A COMPARATIVE STUDY OF PRACTICAL SCIENTIFIC KNOWLEDGE
POSSESSED BY RURAL AND CITY CHILDREN

by

Mabel Schauss

Contributions of the Graduate School
Indiana State Teachers College
Number 239

Submitted in Partial Fulfillment
of the Requirements for the
Master of Arts Degree
in Education
1936
"One of the greatest difficulties in the present teaching of science is that the material is presented in purely objective form, or is treated as a new peculiar kind of experience which the child can add to what he had already had. In reality, science is of value because it gives the ability to interpret and control the experience already had. It should be introduced, not as so much new subject-matter, but as showing the factors already involved in previous experience and as furnishing tools by which that experience can be more easily and effectively regulated." -- John Dewey
ACKNOWLEDGMENTS

The writer wishes to express sincere appreciation to
the members of her thesis committee, Mr. E. L. Abell, Mr.
E. E. Ramsey, and Dr. J. R. Shannon, for their aid and
advice in the preparation of this thesis; to Dr. William
P. Allyn and Dr. James F. Mackell for their aid in critizing
the science test; to the principals, teachers and 9-B
pupils who cooperated so generously in making this study
possible.

M. S.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>LIST OF TABLES</th>
<th>vi</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF FIGURES</td>
<td>vii</td>
</tr>
</tbody>
</table>

## I. INTRODUCTION

- **A. Justification for this Study** | 1 |
- **B. Statement of Problems** | 2 |
- **C. Procedure Used** | 2 |
  - 1. Sources of Test Items | 2 |
  - 2. Description of the Test | 3 |
  - 3. Administration of Test | 3 |
  - 4. Obtaining a Common Measure | 4 |

## II. ORGANIZATION AND ANALYSIS OF DATA

- **A. Similar Studies and Investigations** | 5 |
  - 1. Adelin W. Scott | 5 |
  - 3. H. W. McIntosh, and H. E. Schrammel | 8 |
  - 4. L. S. Pressey, and J. B. Thomas | 9 |
  - 5. B. A. Fukuda | 11 |
- **B. Presentation of Data** | 13 |
  - 1. General Treatment of Data | 13 |
  - 2. Statistical Treatment of Data | 15 |
  - 3. Explanation of Specific Table Headings | 16 |
- **C. Personal Data** | 30 |
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>III. GENERAL SUMMARY</td>
<td>43</td>
</tr>
<tr>
<td>A. Findings</td>
<td>43</td>
</tr>
<tr>
<td>B. Conclusions</td>
<td>44</td>
</tr>
<tr>
<td>C. Limitation of the Study</td>
<td>46</td>
</tr>
<tr>
<td>IV. APPENDIX</td>
<td>48</td>
</tr>
<tr>
<td>A. BIBLIOGRAPHY</td>
<td>48</td>
</tr>
<tr>
<td>B. Otis Intelligence Test</td>
<td>50</td>
</tr>
<tr>
<td>C. Science Test</td>
<td>52</td>
</tr>
</tbody>
</table>
LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Comparative Study of the Science Scores in Biology</td>
<td>18</td>
</tr>
<tr>
<td>II. Comparative Study of the Science Scores in Physiology</td>
<td>19</td>
</tr>
<tr>
<td>III. Comparative Study of the Science Scores in Agriculture</td>
<td>20</td>
</tr>
<tr>
<td>IV. Comparative Study of the Science Scores in Physics</td>
<td>21</td>
</tr>
<tr>
<td>V. Comparative Study of the Science Scores in Chemistry</td>
<td>22</td>
</tr>
<tr>
<td>VI. Comparative Study of the Science Scores in Miscellaneous Items</td>
<td>23</td>
</tr>
<tr>
<td>VII. Comparative Study of Intelligence Quotients of those Having Had Previous Science Contacts in Schools</td>
<td>24</td>
</tr>
<tr>
<td>VIII. Comparative Study of Science Scores According to Previous Science Contacts in School</td>
<td>25</td>
</tr>
<tr>
<td>IX. Comparative Study of the Intelligence Quotients of the Entire Group Taking the Science Test</td>
<td>26</td>
</tr>
<tr>
<td>X. Comparative Study of the Scores of those Having Completed the Entire Science Test</td>
<td>27</td>
</tr>
<tr>
<td>XI. Occupations of Parents</td>
<td>31</td>
</tr>
<tr>
<td>XII. Do These Children Prefer Their Home Environment?</td>
<td>38</td>
</tr>
<tr>
<td>XIII. Study Preferences</td>
<td>39</td>
</tr>
<tr>
<td>XIV. Leisure Time Activities</td>
<td>41</td>
</tr>
<tr>
<td>XV. Miscellaneous Contacts</td>
<td>42</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

FIGURE                               PAGE
1. Intelligence Quotients on Otis Intelligence Test.............................. 28a
2. Complete Scores on Science Test.............................. 29a

vii
I. INTRODUCTION

A. JUSTIFICATION FOR THIS STUDY

During her rural teaching experience, the writer had often received pupils from surrounding city systems during the school year. She noted that these children did not observe local natural phenomena as closely or as accurately as the local country children. The children coming from the city also had considerable difficulty in adjusting themselves to the routine of a one-room country school. The writer had also observed that the country child had equal difficulty in adjusting himself to a city school system.

In the discussion of these problems with various city teachers, the statement was made that country children rated lower than city children on intelligence tests. It was also stated that the country children rated higher on subjects of a mathematical nature than in any other phase of school work.

These statements raised the following questions: Are country children less intelligent than city children? Age for age, and grade for grade, how do country children compare with city children in achievement and intelligence? In what scientific subject fields would country children make higher responses?
These interests were further emphasized and widened by discussions in Mr. E. E. Ramsey's Educational Sociology class concerning the probable influences of environmental factors.

The following questions persisted: Is the use of the conventional standards of measurement of intelligence a fair test of an individual's innate capacity, or is environment also a contributing factor? Since country environment has consistently contributed outstanding men to the nation's leaders, are the conventional standards of measurement of intelligence and achievement always adequate measuring sticks for individuals from every walk of life?

In order to judge children from different environments properly, must we not consider the individual environmental factors as well as the conventional intelligence standards?

B. STATEMENT OF PROBLEMS

From the above discussions and suggestions, the writer formulated the following problems for this thesis:

1. Does environment play any part in the knowledge and learning capacities in various subject fields?

2. What subject or subjects would the country environment most influence?

3. Does environment influence the measure of intelligence possessed by an individual?

C. PROCEDURE USED

In order to solve scientifically the problems set forth in Section B above, the writer compiled a test designed
to ascertain the amount of practical scientific knowledge a child derives from his environment.

To eliminate the influence of technical scientific knowledge, questions of such nature were used that the children would be able to answer through their own observation of environmental phenomena.

1. **Sources of Test Items.** To increase the reliability of this test, questions and suggestions were obtained from the following sources:

   - State High School Tests in General Science for Indiana.
   - The following unpublished Master's Theses of Indiana State Teachers College:
     - Thesis 137--Dixon, Napoleon, *An Objective Test in Biology*

2. **Description of the Test.** The science test consisted of 156 multiple response objective type items including 46 biology questions, 25 agricultural questions, 24 physiology questions, 32 physics questions, 16 chemistry questions, and 22 questions of a miscellaneous nature.

   These items were arranged without regard to uniformity of subject-matter grouping.

   As an aid in later arrangement and classification of data, a one-page questionnaire was placed at the beginning of the test.

3. **Administration of Test.** In order to place this study upon a comparative basis, the writer administered this
test to groups of urban and rural children in Vanderburgh and Posey Counties December, 1935, and January, 1936. The following schools cooperated in making this study possible: Cynthiana, Wadesville, New Harmony, and Mt. Vernon High School of Posey County and Reitz High School at Evansville in Vanderburgh County. From data obtained on the preliminary page of the test, rural and urban groups were distinguished. The children from Reitz and Mt. Vernon High Schools were classified as rural or urban on the basis of distance from the schools and the nature of the parental occupation. The children of the remaining schools were considered as belonging to the rural group.

Since motor ability and reaction time of response differ in individuals, no time limit was set for the science test but pupils were given all the time they desired in making responses.

4. Obtaining a Common Measure. In order to have a commonly accepted standard to use as a basis of classification and grouping, the Otis Self-Administering Test of Mental Ability, Higher Examination: Form A was used to divide the country and city children into two groups. The one group consisted of those having an intelligence quotient of 100 and above, and the other of those having an intelligence quotient below 100.
II. ORGANIZATION AND ANALYSIS OF DATA

A. SIMILAR STUDIES AND INVESTIGATIONS

While the following studies are not of exactly the same nature, as is the problem presented in this thesis, they may be said to be rather closely related to the subject at hand. Only such facts and conclusions which seemed to be most pertinent to the problems of this study were stated.

1. Adelin W. Scott.¹ This author made a very comprehensive summary of studies made from 1916 to 1927, which are psychological in nature and based on intelligence tests. She states that both the number and types of studies has been governed by the development of tests and their statistical evaluation.

These studies show the following results in the comparison of differences in environments and occupations:

a. The occupations of men and the occupations of children's parents tended to affect the scores on the tests of each, those of the professional group ranking highest and those of the unskilled group ranking lowest.

b. The present intelligence test seems to be a better measure of the people of occupations

¹Adelin W. Scott, A Comparative Study of Responses of Children of Different Nationalities and Environments on Intelligence and Achievement Tests, pp. 1-30.
high in the scale than those low in the scale.

In her own study, her problem was to determine the effect upon responses to intelligence and achievement tests when (1) the nationalities of the subjects are different and the environments are similar; (2) the nationality is the same and the environments are different (3) the nationalities are mixed and the environments are similar; and (4) the parents of the subjects are engaged in different occupations.

She used the National Intelligence Test and the Stanford Achievement Test. Data for her study were collected in the El Paso, Texas, City Schools and also taken from the Texas Educational Survey.

The following conclusion was reached:

a. The children of professional and town groups make better scores on intelligence tests than do children of laboring and rural groups.

2. W. H. Pyle and P. E. Collings. These men made a study of the mental and physical development of rural children. It included the entire school population, ages eight to eighteen, of a Missouri county, including over 2,000 children. The mental tests were given in the fall of 1916, and the physical measures made in the fall of 1917.

In the mental tests there was found to be a greater difference between city and country boys in favor of the

---

city than between city and country girls. It therefore follows that the country girl shows up more favorably mentally than does the country boy.

The question arises as to what extent the tests measure native capacity, and to what extent the effects of school training and other environmental influences bear upon the responses made on the tests. The mental tests used measure efficiency in various types of performance. This efficiency is determined by various factors, of which hereditary native capacity is one, and in the opinion of the writers, the most important.

They also state the following factors as being the probable explanation of the superiority of city children:

a. The city children were on the average of better stock than the country children.

b. The environment of the city hastens mental development much as it seems to hasten certain aspects of physical development, as is indicated by the greater muscular speed of city children.

c. The better teachers and schools of the city give the city children a training that enables them to understand better what is expected of them in the tests and to try to do their very best on them. This was especially true in the case of the young children where the difference between country and city children was found to be the greatest.
A scholarship contest for eighth-grade pupils was sponsored by the Kansas Teachers College of Emporia. Fifty-three counties in Kansas conducted contests in April, 1930. Scores of 3,552 pupils were reported for consideration for the state awards.

