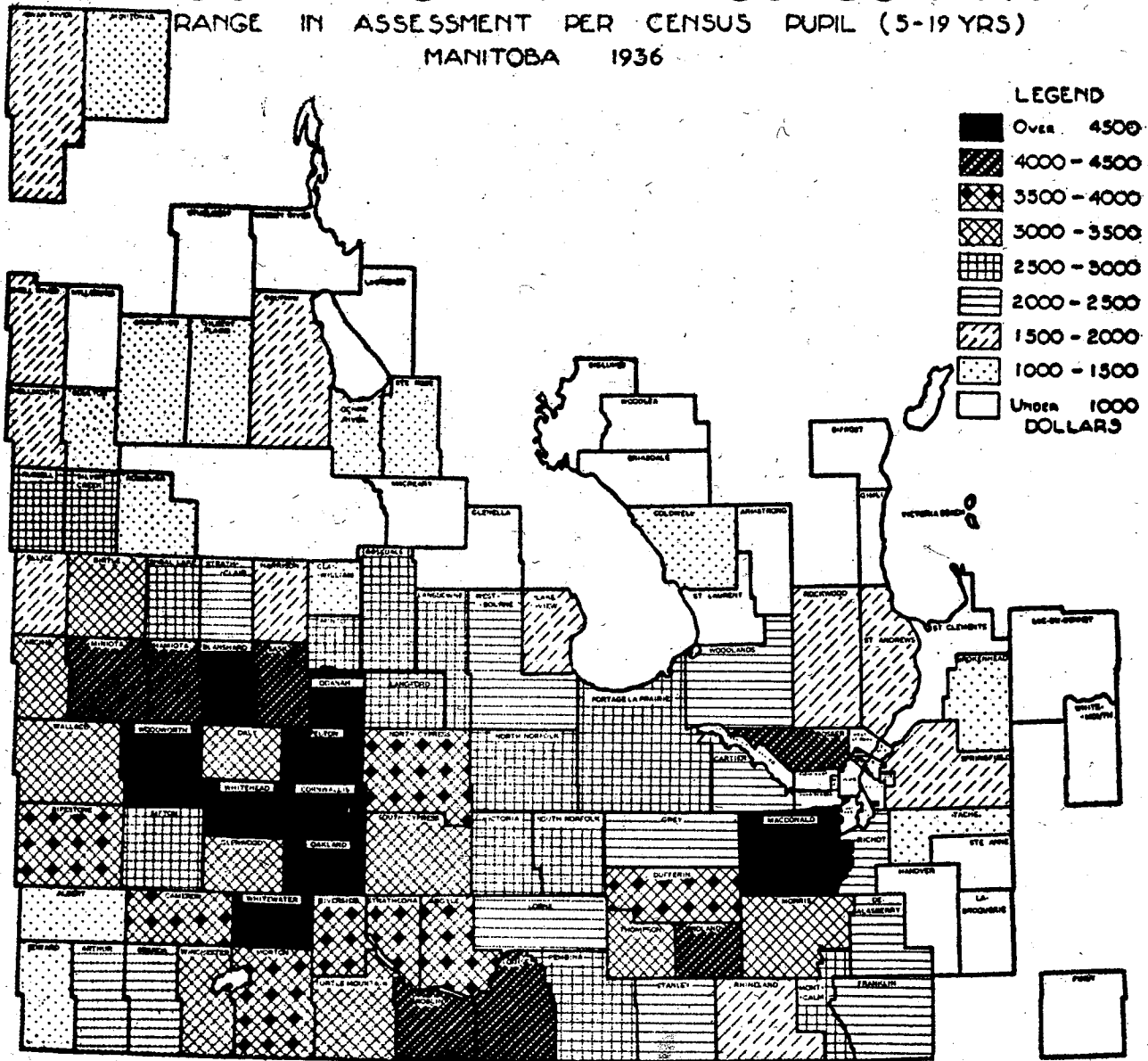


CHART NO. 16

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Figure 2.  
Costs, Dates, Education in Manitoba, Part II,  
Preliminary Report, Published by Economic Survey Board,  
Province of Manitoba, February, 1938.

Provincial Examinations for Grade IX and X  
During the Years 1947, 1948, and 1949

The practice of centrally supervised examinations for Grades IX and X was discontinued in Manitoba in the year 1932 and replaced by Inspectors' examinations. It is generally admitted that the latter did not provide a uniform standard of selection for entrance to the high school nor of progress during the first year. This could not be regarded as a serious matter were the quality and conditions of instruction generally acceptable and somewhat permanent in character. However, the situation in this regard became aggravated by the shortage of qualified teachers at this level over a considerable period of years leaving the schools in rural areas under frequent change in instruction and without any over-all provision for standardization at the point of admission to high school. As a measure of correction to this situation, psychological examinations, and standardized achievement tests were introduced in 1947 and continued in 1948 and 1949. The limitations of this testing programme will be examined later in this chapter.

Purpose of the Study

This thesis purports to estimate (1) existing variations in achievement as revealed by this testing programme, (2) the adequacy of the present testing programme as a means of portraying the variations in ability and effort of pupils upon entrance to and during the first year of high school in the village and town school districts of the Province. It

assumes that success in achievement applies only to the "General Curriculum" now the privilege of every secondary school whether or not individual schools are equipped to take full advantage of its "required" or "elective" subjects of study.

#### Administration and Marking of Tests

All tests used in this study were selected by a committee of School Inspectors in the Province. The Department of Education forwarded the tests to schools where pupils were enrolled in Grade IX and X classes. These tests were administered in mid-June of each year in accordance with the timetable provided by the Registrar's Office. All Grade IX test papers were returned to the Department of Education for marking. This procedure was followed with respect to the Grade IX tests in each of the three years. In 1949, however, standardized tests were arranged for the Grade X pupils, and these tests were administered and marked by the teachers and then the test papers were returned to the Department of Education for checking.

To insure uniformity of marking Grade IX tests, a committee of school teachers was appointed to work under the chairmanship of an Inspector of Schools. Test scores were recorded for each pupil on the Score Sheets provided by the Department of Education. On these Score Sheets also appeared letter grades given each pupil by the teachers on the years work as well as the age of the pupil in years and months in June of the year when the tests were written. The Score Sheets

and the marked test papers were grouped by the Inspectoral Divisions, and the type of school: Collegiate, Two-Room High, One-Room High, Junior High, rural and private were marked on each Score Sheet. The Correspondence Branch Score Sheets were grouped as one unit.

#### Types of Tests Used

In 1947, 1948, and 1949 the Department of Education administered three standardized tests to the Grade IX pupils in the Province and in 1949 three standardized tests to the Grade X pupils. The following tests were used.

Henmon-Nelson Test of Mental Ability, Form: B, Grade IX, 1947 and Form: C, Grade IX, 1948.

Otis Self-Administering Test of Mental Ability. Intermediate Examination, Form: A, Grade IX and X, 1949.

English Minimum Essentials by J. C. Tressler, Form: A, Grade IX, 1947 and Form: C, Grade IX, 1948.

Dominion Arithmetic Test (Fundamental Operations) Form: A, Grade IX, 1947 and Form: B, Grade IX, 1948.

Test of Mathematical Fundamentals by H. R. Beattie, Grades IX and X, 1949.

Haggerty Reading Examination Sigma 3: Form A, Grade IX, 1949.

American Council of Education Co-operative English Test.. Test C1: Reading Comprehension, Form: S, Grade X, 1949.

Further important details pertaining to these tests are indicated in Table 1.

TABLE 1

## SUMMARY OF INFORMATION ON TESTS USED IN THE STUDY

Test	Working Time	Possible Score	Information as to Reliability
Henmon-Nelson Test of Mental Ability Forms: B and C.	30 min.	90	Coefficient of Reliability, Grade IX, .893
Otis Self-Administering Test of Mental Ability Intermediate Examination, Form: A	30 min.	75	Average $r = .948$
Dominion Arithmetic Test, Forms: A and B	35 min.	80	Grade VIII, $r = .97$
Tressler Minimum English Essentials Test, Forms: A and C	47 min.	90	not given
Beattie Test of Mathematical Fundamentals	25 min.	60	not given
Haggerty Reading Examination: Sigma 3	30 min.		Correlation on two trials .885
Co-operative English Test: Reading Comprehension, Form: S	40 min.	150	

The Henmon-Nelson Test of Mental Ability is available in three forms: A, B, and C. It is designed for Grades VII to XII. The Clapp-Young Self Marking system is employed. This Test consists of eighty multiple choice questions and one manual; the same norms are used for all three forms. The manual provides tables for converting raw scores into corresponding I.Q.'s and Mental Ages.

The Tressler English Test is so designed that a single score may be obtained on the whole test to show achievement in English. If used for diagnostic purposes, medians are provided for each of the seven independent tests as indicated in Table 11.

TABLE 11  
 INFORMATION ON THE INDEPENDENT TESTS OF THE  
 TRESSLER MINIMUM ENGLISH ESSENTIALS TEST

Independent tests	Number of questions	Scoring	Medians end of Gr. IX.
1. Grammatical Correctness	20	right minus wrong	7.6
2. Vocabulary	15	No. right	6.8
3. Punctuation and Capitalization	10	"	5.4
4. Sentence and Its Parts	10	"	4.4
5. Sentence Sense	10	"	7.6
6. Inflection and Accent	10	"	4.5
7. Spelling	15	"	8.6

The published norms for the whole Tressler English Test at the end of the ninth year are as follows: 25th. percentile, 36.1, median, 44.6 and 75th. percentile, 54.1. These norms were established in the American schools and designed for all three forms of the test.

The Dominion Arithmetic Test is constructed and published in Canada, and has as its objective to test the knowledge

of the fundamental operations in arithmetic. The manual provided for the test describes it as an achievement type, but also states that it has useful diagnostic possibilities. This test is made up of six component parts as indicated in Table 111.

TABLE 111  
COMPONENT PARTS OF THE DOMINION ARITHMETIC TEST

Part	Score	Content
1. Four Primary Operations	20	(Addition, Subtraction, Multiplication and Division, five of each)
2. Weights and Measures	10	(Addition and Subtraction)
3. Fractions A	10	(Addition and Subtraction)
Fractions B	10	(Multiplication and Division)
4. Decimals A	5	(Addition and Subtraction)
Decimals B	5	(Multiplication and Division)
5. Percentage	10	
6. Decimals and Percentage	10	

A Table of Ontario Grade Norms is provided for each score. However, grade norms for Form A and Form B of the test are not identical.

The Beattie Test of Mathematical Fundamentals is also a Canadian test. It is designed for Grade VII to XII. This



test differs from the Dominion Arithmetic Test in composition and content. Problems are provided in the Beattie test but not in the Dominion Arithmetic Test. The Manual gives the percentiles, means and standard deviations for each Grade.

The two reading tests used in the 1949 study are tests having a wide reputation and use. The Haggerty Reading Examination is a general achievement type of test. Although it is made up of three parts: Vocabulary, Sentence Reading, and Paragraph Reading, norms are not provided for these parts, but for the whole test only. The manual for the test gives corresponding "reading ages" for each significant raw score and a table of scores for each grade level.

The A.C.E. Cooperative Test of English Comprehension is a test of Vocabulary, Speed of Comprehension and Level of Comprehension. Scales are provided for each of the separate parts and for the whole test. This test has been standardized in U.S.A. and different norms are provided for the Southern States. The norms for the Southern States are about two points lower than those for the remainder of the country.

The method of sampling and treatment of test results are indicated in detail in Chapter III of this thesis.

#### Limitations of Testing Programme

Different forms of one group intelligence test were administered to the Grade IX pupils in 1947 and 1948, and different group intelligence test was employed for the Grade IX and Grade X pupils in 1949. Two different forms of the same standardized test in English were administered to the

Grade IX pupils in 1947 and 1948, and two different standardized reading tests were used in 1949 for the ninth and tenth Grade pupils. In 1947 and 1948 different forms of the same arithmetic test were used for the Grade IX pupils, but in 1949 another standardized arithmetic test was used for both Grade IX and Grade X pupils. Comparisons were somewhat difficult due to the fact that the same standardized tests of intelligence and subject-matter were not used for the Grade IX pupils for each of the three years of the study and the results for the Grade X pupils were available for one year only. Nevertheless, if the results present a reasonably consistent pattern of variation, they would be valid for the purpose of this study.

Limitations and values of the intelligence or psychological examinations should be kept in mind. Mursell states that:

1. "They do not reveal a person's capacity for complex and sustained learnings."
2. "Our tests cannot directly reveal capacity for disentangling concepts from complex situations."
3. "Our tests cannot directly reveal capacity for consistent and considered choice between possible courses of action. This capacity clearly involves such traits as persistence, judiciousness, and self-confidence, which are partly intellectual and partly ethical."
4. "Our tests cannot directly reveal capacity for dealing sensibly and wisely with practical problems!"

5. "Our tests cannot reveal directly a person's capacity for controlled and effective methods of work."
6. "Our tests cannot directly reveal the depth, strength and subtlety of a person's appreciative reactions in ethical, social, or aesthetic matters."
7. "Above all, our tests cannot even begin directly to reveal capacity for producing original ideas and construction -- for initiative, for the original solution of problems, for creative endeavor. Indeed, the type of items used systematically discourages originality and places emphasis upon the production of expected 'correct' answers!"<sup>2</sup>.

"The other side of the picture is that despite limitations which every judicious student of the subject is bound to recognize, the modern testing movement has achieved great and indubitable successes, both practical and theoretical." <sup>3</sup>.

1. "It is in connection with the practical uses of psychological tests that the most obvious and unanswerable case can be made, always granted a proper interpretation of the results they yield, many eventualities can be foreseen, and many costly errors in dealing with human beings eliminated." <sup>4</sup>.

The author proceeds to show that in a significant measure they may be used to forecast 'educational prospects' and have a definite value in connection with student selection of courses at college entrance. They may be used to determine a critical score "below which success is unlikely."

"The guidance counselor, the clinical psychologist, and the psychiatrist, find common and important uses for psychological tests. Such workers employ tests not so much for exact and final measurement, but for the refinement of observations." <sup>5</sup>.

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<sup>2</sup> Mursell, James L. Psychological Testing, New York: Longmans Green and Company, 1949, pp. 14-15.

<sup>3</sup> Ibid., p.16.

<sup>4</sup> Ibid., p.16.

<sup>5</sup> Ibid., pp. 18-19

Much that has been stated with reference to psychological examinations is in a measure true of objective examinations in subject-matter areas, more especially if standardized over a population and under curriculum provisions peculiar to a province other than Manitoba. We need our own standardized tests. However, the standardized achievement test in basic studies deals with much factual knowledge common to all secondary school situations, and represents a scientific effort to estimate ability and knowledge, all of which renders their use valuable for comparative studies and for appraising the understanding of individuals.

Standardized achievement tests do not answer the question as to why this result or that result but they do help us to observe the variation in existing standards of learning in particular situations. To arrive at an answer as to why a certain state of achievement exists in a given area or school would necessitate a further study or series of studies. Even establishing the relationship between psychological and achievement tests would not explain the reason for existing variations across such a wide area. It would indicate that they do exist in significant or non-significant quantity and for the individual pupil would constitute a valuable measure of his general ability and achievement. As all Grade IX test papers were examined by a central committee and the school inspector was acquainted with the work of the pupil through the perusal of classroom marks, the psychological and standardized achievement examinations would furnish additional unbiased information as to pupil proficiency and could become an important factor in promotion and classification.

## CHAPTER 11

### REVIEW OF THE TESTING PROGRAMME IN BRITISH COLUMBIA

During the last three decades a large amount of information has been assembled on the results of achievement and psychological tests. Most of the published material is on studies made in U.S. Thus far it has been difficult to find published studies of testing programmes in other provinces of Canada. The writer is of the opinion that due to a greater similarity in curricula, texts, and population among most of the Canadian provinces, comparison of testing programmes and results between two Canadian provinces may approximate more parallel conditions than a comparison of results of a testing programme in Manitoba and U.S. Therefore, when in June 1949, "Canadian Education" published a report prepared by C.B. Conway on "Research and Testing in British Columbia",<sup>1</sup> the writer of this thesis decided to use this report as a piece of work having significance to the study made in this thesis and will quote at length therefrom.

The Report states that up to 1949 twenty-five surveys were made in British Columbia and that standardized achievement, and psychological tests have been used in this work, and that eighteen of the twenty-five surveys, or twenty-five per cent, were conducted below the G rade LX level. The testing programme in British Columbia has been more extensive than that in Manitoba, whereas the emphasis in British Columbia has been

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<sup>1</sup> C.B. Conway, Research and Testing in British Columbia. Canadian Education, The Canadian Education Association, Vol. IV, No. 3, June 1949, p. 59.

on testing below the Grade IX level, in Manitoba, on the other hand, all testing has been conducted exclusively at the high school level, particularly Grade IX. In both provinces most of the testing has been carried out since 1946. The analysis of test results in Manitoba is done by inspectors, and their findings co-ordinated by the Chief Inspector of Schools. However, in British Columbia there is an established bureau of research to take care of this work. The organization of this bureau is described as follows:

"The British Columbia Division of Tests, Standards and Research was established in 1946. It is under the direction of a Director who has the rank of Inspector of Schools and is responsible to the Assistant Superintendent who is also Chairman of the Curriculum Committee. There are two permanent employees, one of whom is the secretary of the Division, and the other the bookkeeper and distributor of standardized tests. One to three temporary employees usually are engaged in tabulating or similar work; and, when testing is at its height, from 10 to 20 college-student markers are employed. The latter have been found to provide an excellent type of assistance."<sup>2</sup>

The author of the Report states that since the bureau has been established in British Columbia test surveys have been conducted on a Province-wide basis and that only a few surveys have been conducted on representative samples of pupils by selecting typical districts and testing almost all of the pupils in those districts.<sup>3</sup> In Manitoba testing is also carried out on a Province-wide basis although Winnipeg and Brandon pupils have written different forms of the same tests at earlier dates

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<sup>2</sup> Ibid., p. 60.

<sup>3</sup> Ibid., p. 63.

making it difficult to establish provincial norms. Representative samples have been analyzed, but no attempt has been made to select specific districts for establishing provincial norms.

In both provinces the testing programme has followed a fairly identical testing pattern: achievement tests are supplemented by psychological tests. In his report Conway refers to psychological tests as scholastic aptitude tests. A summary of the British Columbia "scholastic aptitude" and achievement tests employed is given in Tables IV and V.

TABLE IV

B.C. SCHOLASTIC APTITUDE SURVEYS TO 1948-49<sup>4</sup>

Year	Grade	Test	Mean I.Q.	Mean M.A. (Sept.)	Mean C.A. (Sept.)	No. of Pupils
1946-47	XI	Otis Self-Adminis- tering, C.	104.6	15-6	16-5	5,585
1947-48	IX	Henmon-Nelson H.S., B.	107.1	15-7	14-7	8,960
1946-47	VIII	Otis Int. S.A., C.	103.5	14-1	13-8	8,541
1947-48	VIII	Henmon-Nelson H.S., B.	105.6	14-5	13-8	7,663
1948-49	VII	Pinter Gen. Ability Int. B.	99.6	12-8	12-8	5,566
1946-47	VI	Henmon-Nelson Elem. A.	105.2	12-4	11-10	7,992
1947-48	V	Henmon-Nelson Elem. B.	104.1	11-1	10-9	11,747

<sup>4</sup>Ibid., p.63.

TABLE V

B.C. ACHIEVEMENT TEST SURVEYS TO 1948-49<sup>5</sup>

Date	Test Given	Grade	Number Tested
May, 1948	Co-operative General Mathematics, X	XI-XII	6,630
May, 1949	B.C. General Science	XI-XII	4,050
Dec., 1946	B.C. (Co-operative) Reading Comprehension, S	XI-4	5,495
Mar., 1945	Progressive Achievement, Advanced B.	X-6	
Mar., 1948	B.C. (Co-operative) English Usage, Spelling, Vocabulary, Pm.	IX-6	1,218
Mar., 1948	B.C. (Co-operative) Science, Xm.	VIII-6	8,676
Oct., 1948	Metropolitan, T.	VII-2	5,485
Oct., 1948	B.C. (Metropolitan) Spelling, T.	VII-2	11,051
Oct., 1948	Ayres Handwriting Scale	VII-2	465 (Sample)
Jan., 1947	B.C. (Stanford) Int. Arithmetic, Dm.	VI-5	7,978 <sup>#</sup> (Non-Vanc.)
May, 1947	B.C. (Stanford) Int. Arithmetic, Dm.	VI-9	1,360 (Vanc.)
Jan., 1947	B.C. (Stanford) Int. Language Arts, Em.	VI-5	7,973
May, 1947	B.C. (Stanford) Int. Language Arts, Em.	VI-9	1,360 (Vanc.)
Mar., 1948	B.C. (Stanford) Int. Reading, D.	V-6	11,826
Mar., 1948	Ayres Handwriting Scale	V-6	300 (Sample)
Nov., 1943	B.C. Arithmetic Computation, A & B		2,000
Mar., 1944	B.C. Arithmetic Computation, A & B	IV-V	2,100
	B.C. Arithmetic Computation, A & B	III-IV	1,900

<sup>5</sup>Ibid., p. 62.

<sup>#</sup> Non-Vancouver



Method of Administration and Marking of Tests  
in British Columbia

With the establishment of the Bureau of Research in British Columbia the testing programme developed rapidly. In Table 11 we note that only two surveys were conducted in that Province prior to the establishment of the bureau in 1946. The administration and marking of the tests follows a fairly well established pattern. Conway reports that:

"..Standardized tests purchased from the publishers usually have been specially printed and directions have either been printed or issued in mimeographed form. The tests have been distributed to the school inspectors according to the enrolments in their inspectorates. The inspectors have given the tests themselves, or have distributed them to reliable principals and teachers for administration. The completed tests have been collected and checked in by the inspectors and have been returned to the Division for marking. In most cases they have been marked in the Division; but in some, they have been re-shipped for scoring by machine. On the whole hand-scoring has proved preferable even though it is more expensive. If a sufficient number of markers is hired the tests can be marked just as rapidly, and it has been found that results of machine-scoring are not directly comparable to those obtained when the scoring is done by hand<sup>6</sup>

In Manitoba standardized tests are distributed to schools directly from the Registrar's Office of the Department of Education. No special publication of these tests has been attempted in the Province though directions have been specially printed to insure uniformity of administration. The tests have been administered by principals in high schools

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<sup>6</sup> Ibid., p.61.

and teachers in rural schools. In 1949 Grade X tests were marked by the teachers, but all Grade IX tests have been marked by a central committee. This committee is composed of teachers. The employment of teachers has been made possible as all tests have been marked during the summer holidays and it has been found that this type of work gives the teachers some insight into the testing programme in the Province. All scoring has been done by hand and no attempt has been made to use tests that may be scored by a machine. By and large the administration of tests and marking follows fairly similar lines in both provinces.

It is interesting to note that no surveys involving tests of specific aptitudes or of personality have been attempted in either province. Conway points out that:

"Such tests may be tried out later, but up to the present it has been considered advisable to use tests of proven validity."<sup>7</sup>

The Report underlines the fact that since surveys of achievement had not been made in the past, it was necessary to make comparisons between British Columbia Provincial norms and the U.S. norms, but that a great body of material has been accumulated which will make future comparisons possible.

Conway<sup>8</sup> reports that the same tests may be given again under similar circumstances and if changes in curriculum have been made, it will be possible to determine whether these changes have been justified. He maintains that even if the native

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<sup>7</sup> Ibid., p. 64.

<sup>8</sup> Ibid., p. 64.

ability of the pupils should prove different when these tests are re-administered, that it will be possible to eliminate the effect of this factor on future test results. When the large number of pupils that have been tested and the care with which the tests were administered are taken into consideration, this should assure that the differences found in the future will constitute reliable data for comparative purposes.

#### Results of the British Columbia Surveys

In analyzing the results of the achievement test surveys the author comes to the following conclusions:

- 1." That there is a tremendous range in terms of grade-levels in every subject and in every grade that has been tested.
2. That achievement in Science is higher in Junior High School than in the corresponding grades of elementary schools.
3. That British Columbia is above the U.S. norm in Speed of Reading and Level of Comprehension in Grade XI; in Mathematics in Grades XI and XII; and in Reading, Mathematics and Language in Grade X.
4. Weaknesses are indicated, however, in Grade IX Spelling, Sentence Structure, and Mathematical Fundamentals.
5. Grade VIII is distinctively above the U.S. norm in Science, as is Grade VII in all of the fundamentals covered by the Metropolitan Achievement Test.
6. Weakness in Language Usage seems to be becoming evident in the lower grades of elementary school, as is a weakness in Arithmetic Computation.
7. The problem-solving ability of the pupils has been distinctly higher than their computational ability in all grades.

8. Handwriting is now two grades below the Ayres 1917 norms."<sup>9</sup>

The conclusions reached in British Columbia on the results of psychological tests should prove valuable in appraising the study made in Manitoba as both provinces used tests by the same authors in testing mental ability of the pupils or as Conway refers in his report, "scholastic aptitude". The report lists the following conclusions:

1. "Scholastic aptitude survey results have indicated that in general our pupils are about 5 points above the commonly-accepted norm of 100 I.Q. Such superiority is to be expected because certain pupils in all school systems are institutional cases or are so retarded that they never reach the intermediate grades. The most obvious result, however, is the fact that certain tests are more difficult than others: or rather, that they have been standardized on populations of varying ability. The Pintner General Ability Test, for example, seems to have been standardized on a population distinctly better than that used for the other tests employed in our surveys."<sup>10</sup>
2. An important outcome of our surveys is the indication that results are never quite as favourable when complete coverage is obtained as when testing is done on voluntary basis. Schools with the highest achievement are those in which the most testing is done. If only a fraction of the population is tested, the fraction must be very carefully chosen so that it is a sample that is truly representative of the whole."<sup>11</sup>
3. "The selection must be done in a central office instead of locally. This is not because of any attempt on the part of the teachers or others to mislead authorities. It is due to the fact

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<sup>9</sup> Ibid., pp. 64-65.

<sup>10</sup> Ibid., p. 65.

<sup>11</sup> Ibid., p. 65

that achievement usually is lowest in the schools that are most difficult to test. The small out-of-the-way schools are those most likely to be missed and their achievement usually is least satisfactory."<sup>12</sup>

4. "Province-wide surveys have been conducted frequently enough to make it possible to select equivalent areas with considerable success. Nevertheless, complete coverage definitely is preferable, and province-wide surveys will continue to be made whenever it is possible."<sup>13</sup>

The writer of this thesis will attempt to analyze the results of the psychological tests to determine if the same tendency appears in Manitoba with respect to the Henmon-Nelson and the Otis mental ability tests.

#### Provincial Norms

The British Columbia report emphasizes the fact that provincial norms have more value for future and present comparisons than the published standardized test norms. This is in some measure due to the fact that there is a great deal of variation in achievement from one community to another, as well as a great deal of variation in the scholastic aptitude of the pupils. The differences that effect the results of psychological tests may be due to social inheritance or the environmental background of the pupils. Differences in achievement may also be observed which may be caused by differences in curricula, texts or emphasis. Therefore, the groups studied may be above the published U.S. norms in one subject-

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<sup>12</sup> Ibid., p. 65.

<sup>13</sup> Ibid., p. 67.

matter field and below in another. When provincial norms are used for making comparisons of local results, assurance is thereby given that at least those differences that may be due to length of school year, curricula, texts or test standardization have been eliminated to a certain degree.

Another factor that makes the use of provincial norms more advisable is brought about by the fact that often supposedly equivalent forms of the same test are not 'equivalent'. Conway<sup>14</sup> reports that it was found that the Otis, Higher Form C, seems more difficult than either Form A or Form B. In some cases when equivalent forms are used the central tendency may be the same but the distribution of scores may differ, and therefore, a pupil who attains the same percentile rank on both forms may have different I.Q. scores. He suggests that in recording results of psychological examinations care should be taken to record the form of test used. Experience in British Columbia has shown that the I.Q. is satisfactory for secondary school pupils as a measure of potential ability, but in the elementary schools errors in interpretation and pupil placement may be common if the I.Q.'s are not supplemented with corresponding Mental Age scores.

Additional values of provincial norms and scholastic aptitude tests were found in British Columbia in connection with the recommendation of pupils for university entrance without writing departmental examinations. In accredited schools pupils who received 67 per cent or higher in each school subject could be recommended for university entrance.

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<sup>14</sup> Ibid., p. 68.

However, it was found that pupils who received a grade of 66, 65 or even 60 per cent from the teachers rarely failed to obtain a pass of 50 per cent on departmental examinations. Recommending pupils on the basis of 67 per cent proved successful and the privilege was extended to accredited schools to recommend pupils who obtained 58 per cent for the term work. It was found, however, that the eight point margin over the pass mark of 50 per cent proved too narrow "when the reliabilities of examination and teachers' grades were concerned".<sup>15</sup> It was found that in some schools all the pupils failed in departmental examinations save those that were recommended, and consequently the method of recommendation was altered. On the new basis 60 per cent of the pupils who obtained 58 per cent or higher on school examinations were subject to recommendation. It was found that small classes and highly selected groups were common, and, since the onus of selection of pupils for recommendation fall on the teacher, some teachers were unwilling to accept the responsibility as no rule was formulated that the teachers could follow in all cases. It appears that the teachers were unable to decide whether a score exceeded by 60 per cent of the whole group should be the criterion for recommendation, or the score exceeded by 60 per cent of the university entrance pupils. Again we quote Conway to show how this difficulty was overcome. He comments:

"The availability of distributions of I.Q.'s based on surveys of the province made it possible to offer a solution to this rather confusing situation. It was obvious that when a course had been taken by only a few highly-selected students, and it was felt that the

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<sup>15</sup>Ibid., p. 68.

quality of instruction has been good, a higher proportion of the candidates might be recommended."16

He says further:

"The assumption could be made that, in general, classes with high scholastic aptitude would have high achievement. Therefore, in the absence of standardized achievement test scores, the proportion of high I.Q.'s could be used as a basis for determining the number to be recommended. The criterion that finally was adopted was an I.Q. of 112. In a small class the proportion of candidates to be recommended would be roughly the same proportion as there were candidates with I.Q.'s above 112. Some of the students in a class might have I.Q.'s higher than that, but if their achievement proved to be distinctly lower than that of other pupils they would not be recommended. Some students would have I.Q.'s below 112, but, because of their rank in class, they would be eligible for recommendation."17

Conway concludes that:

"..recommendation should be based on achievement and not on I.Q., but the proportion of high I.Q.'s in a class could be used to give an indication of the number of pupils who probably would be successful."18

It is interesting to observe that a similar situation arose in Manitoba in connection with the acceleration of pupils in 1949. The criterion used for accelerating the top twenty per cent of the Grade X pupils was the results of the Otis Mental Ability test supplemented by achievement on two standardized tests and the school record.

#### Problems of the Testing Programme

The author of the British Columbia report concludes that the testing program has encountered certain problems. One of these problems is a deficiency of achievement tests that would

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16 Ibid., p. 69.

17 Ibid., p. 69.

18 Ibid., p. 69.



have curricular validity in the Province. He seems satisfied that there is an adequate store of good tests of fundamental skills, but not of tests for specific subject-matter areas. To overcome this shortage British Columbia has organized a programme of test construction, however, the limiting features of this programme seem to be that a test has to be administered at least three times before it can be standardized. The second problem, and one to which the author attaches considerable importance is the lack of comparable information on testing done in other provinces.

In succeeding chapters the writer of this thesis will attempt to analyze the results of the tests used in this study and appraise further any similarity that may exist in the two provinces.

#### A Manitoba Study

Another study, unpublished, was made of the progress of a group of students graduating in June of 1947 from the Lord Roberts Junior High School, Winnipeg. This study undertook to examine the modified battery of tests given the Grade IX pupils of Winnipeg to ascertain the worth of such a group of tests in determining future success in Grade XI. The study arrived at the following conclusions:

"If we study the scores made by these pupils in the Grade X and Grade XI examinations, we note that not only is there a remarkable agreement in the ranking of pupils on the Departmental objective tests as compared with ranking on the scores obtained on their High School tests but also that there was almost complete agreement in rating those pupils who showed superior scholarship

in Grade XI and those who failed to pass that grade."<sup>19</sup>

The tests which would appear to be most indicative of success or failure as determined by a comparison of scores in the battery of tests given in Grade IX with the scores on the final Grade XI school examinations are: (1) Mental Ability (2) Reading Comprehension. The following correlations were obtained:<sup>20</sup>

1. Group Test of Intelligence and Grade XI scores	.74
2. Reading Comprehension and Grade XI scores	.68
3. Language Test and Grade XI scores	.55
4. Fundamentals in Mathematics and Grade XI scores	.60
5. General Knowledge and Grade XI scores	.53

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<sup>19</sup> John Scurfield, "University of Manitoba, Unpublished Paper". 1950, p.7.

<sup>20</sup> Ibid., p.5

CHAPTER 111

AGE DISTRIBUTION AND SAMPLING

Age Distribution

Age distributions were made for Grade IX and X pupils, on the basis of sampling explained later in this chapter. The results are tabulated in Tables VI and VII and illustrated by Figures 3, 4 and 5.

Table VI indicates that the average age for Grade IX pupils remained relatively constant for the three years under discussion and that the Grade X age average was approximately one year above that of the age group for Grade IX in any one of the three years 1947, 1948 and 1949.

