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**Provisional Series of Mental
Intelligence Tests for Indian
Scholars**

EDITED BY
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Prefatory Note.

In India up to the year 1921 only a few isolated experiments with intelligence tests had been conducted by missionaries engaged in educational work, amongst whom may be mentioned the Rev. E. L. King of Narsinghpur and the Rev. D. S. Herrick of Bangalore. At the meeting of the Central Advisory Board of Education held in October of that year it was resolved that experiments on a large scale should be conducted with a view to devising a series of mental intelligence tests suitable for children attending Indian schools. As a basis for these experiments it was decided to adopt the Stanford Revision of the Binet-Simon tests published by Professor Lewis Terman of the Leland Stanford Junior University in his work "The Measurement of Intelligence."* Copies of this work were forwarded to the principals of the Training Colleges at Saidapet, Dacca, Jubbulpore and Lahore who were asked to co-operate with the Board by applying the tests on the children attending the model schools attached to those institutions. This work they readily undertook and most interesting reports of their experiments were received from Miss Gordon of Saidapet, Mr. West of Dacca, Mr. Spence of Jubbulpore and Mr. Wyatt of Lahore. The Bureau of Education then undertook the work of collating the results with a view to the production of a provisional series of tests suitable for use in Indian schools. This was the origin of the present publication. In its preparation I have received valuable assistance from Professor Rice of the Forman Christian College, Lahore, who has recently returned from a special study of the subject in America.

The book is intended for use only by teachers who are acquainted with the literature on the testing of general intelligence. More particularly it is assumed that the reader is familiar with the book on which the series is based, "The Measurement of Intelligence" by Professor L. Terman.† No explanation is therefore given of the method of scoring the results of the tests; nor advice as to the use to which the results may be put. To the class of readers for which this book is designed it is unnecessary to explain or justify the use of intelligence tests. Such tests can never take the place of ordinary examinations for, while examinations measure acquired knowledge, mental tests measure the power to acquire knowledge and ability to use the knowledge acquired.

* The Measurement of Intelligence. By L. Terman. (Harrop & Co.)

†*E.g.*,—Mental Tests in the American Army. By C. S. Yoakum and R. M. Yerkes. (H. Holt & Co.)

Mental Tests. By P. B. Ballard. (Hodder & Stoughton.)

A Scale of Performance Tests. By R. Pintner and D. G. Patterson. (Appleton & Co.)

Mental and Scholastic Tests. By C. Burt.

This series commences with Year VIII, because, though the tests should be given in the vernacular, it is not intended for use in primary schools. No tests are given for Years XI, XIII and XIV, because the course of growth of mental age of children is more gradual as the children grow older. It is thus necessary for the purpose of calculating the mental age to assign four months' value to each of the tests for Years XII and XIV and six months' value to each of the tests for Year XVI. As in all other series the tests end with the 16th year, because so far there is no evidence that ability to succeed in tests increases after that age. The intelligence or mental capacity tested ceases, except in exceptional cases, to develop thereafter.

The series is entitled "provisional" because it is anticipated that it will require modification in the light of further Indian experience. It is hoped that those who make use of the series will, when their experiments have been conducted on a sufficiently large scale, communicate the results together with their suggestions for the improvement of the series, to the Educational Commissioner. The particular points on which reports would be useful are indicated in brackets at the end of each test. It will then be possible to compile a second and more accurate series. Such a method of compilation is open to the objection that it is entirely empirical and not based upon any scientific principle. This criticism is however applicable to all such series of tests. The inclusion of any particular test under any particular age can, in the present stage of our knowledge of the subject, only be justified on the ground that a success in the test is attainable by the normal boy of that age, and that the probability of success increases with the increase in age of the boy of average intelligence.

The publication of this first series has been delayed by various circumstances, not the least of which has been the abolition of the Central Advisory Board and the Bureau of Education.

J. A. RICHEY,
Educational Commissioner
with the Govt. of India..

DELHI.
December 1923.

PROVISIONAL SERIES
OF
**Mental Intelligence Tests
for Indian Scholars**

OUTLINE OF TESTS.

YEAR VIII.

1. Counting backwards from 20 to 1.
2. Giving differences.
3. Comprehension.
4. Definitions.
5. Repeating five digits forward.
6. Knox cubes (5).

YEAR IX.

1. Arranging five weights.
2. Reasoning.
3. Repeating four digits reversed.
4. Giving similarities.
5. Interpretation of pictures.
6. Repeating sixteen words.

YEAR X.

1. Drawing designs from memory.
2. Detecting absurdities.
3. Naming fifty words.
4. Reading for eight memories.
5. Comprehension.
6. Knox cubes (6).

YEAR XII.

1. Dissected sentences.
2. Reasoning test.
3. Interpretation of pictures.
4. Using three words in a sentence.
5. Repeating five digits reversed.
6. Paper and envelope test.

OUTLINE OF TESTS.

YEAR XIV.

1. Finding a rule.
2. Paper test.
3. Defining abstract words.
4. Problem questions.
5. Giving similarities (three things).
6. Knox cubes (8).

YEAR XVI.

1. Giving differences between abstract terms.
2. Problem of the enclosed boxes.
3. Repeating six digits reversed.
4. Reasoning test.

YEAR VIII.

TEST I.

Counting backwards from 20 to 1.

Procedure.—Say to the child:—

“Do you think you can count backwards? Start at 20 and go backwards till you reach 1, like this, 23, 22, 21, 20. Now go on counting back to 1.”