Contestants competed in two divisions. Division A was open to pupils from nine-months grade schools in villages and cities; Division B, to pupils from eight-months schools in rural districts. Both divisions took the same tests. A school was most generally represented by one or two contestants, but in a few cases all eighth-grade pupils in the county took the tests. The tests included questions on the following subjects: arithmetic, civics, history, English, reading, and spelling. Each test was of the objective type with true-false, multiple-choice, or completion-type questions. The items selected covered significant phases of the subject-matter, and all items were considered to be appropriate for eighth-grade pupils. The final score for each pupil was the sum of the scores on the separate tests.

The following conclusions were reached:

a. The distribution of the scores of the 1,921 pupils in the graded school and of the 1,611 pupils in the rural schools were somewhat the same, except that the measures of central tendency are higher in the former group.
b. The two groups were also alike in variability, although there is a slight advantage in favor of the rural school group.

c. When the scores of the highest 31 per cent of the pupils were compared, the quartile scores of the pupils in the graded schools were higher than those of the pupils in the rural schools. The mean scores of the pupils in the graded schools were higher in every subject than those of the pupils in the rural schools. The fact that the standard deviations for the two divisions were very close indicated that the variability of the two groups was practically the same. The differences in percentages based on the quartile scores of Division B were in favor of Division A in every subject. The differences were greatest in the fundamental subjects--arithmetic, reading and spelling--and less noticeable in civics, English and history. This fact might indicate that the advantage of the pupils in the nine-months schools is greatest in the first years of school, when the fundamentals are being acquired--an advantage that is retained through the elementary grades.

4. L. S. Pressey and J. B. Thomas. These investigators made a study of 270 country children in a poor rural district of southern Indiana, and of 288 country children.

---

in a fairly good agricultural district in the central part of the state. Special difficulties qualifying the findings, such as language handicaps were not encountered. The situation presented a mingling of agriculture and small scale industry. The Benet and Point Scales were used for testing purposes. A previous study made by S. L. Pressey and G. F. Teter, compared 1,022 colored children of the grades with 2,800 white children of the grades.

In the study made by L. S. Pressey and J. B. Thomas, the writers compared, by means of a mental test, the school children of the two rural districts with the city children used in the previous study. For children ages 10-13 it was found that 20 per cent of the children in the poor district rated above the medians for the city children as compared with 36 per cent in the better district; 6 per cent in the poorer district score above the 75 percentile for the city children, as compared with 11 per cent in the better district; 48 per cent in the poorer district rate below the 25 percentile for the city children, as compared with 28 per cent in the better district.

The final conclusions reached were as follows:

a. A group of unselected country children rate about a year and a half below city children in mental age.

---

b. Analysis by test shows nothing that could be considered distinctive.

c. The children in a good farming district rated above children in a poor farming district.

d. It is urged that the usual type of intelligence test does not give adequate measures of the ability of country children; performance tests and materials more relevant to their environment are needed.

5. G. A. Fukuda. Fukuda made a survey of 257 school children of the Washington School, Evanston, Illinois, 1923, to ascertain the intelligence norms and their relations to nationality, school training, and environment, factors commonly regarded as having a direct bearing upon the intelligence of the children. The nationalities represented were United States (white), 78; United States (colored), 6; Canada, 2; England, 19; Scotland, 3; Ireland, 1; Sweden, 63; Poland, 27; Germany, 25; Norway, 11; Greece, 6; Bohemia, 4; Russia, 3; Russian-Jew, 3; Italy, 2; Denmark, 2; Holland, 1; Mexican, 1. The Terman Revised Benet-Simon Individual Test was used.

The following conclusions were reached:

a. Both the median and the average scores of the intelligence quotients of the total school children (257) was 93.

---

b. The English speaking class scores higher than the non-English speaking class, with a difference of 4 points in both the median and average scores.

c. Those whose parents are engaged in so-called "brain and skilled" work score higher than those whose parents are of other occupations. To put this relation in terms of the average I. Q., it may be said that there is a difference of 13 points between business and office work and unskilled labor, and that there is also a difference of 5 points between the class of skilled labor and that of unskilled labor.

d. The English speaking people are engaged more in the occupations of "brain and skilled" work and less in unskilled labor than the non-English speaking class.

e. The English speaking class gets higher environment scores than the non-English speaking class, the difference being 2 points.

f. The coefficient of correlation between the intelligence quotients and the environment scores is not low, being 53.

g. From these facts it may be concluded that there exists a rather close relationship between intelligence, nationality and environment. High I. Q., high environment score, and brain work go with the people of the English speaking class, and the reverse is true with those of the non-English speaking class.

From the above Fukuda found that a decidedly high I. Q. was held by children whose parents are
engaged in business or office work, and that a low I. Q. was held by the children whose parents are engaged in unskilled labor or peddling. He concluded that a close relationship exists between intelligence, nationality, and environment.

B. PRESENTATION OF DATA

1. General Treatment of Data. No effort was made to separate the scores made by girls from those made by boys in either the city or country group. Since the compulsory school law of Indiana requires school attendance until the age of sixteen, the group responding to the tests, was on an average a typical nine-B group found throughout Indiana.

Although there was no definite time limit placed upon the science test, some of the pupils in the Reitz school failed to complete the test. Only those subject scores which were complete were used, thereby accounting for the variety in the number of those participation in the various science subjects included in the test. Of the total 187 country children who participated in the test, 166 completed it. Two hundred thirty-six city children participated in the test, 153 completing the entire test.

Interesting facts were revealed by the personal data compiled from the information gained on the preliminary sheet of the science test. These will be fully explained in tables at the close of this chapter.

The groups, both country and city, were divided according to the quotients made on the Otis Intelligence Test, or those having an I. Q. of 100 and above and those having an I. Q. below 100.
Another group of 36 children was formed from both of the groups participating in the test and called strictly country and strictly city divisions. These were chosen on basis of their I. Q. That is, the same number of children having an I. Q. of say 110, 115, etc., in the city group were matched by the same number of children having an I. Q. of say 110, 115, etc., in the country group. The writer felt that this would be an added check on environmental influences and add reliability to the interpretation of responses made by the larger group in either the city or country section.

The science test was divided into two forms, A and B on the following basis:

**Biological Sciences:**

<table>
<thead>
<tr>
<th>Biology</th>
<th>Form A (Questions 1-23)</th>
<th>23</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Form B (Questions 1-23)</td>
<td>23</td>
</tr>
</tbody>
</table>

**Physiology**

<table>
<thead>
<tr>
<th>Physiology</th>
<th>Form A (Questions 24-27)</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Form B (Questions 24-44)</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25</td>
</tr>
</tbody>
</table>

**Agriculture**

<table>
<thead>
<tr>
<th>Agriculture</th>
<th>Form A (Questions 28-38)</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Form B (Questions 45-57)</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24</td>
</tr>
</tbody>
</table>

\*A copy of the science test is to be found in the appendix.*
Physical Sciences:

Physics

Form B (Questions 58-89) 32

Chemistry

Form B (Questions 90-105) 16 48

Miscellaneous

Form B (Questions 106-127) 22 22 165

The entire test comprised 165 questions.

2. Statistical Treatment of Data. The writer used the generally accepted statistical methods as recommended by Tiegs and Garrett for the comparison of the groups used in the study. These measures consisted of: (1) the mean (2) the standard deviation (3) the difference between the two means of the two groups being compared (4) the standard error of the mean (5) the standard error of the differences between the two means.

In order to be entirely certain that there is a real difference in the merit of the two groups being compared, the difference between the means should be at least three times as great as the standard error of the difference of the two means. If the difference between the two means is

---

8 These questions were of such a nature, that they could not be fitted into the two previously mentioned divisions, but were felt to have enough value to be included in the list of questions.
9 Ernest W. Tiegs, Tests and Measurements for Teachers, pp. 222-236.
three times as great or greater, then the chances are that in every hundred out of every hundred the merit of the difference between the two groups is real. If the same groups were tested indefinitely, the designated higher group would always be superior.

3. Explanation of Specific Table Headings.

a. **Locality.** This column designates the location of the groups considered in the following tables.

b. **Number.** The figures under the number heading specify the number of pupils considered in each group.

c. **I. Q.** The children were grouped in this section according to their rating on the Otis Intelligence Test.

d. **Mean Score.** This may be explained as the arithmetic mean or statistical average.

e. **Difference of the Mean.** This is found by finding the difference between the two mean scores explained immediately above.

f. **In Favor of.** This column designates which group, country or city, received the largest mean score in the test designated.

g. **D.** "D" represents the difference between the two means discussed in the above explanation. 

**Ed** represents the standard error of the differences between the two means of the two groups being considered. This is found by adding the squares of the
standard error of means of the two groups compared plus the extraction of the square root of the sum of the two squares.

h. **Significant Ratio.** This column represents the answer obtained by the division of "D" by "Ed", in the previous column. If this ratio is 3, it signifies that the test taken is perfectly reliable in measuring what it is intended to measure and any number greater than 3 shows added reliability.

i. **Chances in 100.** If this test were given indefinitely, and the significant ratio were 3 or more, one hundred out of every hundred the results would favor the group designated higher in these tables.

These statements are to be considered in the study of the Tables I to X inclusive.
### TABLE I

**COMPARATIVE STUDY OF THE SCIENCE SCORES IN BIOLOGY**

<table>
<thead>
<tr>
<th>Locality</th>
<th>No.</th>
<th>I. Q.</th>
<th>Mean Score</th>
<th>Dif. in Mean</th>
<th>In favor of</th>
<th>D</th>
<th>Sig. Ratio</th>
<th>Chances in 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>94</td>
<td>100 &amp; above</td>
<td>36.14</td>
<td>3.54</td>
<td>Country</td>
<td>3.54</td>
<td>5.90</td>
<td>100</td>
</tr>
<tr>
<td>City</td>
<td>127</td>
<td>100 &amp; above</td>
<td>36.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strictly Country</td>
<td>36</td>
<td>100 &amp; above</td>
<td>35.60</td>
<td>4.40</td>
<td>Country</td>
<td>4.40</td>
<td>3.92</td>
<td>100</td>
</tr>
<tr>
<td>Strictly City</td>
<td>36</td>
<td>100 &amp; above</td>
<td>31.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>93</td>
<td>below 100</td>
<td>34.42</td>
<td>4.78</td>
<td>Country</td>
<td>4.78</td>
<td>6.63</td>
<td>100</td>
</tr>
<tr>
<td>City</td>
<td>109</td>
<td>below 100</td>
<td>29.64</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strictly Country</td>
<td>36</td>
<td>below 100</td>
<td>32.04</td>
<td>3.22</td>
<td>Country</td>
<td>3.22</td>
<td>2.95</td>
<td>100</td>
</tr>
<tr>
<td>Strictly City</td>
<td>36</td>
<td>below 100</td>
<td>28.82</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This table presents the data concerning the responses given on the biology division of the science test: Form A, questions 1-23; Form B, questions 1-23; making a total of 46 questions. The significant ratio of 5.90 in the groups having an I. Q. of 100 and above, indicates that this country group will always be superior to the city group in the biological knowledge. The same remarks may be made regarding the groups having an I. Q. below 100. While the significant ratios designated in the strictly country and strictly city groups are not as significant as the results previously stated, this may be explained by the small number of cases (36) considered.
TABLE II
COMPARATIVE STUDY OF THE SCIENCE SCORES
IN PHYSIOLOGY