TABLE VI  
QUARTILES AND MEANS OF CHRONOLOGICAL AGES OF  
MANITOBA GRADE IX AND X PUPILS EXPRESSED  
IN YEARS AND MONTHS

Group	N	Q1	Md.	Q3	Mean
Grade IX 1947	1742	14-10	15-6	16-1	15-6
Grade IX 1948	1644	15-1	15-6	16-2	15-6
Grade IX 1949	1513	14-11	15-5	16-1	15-6
Grade X 1949	1736	15-11	16-5	17-0	16-6

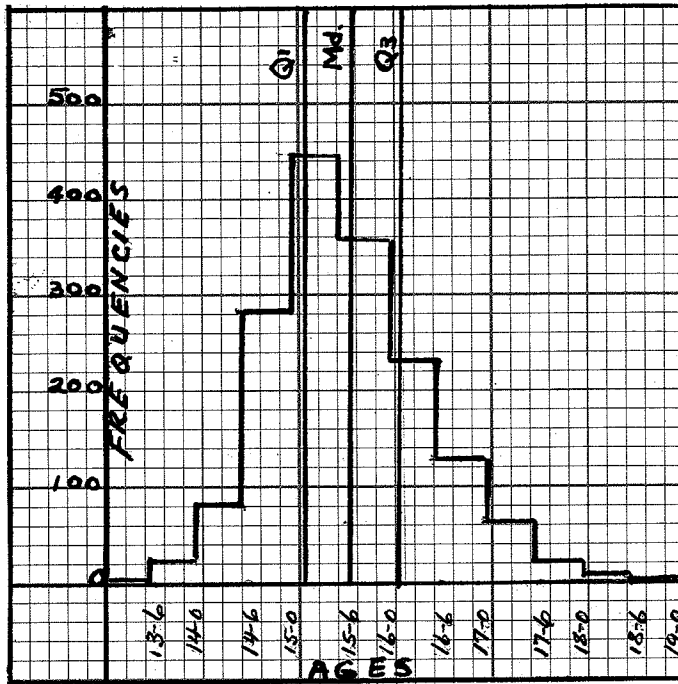


Figure 3.

Distribution of 1644 chronological ages for the Manitoba Grade IX pupils, 1948

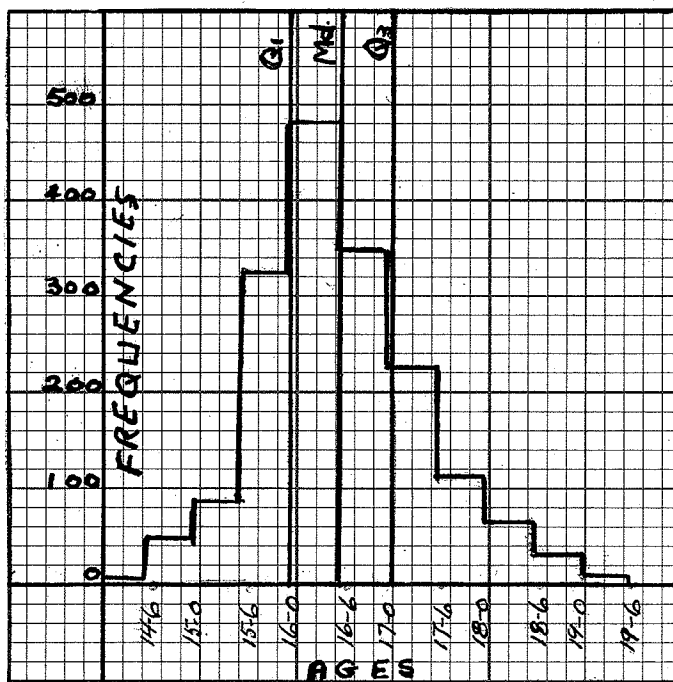


Figure 4.

Distribution of 1736 chronological ages for the Manitoba Grade X pupils, 1949

TABLE VII

DIFFERENT AGE GROUPS OF GRADE 1X AND X PUPILS  
IN MANITOBA EXPRESSED AS PER CENTAGES

Age Group	Gr. 1X 1947	Gr. 1X 1948	Gr. 1X 1949	Gr. X 1949
19				.63
18	.57	.60	.92	5.35
17	5.56	5.16	7.20	19.87
16	20.43	22.14	18.43	47.63
15	45.12	49.26	46.39	24.25
14	26.00	21.22	25.11	2.13
13	2.12	1.58	1.24	

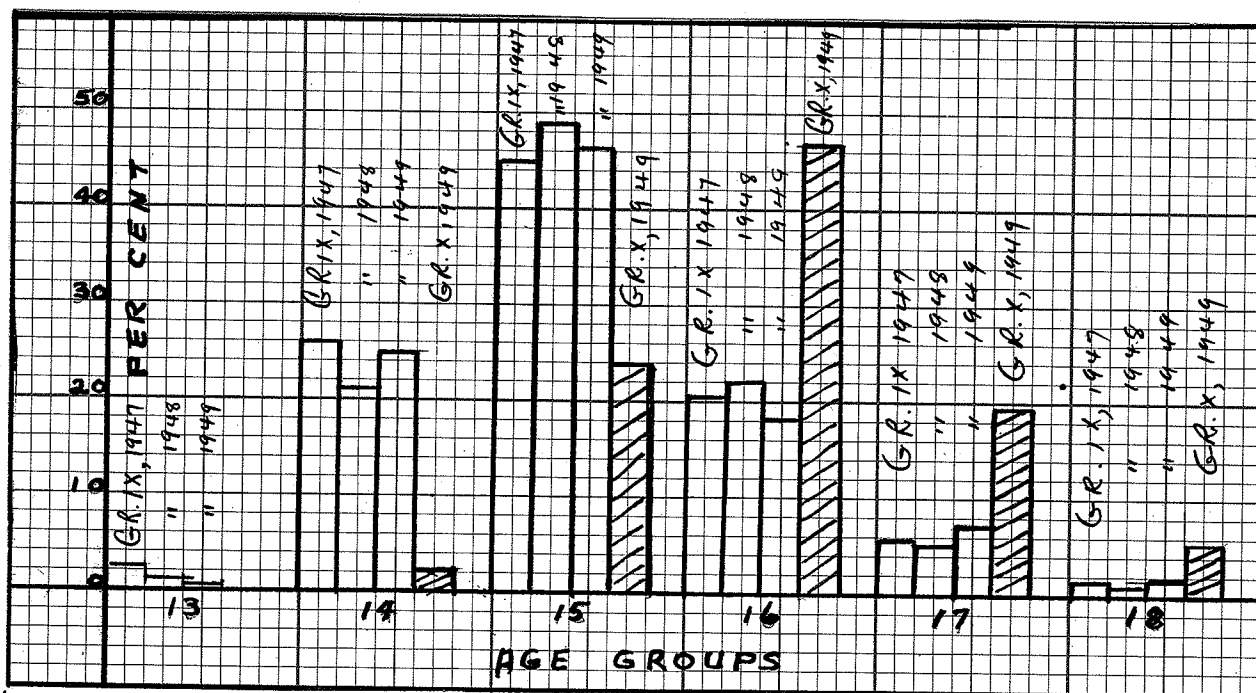


Figure 5.

Distribution of age groups in terms of percentage of the Manitoba Grade 1X and Grade X pupils.

The British Columbia mean chronological age for the Grade IX pupils in September, 1947 is reported as fourteen years and seven months, therefore, we may assume that in June it would be fifteen years and five months which is practically the same as that established for the Manitoba Grade IX enrolment.

#### The Method of Sampling

The studies of pupil marks on psychological examinations, achievement tests and teacher letter rating were made by the writer on the examination results of three successive years. The method of sampling for comparative study was altered somewhat for each year as the writer added to his experience without contemplating the present study. This accounts for the variation in method reported in the section now under consideration. The procedure renders comparisons more difficult and makes greater detail of treatment essential. However, the writer can but analyze and compare the results of each year's study as they were approached at the time. Had the present study been planned in the beginning over the three year period one standard method could have been decided upon and applied throughout.

To determine the reliability of the Tressler English Tests, the Dominion Arithmetic Tests, the Beattie Arithmetic Test and the Haggerty Reading Examination, test papers were drawn at random, two from each of the larger Inspectoral Divisions and one from each of the two smaller Divisions making

a total of fifty papers per sample. The Hoyt method was employed in calculating reliability and the coefficients of reliability are indicated in Table VIII

TABLE VIII

COEFFICIENTS OF RELIABILITY ( $r_{tt}$ ) FOR TESTS OF ENGLISH, ARITHMETIC AND READING AT THE GRADE LX LEVEL

Sample	N	Tressler English $r_{tt}$	Dominion Arithmetic $r_{tt}$
1947			
1	50	.86	.90
2	50	.87	.88
1948			
1	50	.98	.93
2	50	.93	.92
		Haggerty Reading $r_{tt}$	Beattie Arithmetic $r_{tt}$
1949			
1	50	.93	.92
2	50	.98	.93

To determine correlations between mental ability, raw scores and the Tressler English, the Haggerty Reading, and the

<sup>25</sup> Cyril Hoyt, "Testing Reliability Estimated by Analysis Variance", Psychometrica, Vol. 6, No. 3, June, 1941.

two arithmetic tests; and between I.Q.'s and the English and Dominion Arithmetic raw scores, the Grade IX samples for the year 1947 were selected in the following manner:

1. The scores of the first 100 names of the 14 year old rural school pupils appearing on the Score Sheets were used to make a sample of rural pupils.
2. The scores of the first 80 names of the 16 year old rural pupils appearing on the Score Sheets were used to make a sample of 16 year old rural school pupils.
3. To get Junior High samples the scores of every second name appearing on the Score Sheets of 14 year old pupils were tabulated until a sample of 100 was reached, and in the same manner the scores of the 16 year old Junior High group were selected until a sample of 91 was reached.
4. The first 114 names of the 17 year old group appearing on the Score Sheets of 15 Inspectoral Divisions yielded scores for the sample.
5. Every second name appearing on the Score Sheets of pupils recommended for failure was selected to yield scores for this sample of 100 names.
6. A sample of 100 names was selected to represent the Collegiates by taking the scores of every third name appearing on the Score Sheets of 17 Collegiate in the Province.
7. Every fourth name on the Score Sheets of 15 Inspectoral Divisions to make a sample of 100 for the Two-Room High group.
8. Every fourth name on the Score Sheets of 15 Inspectoral Divisions to make a sample of 100 for the One-Room High group.

In 1948 every tenth name was used from the Score Sheets of Collegiates, Two-Room High, One-Room and Junior High until a sample of fifty was secured for each type of school. Correlations were calculated between mental ability and English and between mental ability and arithmetic raw scores. Correlations were also correlated between I.Q.'s and English



and I.Q.'s and arithmetic scores for these samples, and for all names of Inspectoral Divisions A and B.

Score Sheets were used from ten Inspectoral Divisions to get the chronological age distribution of the population studied. The Divisions selected were considered to represent a cross section of the Province. Identical Divisions were not employed for this analysis in each of the three years as some Divisions were in the process of change each year. However, in each case the number studied represented approximately one-third of the population.

Samples were used to analyze responses to each question in the arithmetic tests. These samples were the same as those used to determine the reliability of the tests. In 1949 the Grade IX and X arithmetic samples were compared question by question. The 1947 and 1948 arithmetic samples were compared in the same manner.

Analysis of the Tressler English test was made for each of the seven separate parts of the test. Eleven Inspectoral Divisions were used in 1947 and ten in 1948 as representative samples of the population studied. Medians for each of the separate parts of the test were calculated for these samples and compared graphically with the published medians. Similarly five Inspectoral Divisions were used as additional samples to compare the separate parts of the test for each year.

#### Treatment of Test Results

The scores included in this study to establish norms for the population are derived from the rural and smaller city school

systems in Manitoba. The Correspondence Branch scores were considered separately and the scores for the Winnipeg and Brandon schools were not available, as they used a modified form of the tests and administered them at an earlier date. For convenience the scores of the Collegiate Institutes and Collegiate Departments were grouped together under the title of "Collegiates". Separate analysis was made of the more significant types of schools in the Province: Collegiate, Two-Room High, One-Room High, Junior High Schools and Correspondence Branch. Though the scores of private and rural schools were taken into consideration in arriving at the Provincial norms, they were not singled out for specific study.

Tabulations of test scores were made according to frequency distributions of five intervals. This method was adhered to each year. Results were first tabulated for each Inspectoral Division with scores for all types of schools set out separately. All results from the Inspectoral Divisions were summed and the population frequency distribution determined. In like manner the distributions were summed to secure a single distribution for each type of school.

Quartiles were calculated for each group and the median was used for preliminary comparisons. This was deemed necessary as the norms for the Tressler English Test were expressed as quartiles. Median scores were also available for the Henmon-Nelson and the Beattie Arithmetic tests.

The mean and the standard deviation for each group was

also calculated, in order that comparisons could be made to determine if any statistically significant difference existed among the groups compared. To find the standard error of the mean, the formula  $\frac{\sigma(Pop)}{\sqrt{N}}$ <sup>1</sup> was employed, and to find the standard error of difference between means the formula  $\sigma_{M_1 - M_2} = \sqrt{\sigma_{M_1}^2 + \sigma_{M_2}^2}$ <sup>2</sup> was used. The critical ratio (t) greater than 1.96 was considered significant at the 5% level and that greater than 2.57 at the 1% level.

Percentiles were calculated for some distributions and ogive curves drawn. These were used to compare the results of the Henmon-Nelson Tests with the published norms, and to show the distribution of reading ages and grade norms on the Haggerty Reading Examination.

In 1947 correlations were calculated for the groups described on page 35, and in 1949 for scores in three Inspectoral Divisions.

At the Grade X level correlations were calculated between the vocabulary section of the test and the total score for the A.C.E., Reading Comprehension Test. Scores from four Inspectoral Divisions and scores for ninety Correspondence Branch pupils were used in this project.

The Product-Moment correlation form of five intervals was used for determining the coefficient of correlation.

Mental ability raw scores were converted into corresponding I.Q.'s in 1949 and the results studied in ten

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<sup>1</sup> E. F. Lindquist, A First Course in Statistics, New York: Houghton Mifflin Company, 1938, p. 108.

<sup>2</sup> Ibid., p. 120

Inspectoral Divisions, considered representative of the population. In the previous two years the mean raw score and the quartile and median raw scores for the mental ability tests were also converted into I.Q.'s by using the corresponding chronological ages. The distribution of chronological ages was calculated for the ten Inspectoral Divisions to obtain information as to the age groups each year and in each grade, and to find the degrees of constancy existing from year to year and between Grade IX and X.

In 1948 three groups were selected for specific study: (1) pupils recommended for failure by the teachers, (2) pupils with I.Q.'s of 115 or higher, and (3) pupils making 25 or less on the Tressler English Test. The achievement of these groups was evaluated in terms of standardized test results.

In 1949 the Grade IX Q1 and Q3 mental ability groups were compared to determine whether the pupils with higher mental ability raw scores showed improved achievement in the reading and arithmetic test results. At the Grade X level the Q3 mental ability group was compared with the established norms for the population to estimate whether or not the group showed superior achievement in arithmetic and vocabulary tests.

In order to determine if any relationship existed between ranks accorded each pupil on the year's work and mental ability scores, achievement of Grade IX pupils with mental ability raw scores below the 25th percentile was compared with the achievement of Grade IX pupils with mental ability raw scores above the 75th percentile. This comparison was made by using the

letter grades reported on the Score Sheets by the teachers. The letter grades used in Grade IX were: H(High), G(Good), S(Satisfactory), and W(Weak). In Grade X the achievement of the pupils with mental ability raw scores above the 75th. percentile was evaluated in terms of teacher ranks A, B, C, D, and E. The weak ranks in Grade IX and the E ranks in Grade X were analyzed to ascertain the subject matter areas on which the pupils received these ratings more frequently.

CHAPTER IV

SUMMARY OF ACHIEVEMENT ON THE MENTAL ABILITY TEST

Mental Ability Grade IX

Nearly five thousand mental ability raw scores were analyzed for the Grade IX population in each of the three years included in this study, and nearly four thousand raw scores at the Grade X level in 1949. As the quartiles and medians were calculated in the preliminary analysis, these will be reported in terms of raw scores.

TABLE IX

QUARTILES OF THE MENTAL ABILITY RAW SCORES OF THE NINTH GRADE PUPILS IN MANITOBA, 1947 ON THE HENMON-NELSON TEST OF MENTAL ABILITY FORM: B

Group	N	Q1	Md.	Q3
Population	4,343	47.30	54.50	60.40
Collegiates	933	47.58	54.71	61.04
Two-Room High	524	45.62	52.37	58.92
One-Room High	602	47.30	53.50	60.50
Junior High	680	50.53	57.71	63.42
.....	.....	.....	.....	.....
Correspondence Branch	586	44.55	52.00	60.17

Table IX shows that the median for the Collegiates falls close to the population median of 54., but that the



medians for the Two-Room and One-Room High groups and Correspondence Branch are about two points lower. On the other hand the median for the Junior High group is about three points higher than that for the population studied. A somewhat similar condition may be noted at the first and third quartile, though the Two-Room High group has lower scores at those points than the One-Room High.

In 1948 a different form of the Hermon-Nelson Mental Ability Test was written and similar groups compared in Table X.

TABLE X

QUARTILES OF THE MENTAL ABILITY RAW SCORES OF THE NINTH GRADE PUPILS IN MANITOBA, 1948 ON THE HENMON/NELSON TEST OF MENTAL ABILITY FORM: C

Group	N	Q1	Md.	Q3
Population	4,075	44.08	52.68	61.79
Collegiates	1,174	45.34	53.76	63.19
Two-Room High	5,611	42.63	50.58	58.84
One-Room High	695	42.69	51.72	60.68
Junior High	639	47.79	55.57	63.75
Correspondence Branch	504	42.45	51.98	60.98

The results for this test show that the population median for 1948 is about two points lower, 52.68 as compared with 54.50 for 1947. An approximate difference of about two

points is evident for all groups and equivalence in achievement is apparent for the Two-Room High, One-Room High and Correspondence Branch, with the Two-Room High again having a lower Q3 score. The Junior High group results are higher than those for the other groups both in 1947 and in 1948.

In 1949 the Otis Intermediate Examination was administered to the Grade IX population. The summary of results is tabulated in Table XI.

TABLE XI

QUARTILES OF THE MENTAL ABILITY RAW SCORES OF THE NINTH GRADE PUPILS IN THE PROVINCE OF MANITOBA, 1949 IN THE OTIS MENTAL ABILITY TEST INTERMEDIATE EXAMINATION FORM: A

Group	N	Q1	Md.	Q3
Population	4,217	54.98	61.12	66.45
Collegiates	1,364	55.47	61.60	66.95
Two-Room High	565	52.56	59.56	65.45
One-Room High	684	54.61	60.7 8	66.31
Junior High	584	57.74	62.95	67.46
Correspondence Branch	500	52.04	60.39	64.65

The median raw scores of the Henmon-Nelson and the Otis Tests are not directly comparable. However, comparisons are possible if raw scores are converted into corresponding I.Q.'s. Therefore, if the median ages in Table VI are used



to convert the median mental ability raw scores the median I.Q.'s are as follows: Hermon-Nelson, 1947, 106; Hermon-Nelson, 1948, 105 and Otis 1949, 107. The median I.Q.'s, therefore, do not show any significant variation from year to year.

Mental Ability Grade X.

In 1949 the Otis Test was also administered to the Grade X pupils. Table XII gives significant information in terms of the raw scores.

TABLE XII

QUARTILES, MEDIAN, MEAN, STANDARD ERROR OF THE MEAN AND STANDARD DEVIATION OF THE MENTAL ABILITY RAW SCORES OF THE MANITOBA GRADE X PUPILS, 1949 ON THE OTIS INTERMEDIATE EXAMINATION FORM: A

N	Q <sub>1</sub>	Md.	Q <sub>3</sub>	Mean	S.E.M	S.D.
3,605	60.81	65.69	69.33	64.50	.13	7.65

The difference between the median and the mean in Table XII is very slight, however, the median for the Grade X population is about four points higher than the median for the Grade IX population as shown in Table XI. If, however, we convert the mean and median raw scores for the Grade X population by using the mean and median chronological ages established in Table XVI of this study we get a mean I.Q. of 107 and a median I.Q. of 108. In order to verify the conversion of the median and mean chronological ages into corresponding I.Q.'s, I.Q.

scores for about one-half of the Grade X population, and about one-third Grade LX population was analyzed in 1949 to determine the median and mean I.Q.'s. The information for this analysis is given in Table XLII

TABLE XLII

QUARTILES, MEDIAN, MEAN, STANDARD ERRORS OF MEANS AND STANDARD DEVIATIONS OF I.Q. SCORES OF THE MANITOBA GRADE LX AND X PUPILS, 1949

N	Q <sub>1</sub>	Md.	Q <sub>3</sub>	Mean	S.E. <sub>M</sub>	S.D.
Grade X 1897 (Scores)	103.55	108.63	110.17	107.40	.16	7.45
Grade LX 1576 (Scores)	100.29	107.62	113.48	106.25	.24	9.55

We may conclude that the calculations of I.Q.'s by conversion are accurate as they give us the same results as those summarized in Table XLII, arrived at by direct analysis.

<sup>1</sup>  
In his study Conway reports a mean I.Q. of 107.1 for the B.C. population at the beginning of Grade LX on the Henmon-Nelson Mental Ability Tests. The mean I.Q. established in this study is almost equal that of B.C. A slightly higher mean I.Q. score for the Grade X population suggests that some degree of selectivity had taken place.

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<sup>1</sup> Op. cit., p. 62

Types of School

Further analysis was made to ascertain if the differences that appear in the mean scores of the different types of school are statistically significant, for which purpose the means, the standard error of the means and the standard deviations were calculated for each group. Table XIV summarizes the results:

TABLE XIV

MEANS, STANDARD ERRORS OF MEANS AND STANDARD DEVIATIONS OF THE MENTAL ABILITY RAW SCORES FOR THE FOUR GRADE IX-SCHOOL GROUPS COMPARED

	Collegiates	Two-Room High	One-Room High	Junior High
1947				
N	933	524	602	680
Mean	54.10	52.50	52.50	56.50
S.E <sub>M</sub>	.30	.59	.40	.39
S.D.	10.00	13.65	9.80	10.05
1948				
N	1,174	561	695	639
Mean	54.05	50.25	52.54	56.10
S.E <sub>M</sub>	.41	.49	.45	.44
S.D.	14.20	11.65	12.05	11.25

Table XLV (Continued)

	Collegiates	Two-Room High	One-Room High	Junior High
1949				
N	1,364	565	684	584
Mean	60.95	58.40	59.60	62.16
S.E.M	.22	.38	.34	.29
S.E.	8.10	9.11	8.95	7.05

In Table XLV the mean difference among the four High School groups selected for study are practically the same as that when the median was employed for the purpose of comparison. However, in order to determine if the differences that do appear are statistically significant, the standard error of difference between means was calculated. A critical ratio (t) of 1.96 was considered significant at the five percent level, and a critical ratio greater than 2.57 significant at the one percent level.

The calculation establishes that there is no significant difference between One-Room High and Two-Room High school groups in 1947 and 1948 as indicated by the results of the Henmon-Nelson tests but, that there is a difference in achievement among all the groups in 1949. The achievement of the Junior High groups is definitely highest and the Collegiates next in order. It is reasonable to generalize by stating that the pupils in the suburbs and larger towns in Manitoba show somewhat higher achievement in psychological examinations than do pupils in the smaller rural high schools.

To compare still further the results of the Henmon-Nelson tests for the G grade IX population, percentile curves were drawn. Norms in terms of percentiles are not published for the Otis Test, hence a similar comparison could not be made. Figure 6 shows the population norms and the published norms for the Henmon-Nelson tests.

In each year the curves for the Manitoba Grade IX population are higher than the published norms for the test. This may suggest that the test was standardized on samples inferior in mental ability to the Manitoba samples of population, or that there is a higher degree of selectivity in Manitoba at the Grade IX level. As there is less tendency toward selectivity in the United States in the earlier high school grades than is true of Canada, in all probability the latter assumption is the correct interpretation of this variation in results. In Figure 6 the curve for the 1948 sample is lower than that for 1947 until it reaches the 60th percentile and then slightly higher. It is difficult to conclude whether there is a definite difference in the mental ability of the populations studied each year or whether this difference may be due to some variation in the two forms of the test.

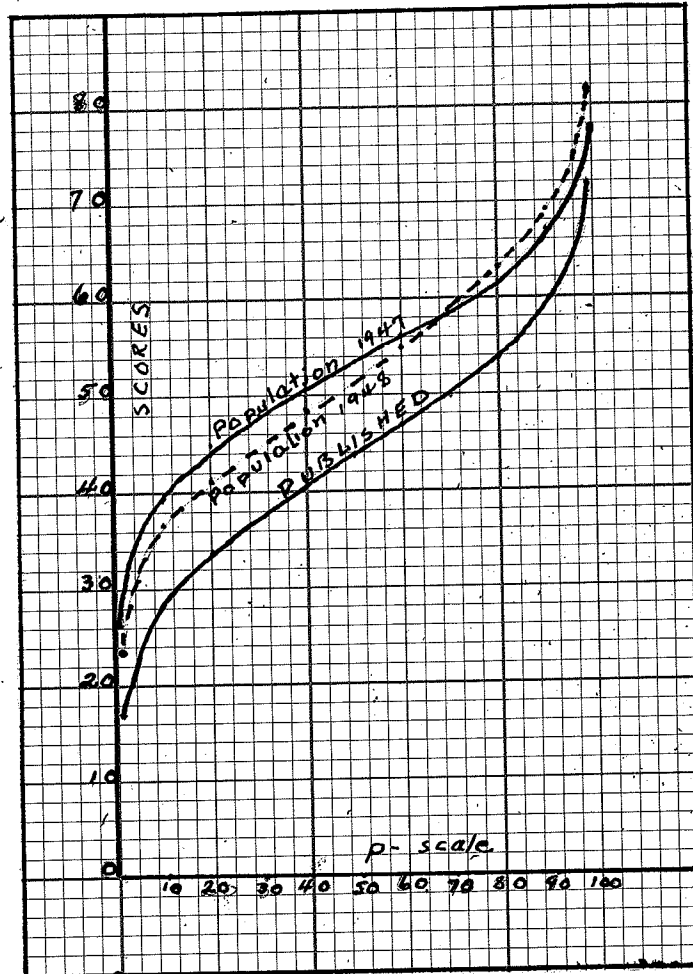


Figure 6.

Percentile curves of 4,343 raw scores, 1947 and 4,075 raw scores, 1948 on the Henmon-Nelson Mental Ability Test for the Manitoba Grade IX samples and the published norms.

## CHAPTER V

### ANALYSIS OF RESULTS OF THE TRESSLER ENGLISH TEST

Two different forms of the Tressler English Test were administered to the Manitoba Grade IX pupils in 1947 and 1948. This test is composed of seven separate parts: Grammatical Correctness, Vocabulary, Punctuation and Capitalization, Sentence and its Parts, Sentence Sense, Inflection and Accent, and Spelling. According to Dora Smith:<sup>1</sup>

unweighted composite tests in punctuation sentence structure, grammar and word usage show higher validity than do any of the single tests representing the same categories.

This test should present a reasonably valid picture of achievement in English.

In this chapter the writer will attempt to analyze the achievement of the population studied, types of schools and groups and try to determine if any specific weakness exists in the separate parts of the test. One set of norms is published for each of the two forms of the test. These norms are intended to show achievement at the end of the ninth year, that is, Grade IX. In the first place we shall examine the extent of agreement of all the Grade IX pupils in Manitoba with the exception of the Correspondence Branch group, with the published norms. This comparison is shown in Table XV, and the distribution of scores of the Grade IX pupils in Figures 7 and 8.

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<sup>1</sup> Dora Smith, "Educational Diagnosis". Thirty-fourth Year Book, Bloomington Illinois: Public School Publishing Company, 1935, Pp. 253-54.

TABLE XVII

COMPARISON OF NORMS ON THE TRESSLER ENGLISH TEST

	Population 1947	Population 1948	Population
N	4,312	4,323	
Q1	31.00	27.00	36.1
Md.	39.70	36.21	44.6
Q3	48.00	45.88	54.1
Mean	39.700	37.50	
S.E.M	.18	.19	
S.D.	12.40	12.85	

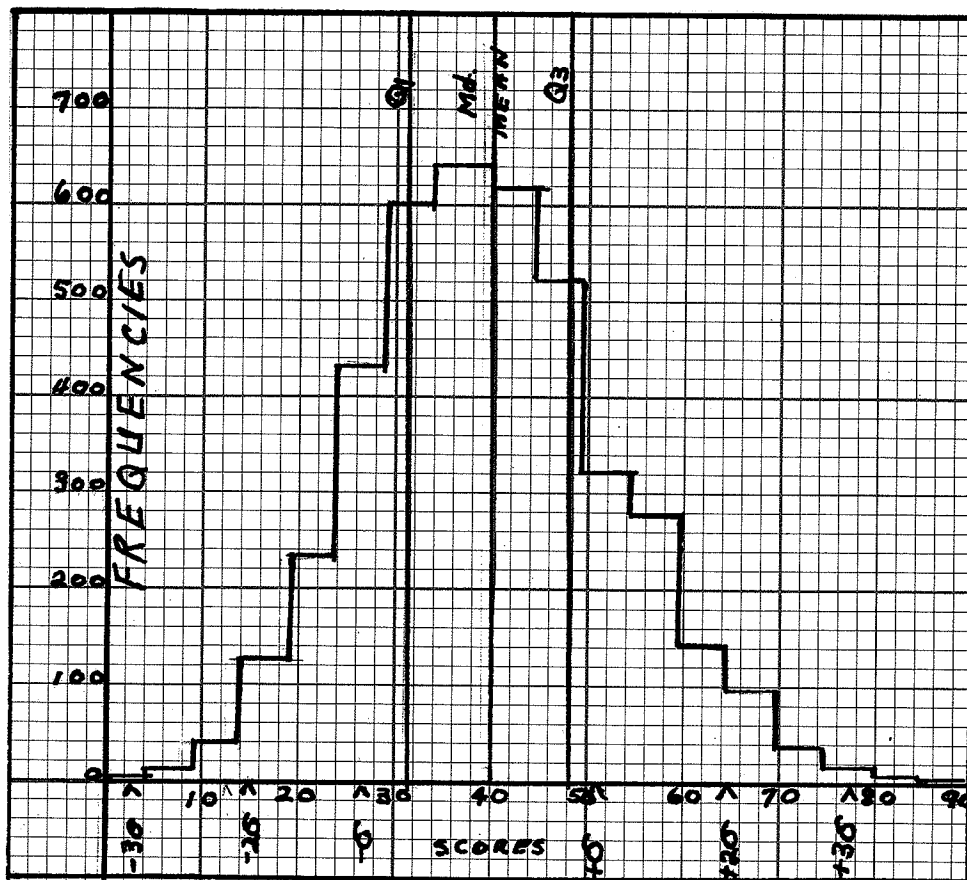


Figure 7 .  
Distribution of raw scores in the Tressler English Test Form: A for 4,312 Manitoba Grade IX pupils in 1947.



The distribution of scores in Figure 7 shows the achievement of the Manitoba Grade 1X pupils to be below the published norms on the average of about six points.

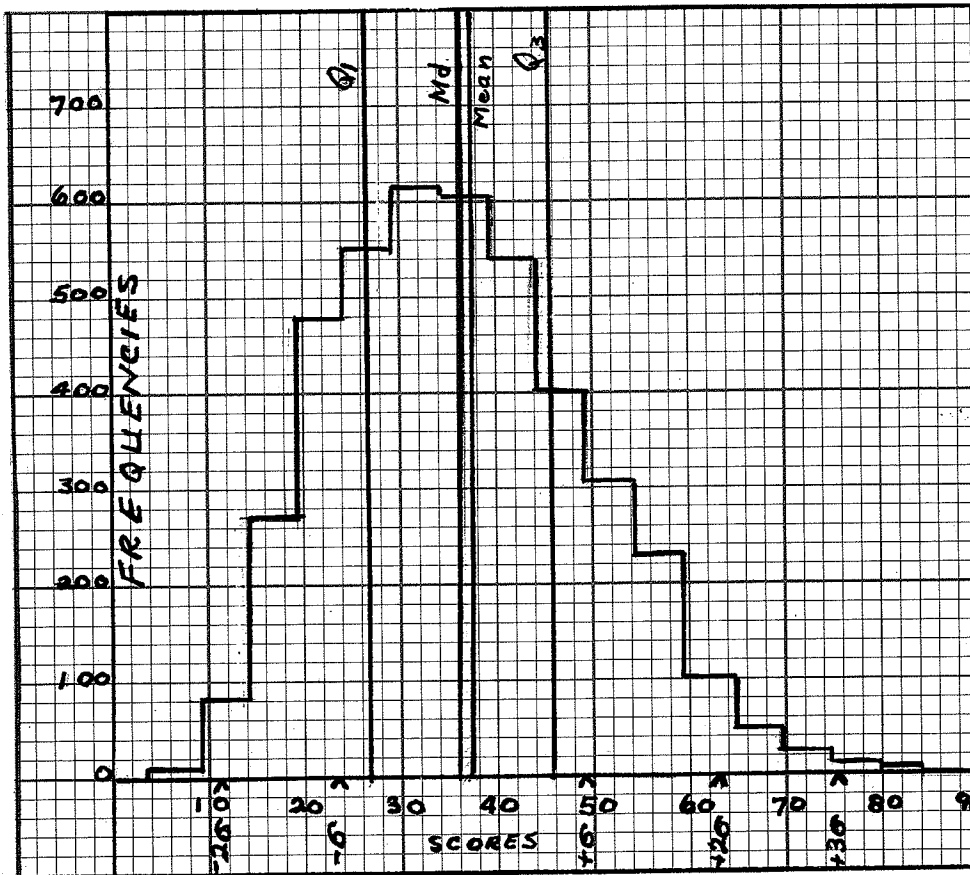


Figure 8.

Distribution of raw scores on the Tressler English Test Form: C for 4323 Manitoba Grade 1X pupils, 1948

By inspection one may detect that the distribution of scores in Figure 8 have a slight positive skewness. The achievement of this group is below that of the 1947 population, with the median score being about three points lower, and nearly nine points below the published norms.

Types of Schools 1947

To compare the achievement of the different types of schools in the Province, quartiles and medians were calculated and are reported in Table XVI.

