

must keep the faith and do his work to the end.

An old man, going a lone highway,
Came at the evening, cold and gray,
To a chasm, vast and deep and wide.
The old man crossed in the twilight dim;
The sullen stream had no fear for him;
But he turned, when safe on the other side,
And built a bridge to span the tide.

"Old man," said a fellow-pilgrim near,
"You are wasting your strength with building here;

You never again will pass this way;
You've *crossed* the chasm deep and wide,
Why build you this bridge at evening-tide?"

The builder lifted his old gray head.
"Good friend, in the path I have come," he said,

"There followeth after me today
A *youth* whose feet must pass this way.
He, too, must cross in the twilight dim;
This chasm, which has been as naught to me,
To that fair-haired youth may a pit-fall be;
Good friend, I am building this bridge for *him.*"

We must think nobly of our work. We must recognize in it infinite possibilities. Education is a constant force. If rightly directed its results are certain. Let us then not grow weary in the way, but let us work on, in the face of misunderstanding and discouragements, if need be, in the faith that the time will come when we shall be amply justified.

"And then," in the words of that great Southerner, the great Virginian, that greatest save one of the presidents of this great nation of ours, "and then trust your guides, imperfect as they are, and some day, when we are all dead, men will come and point at the distant upland with a great shout of joy and triumph and thank God that there were men who undertook to lead in the struggle. What difference does it make if we ourselves do not reach the uplands? We have given our lives to the enterprise. The world is made happier and humankind better because we have lived."

JULIAN A. BURRUSS

Due attention to the inside of books, and due contempt for the outside, is the proper relation between a man of sense and his books.—Lord Chesterfield.

II

TENTATIVE NORMS FOR A SIMPLIFIED RATIONAL LEARNING TEST FOR CHILDREN EIGHT, NINE, AND TEN YEARS OF AGE

A real knowledge of the native abilities of the child in his early school years is a vital educational necessity, a great aid to the teacher as well as an inestimable benefit to the child. The possibilities of such knowledge have been greatly increased of late, thanks to the development of intelligence tests. Group tests are now available, and in the main are so easy to administer that every teacher can, with a little preparatory practice at home, get a fair rating of her pupils herself even if the services of a school psychologist are not available. Special cases, the very dull and the very bright children as well as those showing any other atypical traits, should be tested individually with some good revision of the Binet tests, such as the Stanford Revision. These matters appear very simple to the psychologist, especially the administration of the group test, but practically there are obstacles great enough yet to prevent the use of tests by most teachers. Most of the teachers do not realize the great benefits obtained from a little time devoted to tests for practical purposes. Moreover, they have fallen into a routine that prevents them from indulging in any sort of experimentation, even for the benefit of exceptional children. The slight cost of test materials and the general lack of training in the administration and use of the Binet tests are obstacles to the universal adoption of means now available to the better trained teachers.

It is also true that however useful the standard intelligence tests are in practical educational work, there are traits of importance to success in school that they do not measure. We are consequently keeping up the search for new factors, or for factors not yet measurable, in the hope that in time the various influences and traits making for success in school and in life may be determined for any individual in the early part of his education and thereby controlled for his good.

One of the tests that we have been using in the Jesup Psychological Laboratory to

determine race differences between white and negro children seems so valuable that we desire more information on the correlation of its results with certain traits of recognized value. Our purpose in the present article is to interest teachers to the extent that they will give the test to their students and study the results in relation to intelligence, to school success, to ability to organize work for the attainment of certain practical ends, etc. For the help that this will give us in our work, we feel sure that there will be an immediate reward in the better knowledge of their pupils and in better mutual understanding between teacher and pupil as well as in the acquirement of useful habits of scientific study of the traits and abilities of children. The test in question is the Rational Learning test, simplified for children of elementary school grades. Results on college students with a more difficult form have been published, and the method and norms have been given.* The results of the test are largely free from the influence of past experience; no writing by the subject is required; the subject has constant stimulation throughout the test; and the test puts a premium on ability to organize and think one's way out of a problem involving ideational elements. It is a real test of the subject's learning under a well controlled situation, and on the other hand a complete record is obtained of all the significant responses of the subject in the order of their occurrence. Aside from intelligence differences, variations in such traits as subjectivity of mind, degree of organization in one's thinking, tendencies to talk first and to think afterwards, quickness of response to situations requiring choice also come out in the test, traits that are undoubtedly important.