<table>
<thead>
<tr>
<th>Locality</th>
<th>No.</th>
<th>I. Q.</th>
<th>Mean Score</th>
<th>Dif. in Mean</th>
<th>In favor of</th>
<th>D Ed</th>
<th>Sig. Ratio</th>
<th>Chances in 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>94</td>
<td>100 &amp; above</td>
<td>22.18</td>
<td></td>
<td>1.38</td>
<td>Country</td>
<td>1.38</td>
<td>4.60</td>
</tr>
<tr>
<td>City</td>
<td>127</td>
<td>100 &amp; above</td>
<td>20.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strictly</td>
<td>36</td>
<td>100 &amp; above</td>
<td>22.36</td>
<td></td>
<td>1.62</td>
<td>Country</td>
<td>1.62</td>
<td>2.45</td>
</tr>
<tr>
<td>Country</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City</td>
<td>36</td>
<td>100 &amp; above</td>
<td>20.74</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>95</td>
<td>below 100</td>
<td>19.48</td>
<td></td>
<td>.94</td>
<td>Country</td>
<td>.94</td>
<td>2.18</td>
</tr>
<tr>
<td>City</td>
<td>109</td>
<td>below 100</td>
<td>16.94</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strictly</td>
<td>36</td>
<td>below 100</td>
<td>19.82</td>
<td></td>
<td>1.08</td>
<td>Country</td>
<td>1.08</td>
<td>1.68</td>
</tr>
<tr>
<td>Country</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City</td>
<td>36</td>
<td>below 100</td>
<td>18.74</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This table presents the data in the physiology division of the science test: Form A, question 24-27; Form B, questions 24-44, making a total of 25 questions. The significant ratio of 4.60 signifies that this country group will always be considered as being superior in the physiological knowledge considered in the test. While a significant ratio of 2.18 is not absolutely reliable the chances being 98 in 100, any results obtaining chances above 98 are worthy of consideration. The small number of cases in the strictly country and strictly city group lessens the reliability in these instances.
TABLE III
COMPARATIVE STUDY OF THE SCIENCE SCORES
IN AGRICULTURE

<table>
<thead>
<tr>
<th>Locality</th>
<th>No.</th>
<th>I. Q.</th>
<th>Mean Score</th>
<th>Dif. in Mean</th>
<th>In Favor of</th>
<th>D / Ed</th>
<th>Sig. Ratio</th>
<th>Chances in 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>94</td>
<td>100 &amp; above</td>
<td>17.10</td>
<td>2.13</td>
<td>Country</td>
<td>2.13</td>
<td>.36</td>
<td>5.63</td>
</tr>
<tr>
<td>City</td>
<td>127</td>
<td>100 &amp; above</td>
<td>14.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strictly</td>
<td>36</td>
<td>100 &amp; above</td>
<td>17.88</td>
<td>5.32</td>
<td>Country</td>
<td>5.32</td>
<td>.85</td>
<td>6.25</td>
</tr>
<tr>
<td>Country</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City</td>
<td>36</td>
<td>100 &amp; above</td>
<td>12.56</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>93</td>
<td>below 100</td>
<td>14.40</td>
<td>2.00</td>
<td>Country</td>
<td>2.00</td>
<td>.43</td>
<td>4.65</td>
</tr>
<tr>
<td>City</td>
<td>109</td>
<td>below 100</td>
<td>12.40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strictly</td>
<td>36</td>
<td>below 100</td>
<td>15.26</td>
<td>3.82</td>
<td>Country</td>
<td>3.82</td>
<td>.74</td>
<td>5.16</td>
</tr>
<tr>
<td>Country</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City</td>
<td>36</td>
<td>below 100</td>
<td>11.44</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A consideration of data presented in this table reveals the results of the responses given on the agriculture division of the science test: Form A, questions 28-38; Form B, questions 45-57, making a total of 24 questions. The significant ratios reveal the fact that the country group are outstandingly superior in the agricultural knowledge presented in the science test. Although the significant ratio presented by the strictly country and the strictly city group are reliable, the small number used must be taken into consideration.
### TABLE IV

**COMPARATIVE STUDY OF THE SCIENCE SCORES IN PHYSICS**

<table>
<thead>
<tr>
<th>Locality</th>
<th>No.</th>
<th>I. J.</th>
<th>Mean Score</th>
<th>Dif. in Mean</th>
<th>In Favor of</th>
<th>$\frac{D}{E_d}$</th>
<th>Sig. Ratio</th>
<th>Chances in 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>91</td>
<td>100 &amp; above</td>
<td>25.21</td>
<td>.61</td>
<td>Country</td>
<td>$\frac{.61}{.50}$</td>
<td>1.22</td>
<td>88.5</td>
</tr>
<tr>
<td>City</td>
<td>112</td>
<td>100 &amp; above</td>
<td>24.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strictly</td>
<td>36</td>
<td>100 &amp; above</td>
<td>24.06</td>
<td>1.06</td>
<td>Country</td>
<td>$\frac{1.06}{.85}$</td>
<td>1.24</td>
<td>88.7</td>
</tr>
<tr>
<td>Country</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City</td>
<td></td>
<td></td>
<td>23.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strictly</td>
<td>36</td>
<td>100 &amp; above</td>
<td>23.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>88</td>
<td>below 100</td>
<td>21.42</td>
<td>1.40</td>
<td>City</td>
<td>$\frac{1.40}{.85}$</td>
<td>2.15</td>
<td>98.5</td>
</tr>
<tr>
<td>City</td>
<td>94</td>
<td>below 100</td>
<td>22.82</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strictly</td>
<td>36</td>
<td>below 100</td>
<td>21.50</td>
<td>.74</td>
<td>City</td>
<td>$\frac{.74}{.84}$</td>
<td>.86</td>
<td>80.5</td>
</tr>
<tr>
<td>Country</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City</td>
<td></td>
<td></td>
<td>22.24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strictly</td>
<td>36</td>
<td>below 100</td>
<td>22.24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This table deals with the responses given on the physics division of the science test: Form B, questions 58-89, making a total of 32 questions. The only instance of reliability worthy of consideration in this table is presented by the significant ratio of 2.15 in favor of the city group. Any instance in which the chances in 100 are less than 95 the results of the test are too variable for adequate judgment. Were this test again presented to the same group the results obtained might favor the opposite group. The small number considered in the strictly country and strictly city groups may partly account for the extreme variability in these instances.
<table>
<thead>
<tr>
<th>Locality</th>
<th>No.</th>
<th>I. Q.</th>
<th>Mean Score</th>
<th>Dif. in Mean</th>
<th>In Favor of</th>
<th>D ( \text{Ed} )</th>
<th>Sig. Ratio</th>
<th>Chances in 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>87</td>
<td>100 &amp; above</td>
<td>13.08</td>
<td>.10</td>
<td>Country</td>
<td>.10</td>
<td>1.00</td>
<td>84</td>
</tr>
<tr>
<td>City</td>
<td>98</td>
<td>100 &amp; above</td>
<td>12.98</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strictly</td>
<td>36</td>
<td>100 &amp; above</td>
<td>12.74</td>
<td>.64</td>
<td>Country</td>
<td>.64</td>
<td>.95</td>
<td>83</td>
</tr>
<tr>
<td>Country</td>
<td>85</td>
<td>below 100</td>
<td>11.08</td>
<td>.72</td>
<td>Country</td>
<td>.72</td>
<td>1.80</td>
<td>96</td>
</tr>
<tr>
<td>City</td>
<td>73</td>
<td>below 100</td>
<td>10.36</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strictly</td>
<td>36</td>
<td>below 100</td>
<td>11.22</td>
<td>.40</td>
<td>City</td>
<td>.40</td>
<td>.74</td>
<td>76.3</td>
</tr>
</tbody>
</table>

This table presents the responses given on the chemistry division of the science test: Form B, questions 58-89, making a total of 32 questions. The extreme variability presented by the significant ratios makes prediction concerning the outcome impossible even though the same test were presented to the same group an indefinite number of times. Previous remarks concerning the strictly country and strictly city could be again stated in the consideration of this table.
TABLE VI
COMPARATIVE STUDY OF THE SCIENCE SCORES
IN MISCELLANEOUS ITEMS

<table>
<thead>
<tr>
<th>Locality</th>
<th>No.</th>
<th>I. Q.</th>
<th>Mean Score</th>
<th>Dif. in Favor of Mean</th>
<th>( \frac{D}{E_d} )</th>
<th>Sig. Ratio</th>
<th>Chances in 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>85</td>
<td>100 &amp; above</td>
<td>17.12</td>
<td>.90 Country</td>
<td>.90</td>
<td>.25</td>
<td>99</td>
</tr>
<tr>
<td>City</td>
<td>94</td>
<td>100 &amp; above</td>
<td>16.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strictly Country</td>
<td>36</td>
<td>100 &amp; above</td>
<td>17.38</td>
<td>2.34 Country</td>
<td>2.34</td>
<td>3.65</td>
<td>100</td>
</tr>
<tr>
<td>Strictly City</td>
<td>60</td>
<td>100 &amp; above</td>
<td>15.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>80</td>
<td>below 100</td>
<td>14.00</td>
<td>1.82 Country</td>
<td>1.82</td>
<td>3.03</td>
<td>100</td>
</tr>
<tr>
<td>City</td>
<td>60</td>
<td>below 100</td>
<td>13.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strictly Country</td>
<td>36</td>
<td>below 100</td>
<td>15.10</td>
<td>2.32 Country</td>
<td>2.32</td>
<td>3.62</td>
<td>100</td>
</tr>
<tr>
<td>Strictly City</td>
<td>36</td>
<td>below 100</td>
<td>12.78</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This table considers the responses given on the miscellaneous division of the science test: Form B, questions 90-105, making a total of 16 questions. The significant ratios presented in this table reveal the fact that the country group is superior in the knowledge presented by the miscellaneous items in the science test. Even though the significant ratio of 2.25 is not absolutely reliable, the chances being 99 in 100; any results obtaining chances above 98 are worthy of consideration. Previous remarks concerning strictly country and strictly city group may be again stated in the consideration of the above table.
TABLE VII