TABLE XVI

QUARTILES AND MEDIANS FOR THE DIFFERENT TYPES OF SCHOOLS ON THE TRESSLER ENGLISH TEST FOR THE NINTH GRADE MANITOBA PUPILS 1947

Groups Compared	N	Q <sub>1</sub>	Md.	Q <sub>3</sub>
Population	4,312	31.00	39.70	48.00
Collegiates	935	30.80	40.00	50.00
Two-Room High	534	28.53	37.55	46.66
One-Room High	608	30.55	37.94	46.88
Junior High	685	39.78	47.66	56.83
.....	.....	.....	.....	.....
Correspondence Branch	618	29.67	38.42	48.61

The Junior High School group shows achievement above the published norms, but all the other groups fall below, and with the exception of the Collegiates, below the quartiles and median of the total population. It is interesting to note, however, that the Correspondence Branch pupils show a very slight advantage over the Two-Room High and One-Room High groups. These three groups may be considered to represent areas more rural in character than do the Collegiates.

Types of Schools 1948

In 1948 identical groups were again compared for achievement in the same English test with the number of scores for each group approximately as large as in the 1947 analysis. The distributions for 1948 are given in Table XVII

TABLE XVII

QUARTILES AND MEDIANS FOR THE DIFFERENT TYPES OF SCHOOLS ON THE TRESSLER ENGLISH TEST FORM: C FOR THE NINTH GRADE MANITOBA PUPILS 1948

Groups	N	Q1	Md.	Q3
Population	4,323	27.11	36.21	45.88
Collegiates	1,156	28.01	37.42	41.74
Two-Room High	577	26.03	35.31	44.22
One-Room High	743	24.46	33.78	44.06
Junior High	621	32.39	41.09	50.68
.....	.....	.....	.....	.....
Correspondence Branch	550	23.93	33.23	43.56

The Junior High group shows lower achievement in 1948 than in 1947, and the median and quartiles of this group are below the published norms by about three points. The Collegiates have higher Q1 and median scores than the Q1 and median of the population, but the other three more distinctly rural groups have scores below the population norms.

The Test reveals parallel results in each of the two years, even although the attainment in 1948 is lower than that

in 1947. In Chapter IV (Tables IX and XII) attainment in mental ability of the 1948 population is lower than the attainment of the 1947 population, but it is difficult to conclude whether this lower attainment of the 1948 group in the two tests is due actually to lower mental ability of the group or that the forms of the same tests used in 1948 are more difficult.

The differences among groups which appear in Tables XVI and XVII were tested to determine if they are statistically significant and accordingly the means, the standard errors of means and standard deviations were calculated. These calculations for the 1947 and 1948 groups appear in Tables XVIII and XIX. Critical ratios and significance levels are summarized in Table XX.

TABLE XVIII

MEANS, STANDARD ERRORS OF MEANS AND STANDARD DEVIATIONS OF THE GROUPS COMPARED ON THE TRESSLER ENGLISH TEST OF THE NINTH GRADE MANITOBA PUPILS, 1947

Groups	N	Mean	S.E.M	S.D.
Population	4,312	39.70	.18	12.40
Collegiates	935	40.70	.44	13.57
Two-Room High	534	37.60	.56	13.15
One-Room High	608	36.40	.48	12.00
Junior High	685	47.86	.45	13.03
.....	.....	.....	.....	.....
Correspondence Branch	618	38.84	.52	13.32

TABLE XLX

MEANS, STANDARD ERRORS OF MEANS AND STANDARD DEVIATIONS ON THE TRESSLER ENGLISH TEST FORM: C FOR THE MANITOBA NINTH GRADE PUPILS, 1948

Groups	N	Mean	S.E. Mean	S.D.
Population	4,323	36.60	.19	12.85
Collegiates	1,156	37.50	.36	12.40
Two-Room High	577	35.20	.50	12.10
One-Room High	743	34.55	.48	13.10
Junior High	622	41.50	.51	12.90
.....				
Correspondence Branch	550	33.63	.55	12.95

If the mean is used for comparing the types of schools their position remains unchanged from that established by using the median for comparison. The scatter from the mean as represented by standard deviations differs only about one point and indicates that there is very little difference in the homogeneity of each group.

We may infer from Table XX that each year the Junior High group has shown the highest achievement in the English test, with the Collegiates coming second and that there is no difference in achievement between the Two-Room High and One-Room High Schools. Table XI represented these groups as having a comparatively equal mental ability average.

TABLE XX

STANDARD ERROR OF THE DIFFERENCE BETWEEN MEANS ON THE  
TRESSLER ENGLISH TEST FOR THE NINTH GRADE PUPILS,  
1947 and 1948

Groups Compared	$M_1 - M_2$	$\sqrt{\sigma_{M_1}^2 + \sigma_{M_2}^2}$	t	Significance Level
1947				
Collegiates and				
1. Two-Room High	3.10	.71	4.36	.01
2. Junior High	7.16	.63	11.36	.01
3. One-Room High	4.30	.65	6.61	.01
Two-Room High and				
1. One-Room High	1.20	.73	1.64	not sig.
2. Junior High	10.26	.76	14.36	.01
One-Room High and				
1. Junior High	11.46	.66	17.36	.01
.....				
1948				
Collegiates and				
1. Two-Room High	2.30	.61	3.77	.01
2. One-Room High	2.95	.60	4.91	.01
3. Junior High	4.00	.63	6.29	.01
Two-Room High and				
1. One-Room High	.65	.69	.91	not sig.
2. Junior High	6.30	.71	8.87	.01
One-Room High and				
1. Junior High	6.95	.70	9.92	.01

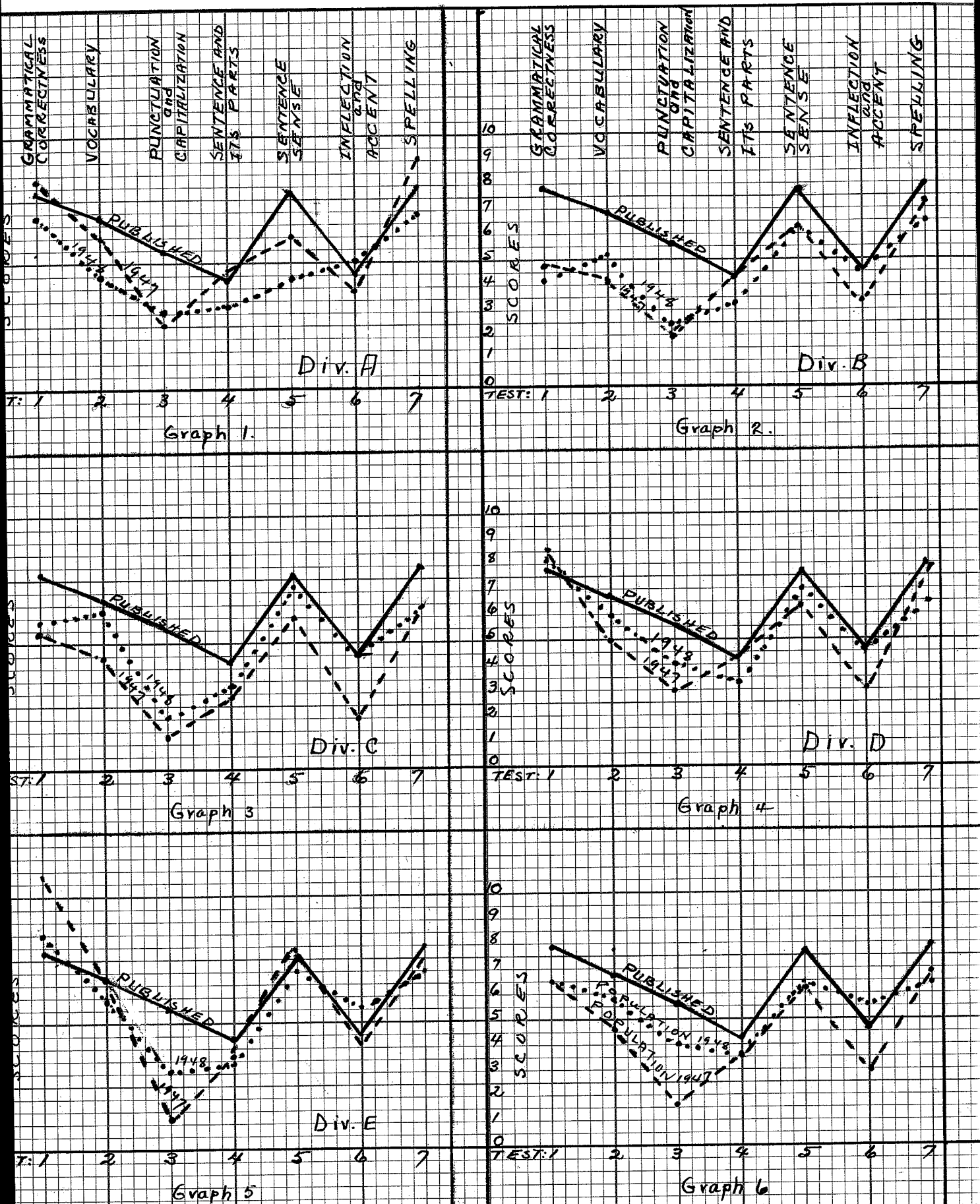


Figure 9.  
Comparison of Tressler English separate test medians for Grade IX Manitoba pupils 1947 and 1948.

Further analysis of the results was made to determine if any specific weaknesses existed in English and accordingly median scores were calculated for each of the seven independent tests using the scores of eleven Inspectoral Divisions as a representative sample. Comparison of the 1947 and 1948 results are shown by means of Graph 6, Fig. 9. in which the published norms also appear. A two year comparison for the five Inspectoral Divisions listed as A, B, C, D, and E and represented by Graphs 1, 2, 3, 4, and 5 also appear in Fig. 9.

It is evident, as shown in Fig. 9, that most medians in 1947 and 1948 are below the published norms and that the greatest weakness appears in Punctuation and Capitalization, with Vocabulary and Inflection and Accent in second position. In his study Conway<sup>2</sup> reports this weakness in Capitalization among the Grade IX pupils of British Columbia and Dora Smith<sup>3</sup> writes:

"..of some fourteen elements of composition considered in numerous studies of pupil errors in English, Capitalization ranks commonly about fifth in difficulty and punctuation first."

In the Tressler English Test, however, Punctuation and Capitalization are combined in one test and no attempt was made in this analysis to separate these elements, however, a glance at graphs 1 to 5 representing the five separate Inspectoral Divisions will show particular weakness in the Punctuation and Capitalization part of the test. The remaining independent tests vary from Division to Division. In Divisions D and E, Grammatical Correctness, for example, is higher than the published median. This tendency is evident



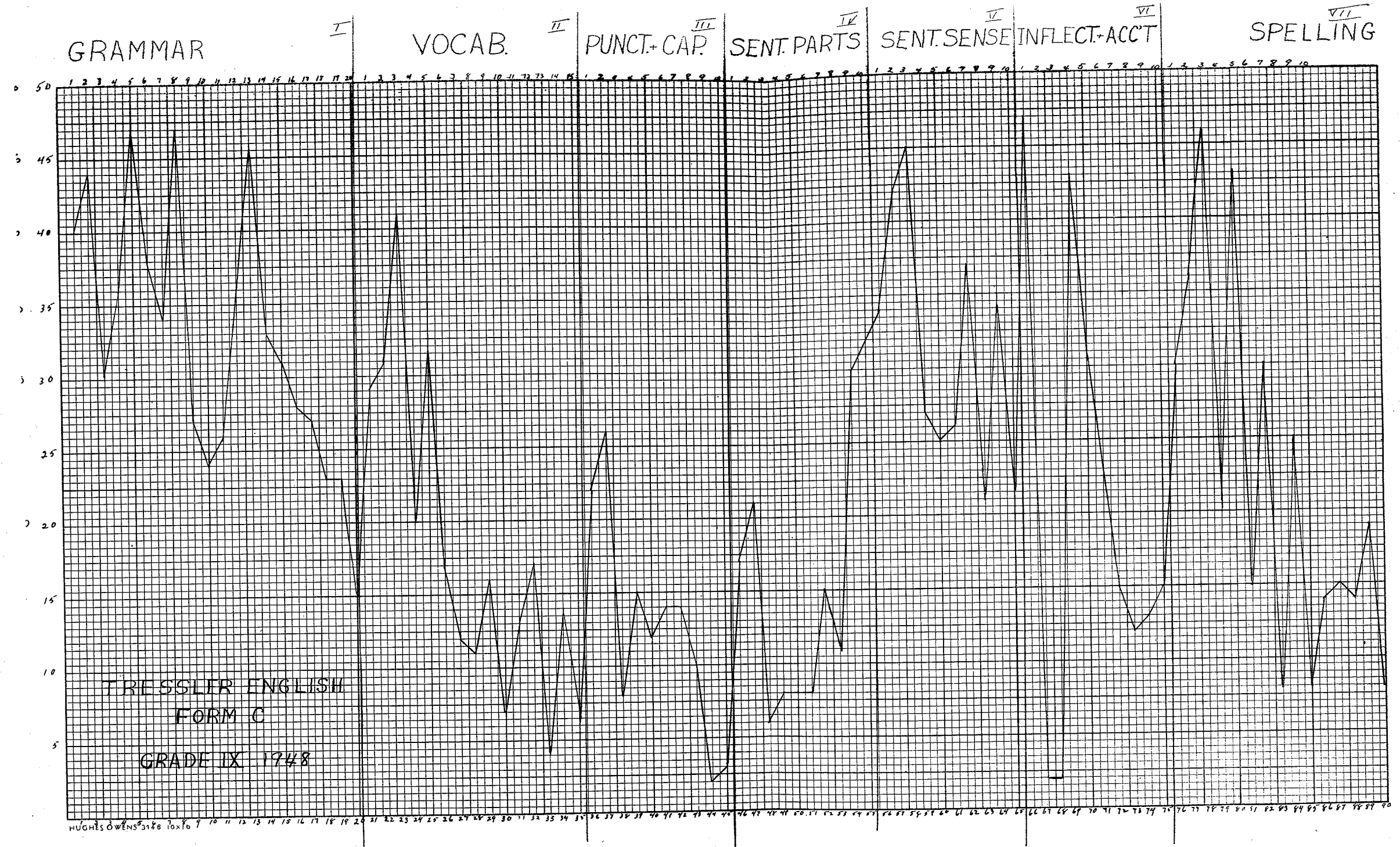


Figure 10.  
Showing the number of correct responses in a sample of fifty on the Tressler English Test for the Manitoba Grade IX pupils, 1948.

in 1947 and 1948. It is interesting to note that in Division E there is a predominance of male teachers who stress the teaching of formal grammar. The graphs show an improvement in Inflection and Accent and Vocabulary in 1948. The weaknesses were discussed in 1947 and it is reasonable to assume that the elements which showed weakness in 1947 were stressed by the Inspectors and the teachers and hence the improvement.

A glance at Fig. 10 which is an analysis of a sample of fifty test papers question by question shows that the independent elements of the test that show weakness in Fig. 9 also show weakness when the sample is analyzed question by question.

## CHAPTER VI

### ANALYSIS OF RESULTS OF TWO ENGLISH TESTS

#### Reading Grade LX

A total of 4,216 G rade LX scores were used to establish norms for the population taking the Haggerty Reading Examination Sigma 3, Form: A. Achievement of different types of schools was also determined and the data appear in Table XXI.

TABLE XXI

QUARTILES, MEANS AND STANDARD DEVIATIONS FOR THE POPULATIONS STUDIED AND TYPES OF SCHOOLS FOR THE GRADE LX MANITOBA PUPILS ON THE HAGGERTY READING EXAMINATION

Group	N	Q <sub>1</sub>	Md.	Q <sub>3</sub>	Mean	S.E <sub>M</sub>	S.D.
Population	4,216	76.64	89.54	102.50	88.50	.29	18.80
Collegiates	1,464	79.31	91.68	104.28	91.35	.46	17.60
Two-Room High	539	70.72	83.94	98.41	84.00	.81	18.90
One-Room High	693	75.15	88.45	100.71	87.55	.69	18.10
Junior High	589	83.85	94.94	107.15	94.85	.13	16.20
Correspondence Branch	503	72.84	86.27	100.23	85.94	.87	18.55

The mean for the population studied is 88.50, which is 4.5 points higher than the published norm of 84. This suggests that the achievement in reading in the Province is satisfactory. The Correspondence Branch pupils have a mean higher than the published norm. The Collegiate and the Junior High pupils have slightly higher achievement, but the students in Two-Room and

One-Room High Schools are below the other groups and the mean for the population. This difference deserves further study. The standard of reading appears to be significantly higher in the Junior High group, with seventy-five percent of the students scoring above the published norm for the Grade. Further analysis of achievement in reading was made by computing the percentiles for the population and drawing an ogive curve.

Figure 11 gives the grade and age norms for the distribution of reading scores. Thirty-eight percent of the pupils are below the Grade IX norm and sixty-eight percent are above the published norm for Grade IX. We may again emphasize the fact that the test indicates a satisfactory level of achievement in reading for the whole Grade IX population. It is, however, evident that there exists a considerable range in reading ability. The weak pupils score as low as the Grade VI level, the strong as high as the Grade XII level. In fact, about twenty-five percent have an achievement equal to the Grade XII norm or above. No doubt it is difficult to fit students representing these two extremes and expect them to carry an equal study load. Twenty-four percent of the students, according to Figure 11, are below the Grade VIII level. One may conclude that these pupils are not prepared to carry the necessary reading in Level 1 of our secondary schools programme. It may be inferred that the teaching of reading at the Junior High level requires thorough appraisal and correction.

1. A programme for the retarded.
2. Provision for pupils reading at the required Grade level, and

3. A programme of instruction in higher reading skills for the superior readers.

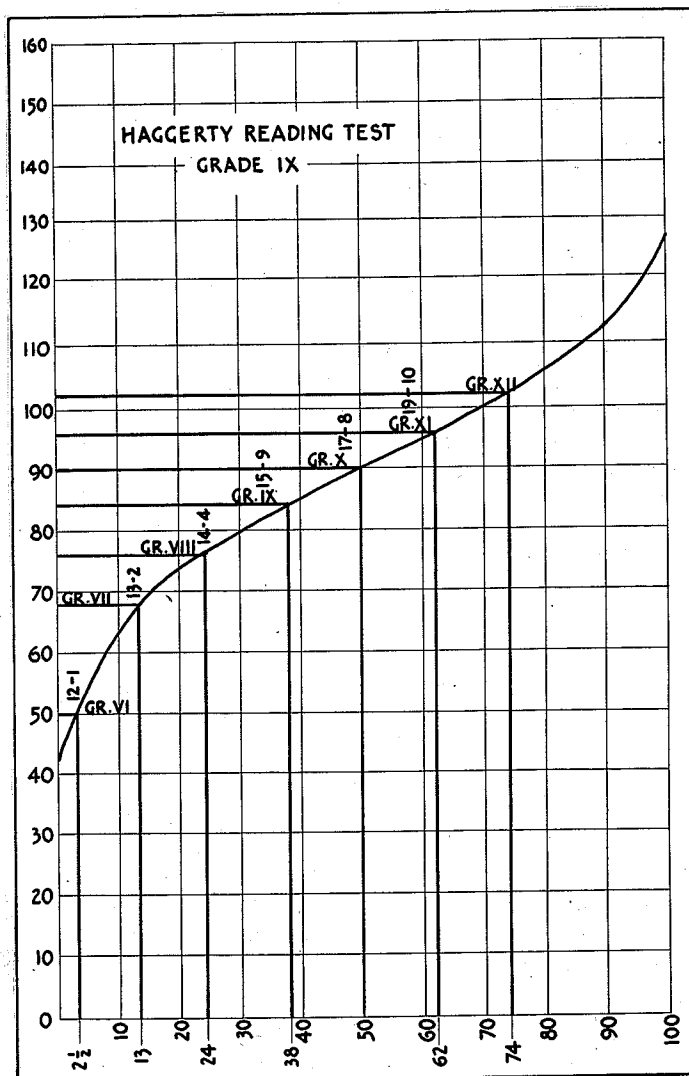


Figure 11

Percentile curve showing distribution of Grade and age norms for the Grade IX Manitoba pupils, 1949.

In order to be able to carry out this programme teachers will have to carry out suitable diagnosis.

"The teacher of silent reading knows the value of diagnosis through objective measurements; he charts progress and graphs results. He does not rely on personal impressions alone, knowing that subjective

data must be re-enforced by objective data if he is to secure an accurate picture of the pupil. The teacher of reading can no more afford to ignore laboratory tests than can the skilful physician. Correct diagnosis of reading difficulties is the logical preface to remedial measures."<sup>1</sup>

It was hoped that the teachers would make use of the results of the Haggerty Reading Test in planning a programme of remediation for students starting Level 1 and those who failed Grade 1X. Principals had the total reading score on the test for each pupil. These scores appeared on the Score Sheet. By comparing the scores with the ogive curve the teacher could determine the reading level of each pupil and arrange a suitable programme. To provide further assistance in this project quartiles were determined for each part of the test: Vocabulary, Sentence Reading, and Paragraph Reading. There are no norms given for these separate parts, but norms for the population were established and the "quartiles" and means are given in Table XXII. Teachers, therefore, may use these to help them locate specific weaknesses for individual pupils.

TABLE XXII

QUARTILES, MEANS AND STANDARD DEVIATIONS  
ESTABLISHED FOR EACH PART OF THE HAGGERTY  
READING EXAMINATION SIGMA 3 FORM A,  
GRADE 1X, 1949

	Q1	Md.	Q3	Mean	S.E.M	S.D.
Vocabulary	26.56	31.79	36.78	31.60	.19	7.30
Sentence Reading	19.66	24.46	29.67	24.05	.18	7.20
Paragraph Reading	30.17	35.52	41.49	35.30	.19	7.65

<sup>1</sup> Stella S. Center and Gladys L. Persons, Teaching High School Students to Read, New York: D. Appleton-Century Company Inc., 1937, p.127

Reading Test Results Grade X, 1949

A total of 538 test booklets were re-scored to find the central tendency for the A.C.E. Reading Comprehension Test. The established mean for this sample was 48.15 with a standard error of the mean of .41 and a S.D. of 9.65. The published mean and S.D. for the test at the end of Grade X are given as 47.6 and 9.2 respectively. This sample would, therefore, indicate a satisfactory standard of achievement at the end of Grade X. In view of what has been discovered in Grade IX it would indicate that reading ability is an important factor in the elimination of pupils at the end of Grade IX and selection for Grade X.

To obviate the re-scoring of all test booklets correlations between the total reading score and the vocabulary score were computed. Scores of four Inspectoral Divisions and the Correspondence Branch were used as separate samples.

TABLE XXIII

CORRELATIONS OF VOCABULARY SCORES AND TOTAL  
READING SCORES A.C.E. READING COMPREHENSION  
TEST FORM S, G RADE X, 1949

Sample	N	r.
1	97	.84
2	127	.83
3	125	.89
4	112	.90
5	90	.84

In Table XXIII co-efficients of correlations range from .83 to .90. All these may be considered as highly significant, and accordingly vocabulary scores regarded as normal.

Vocabulary scores appeared on the Score Sheets, and an analysis of these scores was made for the population studied. Table XXIV summarizes the data.

TABLE XXIV  
VOCABULARY A.C.E. READING COMPREHENSION TEST  
FORM S, GRADE X, 1949

	Q <sub>1</sub>	Md.	Q <sub>3</sub>	Mean	S.E <sub>M</sub>	S.D.
Population (3,573 scores)	39.97	45.92	53.01	46.30	.17	10.00
Published	41.00#	47.00#	53.00#	47.5		9.60

# Interpolated

Although the vocabulary results seem to compare closely with the published norms, nevertheless, twenty-five percent of the Grade X pupils are below the Grade VIII published mean of 39. On the other hand, the top twenty-five percent are above the published Grade XII mean of 53.8. Achievement at Grade X level is very similar to that at the Grade IX level. Hence every effort should be made to arrange a suitable reading programme for weaker pupils in Grade X.



## CHAPTER VII

### ANALYSIS OF RESULTS OF TWO STANDARDIZED ARITHMETIC TESTS

In this chapter an analysis is made of the scores of the Dominion Arithmetic Test and the Beattie Mathematical Fundamentals Test. The scores on the Dominion Arithmetic Test for the Grade IX, 1947 group are compared with the Grade IX, 1948 group. The analysis of the Beattie Test has to do with the Grade IX and Grade X results for 1949. Grade IX findings are used to determine whether any difference in achievement exists among the five types of schools.

#### Dominion Arithmetic Test

Comparison of results was first made by using the quartiles and the median. These data appear on Tables XXV and XXVI.

TABLE XXV

QUARTILES AND MEDIANS FOR THE GROUPS COMPARED ON THE  
DOMINION ARITHMETIC TEST FORM: A FOR THE NINTH  
GRADE MANITOBA PUPILS, 1947

Groups Compared	N	Q1	Md.	Q3
Population	4,345	54.60	62.05	67.80
Collegiates	933	53.73	62.60	69.45
Two-Room High	534	55.17	62.40	68.40
One-Room High	620	53.78	62.27	69.42
Junior High	656	53.78	62.27	68.40
Correspondence Branch	618	53.73	62.60	69.45

TABLE XXVI

QUARTILES AND MEDIANS FOR THE GROUPS COMPARED ON THE  
DOMINION ARITHMETIC TEST FORM: B FOR THE NINTH  
GRADE MANITOBA PUPILS, 1948

Groups Compared	N	Q1	Md.	Q3
Population	4,378	55.81	62.81	68.66
Collegiates	1,168	56.00	62.28	68.04
Two-Room High	585	55.34	63.27	69.37
One-Room High	734	55.60	62.56	68.40
Junior High	660	58.55	64.54	69.81
Correspondence Branch	524	52.46	60.75	66.45

No significant difference exists between median scores of the various groups compared, nor do groups differ from the median for the population. Differences at the Q1 and Q3 levels do appear but they are not significant. However, in 1948, the Junior High and the Two-Room High groups have improved median scores and the Correspondence Branch two points lower. The number of pupil scores in the sample for the population studied each year do not differ significantly. Although the median scores in each year are nearly equal, it is impossible to determine whether the achievement is equal since the manual gives different Grade norms for each form. A comparison of quartiles and medians on the basis of grade norms is made in Table XXVII.

TABLE XXVII

COMPARISON OF 1947 AND 1948 GRADE IX RESULTS ON THE  
DOMINION ARITHMETIC TEST ON THE BASIS OF PUBLISHED  
GRADE NORMS

Groups Compared	Q1		Md.		Q3	
	1947	1948	1947	1948	1947	1948
Population	8.5	8.9	9.2	9.5	9.7	10.1
Collegiates	8.4	9.0	9.2	9.5	9.9	10.1
Two-Room High	8.6	8.9	9.2	9.6	9.8	10.2
One-Room High	8.4	8.9	9.2	9.5	9.9	10.2
Junior High	8.4	9.2	9.2	9.7	9.8	10.2
Correspondence Branch	8.4	8.6	9.2	9.4	9.9	9.9

On the basis of the Ontario norms, therefore, the achievement of the 1948 Grade IX groups is better than that for 1947. There is an improvement in achievement of about three months, the greatest improvement being noticeable in the first quartile. However, the Ontario Grade Norms show that approximately seventy-five percent of the Manitoba Grade IX pupils are below standard. Two conclusions may accordingly be made: either the Manitoba pupils are weak in arithmetic as compared with the Ontario pupils, or that the Ontario standards are too high for testing the achievement of pupils following the Manitoba curriculum.

Percentile curves were drawn to compare the achievement

of the population studied in 1947 and 1948 on the basis of Ontario Grade Norms and appear in Fig. 12.

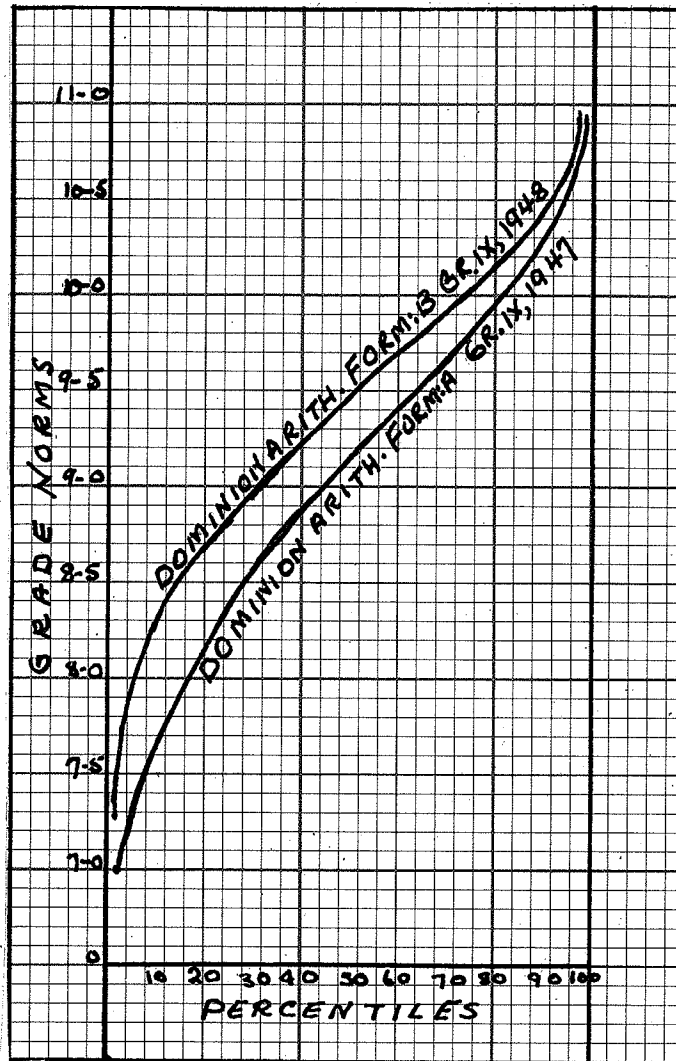


Figure 12.  
Percentile curves of the Grade 1X population 1947 and 1948 on two different forms of the Dominion Arithmetic Test.

Additional calculations were made to determine whether any statistically significant difference could be found among the groups compared for which purpose the standard error of difference between two means was employed. The means, standard errors of means and standard deviations are tabulated in Table XXVII.

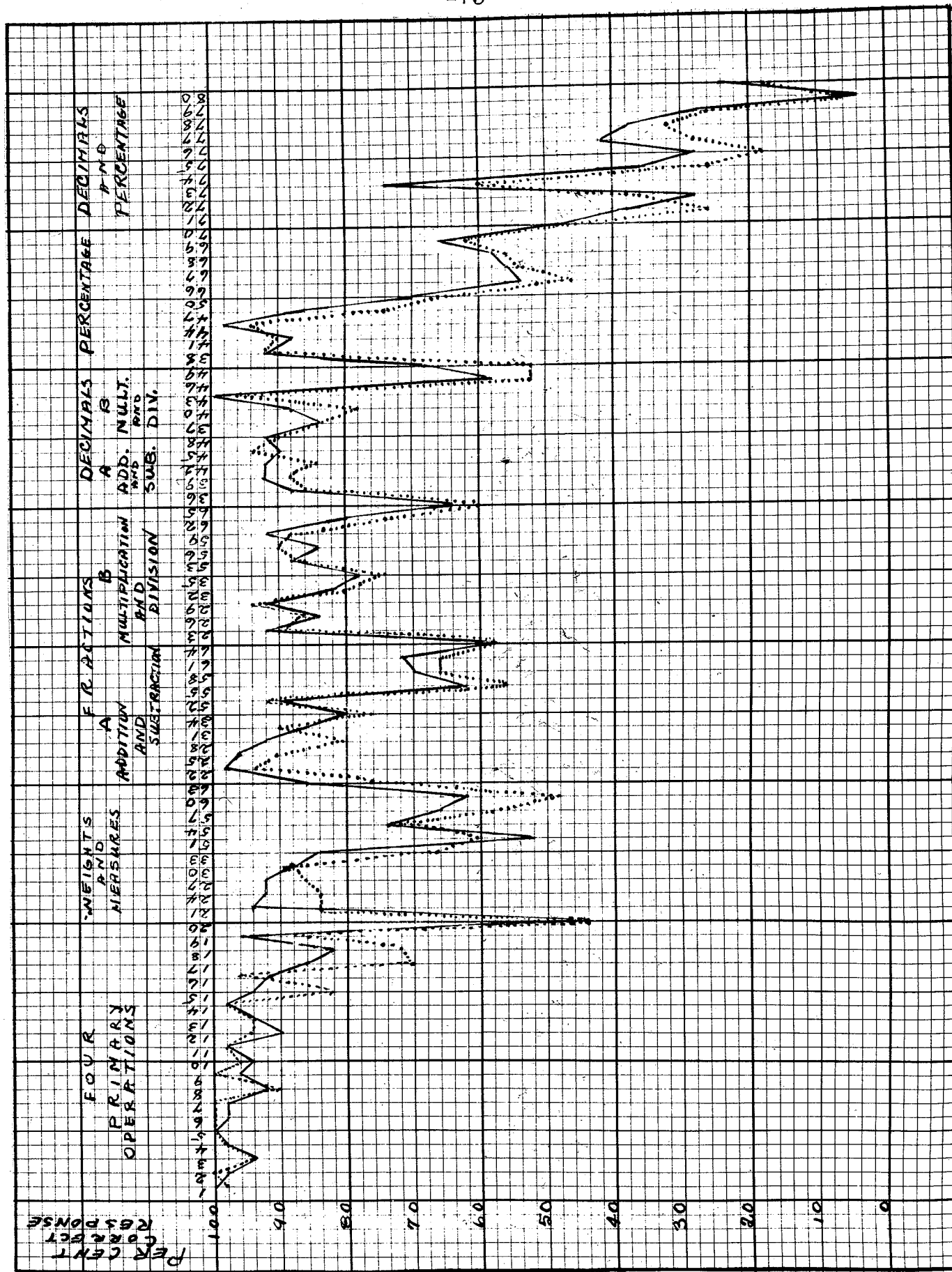


Figure 13.  
 Showing Responses to Each Question for Two  
 Samples on the Dominion Arithmetic Test, 1947.