No apparatus other than a watch, a sheet of paper and a pencil, and a typewritten copy of the instructions is necessary, and the test is easy to administer with a high degree of reliability. The instructions to the subject, given orally and individually to each child, and repeated in whole or in part when-

*Petersen, Joseph—Experiments in Rational Learning, *Psychological Review*, 1913, 25, 443-467; The Rational Learning Test Applied to Eighty-One College Students, *Journal of Educational Psychology*, 1920, 11, 137-150; Tentative Norms in the Rational Learning Test, *Journal of Applied Psychology*, 4, 250-257.

ever this seems advisable in order that the child may know what he is to do, are as follows:

The letters A, B, C, D, and E are numbered 1, 2, 3, 4, and 5, but not in this order: that is, A is not 1 and E is not 5. The numbers are all mixed up any way, so that at first you will have to guess at them. When I call out A you are to guess whatever number you think I gave to A, and keep on guessing till I say 'Right.' Then I will call out B and you must guess numbers for B till I say 'Right' and so on in the same way for C, and for D, and for E. Do you understand? Try to remember the number that belongs to each letter for as soon as you are able to remember all of them twice through without a single mistake, the test will be finished. Each letter has only one number, and no other one has that number; and when I say 'Right' you know what that number is. Do you understand? Let's see how soon you can get through and remember all the numbers.

Before these instructions are read to the subject, the name will have been obtained and recorded, also sex, grade, age, birthday, occupation of father, and any further information that may be desirable. Also the exact time of starting the test must be taken (just before calling A) and that of ending must be noted as soon as the test is completed. The five letters are numbered as follows:

A	B	C	D	E
4	2	5	1	3

These letters and their numbers are written at the top of the test sheet before the test begins. Now the tester, sitting in a position such that the subject cannot see the sheet and what is written on it, calls out A, and the child being tested—the subject—guesses till he gets 4. If he guesses any number above 5, or any letter, as children sometimes do in this test, he must be told that only numbers from 1 to 5 are used. When 4 has been guessed for A, B is called out; and as soon as 2 has been guessed for it, the other letters are called out in order. It is obvious that by careful attention to the associations of the correct numbers the subject can limit the range of guess work and quickly solve the problem. The tax on memory is very small, but organization is necessary. This is obvious from the fact that feeble-minded children, so far as our experience goes, are unable to make progress in the test. They may guess the correct numbers but do not learn to avoid the errors. Every guess of

any kind must be recorded as given. Two correct trials are necessary to complete the test.

It will clarify the method if we give the record of one child, a very good record, how ever.

	A	B	C	D	E	Age 10 years and 14 days Time 2 minutes
	4	2	5	1	3	Repetitions, 3
First Trial	2	3	5	3	3	Errors, 7.
(26)	5	1		1		
	3	2				
	3					
	4					
Second	-----					
Trial	4	2	5	1	3	
Third	-----					
Trial	4	2	5	1	3	

In the following percentile table, norms are given for children of the three ages indicated. The number of children on which these norms are based is given at the base of the table for each age. The children tested were Nashville public school children. We have also norms for negroes of the same ages, which will be published in time with a full account of our studies. The present norms are for the benefit of teachers and investigators who may desire to use the test

as at present developed. A percentile score is the score that passes the percentage of children of a certain age-group, given in the corresponding row at the left of the table, in the column with the heading "Percentiles." Thus an 8.5 year old child completing the test in 12.4 minutes equals or surpasses just 60 percent of his group, whereas a score of 11.9 minutes by a child 9.5 years of age passes 60 percent of the scores by children of that age. Let us suppose that a child eight years and six months old makes the following record: 10.4 min., 21 repetitions and 85 errors. Looking at the table, we find that the time record is nearest the 70 percentile, that the repetitions record is nearest the 50 percentile, and that the score in errors is nearest the 60 percentile. We therefore get the percentile record of the child (assuming that time, number of repetitions, and errors should be weighted equally) as follows:

$70 \text{ plus } 50 \text{ plus } 60 \text{ divided by } 3 = 180/3 = 60.$
This means that the child in question gets a percentile rank of 60; that is to say, he surpasses just 60 percent of the group of which he is a member. This is a valuable thing to know; it shows that the child is a little above normal in the kind of performance involved in the test. A percentile rank of 10, for in-