COMPARATIVE STUDY OF INTELLIGENCE QUOTIENTS OF THOSE HAVING HAD PREVIOUS SCIENCE CONTACTS IN SCHOOL

<table>
<thead>
<tr>
<th>Contact With:</th>
<th>No.</th>
<th>Mean Score</th>
<th>Dif. in Mean</th>
<th>In Favor of</th>
<th>D/Ed</th>
<th>Sig. Ratio</th>
<th>Chances in 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Science Only</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>52</td>
<td>101.75</td>
<td>2.80</td>
<td>City</td>
<td>2.80</td>
<td>1.78</td>
<td>96</td>
</tr>
<tr>
<td>City</td>
<td>99</td>
<td>104.55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biology &amp; General Science</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>62</td>
<td>99.80</td>
<td>.35</td>
<td>City</td>
<td>.35</td>
<td>.14</td>
<td>55</td>
</tr>
<tr>
<td>City</td>
<td>22</td>
<td>100.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biology Only</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>31</td>
<td>101.90</td>
<td>1.30</td>
<td>City</td>
<td>1.30</td>
<td>.47</td>
<td>68</td>
</tr>
<tr>
<td>City</td>
<td>7</td>
<td>103.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neither General Science nor Biology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>21</td>
<td>97.50</td>
<td>4.30</td>
<td>City</td>
<td>4.30</td>
<td>1.43</td>
<td>92.6</td>
</tr>
<tr>
<td>City</td>
<td>25</td>
<td>101.30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This table presents a comparison of the I. Q.'s made by the country and city groups according to their previous science contacts in school. In order to make all possible checks on the data collected the writer felt it necessary to check on any science contacts which the pupils may have had during their school life. The data for these tables were collected by adding questions on the preliminary data sheet for the necessary information presented in the above table. It was found, after tabulation and consideration of the material presented, that no valid conclusions could be drawn, because of the number of cases in some of the groups considered.
TABLE VIII

COMPARATIVE STUDY OF SCIENCE SCORES ACCORDING TO PREVIOUS SCIENCE CONTACTS IN SCHOOL

<table>
<thead>
<tr>
<th>Contact With:</th>
<th>No.</th>
<th>Mean Score</th>
<th>Dif. in</th>
<th>In Favor of</th>
<th>$\frac{D}{Ed}$</th>
<th>Sig. Ratio</th>
<th>Chances in 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Science Only</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>52</td>
<td>116.00</td>
<td>8.90</td>
<td>Country</td>
<td>8.90</td>
<td>3.70</td>
<td>100</td>
</tr>
<tr>
<td>City</td>
<td>99</td>
<td>107.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biology &amp; General Science</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>62</td>
<td>112.95</td>
<td>2.40</td>
<td>City</td>
<td>2.40</td>
<td>5.43</td>
<td>69</td>
</tr>
<tr>
<td>City</td>
<td>22</td>
<td>109.45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biology Only</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>31</td>
<td>112.05</td>
<td>8.15</td>
<td>Country</td>
<td>8.15</td>
<td>1.63</td>
<td>94.5</td>
</tr>
<tr>
<td>City</td>
<td>7</td>
<td>103.90</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neither General Science nor Biology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>21</td>
<td>105.85</td>
<td>7.75</td>
<td>Country</td>
<td>7.75</td>
<td>1.55</td>
<td>93.5</td>
</tr>
<tr>
<td>City</td>
<td>23</td>
<td>98.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This table lists responses of the group having completed the entire science test. This was done according to previous science contacts in order to check upon any previous influence of a scientific nature. The writer attaches no special significance to the facts presented by the data except the first item in the table. The remaining results obtained are not considered reliable because of the small numbers in some of the groups.
TABLE IX

COMPARATIVE STUDY OF THE INTELLIGENCE QUOTIENTS
OF THE ENTIRE GROUP TAKING
THE SCIENCE TEST

<table>
<thead>
<tr>
<th>Locality</th>
<th>No.</th>
<th>Mean Score</th>
<th>Dif. in Mean</th>
<th>In favor of</th>
<th>$D_{Ed}$</th>
<th>Sig. Ratio</th>
<th>Chances in 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>187</td>
<td>99.90</td>
<td>1.85</td>
<td>City</td>
<td>1.85</td>
<td>6.16</td>
<td>100</td>
</tr>
<tr>
<td>City</td>
<td>236</td>
<td>101.75</td>
<td></td>
<td></td>
<td>.30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This table considers the responses given on the Otis Intelligence Test by the entire group completing the science test and also the responses given on the Otis Intelligence Test by the entire group taking the science test. The significant ratio 6.16 reveals the fact that the city group would always be superior on the intelligence test even though these groups were tested repeatedly.
TABLE X

COMPARATIVE STUDY OF THE SCORES OF THOSE HAVING COMPLETED THE ENTIRE SCIENCE TEST

<table>
<thead>
<tr>
<th>Locality</th>
<th>No.</th>
<th>Mean Score</th>
<th>Dif. in Mean</th>
<th>If Favor of</th>
<th>D</th>
<th>Sig.</th>
<th>Chances in 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>166</td>
<td>112.85</td>
<td>6.35</td>
<td>Country</td>
<td>6.35</td>
<td>3.34</td>
<td>100</td>
</tr>
<tr>
<td>City</td>
<td>153</td>
<td>106.50</td>
<td></td>
<td></td>
<td>1.90</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This table lists the responses made by the entire group completing the science test. The significant ratio of 3.34, indicates that in all cases the above group of country children would be superior to the city children considered, even though tested repeatedly on material similar to the science test used by this writer.
FIGURE 1

A comparison of the responses made on the Otis Intelligence Test of the entire group taking the science test.

The city group of 236 pupils shows a higher rating on the Intelligence test.

The median of the entire city group is 101.38.

The median of the entire country group is 98.59.
Figure 1
Intelligence Quotients on Otis Intelligence Test
9-3 Pupils

.........City
___________Country
FIGURE 2

A comparison of the responses made on the science test by those completing the entire test.

The country group of 166 pupils completing the science test shows a higher rating on the test.

The median of the city group completing the science test was 107.32.

The median of the country group completing the science test was 113.33.
Figure 2

Complete Scores on Science Test

9-B Pupils

............City

_________Country
C. PERSONAL DATA

The following tables and explanations present the material compiled from the responses made on the preliminary sheet of the science test. They may be considered as side studies of this thesis but were considered important and interesting enough to warrant inclusion.

Table XI deals with the occupations of the parents of the children considered in this study. When no father was listed, the mother was considered the supporter of the family.

The largest group classified under the country grouping is presented by the agricultural section.

Many of the pursuits of parents classified under the country grouping are of an industrial or city nature. These may be classed as commuters, that is, living in the country but being employed in a nearby town or city. Although their occupation may be classed as being of a city type, the family interests may be considered predominantly country, as the results from the science test seem to indicate.

The largest groups classified under the city grouping are found under the manufacturing and mechanical industries, this section having a total of 75 parents, and trade which totals 31 parents and transportation and communication, listing 37 parents.
### TABLE XI

**OCCUPATION OF PARENTS**

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Country</th>
<th>City</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AGRICULTURE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dairymen</td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Farm Hands</td>
<td>4</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Farmers</td>
<td>82</td>
<td></td>
<td>82</td>
</tr>
<tr>
<td>Orchardists</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Park Workers</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Truck Gardeners</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>91</td>
<td>91</td>
<td></td>
</tr>
<tr>
<td><strong>CLERICAL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secretary</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>DOMESTIC AND PERSONAL SERVICE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barbers</td>
<td>3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Bartenders</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Elevator Tenders</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>First Aid Men</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Janitors</td>
<td>3 8</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Launderers</td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

11 Statistical Abstract of the United States, pp. 53-64, was used in classifying the occupations of the parents.
### TABLE XI (Continued)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil Station Tenders</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Restaurant Operators</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Rooming House Operators</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Tourist Camp Operators</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Waiters</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>13</td>
<td>14</td>
<td>27</td>
</tr>
</tbody>
</table>

**EXTRACTION OF MINERAL**

| Miners, coal                        | 1   | 4   | 5   |

**MANUFACTURING AND MECHANICAL INDUSTRIES**

<p>| Bakers                              | 1   | 2   | 3   |
| Boiler Makers                       |     | 2   | 2   |
| Brewers                             |     | 2   | 2   |
| Broom Makers                        |     | 1   | 1   |
| Cabinet Makers                      | 1   | 2   | 3   |
| Carpenters                          |     | 5   | 7   |
| Concrete Workers                    |     |     | 1   |
| Electricians                        |     | 4   | 4   |
| Factories, Baby Food                |     | 4   | 3   |
| Factories, Cigar                    |     | 5   | 5   |
| Factories, Cotton                   |     | 1   | 1   |
| Factories, Furniture                | 1   | 5   | 6   |
| Factories, Germent                  |     | 2   | 2   |</p>
<table>
<thead>
<tr>
<th>Occupation</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factories, Flow Works</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Firemen</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Foremen</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Foundry Workers</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Machinists</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Manufacturing executives</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Meat curers</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Mechanics</td>
<td>4</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>Metal workers</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Moulders</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Night watchmen</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Pattern cutters</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Painters</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Printers</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Splicers</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Steel Construction workers</td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Stone cutters</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Superintendent of factories</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Tailors</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Tool makers</td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Time keepers</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Upholsters</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Welders</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Wheel wrights</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28</strong></td>
<td><strong>76</strong></td>
<td><strong>104</strong></td>
</tr>
<tr>
<td>PROFESSIONAL SERVICE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Architects</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Engineers, technical</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Ministers</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Nurses</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Physicians</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Teachers</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Veterinary surgeons</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>8</td>
<td>5</td>
<td>13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PUBLIC SERVICE</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditors</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Laborers, state road</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Policemen</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Waterworks, public utilities</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3</td>
<td>8</td>
<td>11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Agents, Insurance</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Butchers</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Clerks</td>
<td>2</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>Coal dealers</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Contractors, road</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Garage mechanics</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Grain elevators</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Occupation</td>
<td>Male</td>
<td>Female</td>
<td>Total</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------</td>
<td>--------</td>
<td>-------</td>
</tr>
<tr>
<td>Grocers</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Icemen</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Inspectors</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Machine shops</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Millers</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Pharmacists</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Poultry house</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Salesmen</td>
<td>6</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>Seamstresses</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Stores, General</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>13</td>
<td>31</td>
<td>44</td>
</tr>
</tbody>
</table>

**TRANSPORTATION AND COMMUNICATION**

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus Drivers</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Conductors</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Dredge Boat Operators</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Express Agents</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ferrymen</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Mail Carriers</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Postmasters</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Railroad Foremen</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Railroad Workers, General</td>
<td>2</td>
<td>23</td>
<td>25</td>
</tr>
<tr>
<td>Telegraph Operators</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Truck Drivers</td>
<td>3</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>13</td>
<td>37</td>
<td>50</td>
</tr>
<tr>
<td>MISCELLANEOUS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>-------</td>
<td>-------</td>
<td>-----</td>
</tr>
<tr>
<td>Housekeeper</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Labor, unspecified</td>
<td>23</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>9</td>
<td>15</td>
<td>24</td>
</tr>
<tr>
<td>No parent mentioned</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>P. W. A.</td>
<td>3</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>61</td>
<td>77</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNCLASSIFIED</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bakers</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Bookkeepers</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Bottle Company workers</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Factory, cigar</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Factory, garment</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Hose workers</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Report Clerks</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Hominy Mill workers</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Secretaries</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Seamstresses</td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>11</td>
<td>16</td>
</tr>
</tbody>
</table>
The apparent sparsity of parents listed under professional service may be explained by the fact that Mt. Vernon does not have a large number of professional people, and Reitz High School at Evansville is mainly representative of the semi-skilled and workingman class of people.

The miscellaneous section lists such phases of occupation, or lack of occupation, which could not readily be included under any other heading of the table.

The unclassified section lists those instances in which the mother was also engaged in an occupation outside of the home.