TABLE XXVIII

MEANS, STANDARD ERROR OF MEANS AND STANDARD DEVIATIONS  
OF GRADE IX GROUPS, 1947 and 1948

Group	N	Mean	S.E.M	S.D.
1947				
Population	4,345	60.45	.16	10.65
Collegiates	933	60.30	.36	11.15
Two-Room High	534	60.15	.47	10.85
One-Room High	620	60.30	.43	10.75
Junior High	656	62.70	.36	9.25
Correspondence Branch	618	61.05	.44	10.95
1948				
Population	4,378	62.90	.11	9.60
Collegiates	1,168	61.92	.26	9.17
Two-Room High	585	61.18	.42	10.20
One-Room High	734	60.95	.37	10.10
Junior High	660	63.05	.32	8.25
Correspondence Branch	524	58.65	.43	9.90

When the mean is used to estimate variability, the Junior High groups rank highest in achievement each year and, the Correspondence Branch pupils lowest in 1948.

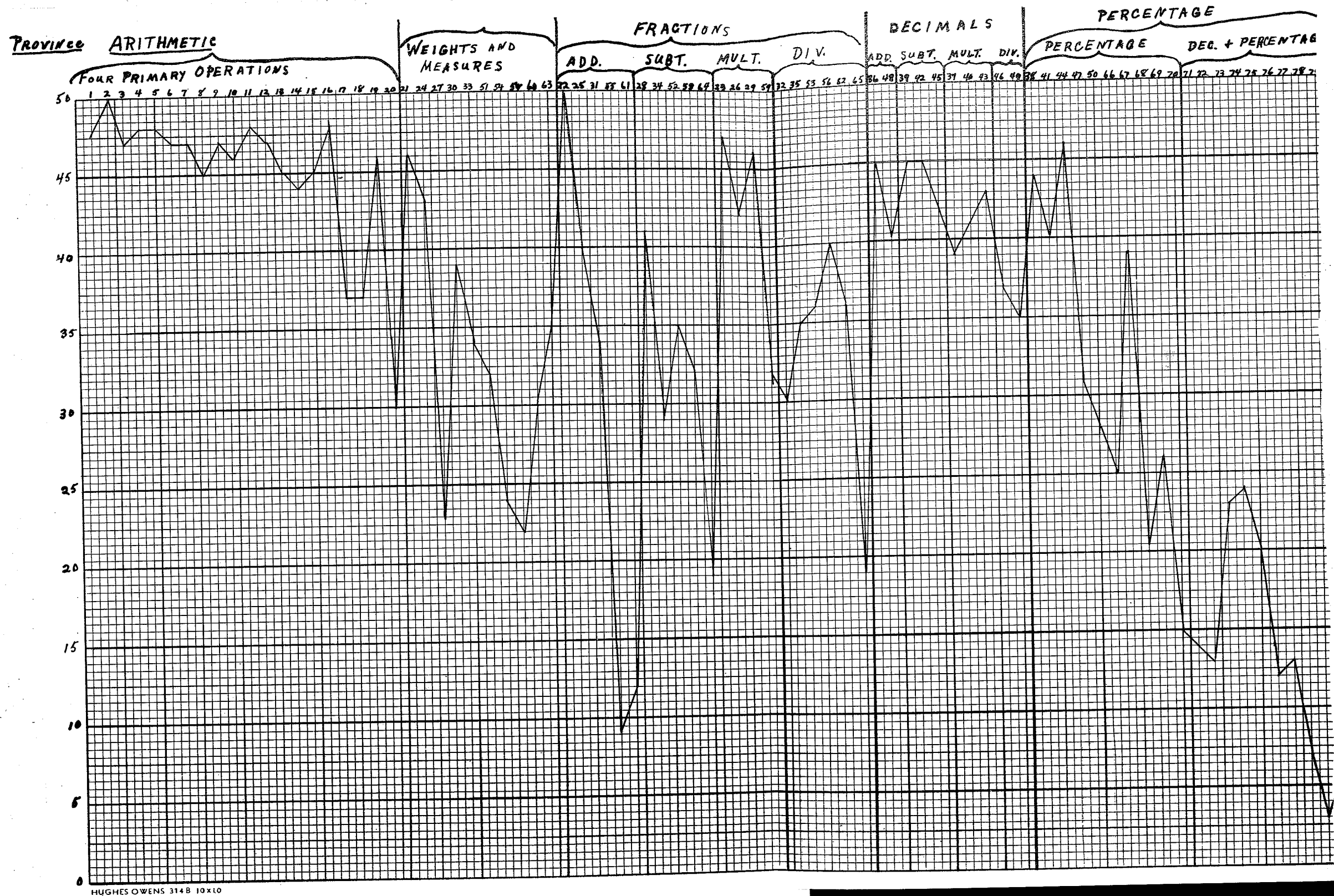


Figure 14  
Showing responses to each question on the  
Dominion Arithmetic Test Grade IX, 1948

HUGHES OWENS 314 B 10x10

In 1947 there is a significant difference in achievement as far as the Junior High group is concerned, but no significant difference is evident among the other three groups. In 1948 the Junior High group again shows higher achievement and the difference between the Collegiate group and the One-Room High is significant. There is no difference between the Two-Room High groups and the One-Room High group in the two years of analysis of results on the Dominion Arithmetic Test.

Question by question analysis was made of two samples of fifty papers each in 1947 and one sample of fifty papers in 1948. Results of this analysis are shown graphically in Figures 13 and 14. The two graphs of the 1947 samples overlap closely and indicate the types of questions with which the pupils had greatest difficulty. Of the twenty questions dealing with the four primary operations all but number 17, 18 and 19 received satisfactory treatment. Questions 17 and 20 deal with long division and question 18 with long multiplication.

Practically all questions from 71 to 80 received lower than a 60 per cent mark in the samples of each year, indicating that pupils are weak in mixed decimals and percentage. Table XXIX shows a comparison of other questions receiving lower than sixty per cent response for the two years.



TABLE XXIX

QUESTIONS RECEIVING LOWER THAN 60 PERCENT RESPONSE ON  
THE SAMPLE ANALYSIS OF THE DOMINION ARITHMETIC TEST  
IN 1947 AND 1948

Question No.	Question	Question No.	Question
	1947		1948
55.	$8 \frac{1}{6} - 5 \frac{4}{7}$	34.	$9 \frac{1}{7} - 4 \frac{3}{7}$
57.	Multiply: 3 yd. 2 ft. by 5 = yd. _____ ft. _____	60.	Multiply 9 yd. 2 ft. by 7 = yd. _____ ft. _____
60.	Divide: 3 lb. 4 oz. of tea by 2	57.	Divide: 43 ft. 4 in. by 5
64.	$31 \frac{1}{8} - 5 \frac{2}{9}$ (Answer in lowest terms)	64.	$75 \frac{5}{6} - 5 \frac{1}{9}$ (Answer in lowest terms)
65.	$3 \frac{1}{3} * 4 \frac{1}{8}$	65.	$2 \frac{3}{8} + 1 \frac{2}{5}$
67.	Change 5% to a decimal fraction.	67.	Change 4% to a decimal.
70.	$83 \frac{1}{3} \%$ of \$1200.	70.	$16 \frac{2}{3}$ of 12.12
72.	$\frac{3}{4}$ of $16 \frac{2}{3} \%$ of \$300.	69.	$\frac{3}{4}$ of 60% of \$100.

The eight questions listed in Table XXIX show that the difficult problems are found in the same type areas. This confirms the validity of the testing program. Specific areas of weakness may be stated in this order: subtraction of fractions, divisions of fractions, and percentage and decimals. It is important to add that questions with vocabulary content and those dealing with denominate numbers cause greatest difficulty.

Beattie Arithmetic Test

The Beattie Arithmetic test administered to the Grade LX and X pupils in 1949 differs from the Dominion in that it has a section on problem solving. The Grade LX groups representing the five types of schools were selected for comparison of achievement in this Test. Table XXX gives the summary of results.

TABLE XXX

QUARTILES, MEANS, STANDARD ERRORS OF MEANS AND STANDARD DEVIATIONS ON THE BEATTIE ARITHMETIC TEST, MANITOBA GRADE LX PUPILS, 1949

Groups	N	Q1	Md.	Q3	Mean	S.E.M	S.D.
Population	4,235	33.81	41.34	47.90	41.40	.15	9.60
Collegiates	1,320	33.02	40.85	47.42	40.05	.26	9.55
Two-Room High	559	32.96	41.35	47.37	40.00	.41	9.65
One-Room High	676	34.55	42.16	50.63	41.45	.37	9.55
Junior High	587	32.87	40.64	47.97	40.05	.38	9.25
Correspondence Branch	501	32.05	39.73	43.36	38.88	.44	9.80

There is little difference in the homogeneity of the types of school as indicated by the means and S.D.'s. However, the One-Room High group shows highest achievement and this difference is significant at the one percent level. The Correspondence Branch is lowest. There is no significant difference in achievement among Collegiates, Two-Room High and Junior High groups. All groups show higher achievement than

the published mean for the test of 34.3, in fact approximately 75 percent of the population exceeds this norm.

In 1949, 3639 scores on the Beattie Arithmetic were analyzed for Grade X and a comparison of Grade LX and Grade X results is made in Table XXXI.

TABLE XXXI  
COMPARISON OF GRADE LX AND GRADE X BEATTIE  
ARITHMETIC TEST RESULTS, 1949

	N	Q <sub>1</sub>	Md.	Q <sub>3</sub>	Mean	S.E. <sub>M</sub>	S.D.
Grade X	3,639	36.06	43.32	49.36	42.35	.15	9.10
Grade LX	4,235	33.81	41.34	47.90	41.90	.15	9.60

The difference between the two grades is not statistically significant.

A sample was drawn at random to represent each Inspectoral Division in the Province. This was considered representative having a median of 41 as compared with a median of 41.34 for the Grade LX population. The sample was analyzed question by question for correct responses, and the percentage of correct responses for each question was determined.

A similar analysis was made of the Grade X sample and the results of the two are represented graphically in Fig. 15.

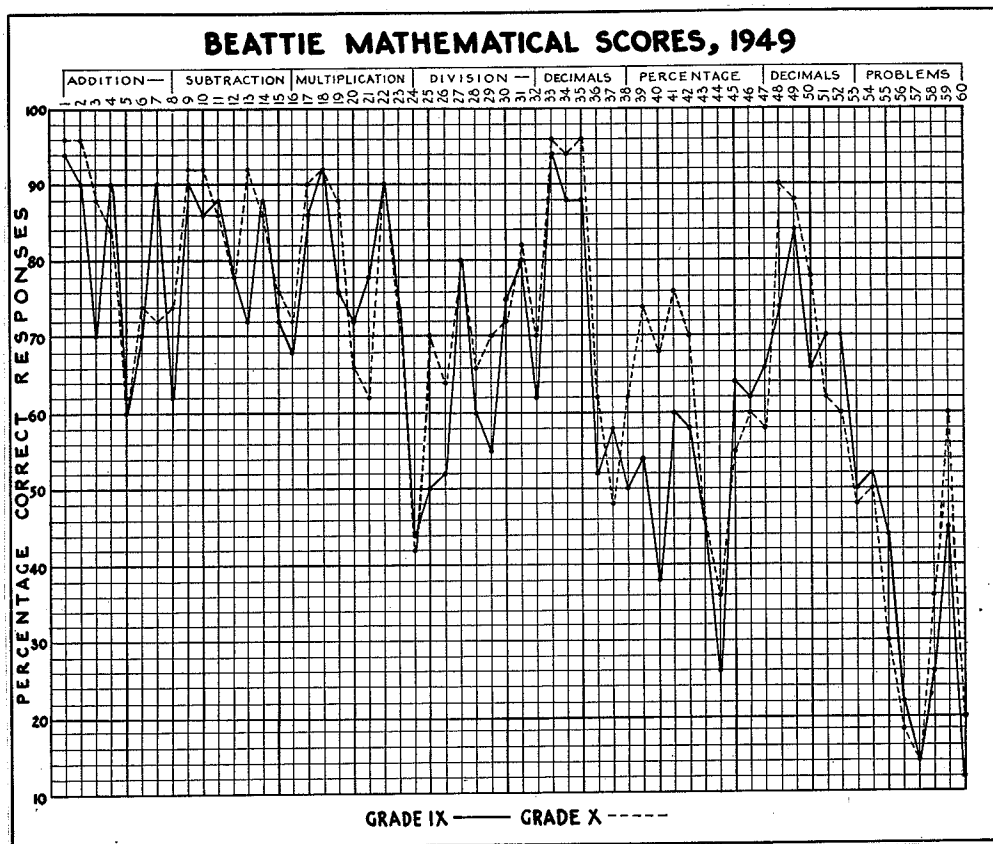


Figure 15.

Showing comparison of Grade IX and Grade X Arithmetic samples.

Fig. 15 indicates that weaknesses in two grades are located in the same type of questions. It would seem that when Grade X pupils start concentrating on Algebra and Geometry their success in arithmetic remains static.

From Fig. 15 we may conclude that the four fundamental operations: addition, subtraction, multiplication, and division are fairly well handled. However, division of fractions

decimals and problem-solving show weakness. The results of 1949 study are in line with the 1947 and 1948 results with respect to weaknesses in certain subject-matter areas with the exception of problem solving. One may infer that much more careful work is necessary in arithmetic in the elementary and Junior High Grades if we are to prevent the disabilities that prevail at the secondary school level.

## CHAPTER VIII

### FURTHER ANALYSIS

In this chapter the writer will make further analyses of test results with respect to specific groups and will also attempt to determine the degree of inter-correlation between mental ability scores and scores in English, Arithmetic and Reading, as well as to establish the reliability of tests other than the psychological type.

Various comparisons of results were made to determine:

1. Achievement in standardized tests of the different age groups.
2. Achievement of pupils recommended for failure.
3. Achievement of pupils with I.Q.'s falling above the 75th. percentile.
4. Achievement of pupils making raw scores on the mental ability tests that rank them within the 25th. and 75th. percentile.
5. Achievement of Q1 and Q3 groups in terms of school ranks.

In 1947 the age groups compared were composed of 14 year old Junior High and 14 year old rural, 16 year old Junior High and 16 year old rural, 17 year old representing a cross section of the Province and failure group of all ages representing a cross-section of the Province. The object of this part of the analysis was to find if superior achievement could be attributed to any age group and whether the low failure group failed to make normal achievement because of lower mental ability or weakness in English or Arithmetic. Mean scores in the three standardized tests administered in 1947 are summarized in Table XXXII.

TABLE XXXL1

MEANS OF THE DIFFERENT AGE GROUPS AND THE FAILURE  
GROUP OF GRADE IX PUPILS IN 1947

Group	N	Mental Ability	Tressler English	Dominion Arithmetic
14 year old Junior High	100	59.10	46.30	62.80
14 year old rural	100	55.40	40.15	61.20
16 year old Junior High	100	51.73	37.55	60.00
16 year old rural	80	49.30	34.00	58.60
17 year old	114	48.25	31.93	56.50
Failure	100	47.00	28.70	53.30

From Table XXXL1 we may infer that the achievement of the groups decreases with increase in age; the greatest range in achievement is evident in English and lowest in arithmetic.

To determine whether the differences in means in Table XXXL1 are statistically significant the standard error of difference between means was calculated and the significance level of difference is reported in Table XXXL11.

TABLE XXXLII

SIGNIFICANCE LEVEL OF DIFFERENCE IN MEANS OF THE GRADE  
IX AGE GROUPS COMPARED ON THREE STANDARDIZED TESTS,  
1947

Groups Compared	Mental Ability	Tressler English	Dominion Arithmetic
14 year old Junior High and:			
14 year rural	.05	.01	not sig.
16 year old Junior High	.01	.01	not sig.
16 year rural	.01	.01	.01
17 year old	.01	.01	.01
Failure	.01	.01	.01
14 year old rural and:			
16 year, Jr. High	.01	not sig.	not sig.
16 year rural	.01	.01	not sig.
17 year old	.01	.01	.01
Failure	.01	.01	.01
16 year, Jr. High and:			
16 year rural	not sig.	not sig.	not sig.
17 year old	.05	.01	.05
Failure	.01	.01	.01
16 year rural and:			
17 year old	not sig.	not sig.	not sig.
Failure	not sig.	.01	.01
17 year old and:			
Failure	not sig.	.01	.05



Although the 14 year old groups show superiority in achievement, there is no significant difference between the 14 year old Junior High group and each of the 14 year old rural and 16 year old Junior High groups in arithmetic. The 14 year old rural group does not differ from the 16 year old Junior High group in English or arithmetic, neither with the 16 year old rural group in arithmetic. No significant difference is apparent between the two 16 year old groups. It would appear that pupils who fail to receive recommendation for promotion are weak in the two core subjects: English and arithmetic.

With respect to mental ability there is no significant difference between the two sixteen year old groups; and the failure group and the seventeen year old group do not differ from the sixteen year old rural group. Mental ability scores were further compared for the five age groups and the failure group on the basis of mean I.Q.'s. This comparison is reported in Table XXXIV.

TABLE XXXIV

MEAN I.Q.'S OF THE FIVE AGE GROUPS AND THE FAILURE GROUP

Group	Mean I.Q.
14 year old Junior High	120
14 year old rural	115
16 year old Junior High	101
16 year old rural	99
17 year old	98
Failure	98

Table XXXIV indicates that the I.Q.'s of the two fourteen year old groups is significantly higher than that of all other groups.

A study was made of achievement of the failure group, of a second group of pupils with I.Q.'s of 115 or higher and of a third group of pupils who made scores below 25 on the English Test. Medians were calculated to show the achievement of these groups in English and arithmetic and also to show the chronological ages and I.Q.'s of these three groups. The data for this analysis was taken from ten Inspectoral Divisions representing a cross section of the Province and is reported in Table XXXV.

TABLE XXXV  
 MEDIANS OF CHRONOLOGICAL AGES AND ACHIEVEMENT  
 OF THREE GRADE IX GROUPS, 1948

Group	Chronological age	Tressler English	Dominion Arithmetic	I.Q.
Failure	15-9	24.7	54.5	92
I.Q.'s of 115 and higher	14-9	51.43	68.82	123
Scores of 25 and below in the English Test	15-11	-----	56.69	94

The group with I.Q.'s of 115 and above shows definitely higher achievement than the established medians for the population and is approximately one year younger. The failure group and those making low scores in the English Test have lower than average I.Q.'s, lower achievement in arithmetic, and could be

classified in the 25th percentile and below for the population,

In 1949 two Grade IX groups were compared: the Q1 mental ability group, pupils with mental ability scores in the 25th percentile or below, and the Q3 group with mental ability scores within the 75th percentile or above. The scores were selected from 10 Inspectoral Divisions representing a cross section of the Province. Achievement in Reading and arithmetic and chronological ages for the two groups is tabulated in Table XXXVI.

TABLE XXXVI

QUARTILES, MEANS, STANDARD DEVIATIONS AND QUARTILES OF CHRONOLOGICAL AGES FOR THE TWO GRADE IX MENTAL ABILITY GROUPS

Group	N.	Q1	Ma.	Q3	M	S.E <sub>M</sub>	S.D.
	Reading						
Q1	332	61.11	72.31	78.73	72.45	.88	16.05
Q3	427	94.58	104.45	113.36	103.64	.69	14.40
	Arithmetic						
Q1	332	27.75	35.08	41.40	34.60	.50	9.30
Q3	426	40.62	46.65	51.65	46.55	.85	17.70
	Ages						
Q1	332	15 - 3	15 - 10	16 - 7			
Q3	426	14 - 0	15 - 2	15 - 6			

Seventy-five percent of the Q1 group (mental ability raw scores of 54 and less) are below the 30th percentile in reading and 20th percentile in arithmetic according to the norms established for the population. On the other hand, seventy-five percent of the Q3 mental ability group is above the 60th percentile in reading and the 50th percentile in arithmetic. The range in reading achievement becomes more marked in terms of Reading Age Norms provided in the Manual for the Haggerty Reading Examination. If the means are compared for the two groups on the basis of reading ages, the mean reading age for the Q1 group is 13 years 8 months as compared with a mean reading age of over 20 years for the Q3 group. Such a superiority in reading should, no doubt, give this group a decided advantage in attaining better ranks in school subjects. Accordingly, a tally was made of the ranks each of these groups received in different subjects studied in school. These ranks were taken from the Score Sheets where they were reported as High (H), Good (G), Satisfactory (S) and Weak (W). The results are expressed as percentages in Table XXXVII.

TABLE XXXVII

SCHOOL RANKS OF TWO GRADE IX MENTAL ABILITY  
GROUPS EXPRESSED AS PERCENTAGES

Group	H	G	S	W
Q1	12.2	25.5	43.8	18.5
Q3	40.2	36.3	19.5	3.9

Over seventy-five percent of the school ranks of the higher mental ability group are either High or Good with only about four percent of them reported as weak. Only 37.7 percent of the ranks of the lower mental ability group are either High or Good and 18.5 percent of the ranks are Weak. The superiority of the higher mental ability group is evident not only in terms of standardized test results, but also in terms of success in school on the year's work. What is more, the pupils with higher mental ability scores are on the average one year younger than the pupils in the lower mental ability group.

The Weak ranks were also analyzed to determine the subject-matter area in which pupils were under-achieving in school.

TABLE XXXVIII  
SCHOOL SUBJECTS IN WHICH THE TWO MENTAL ABILITY GROUPS SHOWED WEAKNESS

Q1		Q3	
Subject	Percent Weak	Subject	Percent Weak
Maths.	17.0	Maths.	7.6
History	16.7	History	19.1
Literature	13.1	Literature	14.0
Language	11.7	Language	5.7
French	10.5	French	19.7
Spelling	9.6	Spelling	7.6
Science	9.4	Science	9.5
Health	3.3	Health	5.0
Prac. Cit.	2.6	Prac. Cit.	1.6
Music	1.5	Music	3.7
Art	1.2	Art	2.5
Latin	1.0	Latin	.6
Biology	1.0	Biology	1.5
German	.8	German	.6
General Shop	.5	Guidance	.6
Homemaking	.1	Dom. Science	.6

Frequency of failure is greatest in History (Social Studies), Literature and French. Pupils with higher mental ability scores did not have as many Weak grades in Mathematics and Language as pupils with lower mental ability scores. It is interesting to note that where electives are offered, some pupils fail in these subjects also. It may be that more could be done in the line of discovering aptitudes of pupils before they are permitted to choose electives. It is difficult to understand why Guidance is listed as a weak subject. It may be due to the fact that the pupil lacked satisfactory personality adjustment or that some teachers actually teach guidance as a school subject, and test for factual information.

Additional analysis was made of the achievement of Grade X mental ability raw scores on the Otis Tests above the 75th percentile. The ten Inspectoral Divisions formerly used were taken for the same year 1949. This group was analyzed for achievement in Vocabulary and arithmetic results and in terms of school ranks on the year's work. Table XXXIX shows the achievement on the two standardized tests and Table XLIX shows teachers' rankings expressed as percent of all the ranks for the group studied.

TABLE XXXIX

CHRONOLOGICAL AGE AND STANDARDIZED TESTSMEDIANS  
OF THE Q3 MENTAL ABILITY GROUP GRADE X, 1949

N	Chronological Age	Vocabulary	Arithmetic
426	16-2	51.9	47.23

The Q3 group has a median chronological age three months below the median chronological age for the sample of the population studied and median scores in Vocabulary and Arithmetic within the 70th percentile.

TABLE XL

DISTRIBUTION OF SCHOOL RANKS OF THE GRADE X  
Q3 MENTAL ABILITY GROUP

School Ranks	Percent
A	45
B	24
C	16
D	9
E	6

Forty-five percent of school ranks of the Q3 group were reported as A and 85 percent are above C or a mark of 60. Only six percent of the ranks are below the 50 mark and could be classed as failures. The E ranks were analyzed for school subjects in which they appear and present nearly the same incidence of failure as that seen in the Grade IX analysis. Table XII summarizes these results.

TABLE XL1

SCHOOL SUBJECTS IN WHICH FAILURE WAS REPORTED  
FOR THE Q3 MENTAL ABILITY GRADE X GROUP,  
1949

Subject	Percent
Mathematics	24.66
French	17.33
Social Studies	12.66
Science	11.33
English	9.33
History	8.66
Latin	4.66
Spelling	2.66
Health	2.00
Composition	2.00
General Shop	1.66
Home Economics	1.33
Shop Science	1.33
Draughting	.66

From the analysis in this chapter we may infer that pupils with higher mental ability scores show better achievement in standardized tests and also in school work in terms of school ranks, and that on the whole these pupils are somewhat younger in age than the average of the population in each grade studied. The younger pupils, the fourteen year old group, have high mean I.Q.'s, whereas the other four groups studied in 1947 have average I.Q.'s close to 100. The group with I.Q.'s above 115 shows achievement that places it within the 75th percentile of the population studied. The 1949 Q3 mental ability Grade IX and Grade X groups have I.Q.'s above 113 and 110 respectively and their achievement in standardized tests is definitely higher than the mean for the population. On the other hand the failure group and pupils who made low scores on the English test have



I.Q.'s which rank them with the lower quartile for the population.

TABLE XLII

CORRELATIONS BETWEEN HENMON-NELSON FORM B MENTAL ABILITY RAW SCORES AND TRESSLER ENGLISH AND DOMINION ARITHMETIC SCORES FOR GRADE IX PUPILS, 1947

Groups	N	Mental Ability and English r	N	Mental Ability and Dom. Arith. Form: A r
Collegiates	100	.51	100	.30
Two-Room High	100	.57	100	.37
One-Room High	100	.46	100	.53
Junior High	100	.50	100	.49
14 year old Junior High	100	.57	100	.41
14 year old rural	100	.63	100	.54
16 year old Junior High	100	.42	100	.34
16 year old rural	80	.40	80	.43
17 year old	114	.48	114	.49
Failures	100	.24	100	.30

TABLE XLIII

CORRELATIONS BETWEEN HENMON-NELSON MENTAL ABILITY  
RAW SCORES AND TRESSLER ENGLISH AND DOMINION  
ARITHMETIC SCORES OF GRADE IX PUPILS, 1948

Groups	N	Mental Ability and English Form: C r	N	Mental Ability Dom. Arith. Form: B r
Collegiates	50	.65	50	.39
Two-Room High	50	.79	50	.65
One-Room High	50	.71	50	.48
Junior High	50	.71	50	.32

TABLE XLIV

CORRELATIONS BETWEEN HENMON-NELSON I.Q.'S AND TRESSLER  
ENGLISH AND DOMINION ARITHMETIC SCORES OF GRADE IX  
PUPILS, 1948

Groups	N	I.Q.'s and English r	N	I.Q.'s and Dom. Arith. r
Collegiates	50	.72	50	.46
Two-Room High	50	.50	50	----
One-Room High	50	.76	50	.41
Junior High	50	.55	50	.45
Inspectoral Division A	103	.61	103	.52
Inspectoral Division B	130	.61	--	--

TABLE XLV

CORRELATIONS BETWEEN OTIS MENTAL ABILITY RAW SCORES  
AND HAGGERTY READING AND BEATTIE ARITHMETIC  
SCORES FOR THE GRADE IX GROUPS, 1949

Groups	N	Otis, Mental Ability and Haggerty Reading r	N	Otis, Mental Ability and Beattie Arith. r
Division A	61	.64	62	.45
Division B	145	.58	146	.32
Division C	118	.48	117	---
Division D	61	.71	61	.34

The fact that the older pupils show under-achievement in terms of standardized tests and school ranks and the younger pupils show higher mental ability scores leads one to believe that the secondary school curriculum should consider seriously a provision for a differentiated curriculum for the over-age pupils who show lower attainment in mental ability tests and are definitely under achieving in the academic type of subjects.

Since there are pupils at the Grade IX and Grade X level that are under-age for the grade, pupils that show superior achievement, who must have been accelerated before they reached the secondary school level; provision for acceleration in the secondary school should be provided.

## CHAPTER LX

### SUMMARY AND CONCLUSION

Some of the more significant findings of previous chapters concerned with analysis of the test data are restated in this chapter and made the basis for general conclusions. It should be kept in mind, in so doing, that the testing programme of the three-year period was experimental and that any conclusions or recommendations drawn would relate to the school situation in Manitoba only. The limitations of any testing programme over such a wide area as the Province of Manitoba, and the limitations of the tests used have been stated earlier in this thesis and need not be re-stated. Like other provinces, Manitoba is in search of improved methods of evaluation for purposes of pupil classification and promotion. Accordingly, the findings and recommendations of this study must be regarded as tentative.

#### Principal Findings

The analysis of examination data indicates:

1. That the mean I.Q. for the population studied is approximately seven points higher than the expected mean of 100. It would appear therefore that the tests used in this study were standardized on a population somewhat inferior, or less selective, than that of pupils enrolled at the end of the Grade IX year. This finding is in accord with those of Conway in British Columbia. Indeed, it is not uncommon to find this true of American tests applied to Canadian schools. It accounts largely for some existing variations in grading.

2. That Junior High School pupils rank highest in all achievement tests except the Beattie Arithmetic test. This difference is significant at the 1 per cent level. Next in order is the Collegiate; third the Two-Room and One-Room High with very little difference between them. A greater degree of selectivity could account for the superior results of Collegiate Institute and Collegiate Department pupils but not of the Junior High School pupils. It may be that this institution, having the Grade IX pupils over a three-year period understands them better and is enabled to concentrate with greater effect than would be true where they constitute the first year of the Higher institution. There is food for thought in this and certainly it does constitute a criticism of limitations under which the Two-Room and One-Room High School must manage evaluation of effort and instruction. The Conway studies confirm this finding but do not diagnose the possible underlying causes.

3. Groups that showed higher scores on the mental ability tests also showed higher achievement in subject-matter areas as indicated by results of standardized tests.

4. Pupils who show high achievement in standardized tests are as a rule chronologically younger than the mean for the population. Many of these pupils may have received double promotions in the elementary grades.

5. Analysis of the results of the Tressler English Test show that results for the Manitoba population studied

are below the U.S. published norms. The Junior High was the only group that exceeded the published norms in 1947. In analyzing the results for the sections of this test for 1947, Vocabulary, Punctuation and Capitalization indicate significant weakness, while the results for 1948 as revealed by median scores in these areas were improved, due possibly to increased emphasis.

6. Reading test results show that the Manitoba Grade IX pupils are above the published norms for the Haggerty Reading Test and the Grade X pupils show achievement in line with the published norms for the A.C.E. Reading Comprehension Test. However, there is a wide range of reading ability at the end of Grade IX, some pupils making scores as low as the Grade VI level. On the other hand, about fifty per cent of the pupils made scores above the Grade X reading level. The fact that pupils with lower reading ability are promoted to Grade IX justifies the use of reading tests in appraising promotions.

7. A considerable percentage of Grade IX and X pupils showed acceptable mastery in four fundamental operations. This has been made evident in the study of three consecutive years. There was evident weakness in fractions, particularly division of fractions, percentage and decimals, denominate numbers and problems. It was found that arithmetic questions with vocabulary content show a greater percentage of error. This may be due, in part, to the fact that when pupils are

weak in reading and reading comprehension that they fail to interpret the question correctly.

8. Since the lower mental ability groups in Grade IX and X show lower achievement in reading and arithmetic and also in terms of school letter grades, it appears that the progress of these pupils calls for a more thorough appraisal than has been the practice. Notwithstanding the fact that only eighteen per cent of the letter grades for this group are classed as weak, many of the pupils received "Satisfactory" letter grades within the range between 50 and 60 per cent. It is possible that many weak subjects were included in this range. It would appear, therefore, that the results of the standardized achievement tests in reading and arithmetic should prove of value in making Province wide promotions at the Grade IX level.

9. There is a difference in achievement among the age groups compared. The older, over-age, pupils show lower achievement in standardized tests than do the younger and somewhat accelerated pupils. Psychological tests, therefore, combined with standardized achievement tests may be used to forecast educational prospects and to help select pupils worthy of acceleration at the secondary school level.

10. In the study of age groups at the end of Grade IX and X, it is evident that the different age groups remain constant from year to year and from Grade IX to Grade X, and when pupils discontinue attending school they do not do so at any particular age level. The fact that the over-age pupils show lower achievement in standardized tests and

inferior work in terms of school letter grades, seems to indicate that purely academic type of curriculum does not appeal to these pupils and that some provision should be made to provide a curriculum consistent with their interests, aptitudes and abilities.

11. There is a higher degree of inter-correlation between mental ability tests and reading and English tests than between the mental ability tests and arithmetic tests. Coefficients of correlation obtained in this study are in accord with other studies. One may infer, therefore, that mental ability test scores similar to those used in this study may also be considered as in close agreement with reading tests.

12. In this study we find that the achievement of the Correspondence Branch pupils does not seem significantly inferior to the achievement of the total population studied.

13. Pupils who came within the 75th percentile on mental ability test showed higher achievement in the other standardized tests and received higher school letter grades. However, pupils who came within the 25th percentile on the mental ability test showed lower achievement on the standardized tests and received lower letter grades in school. The pupils who were recommended for failure standing showed lower achievement in standardized tests, and pupils with low achievement in English were also low in terms of mental ability scores. Therefore, when a battery of tests is administered to the pupils at the high school level, the results of these tests taken together provide something of



a refinement of measures for selecting: (1) pupils who show promise and may be considered for acceleration and, (2) pupils who show inferior achievement and are not a fair risk for promotion. The upper and the lower quartiles may be used reasonably well for this purpose.

### Conclusion

The study indicates that mental and standardized achievement tests have value in a programme of Provincial examinations. Whether or not this is all that should be attempted is another question. Comparative data were not available for the Province of Alberta but, for a number of years, the Provincial Department of Education of that Province has conducted a Grade IX examination as an aid in distributing pupils to different types of secondary school programmes. Alberta used a combination of mental, reading, arithmetic and province-made tests for one of the regular school subjects. On the basis of this testing programme pupils were graded as A, B or C and advised accordingly as to the type of course they might pursue with wisdom if proceeding further in school. Like British Columbia, Alberta is continuing its experiments.