PERCENTILE TABLE
Rational Learning Test with Five Letters*

Percentiles	8.5 year Olds**			9.5 year Olds			10.5 year Olds		
	Min.	Rep.	Errors	Min.	Rep.	Errors	Min.	Rep.	Errors
Highest	2.0	4.0	4.0	1.0	3.0	4.0	1.0	4.0	4.0
90	5.4	8.3	25.3	5.4	7.6	21.0	2.4	6.7	10.3
80	7.9	11.3	42.7	7.6	10.9	37.2	4.8	8.7	20.5
75	9.1	12.5	52.1	8.7	12.2	44.9	5.7	9.6	26.0
70	10.3	13.7	63.3	9.8	13.5	52.5	6.6	10.8	36.7
60	12.4	16.7	84.3	11.9	16.6	70.0	8.3	13.4	51.7
50	14.6	20.5	114.2	14.0	20.5	96.4	10.0	16.3	68.8
40	17.7	24.9	127.9	17.4	24.7	135.0	12.4	19.7	84.3
30	22.0	31.4	166.4	24.8	32.3	198.3	14.8	22.5	99.0
25	25.0	34.5	187.5	31.7	37.5	235.0	16.6	23.8	114.6
20	33.5	40.3	228.3	37.8	45.3	260.0	18.5	25.6	135.0
10	40+	55.3	465	40+	53.3	410	33.0	39.0	220.0
Lowest	40+	106.0	1045.0	40+	106.0	1155.0	36.0	123.0	1162.0
Number of Children	108			84			82		

*The writer desires to acknowledge the assistance of Miss Pantha V. Harrelson in the research from which these data are taken.

**In this table the 8.5 year norms are based on the scores of 108 children ranging in ages from just 8 years to approximately 9 years, the median age being 8.5 years. Norms

for the other ages have similar meaning. No child was allowed more than 40 minutes, and since the experiment was discontinued after the expiration of this time by any child the "repetitions" and the "errors" norms are really too high in the lower percentiles for the 8.5 and 9.5 year old groups.

stance, would probably indicate that the child needs special attention if he is to get much good out of his school work, and one below 3 might indicate feeble-mindedness, though this should be verified by the Binet test.

We have standards now for only the three ages given. Any child may be judged by the standards nearest his own age at the time of the taking of the test. We shall be glad to receive results of this test on children of ages from 6 to 12 years; that is, the number of minutes for each child, the number of repetitions (including the last two with no errors), and the number of errors. Results will be of no value unless all the conditions of the test are followed exactly. The age of each child must be given in years and months to the nearest month. When we get results of tests of a large number of children of each age we shall publish better norms for the use of all teachers interested.

One of the greatest benefits that the writer has derived from the giving of this learning test to numerous subjects is the insight into their mental operations that it affords. Every person has his own characteristic manner of wrestling with the problem, and the tester, who makes a complete record of the subject's significant responses, comes to appreciate keenly the nature of his several difficulties and even to anticipate those that will arise in successive repetitions. He notices failure of retention due to improper attention to essential relations; narrowing of attention due to confusions resulting from slight errors, and consequent failure to avoid guessing numbers that he knows full well belong to letters already learned; strong tendencies, probably innate, on the part of certain persons to respond in a sort of trial and error manner even to a rational problem and then to think afterwards; and many other individual differences and general principles of learning which give him a real interest in and knowledge of the processes of learning with which the teacher has so much to do.

JOSEPH PETERSON

The first thing, naturally, when one enters a scholar's study or library, is to look at his books. One gets a notion very speedily of his tastes and the range of his pursuits by a glance round his bookshelves.—Oliver Wendell Holmes.

III

SOME OF THE NEWER TESTS

With the opening of school the problem arises afresh of measuring the material at hand and of measuring the result of instruction. Numerous school systems have now established the thrice-a-year plan of measuring achievement and intelligence, and most progressive schools do some desultory testing.

The purposes of this article are to call attention to a somewhat wider range of testing devices and materials than is in general use and to point out some of the newer developments in testing. Later articles will furnish special bibliographies and detailed studies of special problems and the use of different tests.

While the new crop of tests each year is bewildering, two very sane tendencies apparently can now be seen at the end of the dozen years since Thorndike's test in handwriting, the first of its kind, came out. Many tests have fallen out of general use, and those that are proving more valuable and adaptable are being rigidly revised and the accompanying directions for giving and scoring are being simplified and improved. It is therefore certain that the teacher's tools of diagnosis will in the next few years be tremendously improved so that a quarter century of the testing movement is likely to show far greater progress than any corresponding period even in the history of medical practice.

INTELLIGENCE TESTS AND TESTING¹

Individual testing of the intelligence of pupils will be made somewhat less expensive of both time and money by using the new Herring Revision of the Binet-Simon Tests. This is arranged in what may be called the spiral form so that a short series of tests may be given if the intelligence quotient only is desired or a longer series if a diagnosis of the child's strengths and weaknesses is desired. It is claimed that results with this test correlate very closely with those gotten by the use of the Terman Revision which has been in vogue for some time and has

¹The majority of the tests referred to in this article are published and distributed by the World Book Company, Yonkers, N. Y. Unless therefore the tests mentioned are published by another concern, the publisher will not be referred to.