In Table XII an effort was made to secure information as to whether or not the children were really contented with their present environment.

Of the 187 country children, 119 prefer their own country environment.

Of the 236 city children, 171 prefer their own city environment.

These data present a relative satisfaction with conditions afforded by their environment.

Table XIII submits the study preferences of the children considered in this study.

An inspection of the data presented reveals a rather close correlation of study preferences by the two groups, the outstanding exception being the science and social science preferences.

Many of both groups had two or more study preferences.
TABLE XII

DO THESE CHILDREN PREFER THEIR HOME ENVIRONMENT?

<table>
<thead>
<tr>
<th>Country</th>
<th>Frequencies</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live in the country and prefer the country</td>
<td>119</td>
<td>63.63</td>
</tr>
<tr>
<td>Live in the country but prefer the city</td>
<td>46</td>
<td>24.21</td>
</tr>
<tr>
<td>Have lived in the city but still prefer the country</td>
<td>14</td>
<td>7.48</td>
</tr>
<tr>
<td>Undecided</td>
<td>8</td>
<td>4.33</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>187</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>City</th>
<th>Frequencies</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live in the city and prefer the city</td>
<td>171</td>
<td>72.45</td>
</tr>
<tr>
<td>Live in the city but prefer the country</td>
<td>38</td>
<td>16.10</td>
</tr>
<tr>
<td>Have lived in the country but prefer the city</td>
<td>19</td>
<td>8.05</td>
</tr>
<tr>
<td>Undecided</td>
<td>8</td>
<td>3.34</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>236</strong></td>
<td></td>
</tr>
<tr>
<td>Subject</td>
<td>Country</td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>Frequencies</td>
<td>Per cent</td>
</tr>
<tr>
<td>Mathematics</td>
<td>75</td>
<td>40.10</td>
</tr>
<tr>
<td>English</td>
<td>65</td>
<td>35.75</td>
</tr>
<tr>
<td>Science</td>
<td>40</td>
<td>21.39</td>
</tr>
<tr>
<td>Home economics</td>
<td>18</td>
<td>9.62</td>
</tr>
<tr>
<td>Industrial arts</td>
<td>18</td>
<td>9.62</td>
</tr>
<tr>
<td>Foreign languages</td>
<td>17</td>
<td>9.09</td>
</tr>
<tr>
<td>Social science</td>
<td>12</td>
<td>6.41</td>
</tr>
<tr>
<td>Commerce</td>
<td>6</td>
<td>3.20</td>
</tr>
<tr>
<td>Physical education</td>
<td>3</td>
<td>1.60</td>
</tr>
<tr>
<td>Art</td>
<td>3</td>
<td>1.60</td>
</tr>
<tr>
<td>Music</td>
<td>2</td>
<td>1.06</td>
</tr>
<tr>
<td>None</td>
<td>13</td>
<td>6.95</td>
</tr>
</tbody>
</table>
The country group preferred mathematics, English and science above all other school subjects.

The city group preferred mathematics, English and social science above all other school subjects.

Table XIV is a consideration of the leisure time activities of the group of children included in this study.

Many of both groups had two or more preferences in the matter of leisure time activities.

Of the 187 country children, almost half preferred to spend at least a part of their time in some reading activity.

Of the 236 city children, 56 spent all or part of their time, outside of school hours, in some phase of work.

The miscellaneous group listed such items as listening to the radio, collecting stamps, collecting verses, and writing stories.

Table XV lists the miscellaneous contacts not otherwise listed in this study.

These factors were included on the sheet of personal data so as to serve as an added check on environmental influences.

Of the 187 country children, 61 read agricultural magazines of some nature.

Of the 236 city children, 24 said that they read agricultural magazines of some kind.

No significant conclusions could be drawn from the material here presented.
TABLE XIV
LEISURE TIME ACTIVITIES

<table>
<thead>
<tr>
<th>Activities</th>
<th>Country</th>
<th></th>
<th>City</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequencies</td>
<td>Per cent</td>
<td>Frequencies</td>
<td>Per cent</td>
</tr>
<tr>
<td>Read</td>
<td>97</td>
<td>51.87</td>
<td>104</td>
<td>44.06</td>
</tr>
<tr>
<td>Work</td>
<td>33</td>
<td>17.64</td>
<td>56</td>
<td>23.30</td>
</tr>
<tr>
<td>Sports, hunt, fish, athletics</td>
<td>17</td>
<td>9.09</td>
<td>32</td>
<td>13.13</td>
</tr>
<tr>
<td>Play</td>
<td>15</td>
<td>8.02</td>
<td>20</td>
<td>8.47</td>
</tr>
<tr>
<td>Play musical instruments</td>
<td>3</td>
<td>1.60</td>
<td>8</td>
<td>3.34</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>18</td>
<td>9.62</td>
<td>20</td>
<td>8.47</td>
</tr>
<tr>
<td>Nothing</td>
<td>12</td>
<td>6.41</td>
<td>10</td>
<td>4.23</td>
</tr>
<tr>
<td>None mentioned</td>
<td>7</td>
<td></td>
<td>15</td>
<td>6.35</td>
</tr>
</tbody>
</table>
TABLE XV
MISCELLANEOUS CONTACTS

<table>
<thead>
<tr>
<th>Nature of</th>
<th>Country</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequencies</td>
<td>Percent</td>
</tr>
<tr>
<td>Agricultural Magazine</td>
<td>61</td>
<td>32.62</td>
</tr>
<tr>
<td>Government Bulletin</td>
<td>43</td>
<td>22.99</td>
</tr>
<tr>
<td>4-H Club</td>
<td>37</td>
<td>19.78</td>
</tr>
<tr>
<td>Farm Bureau</td>
<td>32</td>
<td>17.11</td>
</tr>
<tr>
<td>Agricultural in the 7th or 8th Grade</td>
<td>30</td>
<td>16.04</td>
</tr>
</tbody>
</table>
III. GENERAL SUMMARY

A. FINDINGS
The writer presents the following items as the outcome of the data presented in this thesis:

1. The country groups had a superior rating on the biological science section of the science test, regardless of intelligence quotients, the greatest superiority being shown in the biology and agriculture divisions.

2. The physical science section of the science test presented results in favor of the city groups, but the significant ratio was too low to give reliability to the outcome.

3. The miscellaneous section of the science test was predominantly in favor of the country group.

4. The results of the science test as a whole showed that the country groups ranked as being superior.

5. The intelligence test quotients gave the city groups a superior rating.

6. The majority of the parents of the country groups are engaged in some agricultural pursuit.

7. The majority of the parents of the city groups are engaged in some manufacturing or industrial pursuit, trade or transportation and communication
8. The majority of the children are content in their home environments.

9. The study preferences of both the country and city groups may be considered as being almost similar.

10. Both the city and country groups of children have comparable leisure time interests.

B. CONCLUSIONS

After careful consideration of the data found in relation to the problems under consideration, the writer presents in conclusion the following question: Shall we judge a child solely either by achievement or intelligence testing?

1. The country groups investigated in this study made a superior ranking on the science test. This statement answers affirmatively one of the questions originally set up as problems for this study: Does environment influence subject matter knowledge? The country groups showed a superiority to that degree in which environmental influence seemed to predominate most. That is, biology, agriculture and the miscellaneous items presented the most striking differences between the city and country groups. The chemistry and physics sections rated neither as being superior, although the city group may be considered as having more contacts of this nature than the country group.

McIntosh and Schrammel found that city children rated better in the fundamental subjects of arithmetic, reading and
spelling while difference was less noticeable in civics, English and history. This they attribute to the better teaching of the fundamental subjects.¹

Pressey and Thomas state that material more relevant to the environment of country children are needed for measurement.²

While the country group which the writer studied made a higher rating on the science test, she hesitates to conclude that environment was the sole determining factor.

2. The city group investigated in this study made a superior showing on the intelligence test. This statement answers affirmatively one of the questions originally set up as a problem for this study: Do country children rate higher or lower than city children on intelligence tests? The writer presents this conclusion with considerable reservation and wishes to refer again to the previous studies quoted in Chapter I of this thesis.

Pyle and Collings question to what extent tests measure native capacity, school training and environmental influences. They also conclude that the environment of the city hastens mental development.³

Pressey and Thomas state that the usual type of intelligence tests does not give adequate measure of the ability of country children.⁴

¹ H. W. McIntosh and H. E. Schrammel, op. cit., pp. 301-6
² Pressey and Thomas, op. cit., pp. 283-286
³ Pyle and Collings, op. cit., pp. 534-59
⁴ Pressey and Thomas, op. cit., pp. 283-286
The previous studies considered in Chapter I all conclude that the children of people in professional occupations rate higher on intelligence than those lower in the occupational scale. The parental occupations of the pupils compared in this study may be considered as being on the same level for both country and city groups, since farming and similar agricultural pursuits may be classed as semi or unskilled labor. Yet the city group made a superior rating on the intelligence test given. The writer offers no positive explanation to this problem but in conclusion wishes to quote the following passage:

"A child's proficiency on intelligence tests is the complex resultant of a thousand intermingling factors. Besides the two essential items, the intelligence he has inherited and the age he has reached, a host of subsidiary conditions inevitably affect his score. Zeal, industry, good will, emotional stability, scholastic information, the accident of social class, the circumstance of sex—each and all these irrelevant influences, in one case propitious, improve or impair the final result."  

C. LIMITATION OF THE STUDY

Since the two groups considered in this study were so nearly equal in parental occupation, further investigation as to a comparison of a professional group along similar lines might be of some interest.

Finally, the writer wishes to quote the following statement:

"The only true education comes through the stimulation of the child's powers by the social

5C. Burt, Mental and Scholastic Tests, (London: King, 1921). p. 175
situation in which he finds himself. Through these demands he is stimulated to act as a member of a unity, to emerge from his original narrowness of action and feeling and to conceive of himself from the standpoint of the welfare of the group to which he belongs. Through the responses which others make to his own activities he comes to know what these mean in social terms."

IV. APPENDIX  
A. BIBLIOGRAPHY  

BOOKS  


PERIODICAL ARTICLES  


UNPUBLISHED MATERIALS


MISCELLANEOUS MATERIAL

State High School Tests for Indiana, 1935-36.
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:

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

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:

Which one of the five words below means the opposite of north?
1 pole, 2 equator, 3 south, 4 east, 5 west

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

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:

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.
I. Don't do the impossible.
2. Weeping is bad for the eyes.
3. Don't worry over troubles before they come.
4. Early birds like worms best.
5. Prompt persons often secure advantages over tardy ones.
6. It is foolish to fret about things we can't help.

EXAMINATION BEGINS HERE:

1. The opposite of hate is (?)
   1 enemy, 2 fear, 3 love, 4 friend, 5 joy

2. If 3 pencils cost 5 cents, how many pencils can be bought for 50 cents?

3. A bird does not always have (?)
   1 wings, 2 eyes, 3 feet, 4 a nest, 5 a bill

4. The opposite of honor is (?)
   1 glory, 2 disgrace, 3 cowardice, 4 fear, 5 defeat

5. A fox most resembles a (?)
   1 wolf, 2 goat, 3 pig, 4 tiger, 5 cat

6. Quiet is related to sound in the same way that darkness is related to (?)
   1 a cellar, 2 sunlight, 3 noise, 4 stillness, 5 loud

7. A party consisted of a man and his wife, his two sons and their wives, and four children in each son's family. How many were there in the party?