The entire analysis and discussion of this study not only warrants a continuation of the type of examinations now in use but, possibly, a further but not too extensive venture into one or more of the subjects of study. The letter-grade made by the teacher has significance for the present study and may well be continued in that it expresses

the estimate of the instructor who has had intimate knowledge of the attitudes and progress of the individual pupil throughout the year.

Finally, since the testing programme with respect to promotions at the entrance to high school is in the experimental stage in Manitoba, there is need for a long-term plan of at least three years. Such a plan should involve (1) selection of tests, (2) areas of teaching, (3) methods of administration and appraisal of test results, (4) a uniform plan of assembling data over the entire period under study, and (5) provision for the interpretation of test results and the advisement of secondary school teachers as to the meaning of test results and areas for instructional emphasis. In closing a study of this nature the writer feels that one cannot overstress the importance of the whole problem of classification and promotion and the relation of examination findings to the future success of school instruction.

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APPENDIX A

CALCULATION OF SIGNIFICANCE

LEVEL

TABLE 1  
STANDARD ERRORS OF DIFFERENCE BETWEEN TWO MEANS  
ON THE MENTAL ABILITY TESTS

Groups Compared	$M_1 - M_2$	$\sqrt{\sigma_{n_1}^2 + \sigma_{n_2}^2}$	t	Significance Level
Grade IX 1947				
Collegiates and				
1. Two-Room High	1.60	.66	2.42	.05
2. One-Room High	1.60	.50	3.20	.01
3. Junior High	2.40	.46	5.21	.01
Two-Room High and				
1. One-Room High	0.00	0.00	0.00	not sig.
2. Junior High	4.00	.69	5.51	.01
One-Room High and				
1. Junior High	4.00	.53	7.43	.01
.....				
Grade IX 1948				
Collegiates and				
1. Two-Room High	3.80	.71	5.35	.01
2. One-Room High	1.51	.60	2.52	.05
3. Junior High	2.05	.60	3.42	.01
Two-Room High and				
1. One-Room High	1.29	.66	1.95	not sig.
2. Junior High	5.85	.65	9.00	.01
One-Room High and				
1. Junior High	3.56	.62	5.74	.01
.....				

TABLE 1 (Continued)

Groups Compared	$M_1 - M_2$	$\sqrt{\frac{\sigma^2}{N_1} + \frac{\sigma^2}{N_2}}$	t	Significance Level
Grade IX 1949				
Collegiates and				
1. Two-Room High	2.55	.43	5.93	.01
2. One-Room High	2.35	.40	5.87	.01
3. Junior High	3.36	.36	3.36	.01
Two-Room High and				
1. One-Room High	1.20	.50	2.40	.05
2. Junior High	3.75	.46	8.04	.01
One-Room High and				
1.	2.56	.43	5.95	.01

.....

TABLE 11

STANDARD ERROR OF DIFFERENCE BETWEEN TWO MEANS  
ON DOMINION ARITHMETIC TESTS GRADE 1X,  
1947 AND 1948

Groups Compared	M <sub>1</sub> - M <sub>2</sub>	$\sqrt{\sigma_{H_1}^2 + \sigma_{H_2}^2}$	t	Significance Level
1947				
Collegiates and:				
1. Two-Room High	.15	.59	.25	not sig.
2. One-Room High	--	--	--	"
3. Junior High	2.40	.51	4.70	.01
Two-Room High and:				
1. One-Room High	.15	.55	.27	not sig.
2. Junior High	2.55	.59	4.70	.01
One-Room High and:				
1. Junior High	2.40	.56	4.28	.01
.....				
1948				
Collegiates and:				
1. Two-Room High	.84	.49	1.71	not sig.
2. One-Room High	.97	.45	2.15	.05
3. Junior High	1.13	.41	2.75	.01
Two-Room High and:				
1. One-Room High	.23	.55	.41	not sig.
2. Junior High	1.87	.52	3.59	.01
One-Room High and:				
1. Junior High	2.10	.48	4.37	.01

APPENDIX B

DATA ON THE BEATTIE ARITHMETIC  
TEST



TABLE 111

BEATTIE ARITHMETIC QUESTIONS RECEIVING SIXTY PER CENT CORRECT RESPONSE OR LESS, GRADE 1X, 1949

Question No.	Question	Per Cent Correct Response
20	$19.3$ $\times .75$	42
24	$2\frac{1}{4} \times 7\frac{1}{2} \times 1\frac{1}{2}$	44
25	$3204 \div 34 =$	50
26	$53760 \div 64 =$	52
28	$3\frac{3}{4} \div 4 =$	60
29	$15\frac{1}{4} \div \frac{7}{8} =$	50
36	$38.912 \div 15.2 =$	54
37	$3.8912 \div 152 =$	58
38	$.38912 \div .152 =$	50
39	5% of \$ 36. =	54
40	17% of \$ 2.00 =	38
41	75% of \$ 3.40 =	60
42	125% of 96 =	58
43	2.4% of 40	46
44	$\frac{2}{3}$ % of 600 =	26
53	$4\frac{1}{2}$ % = ..... .	50
54	What is the average of 16, 9, 35, 21?	52
55	What is the interest on \$300. for 4 months at 6%?	44

TABLE 111 (Continued)

Question No.	Question	Per Cent Correct Response
56	What is the net price of goods listed at \$16.40 with a discount of 4%?	22
57	If goods costing \$60. are sold at a gain of \$15., what percent of the selling price is the gain?	14
58	Arrange in order of size: .016, .315, .87, .02	26
59	A boy has two \$5 bills, three \$2. bills, four \$1. bills, three half dollars and two quarters. How much money has he in all?	46
60	A baseball team has won 48 games and lost 12. What percent of its games has it won?	12

TABLE IV

BEATTIE ARITHMETIC QUESTIONS RECEIVING 75 PER CENT CORRECT RESPONSE OR LESS, GRADE X, 1949

Question No.	Question	Per Cent. Correct Response
5	$\frac{5}{16} \div \frac{3}{4} \div \frac{9}{64} =$	60
20	$19.3 \div x.75 =$	66
21	$\frac{7}{8} \times \frac{5}{16} =$	62
24	$2\frac{1}{4} \times 7\frac{1}{2} \times 1\frac{1}{2} =$	42
25	$3204 \div 34 =$	70
26	$53760 \div 64 =$	64
28	$3\frac{3}{4} \div 4 =$	66
29	$15\frac{1}{4} \div \frac{7}{8} =$	70
30	$3\frac{1}{4} \div 1\frac{1}{2} =$	70
32	$18.625 \div .025 =$	70
36	$38.912 \div 15.2 = 256$	62
37	$3.8912 \div 152 = 256$	48
38	$.38912 \div 152 = 256$	62
40	17% of \$ 2.00 =	68
42	125% of 96 =	70
43	2.4% of 40 =	46
44	$\frac{2}{3}$ % of 600 =	36
45	6 = % of 24	56
46	25 = % of 20	60

TABLE IV (Continued)

Question No.	Question	Per Cent Correct Response
47	12 = % of 36	58
51	5% = (what decimal)	62
52	12% = "	60
53	4½% = "	48
54	What is the average of 16, 9, 35, 21?	50
55	What is the interest on \$300. for 4 months at 6%?	30
56	What is the net price of goods listed at \$16.40 with a discount of 4%?	18
57	If goods costing \$60. are sold at a gain of \$ 15., what percent of the selling price is the gain?	14
58	Arrange in order of size: .016, .315, .87, .02	36
59	A boy has two \$ 5.00 bills, three \$2.00 bills, four \$1.00 bills, three half dollars, and two quarters. How much money has he in all?	60
60	A baseball team has won 48 games and lost 12. What percent of its games has it won?	20

APPENDIX C

TEST BATTERY

1. The Henmon-Nelson Test of Mental Ability  
Form B.
2. Otis Self-Administering Test of Mental  
Ability Intermediate Examination: Form A.
3. Tressler English Minimum Essentials Test  
Form A.
4. Haggerty Reading Examination Sigma 3:  
Form A.
5. Cooperative English Test Test C1: Read-  
ing Comprehension (Lower Level) Form S.
6. The Dominion Arithmetic Test Form A.
7. Beattie Test of Mathematical Fundamentals.

Henmon-Nelson Test  
of Mental Ability

# THE CLAPP-YOUNG SELF-MARKING TESTS

Patented March 19, 1929. Also Licensed under U.S. Patent 1,586,628

Edited by Frank L. Clapp, Professor of Education  
University of Wisconsin

## THE HENMON-NELSON TESTS OF MENTAL ABILITY—Form B

High School Intelligence Test . Grades 7-12

By V. A. C. Henmon, Ph.D., Chairman of the Department of Psychology  
University of Wisconsin, and M. J. Nelson, Ph.D., Dean of the  
Faculty, Iowa State Teachers College

Copyright, 1932, by V. A. C. Henmon and M. J. Nelson

**DIRECTIONS TO THE STUDENT:** The three Practice Exercises in the next column at the right are given so that you may see how to do the test. Read each one carefully and mark the answer that you think is right.

Practice Exercise 1. Boys like to play: 1 ball, 2 state, 3 dust, 4 never, 5 blue

1  2  3  4  5

You are to mark in the square which has the same number as does the word that tells what it is boys like to play. This word is "ball." You make a mark like this X in the square that contains the 1, because the number of the word "ball" is 1.

Practice Exercise 2. I am ..... down town. A word for the blank is: 1 able, 2 see, 3 country, 4 going, 5 color

1  2  3  4  5

Mark in the square that you think should be marked. The right word is "going," so you should have marked in the square numbered 4.

Practice Exercise 3.  $\bigcirc$  is to  $\bigcirc$  as  $\square$  is to: 1  $\triangle$ , 2  $\square$ , 3  $\square$ , 4  $\nabla$ , 5  $\square$

1  2  3  4  5

The answer, of course, is number 3, since a circle is to a smaller circle as a square is to a smaller square.

If you find that you have made a mistake and marked in the wrong square, do not erase, but simply draw a circle around it and then mark in the right square.

- 17, 20, . . . , . . . , 29, 32. What two numbers should be placed on the dotted lines? (1) 23 and 26, (2) 21 and 27, (3) 21 and 22, (4) 22 and 26, (5) 23 and 27  1  2  3  4  5
- If the letters **t o i r e f f** were arranged properly, they would spell: 1 refresh, 2 officer, 3 forfeit, 4 inferior, 5 traffic.  1  2  3  4  5
- The aviator leaped with his ..... 1 hangar, 2 legion, 3 parachute, 4 globe, 5 balloon.  1  2  3  4  5
- 3, 6, 9, 12, 15, 18, . . . . . What two numbers should come next? (1) 19 and 20, (2) 21 and 22; (3) 21 and 24, (4) 15 and 12, (5) 17 and 16.  1  2  3  4  5
- Life is ..... of great experiences. A word for the blank is: 1 lined, 2 composed, 3 excited, 4 walk, 5 desire.  1  2  3  4  5
- If the letters **p r a t e p i a c e** were arranged properly, they would spell: 1 appreciate, 2 preparation, 3 temptation, 4 regretful, 5 appropriate.  1  2  3  4  5
- Which word does not belong with the others below? 1 camel, 2 elephant, 3 chicken, 4 zebra, 5 monkey.  1  2  3  4  5
- 1, 7, 2, 7, 3, 7, . . . . . What two numbers should come next? (1) 5 and 7, (2) 4 and 7, (3) 2 and 6, (4) 3 and 7, (5) 6 and 7.  1  2  3  4  5
- If the letters **i n a l e d** were arranged properly, they would spell: 1 delayed, 2 lament, 3 inlaid, 4 denial, 5 elapse.  1  2  3  4  5
- A coward always lacks: 1 friends, 2 courage, 3 purpose, 4 enemies, 5 sense.  1  2  3  4  5
- 85, 94, 103, 112, . . . . . What number should come next? (1) 213, (2) 119, (3) 120, (4) 121, (5) 125.  1  2  3  4  5
- If the letters **t r g r s r e i a** were arranged properly, they would spell: 1 registration, 2 disregard, 3 registrar, 4 germinate, 5 retract.  1  2  3  4  5
- $\bigcirc$  is to  $\bigcirc$  as  $\square$  is to: 1  $\bigcirc$ , 2  $\square$ , 3  $\square$ , 4  $\square$ , 5  $\square$ .  1  2  3  4  5
- 48, 55, 62, 69, . . . . . What number should come next? (1) 62, (2) 76, (3) 65, (4) 75, (5) 77.  1  2  3  4  5
- staff bread the life called is of If these words were arranged to make a good sentence, what would be the word after "of"? 1 staff, 2 bread, 3 the, 4 life, 5 called  1  2  3  4  5
- The son of my father's nephew is my ..... 1 uncle, 2 great-grandson, 3 brother, 4 second cousin, 5 grandson  1  2  3  4  5
- 11.9, 10.8, 9.7, 8.6, 7.5, 6.4, . . . . . What two numbers should come next? (1) 7.5 and 8.6, (2) 5.3 and 4.2, (3) 5 and 4, (4) 6.3 and 5.2, (5) 5.3 and 4.1.  1  2  3  4  5
- $\square$  is to  $\square$  as  $\cup$  is to: 1  $\bigcirc$ , 2  $\cup$ , 3  $\square$ , 4  $\cup$ , 5  $\cup$ .  1  2  3  4  5

20. When you multiply the length of a field by its width, you find its: 1 perimeter, 2 diagonal, 3 area, 4 volume, 5 circumference.  1  2  3  4  5
- 8, 1, 6, 1, 4, 1, . . . . . What two numbers should come next? (1) 3 and 1, (2) 5 and 1, (3) 3 and 2, (4) 2 and 0, (5) 2 and 1.  1  2  3  4  5
- # is to  $\square$  as ## is to: 1  $\#$ , 2  $\square$ , 3  $\#$ , 4  $\#$ , 5  $\#$ .  1  2  3  4  5
- mistakes do students careful make not If these words were arranged to make a good sentence, what would be the third letter of the second word? 1 m, 2 d, 3 s, 4 c, 5 u.  1  2  3  4  5
- $\sqcap$  is to  $\sqcap$  as  $\Gamma$  is to: 1  $\sqcap$ , 2  $\sqcap$ , 3  $\Gamma$ , 4  $\square$ , 5  $\Gamma$ .  1  2  3  4  5
- A rosette is a: 1 banner, 2 decoration, 3 seat, 4 scepter, 5 baton.  1  2  3  4  5
- Historian is to facts as novelist is to: 1 fiction, 2 Stevenson, 3 poem, 4 man, 5 nature.  1  2  3  4  5
- Which word does not belong with the others below? 1 algebra, 2 geometry, 3 arithmetic, 4 history, 5 trigonometry.  1  2  3  4  5
- 85, 79, 73, 67, . . . . . What number should come next? (1) 6, (2) 65, (3) 62, (4) 61, (5) 60.  1  2  3  4  5
- $\bigcirc$  is to  $\bigcirc$  as  $\triangle$  is to: 1  $\bigcirc$ , 2  $\square$ , 3  $\square$ , 4  $\nabla$ , 5  $\triangle$ .  1  2  3  4  5
- My cousin's mother is my sister's ..... 1 aunt, 2 second cousin, 3 daughter, 4 mother, 5 niece.  1  2  3  4  5
- How many square feet of linoleum are needed to cover a square yard of floor? (1) 27, (2) 6, (3) 3, (4) 12, (5) 9.  1  2  3  4  5
- $\sqcap$  is to  $\sqcap$  as  $\Gamma$  is to: 1  $\sqcap$ , 2  $\sqcap$ , 3  $\sqcap$ , 4  $\sqcap$ , 5  $\Gamma$ .  1  2  3  4  5
- with busy filled the bees air of was hum the If these words were arranged to make a good sentence, what would be the last letter of the third word? 1 m, 2 y, 3 d, 4 s, 5 e.  1  2  3  4  5
- "Justice leans to the side where the purse hangs" means about the same as: 1 Nothing is law that is not reason. 2 Laws grind the poor and rich men rule the law. 3 Where law ends, tyranny begins. 4 No man can be both accuser and judge. 5 Custom becomes law  1  2  3  4  5
- Niagara Falls almost of has an Buffalo inexhaustible hydroelectric supply coming power from If these words were arranged to make a good sentence, what would be the last letter of the first word? 1 e, 2 f, 3 c, 4 t, 5 o  1  2  3  4  5
- 2, 3, 5, 8, 12, 17, . . . . . What two numbers should come next? (1) 18 and 22, (2) 22 and 20, (3) 22 and 20, (4) 22 and 20.  1  2  3  4  5

I.Q.

M.A.

Score

Class

Age

Pupil

Date

Birth day

Instructor

Institution

37. ○ is to ○ as □ is to: 1 □, 2 □, 3 ○, 4 □, 5 ○○ ..... 1 2 3 4 5
38. A bank often fails when its assets are not sufficient to ..... its outstanding notes. A word for the blank is: 1 redeem, 2 comprehend, 3 liability, 4 initiate, 5 specify ..... 1 2 3 4 5
39. 4, 8, 16, 32, ..... What number should come next? (1) 36, (2) 48, (3) 40, (4) 54, (5) 64 ..... 1 2 3 4 5
40. Crete is an island in the: 1 Mediterranean Sea, 2 Pacific Ocean, 3 Indian Ocean, 4 Black Sea, 5 North Sea. .... 1 2 3 4 5
41. A man spends  $\frac{1}{2}$  of his weekly salary for board,  $\frac{1}{3}$  for clothing and amusements, and saves \$5.00 per week. What is his weekly salary? 1 \$30.00, 2 \$60.00, 3 \$15.00, 4 \$90.00, 5 \$120.00 ..... 1 2 3 4 5
42. substance made a bricks called and clay are from pottery If these words were arranged to make a good sentence, what would be the word after "substance"? 1 bricks, 2 clay, 3 called, 4 are, 5 pottery ..... 1 2 3 4 5
43. X is to X as - is to: 1 |, 2 |, 3 X, 4 -, 5 | ..... 1 2 3 4 5
44. A creditor always has: 1 a debtor, 2 money, 3 loans, 4 bonds, 5 a bank ..... 1 2 3 4 5
45. Perpetual means about the same as: 1 endless, 2 easy, 3 useless, 4 quiet, 5 tired ..... 1 2 3 4 5
46. My father's uncle is my son's ..... 1 great-uncle, 2 brother, 3 great-great-uncle, 4 grandfather, 5 cousin ..... 1 2 3 4 5
47. The big oak tree near the cottage had lost its ..... A word for the blank is: 1 growl, 2 needles, 3 blossoms, 4 cones, 5 foliage ..... 1 2 3 4 5
48. "Give every man thine ear, but few thy voice" means about the same as: 1 Few words, many deeds. 2 Full vessels give the least sound. 3 Much talk, little work. 4 The tongue is not steel, yet it cuts. 5 A man of sense talks little but listens much. .... 1 2 3 4 5
49. — is to — as □ is to: 1 □, 2 □, 3 □, 4 □, 5 □ ..... 1 2 3 4 5
50. Municipal refers to: 1 farm, 2 church, 3 tribe, 4 factory, 5 town ..... 1 2 3 4 5
51. Two pints equal one liter. Three liters equal one rabeck. What is the cost of 5 rabecks of milk at 6¢ a pint? (1) 90¢, (2) 30¢, (3) \$1.80, (4) 60¢, (5) \$3.60. .... 1 2 3 4 5
52. A tremulous leaf is: 1 green, 2 brown, 3 parched, 4 wilted, 5 quivering ..... 1 2 3 4 5
53. A heavy train in motion always has more ..... than a light one. A word for the blank is: 1 people, 2 momentum, 3 seekers, 4 knives, 5 space ..... 1 2 3 4 5
54. Add is to subtract as humble is to: 1 rich, 2 happy, 3 haughty, 4 mild, 5 ill ..... 1 2 3 4 5
55. "An empty wagon rattles most" means about the same as: 1 Nothing succeeds like success. 2 Trouble is never far away. 3 The poor are always with us. 4 A barking dog seldom bites. 5 True gold fears no fire. .... 1 2 3 4 5
56. 32, 16, 8, ..... What two numbers should come next? (1) 4 and 2, (2) 4 and 0, (3) 4 and 1, (4) 2 and 0, (5) 4 and  $\frac{1}{2}$  ..... 1 2 3 4 5
57. Ordinary is to exceptional as many is to: 1 all, 2 none, 3 few, 4 common, 5 more ..... 1 2 3 4 5
58. When you multiply together the length, the width, and the height of a room, you find its: 1 perimeter, 2 diagonal, 3 area, 4 volume, 5 circumference ..... 1 2 3 4 5
59. Which of these words does not belong with the others? 1 publication, 2 discourse, 3 journal, 4 periodical, 5 magazine ..... 1 2 3 4 5
60. A road always has: 1 dust, 2 gravel, 3 cement, 4 grass, 5 dimensions ..... 1 2 3 4 5
61. Disease is to sanitation as accident is to: 1 doctor, 2 hospital, 3 bandage, 4 cleanliness, 5 care ..... 1 2 3 4 5
63. Land is to peninsula as ocean is to: 1 gulf, 2 lake, 3 cape 4 river, 5 island ..... 1 2 3 4 5
64. Apathetic is the opposite of: 1 dull, 2 energetic, 3 anonymous, 4 fallible, 5 migrating ..... 1 2 3 4 5
65. To moulder is to: 1 deface, 2 decay, 3 design, 4 elevate 5 carve ..... 1 2 3 4 5
66. Motion is to physics as blood is to: 1 temperature, 2 body, 3 veins, 4 physiology, 5 geography ..... 1 2 3 4 5
67. Which of these words does not belong with the others? 1 cosmography, 2 geography, 3 physiography, 4 geology, 5 physiology ..... 1 2 3 4 5
68. A benevolent person is always: 1 handsome, 2 old, 3 religious, 4 charitable, 5 wicked ..... 1 2 3 4 5
69. "The wise make tools of whatever comes to hand" means about the same as: 1 Order is heaven's first law. 2 A poor workman blames his tools. 3 Away from the battle all are soldiers. 4 Opportunity comes but once. 5 Achievement comes with toil rather than with opportunity ..... 1 2 3 4 5
70. A drove his auto 5 times around a track while B drove his around 4 times. A was going how many times as fast as B? (1)  $\frac{1}{5}$ , (2)  $\frac{1}{4}$ , (3) 2, (4)  $\frac{1}{2}$ , (5)  $5\frac{1}{4}$  ..... 1 2 3 4 5
71. Electricity is to wire as gas is to: 1 flame, 2 spark, 3 hot, 4 pipe, 5 stove ..... 1 2 3 4 5
72. When 3 pupils were absent from a class the attendance was 94%. How many pupils were there in the class? (1) 30, (2) 90, (3) 50, (4) 15, (5) 31 ..... 1 2 3 4 5
73. Onyx is a: 1 limestone, 2 quartz, 3 glass, 4 granite, 5 metal ..... 1 2 3 4 5
74. Which of these words does not belong with the others? 1 interminable, 2 perpetual, 3 transitory, 4 enduring, 5 immutable ..... 1 2 3 4 5
75. Ambiguous means about the same as: 1 nice, 2 two-wheeled, 3 porous, 4 indefinite, 5 succinct ..... 1 2 3 4 5
76. Sustenance is: 1 appearance, 2 digestion, 3 nourishment, 4 absorption, 5 harm ..... 1 2 3 4 5
77. Evolution is to revolution as crawl is to: 1 baby, 2 run, 3 floor, 4 stand, 5 knees ..... 1 2 3 4 5
78. Which of these words does not belong with the others? 1 faith, 2 belief, 3 knowledge, 4 credulity, 5 trust ..... 1 2 3 4 5
79. A stipend is a form of: 1 compensation, 2 agreement, 3 stand, 4 punishment, 5 error ..... 1 2 3 4 5
80. Toil is to soil as pay is to: 1 money, 2 sense, 3 may, 4 coin, 5 man ..... 1 2 3 4 5
81. Depressed is the opposite of: 1 repressed, 2 elated, 3 apathy, 4 anxious, 5 eager ..... 1 2 3 4 5
82. A timbrel is a kind of: 1 horn, 2 fife, 3 banjo, 4 drum, 5 organ ..... 1 2 3 4 5
83. The first day a man plowed  $\frac{1}{4}$  of his field. On the next day he plowed  $\frac{1}{2}$  of the remainder. What fractional part remained? (1)  $\frac{1}{2}$ , (2)  $\frac{1}{4}$ , (3)  $\frac{3}{8}$ , (4)  $\frac{3}{16}$ , (5)  $\frac{5}{8}$  ..... 1 2 3 4 5
84. A novice is a: 1 professional, 2 musician, 3 chef, 4 beginner, 5 thug ..... 1 2 3 4 5
85. Garnishee is a term used in: 1 medicine, 2 finance, 3 education, 4 engineering, 5 serving ..... 1 2 3 4 5
86. "No sweetness in a cabbage twice boiled or in a tale twice told" means about the same as: 1 A good tale ill told is a bad one. 2 A tale never loses in the telling. 3 A good tale is not worse for being twice told. 4 There is much good sleep in an old story. 5 A tame tongue is a rare bird. .... 1 2 3 4 5
87. Progenitor means about the same as: 1 offspring, 2 ancestor, 3 descendant, 4 provider, 5 eugenics ..... 1 2 3 4 5
88. A satyr is a: 1 sea lion, 2 loon, 3 deity, 4 horseman, 5 statue ..... 1 2 3 4 5
89. "Marmion" was written by: 1 Tennyson, 2 Milton, 3 Scott, 4 Pone, 5 Bryant ..... 1 2 3 4 5



To find the score, count the squares that are marked out, omitting those that are circled.

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# OTIS SELF-ADMINISTERING TESTS OF MENTAL ABILITY

By ARTHUR S. OTIS, PH.D.

Formerly Development Specialist with Advisory Board, General Staff, United States War Department

## INTERMEDIATE EXAMINATION: FORM A

For Grades 4-9

20

Score.....

*Read this page. Do what it tells you to do.*

*Do not open this paper, or turn it over, until you are told to do so. Fill these blanks, giving your name, age, birthday, etc. Write plainly.*

Name..... Age last birthday..... years  
First name, initial, and last name

Birthday..... Teacher..... Date..... 19.....  
Month Day

Grade..... School..... City.....

This is a test to see how well you can think. It contains questions of different kinds. Here is a sample question already answered correctly. Notice how the question is answered:

*Sample:* Which one of the five words below tells what an apple is?  
1 flower, 2 tree, 3 vegetable, 4 fruit, 5 animal..... ( 4 )

The right answer, of course, is "fruit"; so the word "fruit" is underlined. And the word "fruit" is No. 4; so a figure 4 is placed in the parentheses at the end of the dotted line. This is the way you are to answer the questions.

Try this sample question yourself. Do not write the answer; just draw a line under it and then put its number in the parentheses:

*Sample:* Which one of the five things below is round?  
1 a book, 2 a brick, 3 a ball, 4 a house, 5 a box..... ( )

The answer, of course, is "a ball"; so you should have drawn a line under the words "a ball" and put a figure 3 in the parentheses. Try this one:

*Sample:* A foot is to a man and a paw is to a cat the same as a hoof is to a — what?  
1 dog, 2 horse, 3 shoe, 4 blacksmith, 5 saddle..... ( )

The answer, of course, is "horse"; so you should have drawn a line under the word "horse" and put a figure 2 in the parentheses. Try this one:

*Sample:* At four cents each, how many cents will 6 pencils cost?..... ( )

The answer, of course, is 24, and there is nothing to underline; so just put the 24 in the parentheses.

If the answer to any question is a number or a letter, put the number or letter in the parentheses without underlining anything. Make all letters like printed capitals.

The test contains 75 questions. You are not expected to be able to answer all of them, but do the best you can. You will be allowed half an hour after the examiner tells you to begin. Try to get as many right as possible. Be careful not to go so fast that you make mistakes. Do not spend too much time on any one question. No questions about the test will be answered by the examiner after the test begins. Lay your pencil down.

*Do not turn this page until you are told to begin.*

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## EXAMINATION BEGINS HERE.

1. Which one of the five things below does not belong with the others? (Do not write on these dotted lines.) ( )  
1 potato, 2 turnip, 3 carrot, 4 stone, 5 onion.....
2. Which one of the five words below tells best what a saw is? ( )  
1 something, 2 tool, 3 furniture, 4 wood, 5 machine.....
3. Which one of the five words below means the opposite of west? ( )  
1 north, 2 south, 3 east, 4 equator, 5 sunset.....
4. A hat is to a head and a glove is to a hand the same as a shoe is to what? ( )  
1 leather, 2 a foot, 3 a shoestring, 4 walk, 5 a toe.....
5. A child who knows he is guilty of doing wrong should feel (?) ( )  
1 bad, 2 sick, 3 better, 4 afraid, 5 ashamed.....
6. Which one of the five things below is the smallest? ( )  
1 twig, 2 limb, 3 bud, 4 tree, 5 branch.....
7. Which one of the five things below is most like these three: cup, plate, saucer? ( )  
1 fork, 2 table, 3 eat, 4 bowl, 5 spoon.....
8. Which of the five words below means the opposite of strong? ( )  
1 man, 2 weak, 3 small, 4 short, 5 thin.....
9. A finger is to a hand the same as a toe is to what? ( )  
1 foot, 2 toenail, 3 heel, 4 shoe, 5 knee.....
10. Which word means the opposite of sorrow? ( )  
1 sickness, 2 health, 3 good, 4 joy, 5 pride.....
11. Which one of the ten numbers below is the smallest? (Tell by letter.) ( )  
A 6084, B 5160, C 4342, D 6521, E 9703, F 4296, G 7475, H 2657, J 8839, K 3918
12. Which word means the opposite of pretty? ( )  
1 good, 2 ugly, 3 bad, 4 crooked, 5 nice.....
13. Do what this mixed-up sentence tells you to do. ( )  
number Write the the in 5 parentheses.....
14. If we believe some one has committed a crime, but we are not sure, we have a (?) ( )  
1 fear, 2 suspicion, 3 wonder, 4 confidence, 5 doubtful.....
15. A book is to an author as a statue is to (?) ( )  
1 sculptor, 2 marble, 3 model, 4 magazine, 5 man.....
16. Which is the most important reason that words in the dictionary are arranged alphabetically? ( )  
1 That is the easiest way to arrange them. 2 It puts the shortest words first. 3 It enables us to find any word quickly. 4 It is merely a custom. 5 It makes the printing easier ..
17. Which one of the five things below is most like these three: plum, apricot, apple? ( )  
1 tree, 2 seed, 3 peach, 4 juice, 5 ripe.....
18. At 4 cents each, how many pencils can be bought for 36 cents? ( )
19. If a person walking in a quiet place suddenly hears a loud sound, he is likely to be (?) ( )  
1 stopped, 2 struck, 3 startled, 4 made deaf, 5 angered.....
20. A boy is to a man as a (?) is to a sheep. ( )  
1 wool, 2 lamb, 3 goat, 4 shepherd, 5 dog.....
21. One number is wrong in the following series. What should that number be? (Just write the correct number in the parentheses.) ( )  
1 6 2 6 3 6 4 6 5 6 7 6.....
22. Which of the five things below is most like these three: horse, pigeon, cricket? ( )  
1 stall, 2 saddle, 3 eat, 4 goat, 5 chirp.....
23. If the words below were rearranged to make a good sentence, with what letter would the last word of the sentence begin? (Make the letter like a printed capital.) ( )  
nuts from squirrels trees the gather.....
24. A man who betrays his country is called a (?) ( )  
1 thief, 2 traitor, 3 enemy, 4 coward, 5 slacker.....
25. Food is to the body as (?) is to an engine. ( )  
1 wheels, 2 fuel, 3 smoke, 4 motion, 5 fire.....
26. Which tells best just what a pitcher is? ( )  
1 a vessel from which to pour liquid, 2 something to hold milk, 3 It has a handle, 4 It goes on the table, 5 It is easily broken.....