8. A tree always has (?)
   1 leaves, 2 fruit, 3 buds, 4 roots, 5 a shadow

9. The opposite of economical is (?)
   1 cheap, 2 stingy, 3 extravagant, 4 value, 5 rich

10. Silver is more costly than iron because it is (?)
    1 heavier, 2 scarcer, 3 whiter, 4 harder, 5 prettier

11. Which one of the six statements below tells the meaning of the following proverb? “The early bird catches the worm.”
    1. Don’t do the impossible.
    2. Weeping is bad for the eyes.
    3. Don’t worry over troubles before they come.
    4. Early birds like worms best.
    5. Prompt persons often secure advantages over tardy ones.
    6. It is foolish to fret about things we can’t help.

12. Which statement above tells the meaning of this proverb? “Don’t cry over spilt milk.”

13. Which statement above explains this proverb? “Don’t cross a bridge till you get to it.”

14. An electric light is related to a candle as an automobile is to (?)
    1 a carriage, 2 electricity, 3 a tire, 4 speed, 5 glow

15. If a boy can run at the rate of 6 feet in ½ of a second, how many feet can he run in 10 seconds?

16. A meal always involves (?)
    1 a table, 2 dishes, 3 hunger, 4 food, 5 water

17. Of the five words below, four are alike in a certain way. Which is the one not like these four?
    1 bend, 2 shave, 3 chop, 4 whittle, 5 shear

18. The opposite of never is (?)
    1 often, 2 sometimes, 3 occasionally, 4 always, 5 frequently

19. A clock is related to time as a thermometer is to (?)
    1 a watch, 2 warm, 3 a bulb, 4 mercury, 5 temperature

20. Which word makes the truest sentence? Men are (?) shorter than their wives.
    1 always, 2 usually, 3 much, 4 rarely, 5 never

21. One number is wrong in the following series. What should that number be?
    1 4 2 5 3 6 4 7 5 9 6 9

22. If the first two statements following are true, the third is (?) All members of this club are Republicans. Smith is not a Republican. Smith is a member of this club.
    1 true, 2 false, 3 not certain

23. A contest always has (?)
    1 an umpire, 2 opponents, 3 spectators, 4 applause, 5 victory

24. Which number in this series appears a second time nearest the beginning?
    6 4 5 3 7 8 0 9 5 3 8 8 6 5 4 7 3 0 8 9 1

25. The moon is related to the earth as the earth is to (?)
    1 Mars, 2 the sun, 3 clouds, 4 stars, 5 the universe

26. Which word makes the truest sentence? Fathers are (?) wiser than their sons.
    1 always, 2 usually, 3 much, 4 rarely, 5 never
27. The opposite of awkward is (?)
   1. strong, 2. pretty, 3. short, 4. graceful, 5. swift.

28. A mother is always (?) than her daughter.
   1. wiser, 2. taller, 3. stouter, 4. older, 5. more wrinkled.

29. Which one of the six statements below tells the meaning of the following proverb? “The burnt child dreads the fire.”
   1. Frivolity flourishes when authority is absent.
   2. Unhappy experiences teach us to be careful.
   3. A thing must be tried before we know its value.
   4. A meal is judged by the dessert.
   5. Small animals never play in the presence of large ones.
   6. Children suffer more from heat than grown people.

30. Which statement above explains this proverb? “When the cat is away, the mice will play.”
   1. promise, 2. compromise, 3. injunction, 4. coercion, 5. restoration.

31. Which statement above explains this proverb? “The proof of the pudding is in the eating.”
   1. promise, 2. compromise, 3. injunction, 4. coercion, 5. restoration.

32. If the settlement of a difference is made by mutual concession, it is called a (?)
   1. promise, 2. compromise, 3. injunction, 4. coercion, 5. restoration.

33. What is related to disease as carefulness is to accident?
   1. doctor, 2. surgery, 3. medicine, 4. hospital, 5. sanitation.

34. Of the five things below, four are alike in a certain way. Which is the one not like these four?
   1. smuggle, 2. steal, 3. bribe, 4. cheat, 5. sell.

35. If 10 boxes full of apples weigh 400 pounds, and each box when empty weighs 4 pounds, how many pounds do all the apples weigh?

36. The opposite of hope is (?)
   1. faith, 2. misery, 3. sorrow, 4. despair, 5. hate.

37. If all the odd-numbered letters in the alphabet were crossed out, what would be the tenth letter not crossed out? Print it. Do not mark the alphabet.
   A B C D E F G H I J K L M N O P Q R S T U V W X Y Z.

38. What letter in the word SUPERFLUOUS is the same number in the word (counting from the beginning) as it is in the alphabet? Print it.

39. What people say about a person constitutes his (?)
   1. character, 2. gossip, 3. reputation, 4. disposition, 5. personality.

40. If 2½ yards of cloth cost 30 cents, how many cents will 10 yards cost?

41. If the words below were arranged to make a good sentence, with what letter would the second word of the sentence begin? Make it like a printed capital.
   same means big large the as.

42. If the first two statements following are true, the third is (?)
   George is older than Frank. James is older than George. Frank is younger than James.
   1. true, 2. false, 3. not certain.

43. Suppose the first and second letters in the word CONSTITUTIONAL were interchanged, also the third and fourth letters, the fifth and sixth, etc. Print the letter that would then be the twelfth letter counting to the right.

44. One number is wrong in the following series. What should that number be?
   0 1 3 6 10 15 21 28 34.

45. If 4½ yards of cloth cost 90 cents, how many cents will 2½ yards cost?

46. A man’s influence in a community should depend upon his (?)
   1. wealth, 2. dignity, 3. wisdom, 4. ambition, 5. political power.

47. What is related to few as ordinary is to exceptional?
   1. none, 2. some, 3. many, 4. less, 5. more.

48. The opposite of treacherous is (?)
   1. friendly, 2. brave, 3. wise, 4. cowardly, 5. loyal.

49. Which one of the five words below is most unlike the other four?
   1. good, 2. large, 3. red, 4. walk, 5. thick.

50. If the first two statements following are true, the third is (?)
   Some of Brown’s friends are Baptists. Some of Brown’s friends are dentists. Some of Brown’s friends are Baptist dentists.
   1. true, 2. false, 3. not certain.

51. How many of the following words can be made from the letters in the word LARGEST, using any letter any number of times?
   great, stagger, grasses, trestle, struggle, rattle, garage, strangle.

52. The statement that the moon is made of green cheese is (?)
   1. absurd, 2. misleading, 3. improbable, 4. unfair, 5. wicked.
53. Of the five things following, four are alike in a certain way. Which is the one not like these four?
   1 tar, 2 snow, 3 soot, 4 ebony, 5 coal.
   ( )

54. What is related to a cube in the same way in which a circle is related to a square?
   1 circumference, 2 sphere, 3 corners, 4 solid, 5 thickness.
   ( )

55. If the following words were seen on a wall by looking in a mirror on an opposite wall, which word would appear exactly the same as if seen directly?
   1 OHIO, 2 SAW, 3 NOON, 4 MOTOR, 5 OTTO.
   ( )

56. If a strip of cloth 24 inches long will shrink to 22 inches when washed, how many inches long will a 36-inch strip be after shrinking?
   ( )

57. Which of the following is a trait of character?
   1 personality, 2 esteem, 3 love, 4 generosity, 5 health.
   ( )

58. Find the two letters in the word DOING which have just as many letters between them in the word as in the alphabet. Print the one of these letters that comes first in the alphabet.
   A B C D E F G H I J K L M N O P Q R S T U V W X Y Z.
   ( )

59. Revolution is related to evolution as flying is to (?)
   1 birds, 2 whirling, 3 walking, 4 wings, 5 standing.
   ( )

60. One number is wrong in the following series. What should that number be?
   1 3 9 27 81 108.
   ( )

61. If Frank can ride a bicycle 30 feet while George runs 20 feet, how many feet can Frank ride while George runs 30 feet?
   ( )

62. Count each N in this series that is followed by an O next to it if the O is not followed by a T next to it. Tell how many N's you count.
   N O N T Q M N O T M O N N O Q M N O Q N O T O N A M O N O M.
   ( )

63. A man who is averse to change and progress is said to be (?)
   1 democratic, 2 radical, 3 conservative, 4 anarchistic, 5 liberal.
   ( )

64. Print the letter which is the fourth letter to the left of the letter which is midway between O and S in the alphabet.
   ( )

65. What number is in the space which is in the rectangle and in the triangle but not in the circle?
   ( )

66. What number is in the same geometrical figure or figures as the number 8?
   ( )

67. How many spaces are there that are in any two but only two geometrical figures?
   ( )

68. A surface is related to a line as a line is to (?)
   1 solid, 2 plane, 3 curve, 4 point, 5 string.
   ( )

69. If the first two statements following are true, the third is (?) One cannot become a good violinist without much practice. Charles practices much on the violin. Charles will become a good violinist.
   1 true, 2 false, 3 not certain.
   ( )

70. If the words below were arranged to make the best sentence, with what letter would the last word of the sentence end? Print the letter as a capital.
   sincerity traits courtesy character of desirable and are.
   ( )

71. A man who is influenced in making a decision by preconceived opinions is said to be (?)
   1 influential, 2 prejudiced, 3 hypocritical, 4 decisive, 5 impartial.
   ( )

72. A hotel serves a mixture of 2 parts cream and 3 parts milk. How many pints of cream will it take to make 15 pints of the mixture?
   ( )

73. What is related to blood as physics is to motion?
   1 temperature, 2 veins, 3 body, 4 physiology, 5 geography.
   ( )

74. A statement the meaning of which is not definite is said to be (?)
   1 erroneous, 2 doubtful, 3 ambiguous, 4 distorted, 5 hypothetical.
   ( )

75. If a wire 20 inches long is to be cut so that one piece is § as long as the other piece, how many inches long must the shorter piece be?
   ( )
C. SCIENCE TEST

Name__________________________
Boy__________________________ Girl__________________________ Age________________
County________________________ Township________________________
City__________________________ Street__________________________

How far do you live from school?________________________
Have you always lived at your present home?________________
If not, where else?________________________
What do you do during your spare time?________________________

Do you prefer city life?________________________
Do you prefer country life?________________________
What studies do you like best?________________________

Occupation of your father?________________________
Occupation of your mother?________________________

Have you had agriculture in the seventh or eighth grade? Yes ( ) No ( )
Do you attend farm bureau meetings? Yes ( ) No ( )
Are you a member of the 4-H Club? Yes ( ) No ( )
Do you read agricultural magazines? Yes ( ) No ( )
Do you read government bulletins on agriculture? Yes ( ) No ( )

I (have) (have not) had general science in the seventh or eighth grade.
I (am) (am not) taking biology now.
FORM A

There are four possible words or phrases given for completing each statement below. Only one of the phrases makes the statement true. Make an X in the space at the left of the word or phrase which makes the statement read correctly.

Example:

The numerical superiority of insects is partly due to
  ___ the production of a large number of young.
  ___ their excellently developed nervous system.
  ___ the numerous methods of control.
  ___ their metamorphosis.

1. A frog spends the winter
   ___ by developing a new skin.
   ___ by migrating south.
   ___ by lying dormant at the bottom of a stream.
   ___ by eating food it has stored.

2. The human race, in selecting animals for food, is guided chiefly by
   ___ the clean and sanitary habits of the animal to be eaten.
   ___ the color of the animal.
   ___ kind and humane principles.
   ___ custom, by what our fathers have eaten.

3. The primary function of the flower so far as the plant is concerned is
   ___ to beautify the plant.
   ___ to furnish perfume.
   ___ to produce seeds.
   ___ to furnish flowers for bouquets.

4. A girdled tree will die because
   ___ it will sun scald easily.
   ___ the connection between leaves and roots is broken.
   ___ it is weakened and breaks off.
   ___ insects attack it at this phase.

5. Poisonous snakes inject poison into the victim by means of
   ___ a forked organ protruded from the mouth.
   ___ a pair of long teeth; fangs in the upper jaw.
   ___ a number of teeth in both jaws.
   ___ a sting at the end of its tail.

6. The most effective way of destroying mosquitoes is
   ___ burn lights at night.
   ___ keep the house free of dust.
   ___ cover the windows with screens.
   ___ drain and clean swamps and stagnant pools.
7. Hens lay eggs primarily
   _____ to furnish food for man.
   _____ to reproduce themselves.
   _____ because they are domesticated.
   _____ in order to reduce their weight.

8. An animal is considered a pest and undesirable
   _____ when it competes with man for the necessities of life.
   _____ when it cannot be domesticated.
   _____ when it fails to furnish food and clothing for man.
   _____ when it lives in a hot climate.

9. The clothes moth eats woolen clothing
   _____ to make holes in it.
   _____ to prepare a home in which to live.
   _____ because it has nothing else to eat.
   _____ to get a desirable food for its existence.

10. A very common poisonous plant of Indiana is
    _____ the three leaf ivy.
    _____ the jimson weed.
    _____ the ragweed.
    _____ the trumpet creeper.

11. Flies come from
    _____ eggs laid by adult flies.
    _____ the cocoons of a moth.
    _____ the south where they spent the winter.
    _____ stagnant pools in the vicinity.

12. The primary function of a cow's milk is to
    _____ provide food for her young.
    _____ provide food for human beings.
    _____ dispose of excess food which she has eaten and digested.
    _____ provide means whereby the animal may escape being killed for beef.

13. Tadpoles
    _____ hatch from the eggs laid by frogs.
    _____ come from the clouds during storms.
    _____ arise from the waters of ponds and streams spontaneously.
    _____ are born like baby pigs.

14. Baby snakes
    _____ are fed upon milk furnished by the mother.
    _____ are fed by airplane-shaped insects called snake feeders.
    _____ do not need any food for the first few months.
    _____ find their own food after birth.
15. The most important reason for laws protecting protecting birds is that
   ______ many birds are valuable as a food for man.
   ______ bird's feathers are highly prized for millinery.
   ______ birds destroy large numbers of insect pests.
   ______ people want to learn their names.

16. Grasshoppers may be distinguished from other insects by
   ______ presence near flowers.
   ______ large pair of jumping legs.
   ______ the number of wings.
   ______ bright green color.

17. When birds migrate in the fall and winter
   ______ they change to some other form.
   ______ they hibernate like a bear.
   ______ they go south.
   ______ their feathers become glossy and showy.

18. Genuine leather is made from the
   ______ elements compounded in factories.
   ______ bark of trees.
   ______ fiber of plants.
   ______ skins of animals.

19. Bees swarm because
   ______ they want to go away to die.
   ______ of the crowded condition of the hive.
   ______ there is no food in the hive.
   ______ it is too cold.

20. Insects themselves visit flowers
    ______ to pollinate flowers.
    ______ to protect themselves against the weather.
    ______ to seek food.
    ______ because of their color.

21. Decay is caused by
    ______ the growth of bacteria.
    ______ the growth of one-celled animals.
    ______ the presence of sunlight.
    ______ the presence of moisture in the air.

22. For wind dispersal seeds
    ______ must be light.
    ______ should have a water-proof coat.
    ______ should have spears for holding.
    ______ must be white in color.

23. Flowers attract insects
    ______ to give up their nectar.
    ______ to aid in pollination.
    ______ to shelter them.
    ______ for food purposes.
24. Dogs contract rabies because of
   ___ the presence of the dog star in the heavens.
   ___ increase in temperature.
   ___ increase in weed pollens.
   ___ a virus or organism which attacks the brain and
   produces madness.

25. The heart beats faster
   ___ during sound sleep.
   ___ after exercising.
   ___ when one faints.
   ___ when one is walking slowly.

26. Mosquitoes can be best eliminated by
   ___ swatting them.
   ___ importing birds.
   ___ destroying the breeding places of the mosquitoes.
   ___ using heat.

27. Malaria is transmitted to man by
   ___ drinking water.
   ___ breathing impure air.
   ___ autumn temperatures.
   ___ bite of mosquitoes.

28. Soil bacteria are helpful by
   ___ making the soil porous.
   ___ changing the color of the soil.
   ___ adding nitrogen to the soil.
   ___ making the soil lighter.

29. Black stem rust should be eradicated because it
   ___ kills barberry.
   ___ damages wheat.
   ___ is a bacteria.
   ___ attacks garden vegetables.

30. The prop or spur roots on corn
   ___ aid in holding up the stalk.
   ___ protects the plant against injury by plow.
   ___ helps to keep insects off the stalk.
   ___ aids in fixing bacteria in the soil.

31. In order to control insects, one must
   ___ know their life history and habits.
   ___ be well informed about all insects that live.
   ___ know their size and color.
   ___ know whether they crawl or fly.

32. The farmer cultivates his corn soon after a rain
   ___ to enrich the soil.
   ___ to compress the soil firmly about the roots.
   ___ to hold moisture and aid in growth.
   ___ to fertilize the soil.
33. The Colorado beetle feeds on
    ___ blades of rye.
    ___ foliage of the potato.
    ___ any green plant.
    ___ roots of trees.

34. The San Jose Scale
    ___ eats helpful insects.
    ___ destroys harmful insects.
    ___ causes wormy apples.
    ___ destroys fruit trees.

35. We cull our flock of hens in order that we may
    ___ have a more profitable flock.
    ___ have an equal number of cocks and hens.
    ___ have an older flock.
    ___ prevent chickens from molting.

36. Snakes, in the main, take their food by
    ___ absorbing it through their fangs.
    ___ sucking blood.
    ___ biting off small bits, like dogs and cats.
    ___ swallowing it whole.

37. Crop rotation is practiced by farmers in order to
    ___ lengthen the period of fertility of the land.
    ___ adapt the crops to the season.
    ___ prevent the land from lying idle during the winter.
    ___ secure enough food for the farm animals.

38. Dodder is a parasite because
    ___ it lives off other plants.
    ___ it fertilizes the soil.
    ___ it provides food for animals.
    ___ it is valuable to the farmer.
FORM B

There are four possible words given for completing each incomplete statement below. Only one of these words makes the statement true. Write in the parenthesis ( ) after each statement the number of the word that makes the statement read correctly.

Example:

The chief waste product thrown off by animals is (1) oxygen; (2) carbon dioxide; (3) hydrogen; (4) nitrogen.

Carbon dioxide is the correct answer, so place 2 in the ( ) at the end of the statement.

1. An animal whose blood temperature is the same as the medium in which it lives is said to be (1) cold-blooded; (2) prolific; (3) a mammal; (4) cannibalistic. ( )

2. An example of a fish is the (1) whale; (2) crayfish; (3) seal; (4) carp. ( )

3. A cold-blooded animal is (1) the snake; (2) polar bear; (3) rabbit; (4) wolf. ( )

4. A poisonous snake is the (1) copperhead; (2) blacksnake; (3) cow snake; (4) garter snake. ( )

5. A plant, the seeds of which are adapted for dispersal by wind, is (1) cockle bur; (2) pecan; (3) smartweed; (4) milkweed. ( )

6. Linen is made from the fibre of (1) cotton; (2) flax; (3) seaweeds; (4) cocoon of insects. ( )

7. Ferns reproduce by means of (1) fleshy fruits; (2) spores; (3) budding; (4) tubers. ( )

8. All insects have (1) four wings; (2) scales; (3) six legs; (2) fur. ( )

9. The mouth parts of the mosquito are adapted for (1) chewing; (2) sucking; (3) stinging; (4) or mouth parts are absent. ( )

10. The unfertilized eggs of the honey bee hatch into (1) workers; (2) slaves; (3) guards; (4) drones. ( )

11. An insect that has its home organized like the honey bee is the (1) ant; (2) butterfly; (3) beetle; (4) ladybug. ( )
22. All animal life directly or indirectly depends upon (1) factories; (2) insects; (3) plants; (4) iron.

21. The skeleton of a common animal used in auto laundries for washing automobiles is (1) sponge; (2) snail; (3) ant eater; (4) dragon fly.

25. Besides being a disease of man tularomia is a disease of (1) snakes; (2) fish; (3) quails; (4) rabbits.

12. The crayfish grows by (1) hibernating; (2) molting; (3) increasing its number of pincers; (4) lying in the sun.

13. Eggs of the crayfish are glued to (1) weeds; (2) rocks; (3) fish; (4) the under side of the mother's body.

14. All food originally comes from the (1) sea; (2) air; (3) green plants; (4) fungi.

15. A chicken has no teeth; its food is ground in its (1) gizzard; (2) liver; (3) esophagus; (4) pancreas.

16. The little green cabbage worm later develops into a (1) small white butterfly; (2) roach-like insect; (3) potato bug; (4) moth.

17. One of Indiana's game birds which nests on the ground and lays from 12 to 18 white eggs is the (1) bluebird; (2) hawk; (3) quail; (4) kingfisher.

18. A cat is a close relative of the (1) horse; (2) tiger; (3) opossum; (4) wolf.

19. A plant which lives but a single year is called (1) evergreen; (2) perennial; (3) annual; (4) biennial.

20. A fur-bearing animal of Indiana which carries its young in a pouch of the abdomen is the (1) fox; (2) opossum; (3) skunk; (4) muskrat.

21. The skeleton of a common animal used in auto laundries for washing automobiles is (1) sponge; (2) snail; (3) ant eater; (4) dragon fly.

22. All animal life directly or indirectly depends upon (1) factories; (2) insects; (3) plants; (4) iron.

23. An animal valuable to the farmer because it destroys insects of the garden is the (1) cat; (2) mouse; (3) lizard; (4) toad.

24. A disease of the respiratory tract is (1) tuberculosis; (2) malaria; (3) anemia; (4) typhoid fever.

25. Besides being a disease of man tularomia is a disease of (1) snakes; (2) fish; (3) quails; (4) rabbits.
26. Bones are joined to other bones by (1) nerves; (2) ligaments; (3) skin; (4) veins.