*Do not stop. Go on with the next page.*

27. If George is older than Frank, and Frank is older than James, then George is (?) James.  
1 older than, 2 younger than, 3 just as old as, 4 (cannot say which)..... ( )
28. Count each 7 below that has a 5 next after it. Tell how many 7's you count.  
7 5 3 0 9 7 3 7 8 5 7 4 2 1 7 5 7 3 2 4 7 0 9 3 7 5 5 7 2 3 5 7 7 5 4 7..... ( )
29. If the words below were rearranged to make a good sentence, with what letter would the last word of the sentence begin? (Make the letter like a printed capital.)  
leather shoes usually made are of..... ( )
30. An electric light is to a candle as a motorcycle is to (?)  
1 bicycle, 2 automobile, 3 wheels, 4 speed, 5 police..... ( )
31. Which one of the words below would come first in the dictionary?  
1 march, 2 ocean, 3 horse, 4 paint, 5 elbow, 6 night, 7 flown..... ( )
32. The daughter of my mother's brother is my (?)  
1 sister, 2 niece, 3 cousin, 4 aunt, 5 granddaughter..... ( )
33. One number is wrong in the following series. What should that number be?  
3 4 5 4 3 4 5 4 3 5..... ( )
34. Which of the five things below is most like these three: boat, horse, train?  
1 sail, 2 row, 3 motorcycle, 4 move, 5 track..... ( )
35. If Paul is taller than Herbert and Paul is shorter than Robert, then Robert is (?) Herbert.  
1 taller than, 2 shorter than, 3 just as tall as, 4 (cannot say which)..... ( )
36. What is the most important reason that we use clocks?  
1 to wake us up in the morning, 2 to regulate our daily lives, 3 to help us catch trains,  
4 so that children will get to school on time, 5 They are ornamental..... ( )
37. A coin made by an individual and meant to look like one made by the government is called(?)  
1 duplicate, 2 counterfeit, 3 imitation, 4 forgery, 5 libel..... ( )
38. A wire is to electricity as (?) is to gas.  
1 a flame, 2 a spark, 3 hot, 4 a pipe, 5 a stove..... ( )
39. If the following words were arranged in order, with what letter would the middle word begin?  
Yard Inch Mile Foot Rod..... ( )
40. One number is wrong in the following series. What should that number be?  
5 10 15 20 25 29 35 40 45 50..... ( )
41. Which word means the opposite of truth?  
1 cheat, 2 rob, 3 liar, 4 ignorance, 5 falsehood..... ( )
42. Order is to confusion as (?) is to war.  
1 guns, 2 peace, 3 powder, 4 thunder, 5 army..... ( )
43. In a foreign language, good food = Bano Naab  
good water = Heto Naab  
The word that means *good* begins with what letter?..... ( )
44. The feeling of a man for his children is usually (?)  
1 affection, 2 contempt, 3 joy, 4 pity, 5 reverence..... ( )
45. Which of the five things below is most like these three: stocking, flag, sail?  
1 shoe, 2 ship, 3 staff, 4 towel, 5 wash..... ( )
46. A book is to information as (?) is to money.  
1 paper, 2 dollars, 3 bank, 4 work, 5 gold..... ( )
47. If Harry is taller than William, and William is just as tall as Charles, then Charles is (?) Harry.  
1 taller than, 2 shorter than, 3 just as tall as, 4 (cannot say which)..... ( )
48. If the following words were arranged in order, with what letter would the middle word begin?  
Six Ten Two Eight Four..... ( )
49. If the words below were rearranged to make a good sentence, with what letter would the third word of the sentence begin? (Make the letter like a printed capital.)  
men high the a wall built stone..... ( )
50. If the suffering of another makes us suffer also, we feel (?)  
1 worse, 2 harmony, 3 sympathy, 4 love, 5 repelled..... ( )
51. In a foreign language, grass = Moki  
green grass = Moki Laap  
The word that means *green* begins with what letter?..... ( )

Do not stop. Go on with the next page.

52. If a man has walked west from his home 9 blocks and then walked east 4 blocks, how many blocks is he from his home? ..... ( )
53. A pitcher is to milk as (?) is to flowers.  
1 stem, 2 leaves, 3 water, 4 vase, 5 roots..... ( )
54. Do what this mixed-up sentence tells you to do.  
sum three Write two the four and of..... ( )
55. There is a saying, "Don't count your chickens before they are hatched." This means (?)  
1 Don't hurry. 2 Don't be too sure of the future. 3 Haste makes waste. 4 Don't gamble ..... ( )
56. Which statement tells best just what a fork is?  
1 a thing to carry food to the mouth, 2 It goes with a knife, 3 an instrument with prongs at the end, 4 It goes on the table, 5 It is made of silver..... ( )
57. Wood is to a table as (?) is to a knife.  
1 cutting, 2 chair, 3 fork, 4 steel, 5 handle..... ( )
58. Do what this mixed-up sentence tells you to do.  
sentence the letter Write last this in..... ( )
59. Which one of the words below would come last in the dictionary?  
1 alike, 2 admit, 3 amount, 4 across, 5 after, 6 amuse, 7 adult, 8 affect ( )
60. There is a saying, "He that scatters thorns, let him go barefoot." This means (?)  
1 Let him who causes others discomforts bear them himself also. 2 Going barefoot toughens the feet. 3 People should pick up what they scatter. 4 Don't scatter things around..... ( )
61. If the following words were arranged in order, with what letter would the middle word begin?  
Plaster Frame Wallpaper Lath Foundation..... ( )
62. In a foreign language,  
many boys = Boka Hepo  
many girls = Marti Hepo  
many boys and girls = Boka Ello Marti Hepo  
The word that means *and* begins with what letter?..... ( )
63. A statement which expresses just the opposite of that which another statement expresses is said to be a (?)  
1 lie, 2 contradiction, 3 falsehood, 4 correction, 5 explanation..... ( )
64. There is a saying, "Don't look a gift horse in the mouth." This means (?)  
1 It is not safe to look into the mouth of a horse. 2 Although you question the value of a gift, accept it graciously. 3 Don't accept a horse as a gift. 4 You cannot judge the age of a gift horse by his teeth..... ( )
65. Which one of the words below would come last in the dictionary?  
1 hedge, 2 glory, 3 label, 4 green, 5 linen, 6 knife, 7 honor..... ( )
66. Which statement tells best just what a watch is?  
1 It ticks, 2 something to tell time, 3 a small, round object with a chain, 4 a vest-pocket-sized time-keeping instrument, 5 something with a face and hands..... ( )
67. Ice is to water as water is to what?  
1 land, 2 steam, 3 cold, 4 river, 5 thirst..... ( )
68. Which statement tells best just what a window is?  
1 something to see through, 2 a glass door, 3 a frame with a glass in it, 4 a glass opening in the wall of a house, 5 a piece of glass surrounded by wood..... ( )
69. Which of the five words below is most like these three: large, red, good?  
1 heavy, 2 size, 3 color, 4 apple, 5 very..... ( )
70. Write the letter that follows the letter that comes next after M in the alphabet ..... ( )
71. One number is wrong in the following series. What should that number be?  
1 2 4 8 16 24 64..... ( )
72. An uncle is to an aunt as a son is to a (?)  
1 brother, 2 daughter, 3 sister, 4 father, 5 girl..... ( )
73. If I have a large box with 3 small boxes in it and 4 very small boxes in each of the small boxes, how many boxes are there in all? ..... ( )
74. One number is wrong in the following series. What should that number be?  
1 2 4 5 7 8 10 11 12 14..... ( )
75. There is a saying, "Don't ride a free horse to death." This means (?)  
1 Don't be cruel. 2 Don't abuse a privilege. 3 Don't accept gifts. 4 Don't be reckless. ( )

*If you finish before the time is up, go back and make sure that every answer is right.*



THE REVISED EDITION  
**ENGLISH MINIMUM ESSENTIALS TEST**  
FORM A, Devised by J. C. Tressler

Name.....

Class or Grade..... Age.....

School..... Date.....

**TEST I. GRAMMATICAL CORRECTNESS**

Right..... Wrong..... Test I Score.....

In each of the following exercises one of the italicized and numbered words or expressions is the correct or preferred one. Write the number of your choice (1 or 2) on the line at the right. Write 1 or 2, not the word.

1. She looks (1) *beautiful* (2) *beautifully* in a white dress. ....
2. The costliness of his armor and apparel (1) *are* (2) *is* seen at a glance. ....
3. The man with eight of his friends (1) *was* (2) *were* at the game. ....
4. They have stiff bristles, which (1) *pick* (2) *picks* up the dirt and thread. ....
5. Gladys, Marion, and (1) *I* (2) *myself* are members of the committee. ....
6. Mr. Hamlin told my father that Fred Johnson (1) *had been* (2) *was* dead for five years. ....

7. I (1) *laid* (2) *lay* under the tree till dinner time. ....
8. She is an (1) *alumna* (2) *alumnus* of Vassar College. ....
9. Modern history is the record of events that (1) *happened*  
(2) *have happened* recently. ....
10. Neither Charles nor his brother ate (1) *his* (2) *their* breakfast this  
morning .....  
.....
11. The secretary and (1) *the treasurer* (2) *treasurer* was re-elected. ....
12. I had not heard of (1) *you* (2) *your* winning a prize. ....
13. I intended (1) *to see* (2) *to have seen* her before she sailed for  
Havana. ....
14. When Mr. Gurley (1) *came* (2) *come* home from work, he found a  
message from Captain Clark. ....
15. I was so excited at Father's announcement that I (1) *could hardly*  
(2) *couldn't hardly* eat my supper. ....
16. He has two to boss him now, his sister and (1) *I* (2) *me*. ....
17. Robin Hood was greatly surprised at the courage and strength of  
Will Scarlet, (1) *who* (2) *whom* he thought looked like an over-  
dressed weakling. ....
18. Give it to (1) *whoever* (2) *whomever* comes to the door. ....
19. I like (1) *that* (2) *those* kind of apples. ....
20. Her book is different (1) *from* (2) *than* the one Father gave me. ....



## TEST II. VOCABULARY

Test II Score.....

In each sentence look at the underscored word. Then find below the sentence a word or expression which means the same or almost the same as the underscored word. Write the number of your choice on the line at the right; that is, write 1, 2, 3, 4, or 5. Do not write the word.

1. I caught a glimpse of the azure sky.  
(1) gray (2) dark and stormy (3) clear blue (4) bright  
(5) fiery red .....
2. He talked frankly with the people.  
(1) roughly (2) slowly (3) freely (4) frequently  
(5) convincingly .....
3. In the trees I saw a cardinal.  
(1) red bird (2) blue bird (3) song sparrow (4) owl  
(5) woodpecker .....
4. Humanity in the mass will probably remain frivolous.  
(1) generous (2) courageous (3) silly (4) cordial (5) sincere .....
5. America has a vital interest in European problems.  
(1) permanent (2) slight (3) selfish (4) dollar-and-cent  
(5) essential .....
6. In war times a lower standard of living is inevitable.  
(1) unlikely (2) strange (3) unthinkable (4) unavoidable  
(5) probable .....
7. And perchance there may come a vision true.  
(1) probably (2) doubtless (3) sometime (4) of course  
(5) perhaps .....
8. Every dale was precisely as it had always been.  
(1) hill (2) forest (3) plain (4) valley (5) creek .....
9. The tawny lion paced back and forth in his cage.  
(1) ferocious (2) yellowish brown (3) hungry  
(4) powerfully built (5) tame .....
10. His beard is hoar.  
(1) long (2) black (3) gray (4) pointed (5) clipped .....
11. Prosperity has crowded it into oblivion.  
(1) nothing (2) forgetfulness (3) revolution (4) insignificance  
(5) happiness .....

12. Under less auspicious circumstances, revolutions have terminated differently.

- (1) favoring (2) strange (3) unusual (4) commonplace  
(5) surprising

13. Has he a bland temper?

- (1) violent (2) changeable (3) gentle (4) admirable  
(5) disgraceful

14. The plays include indigenous folklore material.

- (1) worth-while (2) native (3) entertaining (4) unusual  
(5) valuable

15. He was obsequious at home.

- (1) troublesome (2) kind (3) generous (4) disobedient  
(5) cringing

### TEST III. PUNCTUATION AND CAPITALIZATION

Sentences Correct..... Test III Score.....

Punctuate and capitalize these sentences correctly. Do not rewrite the sentences. An unnecessary change is an error. Do not divide one good sentence into two sentences.

1. Leaning on the arm of an officer of the guard mary stuart descended the great staircase to the hall
2. There are a few preachers whose salaries equal that of a minor bank president but their number is so small as to be negligible
3. Was the speaker of the evening president roosevelt or major general williams
4. Although fred morton attended high school in chicago only one winter he won the english prize and the french prize

5. Most girls of sixteen said george can't dance as well as their mothers or older sisters
6. Property can be paid for the lives of innocent and peaceful people cannot be
7. Above the fruit a crowd of wasps hornets flies and gnats whirled madly
8. In august 1914 the first steamer passed through the panama canal which had been constructed under the direction of colonel g w goethals
9. The boy who was called on to recite said that uriah's hair which was red was cropped close to his head
10. On the first ballot the republicans nominated william mckinley a member of congress

#### TEST IV. THE SENTENCE AND ITS PARTS

Test IV Score.....

Draw one line under the subject word and two lines under the verb in each sentence.

- 1, 2. In one corner stood two artists discussing the pictures and statues.
- 3, 4. In the distance there was an ancient, battered Ford loaded down with women and children.

Tell the part of speech of each underscored word. Write the answers above the underscored words.

- 5, 6, 7. He said that the energy which drives our locomotives and forces our steamships through the waves comes from the sun.

Write simple, complex, or compound after each of the next sentences to indicate its class.

8. Scotland possesses a local-option law; and on a request signed by the required number of voters, a borough may vote for or against saloons.
9. On his journey from Mount Vernon to New York, Washington was made to feel that he was greatly beloved by all classes.
10. From an opening between the trees he could overlook all the lower country for many a mile and in the distance could see the lakes of Maine.

## TEST V. SENTENCE SENSE

Test V Score.....

### Examples

1. Hoping that you received the goods in perfect order .. 0 ..
2. Do you know that Proserpine was goddess of the dead she never  
saw the sunshine .. 2 ..

The 0 on the line at the right indicates that the first expression is not a sentence. The 2 shows that the second is two sentences.

### The Test

Indicate by 0, 1, 2, or 3 the number of complete sentences in each of the following. You may punctuate and capitalize the exercises if this work will help you to find the number of sentences. What counts, however, is the 0, 1, 2, or 3 which you place on the dotted line.

1. We are sending you an exact duplicate of the order blank you sent in so that you may see for yourself whose error caused the delay .....
2. Do you know that rowdyism is common among boys who travel to and from school by car they pretend to be gentlemen but lack the essentials of gentility .....
3. Do you realize what that means it means actually making a slave of a citizen who ought to have a free mind .....
4. Two pockets six inches long and five inches wide to be made on each side not more than five inches below the waist .....
5. In winter every boy wants a pair of skates especially when he sees all the other boys skating through the park like a whirlwind .....
6. "The Eve of Waterloo" pictures two scenes one before the enemy arrived and the other after the city was captured .....
7. Why should we worry about the future let us do our best today .....
8. For instance the intelligence of Buck one of the oxen on the farm who used his head to break pumpkins if his teeth failed .....
9. The Church is interested in roads whether roads lead people toward or away from the temple of worship they are factors to be reckoned with .....
10. Since the new requirements for graduation are better than the old because they broaden the pupil's opportunity and training and better fit him for life every high school in the city should adopt them .....

## TEST VI. INFLECTION AND ACCENT

Test VI Score.....

On each dotted line write the verb form asked for.

1. The dog ..... his leg (past perfect active of *bite*).
2. Tilden ..... that he is a good sportsman (present perfect active of *show*).
3. During the night the paper ..... (past passive of *tear*).

On the dotted line write the possessive singular of this word:

4. it .....

On the dotted lines write the possessive plural of these words:

5. turkey .....

6. child .....

Place the accent mark at the end of the accented syllable of each of these words:

7. op po nent

8. the a ter

9. in flu ence

10. ap pli ca ble

TEST VII. SPELLING

Test VII Score.....

In each of the following groups one of the five words is misspelled. Find the word and spell it correctly on the dotted line.

- 1. villain acquaintance grammar receive until .....
- 2. secratary writing feminine autos captain .....
- 3. cashier ninety mileage ridiculous procede .....
- 4. parallel omitted disapoint municipal describe .....
- 5. benifited independence disaster finally courteous .....
- 6. attendant calendar agreement occassion deficit .....
- 7. bouquet similiar bulletin immediate embarrassing .....
- 8. committee laboratory cafateria succeed Philippine .....
- 9. likable sincerely February prejudice tradegy .....
- 10. pursuing duly parliment persistent eligible .....
- 11. cemetary aggravate possessive positive necessary .....
- 12. occured seize prove semicolon endeavor .....
- 13. hurrying imitate dormitory asimilation incredible .....
- 14. stenographer legitimit choosing satisfactorily fascinated .....
- 15. amateur picturesque philosopher installation  
propeganda .....

	R	W	SCORE
Vocabulary			
Sentences			
Paragraphs			
TOTAL			

# Haggerty Reading Examination

## SIGMA 3: FORM A

FOR GRADES 6-12

Arranged and standardized by M. E. HAGGERTY and LAURA C. HAGGERTY, University of Minnesota

My name is ..... I am a .....  
First name Last name Write boy or girl

This is the ..... day of ..... 19..... I am ..... years old.

My next birthday will be ..... 19..... I am in ..... half of Grade.....

The name of my school is ..... The name of my city (county) is .....

The name of my state is .....

### Directions for Test 1

- On the following pages are some words — each word is written like the word *red* in the next line, with some other words and phrases in parentheses.  
red (apple, color, to shine, green)
- One of the words in the parentheses is a definition of the first word. You are to draw a line under the word or phrase which is the best definition, like this:  
red (apple, color, to shine, green)
- Here are some words for practice. Look at the first word and then look at the words and phrases in the parentheses and draw a line under the word or phrase which is the best definition of the first word. The first one is marked as it should be. Mark all the others.
  - orange (round, a fruit, sour, to eat)
  - coffee (black, liquid, drink, bitter)
  - soldier (man, man who fights, animal, gun)
  - pupil (school child, boy, school, teacher)
  - juggler (engineer, plowman, butcher, one who throws balls)
- Now turn to page 2 and mark all the definitions correctly. Mark the definitions in order.

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**TEST 1**  
**VOCABULARY**

Draw a line under the best definition for each word.

1	minister (servant, preacher, agent, to assist).....	1
2	student (one who seeks knowledge, teacher, paper, book).....	2
3	pardon (forgive, hinder, condemn, smile at).....	3
4	island (section, part of the ocean, land surrounded by water, peak).....	4
5	float (sail, sink, to fly, to stay on top of the water).....	5
6	cataract (rushing, a waterfall, a basin, a spray).....	6
7	aisles (houses, passages, churches, length).....	7
8	parliament (a conference, to propose, to palliate, foreigners).....	8
9	perilous (precious, dangerous, to spy, to invest).....	9
10	fleet (navy, engineer, group of vessels, effective).....	10
11	armor (metal, protective covering, soldiers, knights).....	11
12	wharf (person who has no parents, landing place for ships, edge, animal).....	12
13	brandy (wine, liquid, liquor, medicine).....	13
14	noose (midday, a loop with knot, a gallows, a moose).....	14
15	bristling (stubby, standing stiff, long, thin).....	15
16	descend (to move downwards, to fall, to speed, to climb).....	16
17	retort (a charge, to speak back, civility, to control).....	17
18	calm (quiet, sleepy, night, restful).....	18
19	cupola (church, high, schoolhouse, rounded dome).....	19
20	swain (a prince, a country lover, swing, a student).....	20
21	coast (shore line, outside, near the sea, boundary).....	21
22	value (prize, worth, cost, amount).....	22
23	deceitful (trustworthy, misleading, sincere, careful).....	23
24	lapwing (flapping, crest, a bird, to waver).....	24
25	dubious (certain, unsettled, determined, in danger).....	25
26	pallid (morose, darkness, pale, placid).....	26
27	dwindled (swindled, decreased, to consume, dwarflike).....	27
28	derision (amazement, mockery, decision, to succumb).....	28
29	navies (commerce, navigation, fleets of warships, canoes).....	29
30	crevice (tiny, a fissure, rocky, mountains).....	30
31	ardent (praise, passionate, relative, to wed).....	31
32	scrupulous (populous, scrappy, conscientious, sacred).....	32
33	steel (metal, mineral, hard substance, a kind of iron).....	33
34	revive (to remember, to call back, to have life again, to return).....	34
35	zinc (stove, to wash dishes in, soft lead, mineral).....	35

☞ Go to top of next page.



TEST 2

SENTENCE READING

Draw a line under the right answer to each question.

- |     |  |     |    |
|-----|--|-----|----|
| 1.  | Can good children make promises ?.....                           | YES | NO |
| 2.  | Do all people rent houses ?.....                                 | YES | NO |
| 3.  | Do laborers ever become exhausted ?.....                         | YES | NO |
| 4.  | Are compasses used by mariners ?.....                            | YES | NO |
| 5.  | Can children act in a serviceable manner ?.....                  | YES | NO |
| 6.  | Do caravans always move with great speed ?.....                  | YES | NO |
| 7.  | Is day always preceded by night ?.....                           | YES | NO |
| 8.  | Can a boy be absorbed in a performance ?.....                    | YES | NO |
| 9.  | Do vicious men plan revenge ?.....                               | YES | NO |
| 10. | Are all experiences humiliating ?.....                           | YES | NO |
| 11. | Are all sources of information reliable ?.....                   | YES | NO |
| 12. | Do some people have bright prospects ?.....                      | YES | NO |
| 13. | Do histories consist chiefly of prophecies ?.....                | YES | NO |
| 14. | Are brazen persons the best companions ?.....                    | YES | NO |
| 15. | Can a man possess both valor and vigor ?.....                    | YES | NO |
| 16. | Are continuous sounds always harmonious ?.....                   | YES | NO |
| 17. | Are armed cruisers vessels of war ?.....                         | YES | NO |
| 18. | Is a battery a place where transports are made ?.....            | YES | NO |
| 19. | Are venerable people sometimes invincible ?.....                 | YES | NO |
| 20. | Do lunatics render great service to their country ?.....         | YES | NO |
| 21. | Are inquiring friends sometimes courteous ?.....                 | YES | NO |
| 22. | Should evildoers make amends ?.....                              | YES | NO |
| 23. | Do autumnal showers occur in the winter ?.....                   | YES | NO |
| 24. | Can prominent people administer relief ?.....                    | YES | NO |
| 25. | Are devices used in measuring time ?.....                        | YES | NO |
| 26. | Do ravenous monsters respond to persuasion ?.....                | YES | NO |
| 27. | Are arsenals primarily for civic meetings ?.....                 | YES | NO |
| 28. | Are stalactites parts of dwellings ?.....                        | YES | NO |
| 29. | Are the prospects of good crops always remote ?.....             | YES | NO |
| 30. | Do financial transactions involve monetary considerations ?..... | YES | NO |
| 31. | Are the adherents of law and order sometimes orthodox ?.....     | YES | NO |
| 32. | May popular distrust be evident to a sovereign ?.....            | YES | NO |
| 33. | Can a challenge to a duel be accepted ?.....                     | YES | NO |
| 34. | Is it mutinous to give succor to the helpless ?.....             | YES | NO |
| 35. | Can the confidence of a discouraged man be restored ?.....       | YES | NO |
| 36. | Are insidious people usually deceptive ?.....                    | YES | NO |
| 37. | May candidates live in hamlets ?.....                            | YES | NO |
| 38. | Does fidelity denote faithfulness ?.....                         | YES | NO |
| 39. | Do conciliating parties have pacific interests ?.....            | YES | NO |
| 40. | Are assiduity and frugality undesirable characteristics ?.....   | YES | NO |

Right.....Wrong.....Score.....

36	hypothesis (a supposition, relation, provision, reflex).....	36
37	apathy (pathetic, cold, indifference, dislike).....	37
38	appreciate (lovely, to esteem duly, likable, to listen to).....	38
39	epaulets (dresses, boy's garments, shoulder ornaments, apparel).....	39
40	chalice (bowl, dew, a flower cup, vase).....	40
41	blithe (springlike, juicy, joyous, full of melody).....	41
42	accuracy (positive, necessary, mistakes, exactness).....	42
43	extricate (liberal, entangle, set free, to fasten to).....	43
44	primitive (forests, first, to postpone, to abolish).....	44
45	sagacious (lacking in judgment, improved, wise, a remark).....	45
46	phantom (a delight, like a phaeton, delusion, paltry).....	46
47	facetious (friendly, morose, witty, stupid).....	47
48	avidity (to vow, harshness, eagerness, to avoid).....	48
49	dispel (to expend, to distrust, to scatter, to relieve).....	49
50	delectable (eatable, expensive, delicious, fancy).....	50

Score.....

*Directions for Test 2*

1. In the following pages are some sentences. Each sentence asks a question which can be answered by YES or NO. The sentences are written like this :

Are all men soldiers?.....YES NO

2. You are to draw a line under the right answer, like this :

Are all men soldiers?.....YES NO  
 Are some men soldiers?.....YES NO

3. Mark the right answer to these sentences by drawing a line under the YES or the NO. Do not mark both YES and NO. Mark only the right answer.

- a. Is snow white?.....YES NO
- b. Are elephants plants?.....YES NO
- c. Can a pupil respond to a question?.....YES NO
- d. Are multitudinous defects desirable?.....YES NO
- e. May a hamlet be located in a province?.....YES NO

4. Now turn to page 4 and mark all the sentences correctly. Mark the sentences in order.

### Directions for Test 3

Read these directions in order and do what they say to do.

1. The following pages contain a series of paragraphs with directions. You are to read the paragraphs and do what the directions tell you to do.

2. There are two kinds of directions. The first direction is to "*underline*." Where this direction occurs, you are to draw a line under the correct word or phrase, as in this sample:

He was an old-fashioned scholar who made the boys learn the Latin grammar by heart, and who flogged them when they failed.

1. Underline the correct word to complete this sentence:

The "old-fashioned scholar" was  
young  
jolly  
severe  
ignorant

"Severe" is the correct word, and so you should draw a line under the word "severe." Do it before you read the next line.

3. The second direction is to "*check*." Where this direction occurs, you are to put a check like this  $\checkmark$  in front of the correct statement, as in this sample:

2. Check the true sentence:

- a. — The scholar was a boy.
- b. — The scholar taught history.
- c. — The scholar taught Latin.

4. The first and second statements are clearly false. The third one is true. So a check mark should be put in front of the third sentence. Put it on the line between the letter *c* and the first word of the sentence. Do it.

5. On the following pages read each paragraph as you come to it. Then read directions which follow the paragraph and do what the directions tell you to do. The correct answers to all questions are to be found by reading the paragraphs. Read the paragraphs as often as you need to.

6. Now turn the page. You will have about twenty minutes to work. Do all you can in that time, but work carefully. Make the correct mark for each direction.

## TEST 3

### PARAGRAPH READING

#### I

A carriage, drawn by four horses, dashed 'round the turn of the road. Within it, thrust partly out of the window, appeared the face of a little old man, with a skin as yellow as gold. He had a low forehead, small, sharp eyes puckered about with innumerable wrinkles, and very thin lips, which he made still thinner by pressing them forcibly together.

1. Underline the correct phrase :

The carriage was drawn by

two mules
a fancy team
four horses
a gray mare

2. Check the sentence which is true :

- The carriage was slowly drawn around the turn.
- The carriage was turned over as it rounded the turn.
- The carriage was hurried violently around the turn.

3. Check the false statements :

- The man was large and bony.
- The man was middle-aged.
- The man was little and old.

#### II

There was the greatest interest throughout the ship, and not an eye was closed that night. As the evening advanced, Columbus took a position in the cabin of his vessel and kept up a continuous watch. About two o'clock he thought he beheld a light, glimmering at a great distance. Fearing his eager eyes might deceive him, he called a gentleman of the King's bedchamber, to inquire whether he saw such a light, and he admitted that he saw it.

1. Underline the word that shows what time

it was :

midday
forenoon
night
afternoon

2. Underline the correct phrase :

Columbus was

riding on a train
walking on land
living in a house
traveling in a boat

3. Check the statement which is true :

- Columbus called the King.
- The gentleman saw a light.
- All were asleep except Columbus.

4. Check one statement which is not true :

- Columbus watched continuously.
- Columbus first saw the light.
- No one except Columbus was interested.
- Columbus saw the light after midnight.

#### III

In the anteroom he found his attendant Anwold, who, taking the torch from the hand of the waiting-maid, conducted him with more haste than ceremony to an exterior and ignoble part of the building, where a number of small apartments, or rather cells, served for sleeping places to the lower order of domestics and to strangers of mean degree.

1. Check the true sentences :

- Anwold was in the basement.
- Anwold was in a waiting-room.
- Anwold was not to be found.

2. Check the true statements :

- The attendant took the light from the maid.
- The attendant led the way.
- Anwold held high his torch.

3. Underline the phrase making this sentence true :

The poorest servants

the downstairs
apartments
had sleeping quarters in:
the worst part
of the building
the attic

4. Underline the words which describe the strangers :

fashionable
guests of high repute
of low manner
poorly clad

➡ Go to top of next page.

## VI

The champions were therefore prohibited to thrust with the sword, and were confined to striking. A knight, it was announced, might use a mace or battle-ax at pleasure, but the dagger was a prohibited weapon. A knight unhorsed might renew the fight on foot with any other on the opposite side in the same predicament; but mounted horsemen were in that case forbidden to assail him. When any knight could force his antagonist to the extremity of the lists, so as to touch the palisade with his person or arms, such opponent was obliged to yield himself vanquished, and his armor and horse were placed at the disposal of the conqueror. A knight thus overcome was not permitted to take further share in the combat. If any combatant was struck down, and unable to recover his feet, his squire or page might enter the lists and drag his master out of the press; but in that case the knight was adjudged vanquished, and his arms and horse declared forfeited.

1. Underline the word which names the weapon that could not be used:

sword  
mace  
dagger  
battle-ax

2. Check the one of these statements which is false:

- a. — A knight could fight on foot.  
b. — One knight could not injure another knight.  
c. — Mounted horsemen could fight only mounted horsemen.

3. Check the false statements:

- a. — A knight could be vanquished without being killed.  
b. — A knight's page could fight.  
c. — A vanquished knight retained his horse.

4. Check the true statements:

- a. — Champions were prohibited to use the sword.  
b. — An unhorsed knight could renew the fight.  
c. — An opponent was vanquished if his arms touched the palisade.  
d. — A knight dragged from the lists by his page was beaten.

## VII

The speech of Judge Hoar was perfect, and to that handful of people, who heartily applauded it. When a good man rises in the cold and malicious assembly, you think, "Well, it would be more prudent to be silent. Why not rest on a good past? Nobody doubts your talent and power; and, for the present business, we know all about it, and are tired of being pushed into patriotism by people who stay at home." But he, taking no counsel of past things, but only of the inspiration of his today's feelings, surprises them with his tidings, his better knowledge, his larger view, his steady gaze at the new and future event, whereof they had not thought, and they are interested like so many children, and carried off out of all recollection of their malignant nonsense, and he gains his victory by prophecy, where they expected repetition. He knew beforehand that they were looking behind, and that he was looking ahead, and therefore it was wise to speak. What a godsend are these people to a town! and the Judge, what a faculty! — he is put together like a Waltham watch, or like a locomotive just finished from the Tredegar Works.

1. Check all true statements, if any:

- a. — The audience was inclined to look backward.  
b. — At the end of the speech the audience was hostile.  
c. — The speaker had a forward-looking mind.

2. Check all false statements, if any:

- a. — The author admires Judge Hoar.  
b. — The speaker surprised his audience.  
c. — The audience changed its attitude.  
d. — The speech was a failure.

3. Underline the words which best describe Judge Hoar:

talented  
sagacious  
retrospective  
prophetic

4. Check the false statements:

- a. — The Judge talked about an old subject in a new way.  
b. — The audience was wiser than the Judge.  
c. — The Judge was a burden to his community.

## IV

The great error in Rip's composition was an insuperable aversion to all kinds of profitable labor. It could not be for the want of assiduity or perseverance; for he would sit on a wet rock, with a rod as long and heavy as a Tartar's lance, and fish all day without a murmur, even though he should not be encouraged by a single nibble. He would carry a fowling-piece on his shoulder for hours together, trudging through woods and swamps, and up hill and down dale, to shoot a few squirrels or wild pigeons. He would never refuse to assist a neighbor, even in the roughest toil, and was a foremost man at all country frolics for husking Indian corn, or building stone-fences; the women of the village, too, used to employ him to run their errands, and to do such little odd jobs as their less obliging husbands would not do for them. In a word, Rip was ready to attend to anybody's business but his own; but as to doing family duty, and keeping his farm in order, he found it impossible.

1. Underline the one phrase which tells what Rip did not like to do:

run errands  
work at home  
hunt  
fish

2. Check the one of the following sentences which is true:

a. — Rip never showed perseverance.  
b. — Rip's neighbors disliked him.  
c. — Rip was an obliging neighbor.

3. Check the one of the following sentences which is true:

a. — Rip owned a well-kept farm.  
b. — Rip disliked profitable labor.  
c. — Rip always avoided rough work.

4. Underline the words which describe Rip's character:

careless  
good-natured  
thrifty

## V

Yet, unless I greatly deceive myself, the general effect of this chequered narrative will be to excite thankfulness in all religious minds, and hope in the breasts of all patriots. For the history of our country during the last hundred and sixty years is eminently the history of physical, of moral, and of intellectual improvement. Those who compare the age on which their lot is fallen with a golden age which exists only in their imagination may talk of degeneracy and decay; but no man who is correctly informed as to the past will be disposed to take a morose or desponding view of the present.

1. Underline the phrase necessary to complete this sentence:

The author believes \_\_\_\_\_  
his narrative will: \_\_\_\_\_

discourage the people  
inspire hope in the people  
leave the people indifferent

2. Check all the true statements among the following:


a. — By "chequered narrative" the author refers to a historical narrative.  
b. — The author believes his country has improved in the past century.  
c. — The author believes all persons will accept his conclusions.

3. Check all the true statements among the following:

a. — The author believes there has been degeneracy and decay in his country.  
b. — Well-informed persons will take a hopeful view of the present.  
c. — The "golden age" exists in imaginative minds.

4. Check the true statement:

a. — The country had improved physically but not morally.  
b. — Correctly informed persons will take a morose view of the present.  
c. — The history of "our country" is encouraging to religious minds.

 Go to top of next page.



PART I  
VOCABULARY

(15 minutes)

Directions: In each group below, select the numbered word or phrase that most nearly corresponds in meaning to the word at the head of that group, and put its number in the parentheses at the right. It is quite likely that you will finish this part before the time is up. In that case, go on immediately to Part II, because additional time spent on Part II will probably improve your Speed of Comprehension Score.

- | Column A   | Column B   | Column C   |
|--|--|--|
| <b>intrude</b><br>1-1 turn upside down<br>1-2 insult unintentionally<br>1-3 enter without permission<br>1-4 perform<br>1-5 inclose . . . . .1( ) | <b>8. evacuate</b><br>8-1 surprise<br>8-2 puff up<br>8-3 withdraw from<br>8-4 seal up<br>8-5 praise . . . . .8( )                | <b>15. desolated</b><br>15-1 lonely<br>15-2 protected<br>15-3 imprisoned<br>15-4 sunny<br>15-5 torn . . . . .15( )                                     |
| <b>schooner</b><br>kind of<br>2-1 chair<br>2-2 plate<br>2-3 book<br>2-4 boat<br>2-5 fish . . . . .2( )   | <b>9. squirm</b><br>9-1 squeeze<br>9-2 search<br>9-3 wriggle<br>9-4 suffer<br>9-5 scowl . . . . .9( )                            | <b>16. pedigree</b><br>16-1 old-fashioned wig<br>16-2 footstool<br>16-3 process of education<br>16-4 line of ancestry<br>16-5 influence . . . . .16( ) |
| <b>custodian</b><br>3-1 caretaker<br>3-2 pudding<br>3-3 receptacle<br>3-4 beggar<br>3-5 jail . . . . .3( )                                       | <b>10. panther</b><br>10-1 leopard<br>10-2 long coat<br>10-3 bracket<br>10-4 cupboard<br>10-5 kettle . . . . .10( )              | <b>17. slime</b><br>17-1 junk<br>17-2 mud<br>17-3 paint<br>17-4 fruit<br>17-5 dye . . . . .17( )   |
| <b>junction</b><br>4-1 auction sale<br>4-2 dump<br>4-3 meeting point<br>4-4 barrier<br>4-5 storehouse . . . . .4( )                              | <b>11. eliminate</b><br>11-1 build up<br>11-2 improve<br>11-3 get rid of<br>11-4 light up<br>11-5 overlook . . . . .11( )        | <b>18. scuffle</b><br>18-1 frill<br>18-2 confused struggle<br>18-3 disordered heap<br>18-4 valve<br>18-5 broom . . . . .18( )                          |
| <b>muslin</b><br>kind of<br>5-1 metal<br>5-2 tribesman<br>5-3 grain<br>5-4 wood<br>5-5 cloth . . . . .5( )                                       | <b>12. feud</b><br>12-1 quarrel<br>12-2 provisions<br>12-3 treaty<br>12-4 crusade<br>12-5 fort . . . . .12( )                    | <b>19. cologne</b><br>19-1 toilet water<br>19-2 beverage<br>19-3 coloring matter<br>19-4 pedestal<br>19-5 medicine . . . . .19( )                      |
| <b>amputate</b><br>6-1 cut off<br>6-2 electrify<br>6-3 become sour<br>6-4 calculate<br>6-5 amplify . . . . .6( )                                 | <b>13. veranda</b><br>13-1 hut<br>13-2 open carriage<br>13-3 porch<br>13-4 temple<br>13-5 servant . . . . .13( )                 | <b>20. inflate</b><br>20-1 imprison<br>20-2 suck in<br>20-3 clear out<br>20-4 blow up<br>20-5 open . . . . .20( )                                      |
| <b>ailment</b><br>7-1 accusation<br>7-2 pay<br>7-3 remedy<br>7-4 sickness<br>7-5 oil . . . . .7( )   | <b>14. infantry</b><br>14-1 cursing<br>14-2 nursery school<br>14-3 gunfire<br>14-4 foot soldiers<br>14-5 covering . . . . .14( ) | <b>21. silhouette</b><br>21-1 outline<br>21-2 dress<br>21-3 locket<br>21-4 young girl<br>21-5 actress . . . . .21( )                                   |

Go on to the next page.



Column D

Column E

Column F

- 22. rendezvous**  
 22-1 prison  
 22-2 public reception  
 22-3 farewell  
 22-4 meeting place  
 22-5 excuse . . . . .22( )
- 23. perplexed**  
 23-1 puzzled  
 23-2 combined  
 23-3 twisted  
 23-4 bent  
 23-5 misled . . . . .23( )
- 24. relay**  
 24-1 propose  
 24-2 set aside  
 24-3 predict  
 24-4 pass on  
 24-5 hesitate . . . . .24( )
- 25. ritual**  
 25-1 ceremony  
 25-2 written permit  
 25-3 graveyard  
 25-4 carnival  
 25-5 manual . . . . .25( )
- 26. judicious**  
 26-1 ridiculous  
 26-2 humble  
 26-3 wise  
 26-4 slow  
 26-5 solemn . . . . .26( )
- 27. romp**  
 27-1 cut off  
 27-2 injure  
 27-3 trample  
 27-4 rebel  
 27-5 frolic . . . . .27( )
- 28. pliable**  
 28-1 navigable  
 28-2 readable  
 28-3 peaceful  
 28-4 unprotected  
 28-5 flexible . . . . .28( )
- 29. corrode**  
 29-1 assemble  
 29-2 eat away  
 29-3 avoid  
 29-4 expand  
 29-5 shatter . . . . .29( )
- 30. orbit**  
 30-1 ball  
 30-2 path  
 30-3 chain  
 30-4 hole  
 30-5 planet . . . . .30( )

- 31. jurisdiction**  
 31-1 plea  
 31-2 punishment  
 31-3 authority  
 31-4 court  
 31-5 trial . . . . .31( )
- 32. pastel**  
 32-1 soft clay  
 32-2 pale color  
 32-3 gummed stamp  
 32-4 glue  
 32-5 pattern . . . . .32( )
- 33. humiliation**  
 33-1 humility  
 33-2 humor  
 33-3 prayer  
 33-4 mortification  
 33-5 destruction . . . . .33( )
- 34. futility**  
 34-1 foolishness  
 34-2 productiveness  
 34-3 cowardice  
 34-4 injustice  
 34-5 uselessness . . . . .34( )
- 35. heedless**  
 35-1 thoughtless  
 35-2 hopeless  
 35-3 unlucky  
 35-4 daring  
 35-5 carefree . . . . .35( )
- 36. hubbub**  
 36-1 center  
 36-2 clamor  
 36-3 axle  
 36-4 tent  
 36-5 conference . . . . .36( )
- 37. precipice**  
 37-1 warning  
 37-2 haste  
 37-3 cliff  
 37-4 preliminary  
 37-5 summit . . . . .37( )
- 38. synthetic**  
 38-1 temporary  
 38-2 scientific  
 38-3 automatic  
 38-4 useless  
 38-5 artificial . . . . .38( )
- 39. burly**  
 39-1 rude  
 39-2 husky  
 39-3 ugly  
 39-4 reckless  
 39-5 polished . . . . .39( )

- 40. vigilance**  
 40-1 peace  
 40-2 strength  
 40-3 speed  
 40-4 protection  
 40-5 watchfulness . . . . .40( )
- 41. modify**  
 41-1 understand  
 41-2 modernize  
 41-3 resist  
 41-4 accept  
 41-5 change . . . . .41( )
- 42. partridge**  
 kind of  
 42-1 hill  
 42-2 shrub  
 42-3 bird  
 42-4 vegetable  
 42-5 fish . . . . .42( )
- 43. cessation**  
 43-1 vibration  
 43-2 blessing  
 43-3 assembly  
 43-4 feeling  
 43-5 discontinuance . . . . .43( )
- 44. permeate**  
 44-1 explore  
 44-2 solidify  
 44-3 get lost  
 44-4 spread through  
 44-5 allow . . . . .44( )
- 45. omnipotent**  
 45-1 ever-present  
 45-2 all-powerful  
 45-3 very large  
 45-4 sympathetic  
 45-5 ready-made . . . . .45( )
- 46. acrid**  
 46-1 sharp and irritat-  
 ing  
 46-2 sudden and unex-  
 pected  
 46-3 cold and clear  
 46-4 stubborn  
 46-5 impure . . . . .46( )
- 47. hoodwink**  
 47-1 overlook  
 47-2 deceive  
 47-3 protect  
 47-4 sleep  
 47-5 signal . . . . .47( )
- 48. lax**  
 48-1 short  
 48-2 wanting  
 48-3 tired  
 48-4 slack  
 48-5 swollen . . . . .48( )

PART II: READING

(25 minutes)

**Directions:** This part consists of selections taken from stories, articles, humorous anecdotes, textbooks, etc. Following each passage are several multiple-choice items concerning the selection. In each case you are to **read the selection carefully first**, and then decide on the basis of the selection which one of the choices given after each incomplete statement **best** completes the meaning of the statement. If you cannot decide, you may go back to the passage. Put **number** of your choice in the parentheses at the right of each item. Since this test measures Speed of Comprehension as well as Level of Comprehension, enough material has been included so that even the most rapid readers probably will not finish in the time allowed.

The two Indian warriors did not say anything, but paddled on in silence. Red Feather did not let them know that he was awake. He had not stirred except to open his eyes. Over him the stars winked as if they were crying because he was unhappy. Far, far away he heard a wolf. Now and then he heard an owl among the birches that stood along the banks of the stream.

1. Red Feather is apparently
  - 1-1 blindfolded.
  - 1-2 asleep in bed.
  - 1-3 on horseback.
  - 1-4 in a boat.
  - 1-5 enjoying himself. . . . . 1( )
2. The Indians must be
  - 2-1 traveling at night.
  - 2-2 walking through the forest.
  - 2-3 crossing a large lake.
  - 2-4 carrying Red Feather in their arms.
  - 2-5 hunting for Red Feather. . . . . 2( )

- 
- (1) I took a single-horse sledge and drove briskly
  - (2) toward St. Petersburg. In the midst of a dreary
  - (3) forest I spied a terrible wolf making after me with
  - (4) all the speed of ravenous hunger. He soon over-
  - (5) took me and there was no possibility of escape,
  - (6) but I laid myself down flat in the sledge and let my
  - (7) horse run for our safety. What I wished, but
  - (8) hardly hoped for, happened immediately after.
  - (9) The wolf leaped over me and, falling furiously on
  - (10) the horse, began instantly to devour the poor
  - (11) animal, which ran faster for his pain and terror.
  - (12) I lifted my head slyly up and with horror I beheld
  - (13) that the wolf had eaten his way into the horse's
  - (14) body; so I seized my advantage and fell upon him
  - (15) with the butt end of my whip. This unexpected
  - (16) attack in his rear frightened him so much that he
  - (17) leaped forward with all his might; the horse's car-
  - (18) cassin dropped on the ground, but in his place the
  - (19) wolf was in the harness, and I on my part whipping
  - (20) him continually, we both arrived in St. Petersburg
  - (21) contrary to our respective expectations and very
  - (22) much to the astonishment of the spectators.

3. The spectators in St. Petersburg are said to have seen
  - 3-1 a sledge pulled by both a horse and a wolf.
  - 3-2 a sledge pulled by a wolf.
  - 3-3 the writer pulling a captured wolf after him.
  - 3-4 a wolf chasing the writer in his sledge.
  - 3-5 a wolf in the shape of a horse pulling a sledge. . . . . 3( )
4. The spectators were astonished chiefly
  - 4-1 because the writer was able to escape from the wolf.
  - 4-2 at the speed with which the writer's sledge was traveling.
  - 4-3 at the writer's cruelty to animals.
  - 4-4 at the writer's means of travel.
  - 4-5 at the sight of the writer riding in a sledge. . . . . 4( )
5. It is safe to conclude that this anecdote is
  - 5-1 a true account of an unusual event.
  - 5-2 slightly exaggerated.
  - 5-3 not intended to be believed.
  - 5-4 proof of the dangers of traveling near St. Petersburg.
  - 5-5 intended to discourage traveling in the winter. . . . . 5( )
6. "For" in line 11 most nearly means
  - 6-1 because of.
  - 6-2 to get to.
  - 6-3 in spite of.
  - 6-4 to get away from.
  - 6-5 against. . . . . 6( )
7. "Fell upon" in line 14 means
  - 7-1 jumped on.
  - 7-2 attacked.
  - 7-3 seized.
  - 7-4 stumbled on.
  - 7-5 rested upon. . . . . 7( )

-----

"Fierce as a falcon"—"As swift as a falcon"—these are two of the proverbs about the most savage and relentless of all the birds of prey. No bird is more feared by other birds than is the falcon—not even the lordly eagle himself. The falcon's method of attack is to swoop down

(Continued in next column)

Go on to the next page

Column G

Column H

Column I

**restitution**

- 49-1 organization
- 49-2 waiting quietly
- 49-3 disturbance
- 49-4 reward
- 49-5 giving back . . . 49( )

**insipid**

- 50-1 tasteless
- 50-2 insistent
- 50-3 clear
- 50-4 motionless
- 50-5 uncomfortable . 50( )

**rudimentary**

- 51-1 impolite
- 51-2 uncivilized
- 51-3 elementary
- 51-4 protected
- 51-5 destructive . . . 51( )

**averse**

- 52-1 poetic
- 52-2 disinclined
- 52-3 upside down
- 52-4 eager
- 52-5 peculiar . . . . 52( )

**53. inmate**

- 53-1 companion
- 53-2 foe
- 53-3 naval officer
- 53-4 inhabitant
- 53-5 guard . . . . . 53( )

**54. incarcerate**

- 54-1 harden
- 54-2 imprison
- 54-3 compel
- 54-4 infect
- 54-5 rot . . . . . 54( )

**55. obscene**

- 55-1 out-of-date
- 55-2 hidden
- 55-3 cowardly
- 55-4 slanderous
- 55-5 indecent . . . . 55( )

**56. mastication**

- 56-1 slaughter
- 56-2 conquest
- 56-3 shame
- 56-4 chewing
- 56-5 amazement . . 56( )

**57. brigand**

- 57-1 insolent person
- 57-2 sailor
- 57-3 bandit
- 57-4 jailer
- 57-5 ship . . . . . 57( )

**58. inept**

- 58-1 unclean
- 58-2 unlikely
- 58-3 lazy
- 58-4 unavoidable
- 58-5 unsuitable . . . 58( )

**59. capitulate**

- 59-1 entitle
- 59-2 surrender
- 59-3 behead
- 59-4 put in charge
- 59-5 congratulate . . 59( )

**60. mauve**

- 60-1 soft
- 60-2 cloudy
- 60-3 speckled
- 60-4 sad
- 60-5 purple . . . . . 60( )

Go on to the next part.

Number wrong	0	3	7	11	15	19	23	27	31	35	39	43	47
Amount to be subtracted	2	6	10	14	18	22	26	30	34	38	42	46	+

Number right \_\_\_\_\_

Subtract \_\_\_\_\_  
(See table above)

Raw Score = Difference \_\_\_\_\_

Scaled Score \_\_\_\_\_  
(See table on key)

(Continued from preceding column)

its prey from above, and so well does the intended know this that it makes every effort to fly above pursuer.

The beak of the falcon is well adapted to seizing and holding. It is razor-sharp with the hooked upper section projecting beyond the lower. Emphasizing the bird's expression is a sort of bony outcropping above each eye.

This shield doubtless protects the eye from the sun and aids in its remarkably keen vision. The wings long and when at rest come to a point. As for swift-ness the falcon can fly faster than the wild duck or pigeon and is even more tireless than they.

- The best heading for this passage would be
- 8-1 Savage Birds.
  - 8-2 Habits of the Falcon.
  - 8-3 The Falcon.
  - 8-4 The Eagle and the Falcon.
  - 8-5 Enemies of Birds. . . . . 8( )

- From this passage we may infer that
- 9-1 wild ducks are easily tired.
  - 9-2 falcons fly swiftly but only for short distances.
  - 9-3 pigeons fly more swiftly than falcons.
  - 9-4 wild ducks fly much faster than pigeons.
  - 9-5 wild ducks and pigeons fly long distances without tiring. . . . . 9( )

- The bony outcropping above each of the falcon's eyes helps it to
- 10-1 see better in the sunlight.
  - 10-2 see better at night.
  - 10-3 hold its prey.
  - 10-4 fly swiftly.
  - 10-5 stun its victims. . . . . 10( )

- Apparently the falcon is best known for
- 11-1 being fierce and swift.
  - 11-2 having a fierce expression.
  - 11-3 having long, pointed wings.
  - 11-4 flying very high.
  - 11-5 having a razor-sharp beak. . . . . 11( )

- The passage definitely states that the eagle
- 12-1 does not fear the falcon.
  - 12-2 has reason to fear the falcon.
  - 12-3 is no more to be feared by other birds than the falcon.
  - 12-4 is the most savage of all birds.
  - 12-5 is the largest of all birds. . . . . 12( )

- From this passage we may be certain that the falcon attacks
- 13-1 small animals.
  - 13-2 wild ducks and pigeons.
  - 13-3 eagles.
  - 13-4 men.
  - 13-5 some kinds of birds. . . . . 13( )

A well-known writer once remarked, "The human race is made up of cowards; and I am not only marching in the ranks but carrying a banner."

- 14. The writer considers himself to be
  - 14-1 a famous man.
  - 14-2 less courageous than the average man.
  - 14-3 more ambitious than the average man.
  - 14-4 an educator of men.
  - 14-5 more clever than the average man. . 14( )

Wilson's writing has some defects. In one place in his novel, *The Manhunter*, and in the restricted space of two-thirds of a page, Wilson has scored 114 offenses against literary art out of a possible 115. It breaks the record.

There are nineteen rules governing literary art in the domain of romantic fiction—some say twenty-two. In *The Manhunter*, Wilson violated eighteen of them. These eighteen require, among other things, that the personages in a tale shall be alive, except in the case of corpses, and that always the reader shall be able to tell the corpses from the others. But this detail has often been overlooked in *The Manhunter*.

A work of art? *The Manhunter* has no invention; it has no order, system, sequence, or result; it has no life-likeness, no seeming of reality; its humor is pathetic; its pathos is funny; its conversations are—oh! indescribable; its love scenes odious; its English a crime against the language. Counting these out, what is left is Art. I think we must all admit that.

- 15. The main point of this passage is that
  - 15-1 *The Manhunter* is not a work of art.
  - 15-2 romantic fiction must follow the nineteen rules of literary art or fail.
  - 15-3 Wilson is a great writer.
  - 15-4 we must be broadminded in judging works of art.
  - 15-5 *The Manhunter* is a great work of art. 15( )

- 16. The tone of this passage may most accurately be described as
  - 16-1 restrained.
  - 16-2 sarcastically humorous.
  - 16-3 solemn.
  - 16-4 matter-of-fact.
  - 16-5 mildly critical. . . . . 16( )

- 17. The characters in *The Manhunter* are
  - 17-1 very much alive.
  - 17-2 dead people.
  - 17-3 well drawn.
  - 17-4 not convincing.
  - 17-5 cleverly described. . . . . 17( )

- 18. The writer of this passage wishes to give the impression that "what is left" (next to last sentence) is
  - 18-1 all that really matters.
  - 18-2 more important than what he has found to be bad.
  - 18-3 just as important as the faults he has listed.
  - 18-4 enough to earn at least a little praise for the book.
  - 18-5 almost nothing. . . . . 18( )

George's was a reliable weapon because as one of the stage-drivers afterward said, "If she didn't get what she went after, she would fetch something else." And so she did. She once went after a deuce of spades nailed against a tree, and fetched a mule standing about thirty yards to the left of it. George didn't want the mule; but the owner came out with a double-barreled shotgun and persuaded him to buy it, anyhow.

19. George's weapon was called reliable because with it George
- 19-1 could hit the mark every time.
  - 19-2 always got himself into trouble.
  - 19-3 felt well protected.
  - 19-4 impressed the stage-drivers.
  - 19-5 rarely failed to hit something. . . . 19( )
20. We may infer from the passage that George bought the mule mainly because the owner was
- 20-1 angry.
  - 20-2 a poor man.
  - 20-3 well armed.
  - 20-4 persistent.
  - 20-5 willing to sell it cheaply. . . . 20( )
21. This passage is intended to be
- 21-1 sarcastic.
  - 21-2 descriptive.
  - 21-3 pathetic.
  - 21-4 humorous.
  - 21-5 laudatory. . . . 21( )

- (1) Reverend Dr. Keate was a terrible little man who
- (2) considered the flogging-block a necessary station
- (3) on the road to perfection, and who ended a sermon
- (4) on the Sixth Beatitude by saying, "Now, boys, be
- (5) pure in heart! For if not, I'll flog you until you
- (6) are!" The country gentlemen and merchant
- (7) princes who put their sons under his care were not
- (8) displeased by such a specimen of pious ferocity,
- (9) nor could they think lightly of the man who had
- (10) birched half the ministers, bishops, generals, and
- (11) dukes in the kingdom.
- (12) England required from her public schools a
- (13) generation of smooth-tongued hypocrites. In
- (14) order to crush out any possible republican ardor
- (15) in the young aristocrats of Eton, their studies were
- (16) organized on conventional and frivolous lines.
- (17) At the end of five years the pupil had read Homer
- (18) twice through, almost all of Virgil, and an expur-
- (19) gated Horace; he could turn out passable Latin
- (20) epigrams on Wellington and Nelson. The taste
- (21) for Latin quotations was then so pronounced that
- (22) when Pitt, speaking in the House of Commons, was
- (23) interrupted in a quotation from the *Aeneid*, the
- (24) whole House, Whigs and Tories alike, rose as one
- (25) man to supply the end. Certainly a fine example
- (26) of homogeneous culture!

22. The education provided for the young aristocrats was mainly
- 22-1 classical.
  - 22-2 practical.
  - 22-3 religious.
  - 22-4 military.
  - 22-5 political. . . . 22( )
23. "Birched" in line 10 most nearly means
- 23-1 educated.
  - 23-2 scared.
  - 23-3 whipped.
  - 23-4 treed.
  - 23-5 expelled. . . . 23( )
24. The writer believes that the kind of education described in the passage was most successful in producing
- 24-1 brilliant scholars.
  - 24-2 able leaders.
  - 24-3 good speakers.
  - 24-4 uniformity among its graduates.
  - 24-5 a wide knowledge of good literature. 24( )
25. "Frivolous," as used in line 16, means
- 25-1 playful.
  - 25-2 interesting.
  - 25-3 unpredictable.
  - 25-4 amusing.
  - 25-5 trivial. . . . 25( )
26. The schools mentioned in the passage were apparently
- 26-1 schools for the upper social classes.
  - 26-2 schools for boys and girls.
  - 26-3 government training schools for public service.
  - 26-4 schools preparing students for the ministry.
  - 26-5 elementary schools for all children. . 26( )
27. The studies in the schools mentioned in the passage were intended primarily to
- 27-1 be amusing to the students.
  - 27-2 encourage the growth of democracy.
  - 27-3 make the students religious.
  - 27-4 continue the traditional social system.
  - 27-5 prepare students for entrance to college. . . . 27( )
28. Which one of the following sayings best expresses Reverend Dr. Keate's philosophy of education?
- 28-1 Mighty oaks from little acorns grow.
  - 28-2 Don't judge a book by its cover.
  - 28-3 The child is father to the man.
  - 28-4 Spare the rod and spoil the child.
  - 28-5 All is not gold that glitters. . . . 28( )
29. The writer's attitude toward the education provided by the English public schools is one mainly of
- 29-1 mild approval.
  - 29-2 amusement.
  - 29-3 disapproval.
  - 29-4 admiration.
  - 29-5 apology. . . . 29( )

"Certainly a fine example of homogeneous culture" in lines 25-26 is intended to be

- 30-1 a mere statement of fact.
- 30-2 a criticism of English schools.
- 30-3 a tribute to the schools mentioned in the passage.
- 30-4 a compliment for the members of the House of Commons.
- 30-5 an indication of the writer's satisfaction with English culture. . . . . 30( )

\* \* \* \* \*

still don't know how I got through the assorted things for my hats and gowns. Strange women pulled me around and hauled at me. Managers burst in and bawled out orders in French. The flunkies replied, as far as I could make out, what did the manager expect, with this bulk to work on? Mrs. Stiles popped in now and then to say, "Isn't it fun, my dear!"

The fittings were accomplished in an atmosphere of

- 31-1 optimism.
- 31-2 good-natured amusement.
- 31-3 hopelessness.
- 31-4 quiet efficiency.
- 31-5 confusion. . . . . 31( )

During the fittings, the writer apparently felt mainly

- 32-1 bewildered and annoyed by the process.
- 32-2 angry with the dressmakers.
- 32-3 pleased with the prospect of having new clothes.
- 32-4 grateful to Mrs. Stiles.
- 32-5 amused by the remarks of the dressmakers. . . . . 32( )

The fittings apparently gave the most satisfaction to

- 33-1 the writer.
- 33-2 the dressmaker.
- 33-3 the manager.
- 33-4 the flunkies.
- 33-5 Mrs. Stiles. . . . . 33( )

The tone of the writer indicates that she now thinks of her experiences in the fitting room with

- 34-1 regret.
- 34-2 annoyance.
- 34-3 amusement.
- 34-4 indifference.
- 34-5 gratitude. . . . . 34( )

The writer must have been

- 35-1 clever in dealing with salespeople.
- 35-2 eager to have some new clothes.
- 35-3 easy to fit.
- 35-4 able to understand French very well.
- 35-5 a large woman. . . . . 35( )

- (1) A green plant having leaves, stems, and roots
- (2) secures carbon dioxide from the air through its
- (3) leaves and water from the soil through its roots.
- (4) The water is transported from the roots through
- (5) the stems to the leaves. Here, in the presence of
- (6) sunlight and chlorophyll, these compounds are
- (7) broken down within the mesophyll cells into
- (8) their separate atoms. The carbon dioxide is
- (9) broken up into separate atoms of carbon and
- (10) oxygen and the water is broken up into separate
- (11) atoms of hydrogen and oxygen. Then certain
- (12) quantities of these recombine in such a way as to
- (13) produce sugar and release oxygen as a by-product.
- (14) The sugar is sometimes later transformed into
- (15) starch.

36. Carbon dioxide is obtained principally through

- 36-1 the chlorophyll.
- 36-2 the roots.
- 36-3 the stems.
- 36-4 the leaves.
- 36-5 sunlight. . . . . 36( )

37. The mesophyll cells are located in the

- 37-1 roots.
- 37-2 leaves.
- 37-3 stems.
- 37-4 chlorophyll.
- 37-5 compounds. . . . . 37( )

38. Carbon dioxide and water both contain

- 38-1 oxygen.
- 38-2 carbon.
- 38-3 hydrogen.
- 38-4 chlorophyll.
- 38-5 sugar. . . . . 38( )

39. "These compounds" in line 6 refers to

- 39-1 air and soil.
- 39-2 carbon dioxide and water.
- 39-3 stems and leaves.
- 39-4 leaves and roots.
- 39-5 sunlight and chlorophyll. . . . . 39( )

40. The main purpose of the writer is to

- 40-1 describe the chemical processes in green plants.
- 40-2 point out the importance of sugar manufacture in the life of green plants.
- 40-3 explain the chemical composition of water and carbon dioxide.
- 40-4 illustrate the atomic theory.
- 40-5 explain the chemical composition of sugar. . . . . 40( )

In people who have become accustomed to gentle manners, the sense of the shameful of manual labor may become so strong that, at a critical moment, it will even set aside the instinct of self-preservation. So, for instance, a certain King of France is said to have lost his life. In the absence of the servant whose duty it was to shift his master's seat, the King sat uncomplaining before the fire and suffered his royal person to be toasted beyond recovery. But in so doing he saved his most Christian majesty from menial contamination.

- 41. The King of France did not move his chair because
  - 41-1 it was too heavy for him to lift.
  - 41-2 he wanted to be directly in front of the fire.
  - 41-3 that action would have required manual labor on his part.
  - 41-4 he did not want to offend his servant.
  - 41-5 he did not realize that it was necessary to do so. . . . . 41( )
  
- 42. In regard to the King of France, the writer is
  - 42-1 respectful.
  - 42-2 sorrowful.
  - 42-3 pitying.
  - 42-4 admiring.
  - 42-5 sarcastic. . . . . 42( )
  
- 43. The King may best be described as
  - 43-1 unfeeling.
  - 43-2 proud.
  - 43-3 unintelligent.
  - 43-4 absent-minded.
  - 43-5 careless. . . . . 43( )
  
- 44. The writer's main purpose is to
  - 44-1 make fun of the King of France.
  - 44-2 describe a very unusual event.
  - 44-3 ridicule the idea that manual labor is degrading.
  - 44-4 show how stupid kings sometimes are.
  - 44-5 show that servants are sometimes wiser than kings. . . . . 44( )

-----

The King of Assyria sent a great host against Jerusalem in Judah. And the captain of the hosts of the Assyrians came and stood by the wall of Jerusalem and cried to the people with a loud voice in the language of Judah, and spake, saying, "Hear the words of the great King, the King of Assyria. Thus saith the King, 'Let not Hezekiah your King deceive you: for he shall not be able to deliver you out of mine hand.'

(Continued in next column)

(Continued from preceding column)

"Neither let Hezekiah your King make you trust the Lord, saying, 'The Lord will surely deliver us, this city shall not be delivered into the hand of the King of Assyria.'

"Hearken not to Hezekiah your King: for thus saith the King of Assyria, 'Make an agreement with me this day, and come out to me, and then eat ye every one of his own vine, and every one of his fig tree, and drink ye every one of the waters of his well: until I come and take you away to a land like your own land, a land of olive oil and of honey, that ye may live and not die. And hearken not unto Hezekiah your King when he persuadeth you, saying, 'The Lord will deliver us.'

"Hath any of the gods of the nations delivered any of his land out of the hand of the King of Assyria? Who hath they among all the gods of the countries that he hath delivered their country out of mine hand, that the Lord should deliver Jerusalem out of mine hand?"

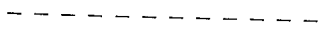
- 45. The leader of the Assyrians is endeavoring to persuade the citizens of Jerusalem to
  - 45-1 worship the gods of Assyria.
  - 45-2 make their vineyards and fields more productive.
  - 45-3 choose a more warlike king than Hezekiah.
  - 45-4 trust in the Lord for deliverance.
  - 45-5 surrender the city without fighting. 45( )
  
- 46. The leader of the Assyrians addressed the people in their own language principally because he
  - 46-1 was pretending to be one of them.
  - 46-2 liked them.
  - 46-3 hoped to create dissension among them.
  - 46-4 wanted to be sure they would understand him.
  - 46-5 did not trust an interpreter. . . . . 46( )
  
- 47. Hezekiah had apparently adopted the policy of
  - 47-1 nonresistance.
  - 47-2 compromise with the invaders.
  - 47-3 opposition to the invaders.
  - 47-4 frightening his enemy.
  - 47-5 withdrawing before the enemy. . . 47( )
  
- 48. The speaker wants the people of Jerusalem to believe that their present position is
  - 48-1 hopeless.
  - 48-2 secure.
  - 48-3 enviable.
  - 48-4 ridiculous.
  - 48-5 unusual. . . . . 48( )

The King of Assyria specifically states that he intends to

- 49-1 destroy the Temple of the Lord.
- 49-2 trust in the Lord.
- 49-3 transport the people of Jerusalem.
- 49-4 break down the walls of Jerusalem.
- 49-5 introduce the Assyrian language and culture. . . . . 49( )

To add to the force of his argument, the speaker

- 50-1 encourages the people to enjoy themselves while there is still time.
- 50-2 makes direct threats.
- 50-3 praises the spirit of the people.
- 50-4 condemns the King of Jerusalem.
- 50-5 points to the fate of other countries. 50( )



Near the banks of a wide river I thought I heard a rustling noise behind me; on turning about, I was almost petrified at the sight of an approaching lion. I attempted to escape into the water but waiting for me I discovered a huge crocodile with his mouth wide open. Just as the lion leaped toward me, I fell to the ground in fear and lay there, expecting every moment to feel his teeth or talons in me. Then I heard a violent but unusual noise and when I ventured to raise my head and look around, I saw to my unspeakable joy that as I fell the lion had, by the eagerness with which he sprang at me, jumped forward straight into the crocodile's mouth, which, as I before observed, had been wide open. The head of the one stuck in the throat of the other. I fortunately recollected my hunting knife and with this I severed the lion's head from his body at one blow! Then, with the butt end of my gun I rammed the head farther into the throat of the crocodile and destroyed him.

According to this passage, the writer killed the crocodile by

- 51-1 shooting it.
- 51-2 cutting off its head.
- 51-3 letting the lion attack it.
- 51-4 drowning it.
- 51-5 choking it. . . . . 51( )

"Observed," as the word is used in line 14, means

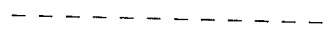
- 52-1 saw.
- 52-2 thought.
- 52-3 noticed.
- 52-4 found.
- 52-5 stated. . . . . 52( )

The writer's main purpose is probably to

- 53-1 show how clever he is.
- 53-2 tell an amusing story.
- 53-3 describe his narrowest escape from death.
- 53-4 show the reader how to act in similar circumstances.
- 53-5 warn the reader against carelessness. 53( )

54. It is most probable that the remarkable events described in this passage

- 54-1 took place in Africa.
- 54-2 were the results of the writer's skillful actions.
- 54-3 actually saved the writer's life.
- 54-4 were entirely accidental.
- 54-5 did not really take place. . . . . 54( )



In short, the story of ancient Greek life is a story not only of moderation but also of simplicity. "Things," chairs and tables and books and houses and carriages, are apt to take up a great deal of their owner's time. In the end they invariably make him their slave and his hours are spent looking after their wants, keeping them polished and brushed and painted. The Greeks, before everything else, wanted to be free, both in mind and in body. That they might maintain their liberty, and be truly free in spirit, they reduced their daily needs to the lowest possible point.

55. The main point of this passage is that

- 55-1 the Greeks despised work and avoided it as much as possible.
- 55-2 it takes much time and effort to care for one's possessions.
- 55-3 the Greeks tried to live so as not to be encumbered with material possessions.
- 55-4 the institution of slavery necessarily follows the accumulation of wealth.
- 55-5 the Greeks loved liberty as well as material possessions. . . . . 55( )

56. The writer's attitude toward the Greeks is principally one of

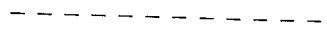
- 56-1 approval.
- 56-2 disapproval.
- 56-3 pity.
- 56-4 resentment.
- 56-5 condescension. . . . . 56( )

57. This passage implies that to attain complete freedom a person would have to

- 57-1 have an assured income.
- 57-2 have no material possessions.
- 57-3 have everything he wanted.
- 57-4 give up modern inventions.
- 57-5 give up all the pleasures of life. . . 57( )

58. This passage is apparently

- 58-1 unrelated to what has preceded it in the selection from which it was taken.
- 58-2 a contradiction of what has preceded it in the selection from which it was taken.
- 58-3 a summary of what has preceded it in the selection from which it was taken.
- 58-4 an introductory passage.
- 58-5 an elaboration of what has preceded it in the selection from which it was taken. . . . . 58( )





All propaganda should be popular and should adapt its intellectual level to the comprehension ability of the least intellectual of those whom it is desired to address. If it is, as it is with propaganda for carrying through a war, a matter of gathering a whole nation within its circle of influence, there cannot be enough attention paid to avoidance of too high a level of intellectuality.