27. The safest kind of milk to drink is (1) pasteurized; (2) clarified; (3) warm; (4) frozen.

28. The most nearly complete food is (1) milk; (2) bread; (3) meat; (4) oatmeal.

29. The skeleton of man is made of (1) carbon; (2) gristle; (3) bone; (4) shells.

30. The gallbladder is within the (1) liver; (2) spleen; (3) heart; (4) stomach.

31. Diphtheria is a disease of (1) the throat; (2) skin; (3) liver; (4) lungs.

32. The amount of heat one uses is measured in (1) degrees; (2) ounces; (3) grams; (4) calories.

33. A substance which, when taken into the body, tends to cause death is (1) an antidote; (2) vaccine; (3) a poison; (4) an antitoxin.

34. The decay of teeth is caused by (1) bacteria; (2) chewing; (3) enzymes; (4) sodium.

35. If blood fails to clot the result is a (1) hemorrhage; (2) diabetes; (3) increased blood pressure; (4) dropsy.

36. The normal temperature of the body of an adult person approximately is (1) 50°F Fahrenheit; (2) 98.6°F Fahrenheit; (3) 150°F Fahrenheit; (4) 106°F Fahrenheit.

37. Wearing glasses will not correct (1) near-sightedness; (2) far-sightedness; (3) cross-eyes; (4) color-blindness.

38. In pasteurization, milk must be (1) chilled; (2) sunned; (3) treated with chemicals; (4) heated.

39. Light gets into the retina of the eye through (1) eyelids; (2) pupil; (3) iris; (4) eyelashes.

40. The power of the body to resist disease is called (1) vaccination; (2) inoculation; (3) immunity; (4) antitoxin.

41. Smallpox is prevented by (1) medicine; (2) vaccination; (3) an operation; (4) anti-toxin.
42. A thermometer is used to measure (1) temperature; 
(2) pressure; (3) weight; (4) sight. 

43. In the dark the pupil of a cat's eye is (1) larger; 
(2) smaller; (3) absent; (4) of equal size. 

44. All cows in certified dairies are tested for 
(1) typhoid; (2) mange; (3) diphtheria; (4) tuberculosis. 

45. The principal disease of hogs is (1) diphtheria; 
(2) rickets; (3) cholera; (4) pneumonia. 

46. Two breeds of hogs are Poland China and (1) Percheon; 
(2) Hereford; (3) Duroc Jersey; (4) Ayrshire. 

47. An animal which is very destructive to young apple 
trees is (1) the rabbit; (2) the fox; (3) the bat; 
(4) owl. 

48. An example of a leguminous plant is the (1) clover; 
(2) toadstool; (3) nasturtium; (4) moss. 

49. Acid soil may be helped by adding (1) sand; (2) water; 
(3) limestone; (4) fertilizer. 

50. A plant growing where it is not wanted is considered 
a (1) weed; (2) vegetable; (3) flower; (4) necessity. 

51. A common disease of cats in Indiana is (1) brown 
rot; (2) scab; (3) club root; (4) smut. 

52. Peas, alfalfa, soy-beans, and clover are used in 
crop rotations because they add to the soil (1) cal-
cium; (2) carbon; (3) oxygen; (4) nitrogen. 

53. Most fertilizers contain the valuable plant-food 
element (1) nitrogen; (2) iron; (3) oxygen; 
(4) chlorine. 

54. The apple worm is the larva of the (1) boll weevil; 
(2) tsetse fly; (3) codling moth; (4) milkweed 
butterfly. 

55. Soil is protected from erosion by (1) vegetation; 
(2) irrigation; (3) reclamation; (4) fertilization. 

56. An insect that is helpful to man is (1) ladybug; 
(2) codling moth; (3) chinch bug; (4) Colorado 
beetle.
57. Seeds for plants, like tomatoes and cabbages, should be planted (1) in the fall; (2) in the late spring; (3) in the late winter; (4) during the summer.

58. If a cat falls from a tall building or tree, it demonstrates a theory of physics by (1) turning a somersault; (2) landing on its feet; (3) scratching itself; (4) running up the nearest tree.

59. Frozen water pipes burst because of (1) expansion of freezing water; (2) contraction of metal; (3) expansion of metal; (4) chemical action.

60. When air is heated it (1) expands; (2) contracts; (3) falls; (4) liquifies.

61. The source of the most healthful light is (1) the sun; (2) kerosene lamp; (3) electric light; (4) candle light.

62. The propelling mechanism of an automobile is termed the (1) differential; (2) governor; (3) chassis; (4) motor.

63. Balloons float in the air because (1) they are lighter than air; (2) they are of a silvery color; (3) they are made of rubber; (4) they use an engine for propelling purposes.

64. The capacity to do work is called (1) momentum; (2) mechanical advantage; (3) energy; (4) velocity.

65. The best lining for a refrigerator is (1) tin; (2) enamel; (3) copper; (4) iron.

66. The device in water or steam pipes for stopping the flow at any point is called a (1) damper; (2) valve; (3) faucet; (4) switch.
Two types of aircraft with motor power are the airplane and (1) submarine; (2) dirigible; (3) yacht; (4) gliders.

When the lights of an automobile are on and the engine is running the battery is being (1) charged; (2) discharged; (3) renewed; (4) recovered.

The silvery liquid frequently found in thermometers is (1) white gold; (2) water; (3) mercury; (4) silver.

When alcohol is added to water, the freezing temperature of the mixture is (1) higher than that of pure water; (2) the same as pure water; (3) lower than that of pure water; (4) approximately the same as pure water.

Ordinary suction pumps will lift water only approximately (1) 5 ft.; (2) 15 ft.; (3) 25 ft.; (4) 60 ft.

Two types of aircraft with motor power are the airplane and (1) submarine; (2) dirigible; (3) yacht; (4) gliders.

When the lights of an automobile are on and the engine is running the battery is being (1) charged; (2) discharged; (3) renewed; (4) recovered.

The airplane furnishes wind by means of the (1) cockpit; (2) propeller; (3) rudder; (4) gliders.

The steam engine uses energy by expansion of (1) coal; (2) air; (3) steam; (4) lubricating oil.

The most common means of transportation is by (1) airplanes; (2) sailboat; (3) automobile; (4) dirigible.

The gas and air used by the automobile are mixed in the (1) valve; (2) starter; (3) carburetor; (4) choker.

Violin music is produced by means of (1) reeds; (2) hammers; (3) tubes; (4) strings.

Reflected sounds are called (1) echoes; (2) splashes; (3) gurgles; (4) crashes.

Electricity is bought by the (1) volt; (2) ampere; (3) kilowatt hour; (4) centimeter.
84. Two or more cells connected together form a (1) battery; (2) dynamo; (3) valve; (4) ampere.

85. A non-conductor of electricity is called (1) an insulator; (2) distributor; (3) fuse; (4) carburetor.

86. The ordinary voltage for homes is (1) 50 volts; (2) 110 volts; (3) 145 volts; (4) 200 volts.

87. A magnet will easily attract (1) copper; (2) iron; (3) tin; (4) zinc.

88. The fine wire in electric lamps is made of (1) copper; (2) iron; (3) tungsten; (4) brass.

89. The safety device in a switch box is called (1) a fuse; (2) meter; (3) an ampere; (4) a dial.

90. The water best fitted to remove dirt from clothes is (1) hot hard; (2) hot soft; (3) tepid hard; (4) cold soft.

91. Concrete is best reinforced with (1) wood; (2) straw; (3) rope; (4) iron.

92. The best method of sewage disposal is (1) cess pool; (2) open sewer; (3) closed sewer; (4) septic tank.

93. It is dangerous to put fresh coal on a fire, close down the damper and leave the stove door open or lid off because (1) the fire goes out; (2) waste of coal; (3) a poisonous gas escapes; (4) an explosion will occur.

94. Soap lathers best in water that is (1) hard; (2) cold; (3) mineral; (4) distilled.

95. Cleaning without water is (1) dry cleaning; (2) sponging; (3) using disinfectant; (4) pressing.

96. People are sometimes killed when automobile engines are running in small closed garages by the poisonous gas called (1) carbon dioxide; (2) phosgene; (3) methane; (4) carbon monoxide.

97. One of our lightest metals is (1) tin; (2) aluminum; (3) iron; (4) lead.

98. The most used product made from petroleum is (1) kerosene; (2) lubricating oil; (3) gasoline; (4) naptha.
99. Lime is made from (1) shale; (2) limestone; (3) loam; (4) granite.

100. Pure gold is always (1) white; (2) yellow; (3) green; (4) red.

101. Glass is manufactured at a high temperature from (1) sand; (2) clay; (3) gravel; (4) loam.

102. Concrete is made by the mixing of proper proportions of water and sand with (1) lava; (2) straw; (3) cement; (4) bark.

103. Water put in automobile batteries should be (1) hard; (2) hot; (3) distilled; (4) mineral water.

104. Water is best purified by (1) distillation; (2) straining; (3) softening; (4) freezing.

105. The common friction match is tipped with (1) sulphur; (2) carbon; (3) mercury; (4) oxygen.

106. The morning star is seen before sunrise in the (1) south; (2) west; (3) east; (4) north.

107. The rainbow is seen after a shower in the afternoon (1) directly overhead; (2) in the north; (3) in the east; (4) in the south.

108. The surface of the moon is (1) smooth; (2) rugged; (3) plane; (4) level.

109. The pointers in the Big Dipper point toward (1) Venus; (2) the North Star; (3) the sun; (4) the Milky Way.

110. The sun is nearer the earth in (1) spring; (2) fall; (3) winter; (4) summer.

111. The exact hour of the day at any place may be measured by a sun dial, and is (1) standard time; (2) railroad time; (3) central time; (4) sun time.

112. The most numerous kind of animal is the (1) insect; (2) man; (3) fox; (4) bird.

113. The longest resting period for most plants is (1) spring; (2) summer; (3) autumn; (4) winter.

114. Frozen rain drops fall as (1) dew; (2) hail; (3) fog; (4) mist.
115. A governmental agency which has greatly aided agricultural people is the (1) Stock Exchange; (2) Wall Street; (3) Weather Bureau; (4) Department of War.

116. Temperature is measured in (1) watts; (2) degrees; (3) calories; (4) currents.

117. When metal, such as iron, is heated, it becomes (1) larger; (2) smaller; (3) dark; (4) green.

118. The longest day of the year occurs in the month of (1) January; (2) June; (3) December; (4) March.

119. When the moon is between the earth and the sun, it is (1) full moon; (2) new moon; (3) first quarter; (4) last quarter.

120. The evening star is seen after sunset in the (1) north; (2) south; (3) east; (4) west.

121. Wet clothes dry most quickly when the weather is (1) cold and damp; (2) hot and damp; (3) rainy; (4) clear and windy.

122. A large amount of smoke is caused by burning (1) hard coal; (2) gas; (3) wood; (4) soft coal.

123. Man's greatest source of natural heat is the (1) moon; (2) sun; (3) stars; (4) volcanoes.

124. Ridding surgical instruments of bacteria is called (1) sterilization; (2) pasteurization; (3) germination; (4) fertilization.

125. The color which absorbs heat most rapidly is (1) white; (2) blue; (3) black; (4) pink.

126. An artificial fiber used for ladies' hose is (1) cotton; (2) wool; (3) rayon; (4) jute.

127. A bonfire will burn best on a (1) cold damp day; (2) hot damp day; (3) drizzly day; (4) clear, windy day.