59. The writer's point of view may best be described as
- 59-1 naive.
  - 59-2 idealistic.
  - 59-3 sentimental.
  - 59-4 warlike.
  - 59-5 realistic. . . . . 59( )

60. In the writer's opinion, the majority of people are
- 60-1 easily influenced by any type of propaganda.
  - 60-2 unintelligent.
  - 60-3 apt to make decisions for themselves.
  - 60-4 apt to avoid being influenced by propaganda.
  - 60-5 apt to respect intellectual ability. . 60( )

\* \* \* \* \*

Old Colonel Watts of the Infantry, a very large, burly, red-faced gentleman with a snow-white beard and a voice like a bass trombone, has an unfortunate habit of thinking out loud. One Sunday morning the Colonel took it into his head to go to church, where he took a seat almost directly beneath the pulpit. It happened to be the 17th day of the month, but in giving out the Psalms for the day, the minister made a mistake and announced, "The 16th day of the month; morning prayer, beginning at the 79th Psalm." To the astonishment of the congregation, Colonel Watts thought aloud in a deep voice, "The 17th day of the month, by Jupiter!" The clergyman immediately corrected himself, "Ah! the 17th day of the month; morning prayer, beginning at the 86th Psalm." In the silence that followed, the assembly heard another thought from the Colonel, who remarked in the same deep tone, "Had him there!"

61. From the passage, it appears most likely that the Colonel
- 61-1 went to church regularly.
  - 61-2 rarely attended church.
  - 61-3 did not like the minister.
  - 61-4 went to sleep during the church service.
  - 61-5 was wrong about the date of the month. . . . . 61( )

62. It is probable that the principal reaction of the majority of the congregation to the Colonel's last remark was one of
- 62-1 amusement.
  - 62-2 disgust.
  - 62-3 horror.
  - 62-4 regret.
  - 62-5 anger. . . . . 62( )

63. Colonel Watts corrected the minister because he
- 63-1 did not want him to read the wrong prayer.
  - 63-2 thought that he would save the minister from embarrassment.
  - 63-3 thought that the other members of the congregation were too bashful to do so.
  - 63-4 happened to think of the correct date.
  - 63-5 thought that it would teach the minister a lesson. . . . . 63( )

We cannot hope to achieve social balance unless we acknowledge the economic implications of this new profit order. During the age of expansion, capitalism gave cream to the few, skimmed milk to the middle classes, and a blue watery residue to the majority: farmers and industrial workers, agricultural laborers, slaves. The highest hope of capitalism, its most sacred aim, was that a fractional few of the skimmed-drinkers might, by elbowing and pushing, claim a part for themselves among the cream drinkers. In an age of economic balance, on the other hand, we must look forward to a widespread distribution of whole milk to everybody.

64. The author believes that the greatest obstacle to social and economic balance is
- 64-1 the profit system.
  - 64-2 the unrest of the lower classes.
  - 64-3 overpopulation in proportion to available natural resources.
  - 64-4 undernourishment.
  - 64-5 social change that is too rapid. . . 64( )
65. Capitalism has attempted to justify itself by the claim that
- 65-1 it has a sacred right to exist.
  - 65-2 the middle classes make up the majority of the population.
  - 65-3 it provides a living of some kind for all classes.
  - 65-4 the nineteenth and early twentieth centuries were an age of expansion.
  - 65-5 everyone has the chance to become wealthy. . . . . 65( )
66. This passage is a plea for
- 66-1 closer government regulation of the dairy industry.
  - 66-2 a nonprofit system of production and distribution.
  - 66-3 pure food laws.
  - 66-4 the strengthening of private capitalism.
  - 66-5 government aid to the farmer. . . 66( )

Nowadays a new university begins as a large sum of money deposited in a bank. This money is used to construct buildings and laboratories and dormitories. Finally professional teachers are hired, entrance examinations are held, and the university is on the way.

(Continued in next column)

Go on to the next page

(Continued from preceding column)

In the Middle Ages things were done differently. A wise man said to himself, "I have discovered a great truth. I must impart my knowledge to others." And he began to preach his wisdom wherever and whenever he could reach a few people to listen to him. If he was an interesting speaker, the crowd came and stayed. If he was dull, he shrugged their shoulders and continued their way. And by certain young men began to come regularly to hear the words of wisdom of this great teacher. They bought copybooks with them, and a little bottle of ink, and a goose quill, and wrote down what seemed to be important. One day it rained. The teacher and his disciples retired to an empty basement or to the room of the "professor." The learned man sat in his chair and the boys sat on the floor. That was the beginning of the medieval university.

- In the Middle Ages, a man would not start to teach unless he
- 67-1 had been to a university himself.
  - 67-2 had enough money to start a school.
  - 67-3 were asked to do so by his young friends.
  - 67-4 felt that he knew something that others should know also.
  - 67-5 had a room or an empty basement to hold classes in. . . . . 67( )

- According to this passage, a modern university is usually started by
- 68-1 professional teachers.
  - 68-2 somebody with a lot of money.
  - 68-3 eager students.
  - 68-4 a wise man.
  - 68-5 an interesting speaker. . . . . 68( )

- To start a university in the Middle Ages, it was most necessary to have
- 69-1 financial support.
  - 69-2 a popular teacher.
  - 69-3 students of great ability.
  - 69-4 copybooks and other equipment.
  - 69-5 suitable buildings. . . . . 69( )

- In the discussion of the beginnings of the medieval university, the rain is mentioned because it
- 70-1 forced the selection of a university building.
  - 70-2 served as the subject of a lecture.
  - 70-3 spoiled the ink.
  - 70-4 stopped the classes.
  - 70-5 prevented the teacher from getting an audience. . . . . 70( )

Have you ever examined a dead rattlesnake carefully? You should do so, remember that it is a mistake to imagine that the age of a rattlesnake may be told by counting each segment of its rattle as a year. Each time a rattlesnake sheds its skin, a new ring or segment of the rattle is uncovered at the end of the tail. Rattlesnakes shed from two to three skins a year—that is, during the summer months. At birth the snake has merely a button

(Continued in next column)

(Continued from preceding column)

to represent the future rattle. The first ring uncovered is larger than the button, and each subsequent ring yet larger until the reptile has attained its full growth, when all the segments produced are of uniform size. If a snake has a perfect rattle—a button at the tip and successively larger segments—and three joints of the rattle are counted as a year, a fair idea of the snake's age may be obtained. If all the segments are of uniform size, the reptile has lost the segments of its youth—possibly many more of them—through wear or accident, and no idea of the serpent's age can be ascertained except that it is a mature specimen.

71. The best heading for this passage is
- 71-1 How Snakes Shed Their Skins.
  - 71-2 Telling the Age of a Rattlesnake.
  - 71-3 How Rattlesnakes Warn Their Enemies.
  - 71-4 The Rate of Growth of a Rattlesnake.
  - 71-5 How Rattlesnakes Lose Their Rattles. . . . . 71( )

72. The age of a rattlesnake can be estimated if
- 72-1 each segment of the rattle is counted as one year.
  - 72-2 it is a full-grown snake.
  - 72-3 all the segments of the rattle are present.
  - 72-4 all the segments of the rattle are of uniform size.
  - 72-5 the number of segments present at birth is known. . . . . 72( )

73. A rattlesnake with a perfect rattle of ten segments would most likely be about
- 73-1 a year old.
  - 73-2 two or three years old.
  - 73-3 three or four years old.
  - 73-4 eight years old.
  - 73-5 ten years old. . . . . 73( )

74. If you examined a rattlesnake's rattle and found that there were four rings, each one smaller than the last as you approached the tip, you could most reasonably say that the snake
- 74-1 was four years old.
  - 74-2 was about four months old.
  - 74-3 was a completely mature specimen.
  - 74-4 had not yet attained its full growth.
  - 74-5 had lost its rattle and was growing a new one. . . . . 74( )

75. The number of segments in a perfect rattle gives the most accurate indication of the
- 75-1 time that has passed since the rattlesnake last shed its skin.
  - 75-2 number of times the rattlesnake has shed its skin.
  - 75-3 warmth of the climate in which the rattlesnake lives.
  - 75-4 poisonous quality of the snake.
  - 75-5 age of the rattlesnake in years. . . . . 75( )

One day, as a hod carrier was going up a ladder with a hod full of bricks on his shoulder, he felt the first rung of the ladder break under his foot. He quickly stepped up to the second, and, as that started to break, to the third rung. He skillfully repeated this performance as each rung broke beneath his weight and when he stepped upon the roof of the building the ladder fell completely apart.

76. The hod carrier may best be described as
- 76-1 careless.
  - 76-2 stupid.
  - 76-3 unusually quick.
  - 76-4 strong.
  - 76-5 unusually heavy. . . . . 76( )
77. This anecdote may best be described as a
- 77-1 true story of an unusual event.
  - 77-2 story that has been exaggerated to provide humor.
  - 77-3 plausible story.
  - 77-4 tribute to the hod carrier's presence of mind.
  - 77-5 warning regarding the danger of climbing ladders. . . . . 77( )

(1) After a period of particularly horrible massacres  
 (2) by the Turks in Bulgaria in the year 1876, the  
 (3) Russian people lost all patience. In April of the  
 (4) year 1877 the Russian armies crossed the Danube,  
 (5) stormed the Shipka pass, and after the capture of  
 (6) Plevna, marched southward until they reached the  
 (7) gates of Constantinople. Turkey appealed for  
 (8) help to England. There were many English  
 (9) people who denounced their government when it  
 (10) took the side of the Sultan. But Disraeli, who  
 (11) had just made Queen Victoria Empress of India  
 (12) and who loved the picturesque Turks while he  
 (13) hated the Russians, decided to interfere. Russia  
 (14) was forced to conclude the peace of San Stefano  
 (15) (1878) and the question of the Balkans was left  
 (16) to a Congress that convened at Berlin in June and  
 (17) July of the same year.

(18) This famous conference was entirely dominated  
 (19) by the personality of Disraeli. Even Bismarck  
 (20) feared the clever old man with his well-oiled curly  
 (21) hair and his supreme arrogance, tempered by a  
 (22) cynical sense of humor and a marvelous gift for  
 (23) flattery. At Berlin the British prime minister  
 (24) carefully watched over the fate of his friends the  
 (25) Turks. Montenegro, Serbia, and Rumania were  
 (26) recognized as independent kingdoms. The princi-  
 (27) pality of Bulgaria was made partly independent  
 (28) under the rule of Prince Alexander of Battenberg,

(Continued in next column)

(Continued from preceding column)

- (29) a nephew of Tsar Alexander II. But none of the
  - (30) countries was given the chance to develop
  - (31) powers and its resources as it would have been
  - (32) to do had England been less anxious about
  - (33) fate of the Sultan, whose domains were neces-
  - (34) sary to the safety of the British Empire as a bulwark
  - (35) against further Russian attack.
78. The explanation of Disraeli's actions contained in the last sentence of this passage is
- 78-1 self-contradictory.
  - 78-2 presented as an alternative to the explanation in lines 10-13.
  - 78-3 contradictory to the explanation contained in lines 10-13.
  - 78-4 probably more important than the explanation in lines 10-13.
  - 78-5 probably less important than the explanation contained in lines 10-13. 78( )
79. This passage implies that Russia's reasons for making war on Turkey were
- 79-1 unknown.
  - 79-2 only partly known.
  - 79-3 justified to some extent.
  - 79-4 entirely selfish.
  - 79-5 not at all justified. . . . . 79( )
80. The peace of San Stefano must have followed a defeat for the
- 80-1 Turks.
  - 80-2 Russians.
  - 80-3 English.
  - 80-4 Bulgarians.
  - 80-5 Germans. . . . . 80( )
81. The writer apparently believes that Bismarck was
- 81-1 an unusually fearless leader.
  - 81-2 an inexperienced leader.
  - 81-3 easily impressed by other statesmen.
  - 81-4 really more clever than Disraeli.
  - 81-5 a timid leader. . . . . 81( )
82. After the Congress mentioned in line 16, the Balkan states
- 82-1 were completely independent.
  - 82-2 remained under Turkish rule.
  - 82-3 were divided between Turkey and Russia.
  - 82-4 were placed under the rule of Turkey and England.
  - 82-5 were only partly independent. . . 82( )
83. We may infer that, before 1876, massacres in Bulgaria were
- 83-1 prevented by Turkish officials.
  - 83-2 unusual.
  - 83-3 unknown.
  - 83-4 caused by Russian interference.
  - 83-5 fairly common. . . . . 83( )

met an old backwoodsman who was extravagantly of whisky and I inquired for his wife. "She is dead, creature," said he, "and is probably better off than was here. She was a seamstress and her greatest enjoyment of happiness in this world was only so, so."

This anecdote is intended primarily to be

- 84-1 simply informative.
- 84-2 apologetic.
- 84-3 explanatory.
- 84-4 amusing.
- 84-5 sorrowful. . . . . 84( )

The effect of this anecdote is obtained chiefly by

- 85-1 its simple, direct style.
- 85-2 its indirect approach.
- 85-3 overstatement.
- 85-4 a play on words.
- 85-5 an appeal to the reader's sympathy. 85( )

The main point of this anecdote would be lost if the

- 86-1 backwoodsman's wife had not been a seamstress.
- 86-2 backwoodsman had not been fond of whisky.
- 86-3 backwoodsman's wife had not died.
- 86-4 backwoodsman had married a second time.
- 86-5 backwoodsman had not been sorry that his wife had died. . . . . 86( )

Bells are usually formed of a composition of copper and tin called bell-metal. After the proper proportions of the two metals are fused together, the compound is pressed into a mold. The notion that in old times silver was mixed with bell-metal to sweeten the tone is a mistake. Silver, in any quantity, would injure the tone.

(Continued in next column)

(Continued from preceding column)

The quality of a bell depends not only on the composition of the metal it is made of, but very much also on its shape, and on the proportions between its height, width, and thickness. The pitch of a bell is higher the smaller it is. Glass bells give an extremely fine sound, but are too brittle to stand the continued use of a clapper.

- 87. From the passage we may infer that the largest bell in a set of chimes would
  - 87-1 have the poorest tone.
  - 87-2 contain the largest proportion of silver.
  - 87-3 be made of the thickest metal.
  - 87-4 have the lowest pitch.
  - 87-5 contain the largest proportion of copper. . . . . 87( )
- 88. According to the passage, bells made many years ago
  - 88-1 usually contained silver.
  - 88-2 had a poor quality of tone.
  - 88-3 contained no silver.
  - 88-4 were carelessly made.
  - 88-5 were very beautifully shaped. . . . 88( )
- 89. What property of a bell is said to depend on both the composition of the metal and the shape into which it is molded?
  - 89-1 Its proportions
  - 89-2 Its length of life
  - 89-3 Its pitch
  - 89-4 Its tone quality
  - 89-5 Its thickness . . . . . 89( )
- 90. The best heading for this passage would be
  - 90-1 Bells.
  - 90-2 The Manufacture of Bells.
  - 90-3 The Quality of Bells.
  - 90-4 Kinds of Bells.
  - 90-5 The Use of Bells. . . . . 90( )

\* \* \* \* \*

Number wrong	0	3	7	11	15	19	23	27	31	35	39	43	47	51	55	59	63	67	71
Amount to be subtracted	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	62	66	70	+

**Speed of Comprehension Score**

Total number right \_\_\_\_\_

Subtract  
(See table above) \_\_\_\_\_

Raw Score = Difference \_\_\_\_\_

Scaled Score \_\_\_\_\_  
(See table on key)

**Level of Comprehension Score**

Number of *completed* scales \_\_\_\_\_  
(1 if last item marked is 30, 31, ... 59;  
2 if last item marked is 60, 61, ... 89;  
3 if last item marked is 90)

Number right \_\_\_\_\_  
(on *completed* scales only)

Subtract \_\_\_\_\_  
(Look up in table at left amount to be subtracted corresponding to the number wrong on *completed* scales)

Raw Score = Difference \_\_\_\_\_

Scaled Score \_\_\_\_\_  
(See table on key under column corresponding to number of scales *completed*)

# THE DOMINION TESTS

## ARITHMETIC

(FUNDAMENTAL OPERATIONS FOR GRADES IV TO VIII)

FORM A

Name..... Boy or Girl.....  
(In capitals) Last First

Age Last Birthday..... Date of Birthday.....  
Month Day of month

Name of School..... Grade.....

City, Town or Municipality..... Province.....

Name of Teacher..... Date of Examination.....

### INSTRUCTIONS TO PUPILS

This test contains five pages of Arithmetic examples. You are not expected to get all of the examples, but start with the first and work steadily on. Try to get as many done as you can without making mistakes. If you come to one that is too hard for you, skip it and come back to it later if you have time.

**DO NOT TURN THIS PAGE OVER UNTIL YOU ARE TOLD TO DO SO.**

Here is a sample to show you how the examples are arranged:

<p>1. Add</p> <table style="margin-left: auto; margin-right: auto;"> <tr><td style="text-align: right;">24</td></tr> <tr><td style="text-align: right;">35</td></tr> <tr><td style="text-align: right; border-top: 1px solid black;">59</td></tr> </table>	24	35	59	<p>2. Subtract</p> <table style="margin-left: auto; margin-right: auto;"> <tr><td style="text-align: right;">12</td></tr> <tr><td style="text-align: right;">8</td></tr> <tr><td style="text-align: right; border-top: 1px solid black;"> </td></tr> </table>	12	8		<p>3. <math>25 \div 5</math></p> <p style="text-align: center;">=</p> <table style="margin-left: auto; margin-right: auto;"> <tr><td style="border-top: 1px solid black; width: 40px;"> </td></tr> </table>	
24									
35									
59									
12									
8									

You are told what to do in each example. You may figure anywhere except in the little boxes which are for your answers. Look at example number 1, above: You are told to add 24 and 35. The answer is 59, so 59 has been put in the box. Now look at number 2, in which you are told to subtract. Since 8 from 12 leaves 4, the answer 4 should go in the second box. Everyone put it in now. (Pause). Now write the answer for example 3 in the box. (Pause.) Since  $25 \div 5 = 5$ , you should have the figure 5 in this third box. (Examiner points to box.)

**In every example you do, be sure to put your answer in the box.**

**All answers in fractions must be given in lowest terms and improper fractions must be changed to mixed numbers in order to be counted correct.**

You will have exactly 35 minutes for the test. See how many examples you can get right in that time. Remember there are five pages.

**Be sure you do what you are told to do in each example.**

**Do not waste time on examples that are too hard for you.**

Score = Number correct =

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1934

DEPARTMENT OF EDUCATIONAL RESEARCH  
 ONTARIO COLLEGE OF EDUCATION  
 371 BLOOR STREET WEST  
 TORONTO 5

1. Add $8+9=$ <input type="text"/>	2. Add $16+48=$ <input type="text"/>	3. Subtract $14-9=$ <input type="text"/>	4. Multiply $9 \times 7=$ <input type="text"/>	5. Divide $48 \div 6=$ <input type="text"/>
6. Add $38092 + 4742 =$ <input type="text"/>	7. Subtract $100 - 45 =$ <input type="text"/>	8. Subtract $1626 - 829 =$ <input type="text"/>		
9. Multiply $906 \times 8 =$ <input type="text"/>	10. Add $47 + 53 + 63 + 89 =$ <input type="text"/>	11. Divide (Be sure to put your answer in the box) $9 \overline{) 46} =$ <input type="text"/>		
12. Multiply $620 \times 60 =$ <input type="text"/>	13. Add $21 + 846 + 154 + 1078 + 1397 =$ <input type="text"/>	14. Divide $4 \overline{) 3416} =$ <input type="text"/>		
15. Multiply $381 \times 307 =$ <input type="text"/>	16. Subtract $641 - 68 =$ <input type="text"/>	17. Divide $37 \overline{) 85359} =$ <input type="text"/>		
18. Multiply $643 \times 692 =$ <input type="text"/>	19. Subtract $5603 - 2098 =$ <input type="text"/>	20. Divide $93 \overline{) 27005} =$ <input type="text"/>		

Go right on to Page 2.

Number correct Page 1 (

Percentage	Decimals and Percentage	
66. Change $37\frac{1}{2}\%$ to a fraction in lowest terms.  = <input type="text"/>	NOTE: Leave these two columns until the last.	
	71. Write as decimals and add: 7 thousandths = 3 hundredths =  sum = <input type="text"/>	72. $\frac{3}{4}$ of $16\frac{2}{3}\%$ of \$300  = <input type="text"/>
67. Change 5% to a decimal fraction.  = <input type="text"/>	73. $1\frac{1}{4} \times 20.4$  = <input type="text"/>	74. $4.5 \times 12\frac{1}{2}\%$ of \$160  = <input type="text"/>
68. 7% of \$3.00  = <input type="text"/>	75. $6.48 \div 3\frac{3}{7}$  = <input type="text"/>	76. What part of a yard is 30 inches? (Give answer in the form of a percentage)  = <input type="text"/>
69. 3 is what per cent of 4?  = <input type="text"/>	77. $2.75 + 4\frac{1}{5} - 3.05$ (Give answer in the form of a decimal)  = <input type="text"/>	78. $\frac{1}{4}$ of 80% of .2 (Give the answer in the form of a decimal)  = <input type="text"/>
70. $83\frac{1}{3}\%$ of \$1200.  = <input type="text"/>	79. $\frac{3.6 \times .495 \times .01}{.5 \times .004 \times 9.9}$  = <input type="text"/>	80. 3.25 min. + 45 secs. $+ 4\frac{1}{2}$ min. - 30 secs.  = <input type="text"/> min.

**THE END.**

If you have finished the test look over your work to see that it is correct.

NOTE: Be Sure to Change Improper Fractions to Mixed Numbers and Reduce all Fractions to Lowest Terms.

Weights and Measures	Fractions (A)	Fractions (B)
21. How many feet and inches in 53 inches?  -      ft.      and      in.	22. Subtract  $6\frac{2}{3}$ $3\frac{1}{3}$ - <input type="text"/>	23. $\frac{1}{5}$ of 140  - <input type="text"/>
24.  \$894.00 - \$31.35  - <input type="text"/>	25. $\frac{3}{8} + \frac{1}{2}$  - <input type="text"/>	26. $\frac{4}{7} \times \frac{2}{3}$  - <input type="text"/>
27. Add 3 doz. and 4 eggs, to 5 doz. and 10 eggs  -      doz.      and      eggs	28. $6 - 3\frac{3}{4}$  - <input type="text"/>	29. $\frac{1}{4} \div \frac{3}{8}$  - <input type="text"/>
30. Subtract  8 ft. 3 in. 3 ft. 10 in.  -      ft.      in.	31. $\frac{5}{6} - \frac{2}{5}$  - <input type="text"/>	32. $3\frac{1}{3} \times 4\frac{1}{2}$  - <input type="text"/>
33. 11 times 5 pints  -      qt.      and      pt.	34. $3\frac{3}{5} + 1\frac{4}{5}$  - <input type="text"/>	35. $\frac{7}{8} \div 4$  - <input type="text"/>

Go right on to Page 3.

Number correct Page 2 (      )



Decimals (A)	Decimals (B)	Percentage
<p>36. Copy in a column and add  <math>1.1 + 30. + .003</math></p> <p align="center">-</p> <hr/>	<p>37. Multiply</p> <p align="right">.32 .3</p> <p align="center">=</p> <hr/>	<p>38. Change 25% to a fraction in lowest terms.</p> <p align="center">=</p> <hr/>
<p>39. Subtract</p> <p align="center"><math>58.65 - 2.3</math></p> <p align="center">-</p> <hr/>	<p>40. Multiply</p> <p align="center"><math>.12 \times .12</math></p> <p align="center">-</p> <hr/>	<p>41. 3% of 500</p> <p align="center">=</p> <hr/>
<p>42. Subtract</p> <p align="right">7. .326</p> <p align="center">-</p> <hr/>	<p>43. Place the decimal point in the product in the correct place</p> <p align="center"><math>436 \times .6 = 2616</math></p>	<p>44. <math>\frac{2}{3}</math> is what per cent?</p> <p align="center">=</p> <hr/>
<p>45. Add</p> <p align="center"><math>.23 + 1.4</math></p> <p align="center">-</p> <hr/>	<p>46. Place the decimal point in the quotient in the correct place</p> <p align="right">203 534) 10.8402</p>	<p>47. <math>12\frac{1}{2}\%</math> of 800</p> <p align="center">=</p> <hr/>
<p>48. Subtract</p> <p align="center"><math>2.43 - .2</math></p> <p align="center">=</p> <hr/>	<p>49. Divide</p> <p align="right">.04) 16</p> <p align="center">=</p> <hr/>	<p>50. 7% of \$30.00</p> <p align="center">=</p> <hr/>

Go right on to Page 4.

Number correct Page 3 (      )

**NOTE: Be sure to Change all Improper Fractions to Mixed Numbers and Reduce all Fractions to Lowest Terms.**

Weights and Measures	Fractions (A)	Fractions (B)
<p>51. A floor is 30 ft. long and 30 ft. wide.</p> <p>Its area is .....sq ft.</p> <p>= <input type="text"/> sq. yd.</p>	<p>52. <math>\frac{3}{4} + \frac{1}{6} + \frac{7}{12}</math></p> <p>= <input type="text"/></p>	<p>53. <math>1\frac{2}{3} \div \frac{1}{4}</math></p> <p>= <input type="text"/></p>
<p>54. Subtract 20 min. 15 secs. from 50 min.</p> <p>= <input type="text"/> min. <input type="text"/> sec.</p>	<p>55. <math>8\frac{1}{6} - 5\frac{4}{7}</math></p> <p>= <input type="text"/></p>	<p>56. Change to a mixed number in lowest terms <math>\frac{38}{8}</math></p> <p>= <input type="text"/></p>
<p>57. Multiply</p> <p>3 yd. 2 ft. by 5.</p> <p>= <input type="text"/> yd. <input type="text"/> ft.</p>	<p>58. Add</p> <p><math>22\frac{3}{4}</math> <math>29\frac{5}{7}</math></p> <p>= <input type="text"/></p>	<p>59. <math>2 \times 1\frac{7}{8}</math></p> <p>= <input type="text"/></p>
<p>60. Divide</p> <p>3 lb 4 oz. of tea by 2</p> <p>= <input type="text"/> lb. <input type="text"/> oz.</p>	<p>61. Subtract</p> <p><math>7\frac{3}{4}</math> <math>4\frac{5}{6}</math></p> <p>(Answer in lowest terms) = <input type="text"/></p>	<p>62. <math>\frac{7}{10} \div 2\frac{2}{3}</math></p> <p>= <input type="text"/></p>
<p>63. Find the average</p> <p>423 56 7 314</p> <p>= <input type="text"/></p>	<p>64. <math>31\frac{1}{8} - 5\frac{2}{9}</math></p> <p>= <input type="text"/></p>	<p>65. <math>3\frac{1}{3} \div 4\frac{1}{8}</math></p> <p>= <input type="text"/></p>

Go right on to Page 5.

Number correct Page 4 (      )

## VI. FILL IN THE CORRECT ANSWERS

39. 5% of \$36 = \_\_\_\_\_ 40. 17% of \$2.00 = \_\_\_\_\_ 41. 75% of \$3.40 = \_\_\_\_\_
42. 125% of 96 = \_\_\_\_\_ 43. 2.4% of 40 = \_\_\_\_\_ 44.  $\frac{2\%}{3}$  of 600 = \_\_\_\_\_
45. 6 = \_\_\_\_\_ % of 24 46. 25 = \_\_\_\_\_ % of 20 47. 12 = \_\_\_\_\_ % of 36

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## VII. CHANGE TO DECIMALS

48.  $\frac{1}{2}$  = \_\_\_\_\_ 49.  $\frac{3}{4}$  = \_\_\_\_\_ 50.  $\frac{2}{5}$  = \_\_\_\_\_
51. 5% = \_\_\_\_\_ 52. 12% = \_\_\_\_\_ 53.  $4\frac{1}{2}\%$  = \_\_\_\_\_

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## VIII. SOLVE THE FOLLOWING

54. What is the average of 16, 9, 35, 21?  
Answer = \_\_\_\_\_
55. What is the interest on \$300 for 4 months at 6%?  
Answer = \_\_\_\_\_
56. What is the net price of goods listed at \$16.40 with a discount of 4%?  
Answer = \_\_\_\_\_
57. If goods costing \$60 are sold at a gain of \$15, what per cent of the selling price is the gain?  
Answer = \_\_\_\_\_
58. Arrange in order of size: .016, .315, .87, .02  
Answer = \_\_\_\_\_
59. A boy has two \$5 bills, three \$2 bills, four \$1 bills, three half dollars, and two quarters. How much money has he in all?  
Answer = \_\_\_\_\_
60. A baseball team has won 48 games and lost 12. What per cent of its games has it won?  
Answer = \_\_\_\_\_

### III. MULTIPLY

17. 
$$\begin{array}{r} 52 \\ 35 \\ \hline \end{array}$$

18. 
$$\begin{array}{r} 608 \\ 70 \\ \hline \end{array}$$

19. 
$$\begin{array}{r} 306 \\ 285 \\ \hline \end{array}$$

20. 
$$\begin{array}{r} 19.3 \\ .75 \\ \hline \end{array}$$

21.  $\frac{7}{8} \times \frac{5}{16} =$  \_\_\_\_\_

22.  $36 \times \frac{3}{4} =$  \_\_\_\_\_

23.  $\frac{3}{5} \times 4\frac{1}{2} =$  \_\_\_\_\_

24.  $2\frac{1}{4} \times 7\frac{1}{2} \times 1\frac{1}{2} =$  \_\_\_\_\_

---

### IV. DIVIDE

25.  $3204 \div 34 =$  \_\_\_\_\_

26.  $53760 \div 64 =$  \_\_\_\_\_

27.  $\frac{1}{2} \div \frac{1}{4} =$  \_\_\_\_\_

28.  $3\frac{3}{4} \div 4 =$  \_\_\_\_\_

29.  $15\frac{1}{4} \div \frac{7}{8} =$  \_\_\_\_\_

30.  $3\frac{1}{4} \div 1\frac{1}{2} =$  \_\_\_\_\_

31.  $1.25 \div .5 =$  \_\_\_\_\_

32.  $18.625 \div .025 =$  \_\_\_\_\_

---

### V. PLACE THE DECIMAL POINT IN EACH OF THE FOLLOWING ANSWERS.

33.  $1.5 \times 12 = 180$

34.  $.92 \times .7 = 644$

35.  $.125 \times 16 = 2000$

36.  $38.912 \div 15.2 = 256$

37.  $3.8912 \div 152 = 256$

38.  $.38912 \div .152 = 256$

# TEST OF MATHEMATICAL FUNDAMENTALS

for

## Grades 7 to 12

by

H. R. BEATTIE, B.A.

DIRECTOR OF GUIDANCE

DEPARTMENT OF EDUCATION, PROVINCE OF ONTARIO.

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FILL IN THE FOLLOWING. PLEASE USE BLOCK LETTERS.

Name ..... Date .....

LAST MIDDLE FIRST

Address ..... Age .....

Date of Birth ..... School .....

Grade ..... Home-Room Teacher .....

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### INSTRUCTIONS

1. Do NOT turn this sheet until told to do so.
2. If you do not understand a question skip it and go on with the next question.
3. Do not waste time. Your standing is determined by the number of answers correct.
4. You are not expected to finish every example, but work steadily and do the best you can.
5. You may do your figuring on the test paper.
6. Once we are started, no help will be given to any pupil.
7. You have twenty-five (25) minutes to do the test.

SCORE .....

VOCATIONAL GUIDANCE CENTRE

Ontario College of Education

UNIVERSITY OF TORONTO

371 BLOOR STREET WEST - TORONTO 5, CANADA

### I. ADD

1. 
$$\begin{array}{r} 7 \\ 9 \\ 5 \\ 4 \\ 3 \\ 6 \\ 1 \\ \hline \end{array}$$

2. 
$$\begin{array}{r} 456 \\ 82 \\ 51 \\ \hline 962 \\ \hline \end{array}$$

3. 
$$\begin{array}{r} \$ 65.42 \\ 452.80 \\ 96.40 \\ 4.00 \\ .95 \\ \hline 8.36 \\ \hline \end{array}$$

4.  $\frac{3}{8} + \frac{9}{16} =$  \_\_\_\_\_

5.  $\frac{5}{16} + \frac{3}{4} + \frac{9}{64} =$  \_\_\_\_\_

6.  $9\frac{1}{4} + 8\frac{1}{2} + 5\frac{3}{4} =$  \_\_\_\_\_

7.  $.09 + .625 + 1.5 =$  \_\_\_\_\_

8. 
$$\begin{array}{r} 4 \text{ yd. } 2 \text{ ft. } 6 \text{ in.} \\ 2 \text{ yd. } 1 \text{ ft. } 1 \text{ in.} \\ \hline \end{array}$$

---

### II. SUBTRACT

9. 
$$\begin{array}{r} 1461 \\ 975 \\ \hline \end{array}$$

10. 
$$\begin{array}{r} 357.65 \\ 164.08 \\ \hline \end{array}$$

11.  $\frac{15}{16} - \frac{7}{8} =$  \_\_\_\_\_

12.  $3\frac{3}{4} - 1\frac{1}{4} =$  \_\_\_\_\_

13.  $\$3.15 - 29c =$  \_\_\_\_\_

14.  $9.173 - 4.62 =$  \_\_\_\_\_

15.  $6\frac{3}{4} - 4.3 =$  \_\_\_\_\_

16. 
$$\begin{array}{r} 6 \text{ yd. } 1 \text{ ft. } 3 \text{ in.} \\ 3 \text{ yd. } 1 \text{ ft. } 9 \text{ in.} \\ \hline \end{array}$$