Supplementary instructions.—Even if the child says he cannot do it, urge him to try. When once started he will often succeed. Do not prompt and do not hurry him.

Scoring.—The test is passed if the child counts from 20 to 1 correctly in 20 seconds with not more than one single error. Errors which the child spontaneously corrects are not counted as errors.

Remarks.—This is a test of sustained attention. With any relaxation of attention the child is likely to hesitate, or stop somewhere in the series, *e.g.*, at 14 and then, owing to the law of habit, start counting forwards again 14, 15, 16.

The instructions given are those framed by Binet and form perhaps an easier introduction to the test than those given by Terman. The suggestion of Yerkes that in prompting we should start the series from a higher number, *e.g.*, 23, rather than encroach on the test set by giving 20, 19, 18 has been adopted; it has obvious advantages.

Binet assigned 20 seconds for this test and though this has been extended to 40 seconds by Terman, experiments in Indian schools show that the lower limit of time is sufficient for its performance. But if the child is counting steadily and without stumbling it is not necessary to be pedantic about the time limit. (The time taken in each case and the number of errors should be recorded with a view to checking the standard of difficulty of this test.)

TEST II.

Giving Differences.

Procedure.—Say to the child “What is the difference between milk and water?” If the child does not understand say, “You know what milk is, do you not? And you know what water is. Now tell me the difference between milk and water.” Proceed in the same way with—stone and egg, wood and glass.

Additional instructions.—Beware of giving any supplementary or leading questions. Only if the answer is not quite clear, *e.g.*, “one is harder than the other,” may the examiner enquire further to elucidate the meaning.

Scoring.—The test is passed if a real difference is given in two out of three comparisons. The difference need not of course be an essential one.

Remarks.—This test has been placed in Year VII by Terman. It appears to belong to Year VIII in India, in which year it has generally been used elsewhere.

“Milk and water,” suggested by Winch, are substituted for fly and butterfly.” The other two comparisons are the original ones suggested by Binet and adopted by Terman.

The character of the child’s responses should be noted as throwing light on his thought processes. It is noteworthy that the ability to give differences precedes the ability to name similarities.

Any tendency to stereotyped answers should be noted. For example a child who says “a stone is harder than an egg” may go on to say “glass is harder than wood.” Two such answers should not by themselves constitute a pass.

(Typical answers should be recorded.)

TEST III.

Comprehension.

Procedure.—Ask the child:—

- (a) If while on your way to school you find that you are likely to be late what should you do?
- (b) If you have lost a pen which belongs to someone else what should you do?
- (c) If another boy hits you by accident without meaning to do so, what should you do?

Supplementary instructions.—Twenty seconds is allowed for obtaining an answer to each question before the next question is put. If necessary the question may be repeated, but no alteration may be made in the form of the question. Usually the answer is given at once, or not at all.

Scoring.—Two of the three questions must be correctly answered. No one form of answer is required.

The following are types of correct answers:—

- (a) “Run.” “Hurry up.”
- (b) “Buy him a new one.” “Give him mine.” “Say you are sorry.”
- (c) “Excuse him.” “Ask him to be careful.” “Pay no attention.”

Remarks.—The object of this test is to see if the child has the power of visualising an imaginary situation, and the intelligence to suggest the proper course of action if the situation were present. It is a test of imagination and judgment.

The questions have been re-arranged in order of difficulty, following Burt. The form of the sentences has been inverted, as they would usually be found in Indian vernaculars.

The first question is not so suitable for Indian as for American conditions, since punctuality is not made of so much importance in Indian schools under a voluntary education system. It is necessary to emphasise the words "while on the way to school" otherwise a common answer will be "take an excuse." This and such answers as "go home," "make an excuse" should be judged incorrect. The only alternative question suggested, however, the "catching of a train," as originally given by Binet would present a situation unknown to the majority of Indian school boys of eight years old.

The second question has been changed from "breaking something" to "losing a pencil." The latter suggests a more concrete situation, and the object mentioned is within the means of the child to replace. The change has been made as a result of Indian experience.

Any answer to the third question which suggests anger or resentment is incorrect.

(The tests should be re-arranged in order of difficulty. Typical answers should be recorded.)

TEST IV

Definitions.

Procedure.—Ask the child:—

"What is a chair?" then "What is a tiger?" "What is a sepoy?" "What is a shop?"

No supplementary questions may be asked.

Scoring.—The test is passed if two of the four words are defined in terms superior to use. "Superior to use" includes chiefly (*a*) definitions which describe the object or tell something of its nature (form, size, colour, appearance and substance, etc.), (*b*) definitions which classify the object or show its relations to other objects.

For example "a shop is a house where things are sold," "a tiger is an animal that lives in the jungle" are satisfactory: "to buy things," "to eat you up" are unsatisfactory.

This test is difficult to score, and the actual words used by the child should be recorded.

Remarks.—It is questionable how far this test is not merely linguistic. The child who defines a tiger as "to eat you up" may have a clearer idea of the beast than the one who describes it as "an animal that lives in the jungle." It will often be the power of expressing the idea rather the idea itself that may be lacking. Past schooling will also affect the form of the answer.

With the exception of tiger it has been necessary to substitute other words for those given by Terman, *i.e.*, "balloon," "football," "soldier." Not only are these words unfamiliar to many children but the whole test has proved rather hard for this age. The word "tiger" has been left as it is far more familiar to Indian children than to American.

For "soldier" "sepoy" has been suggested, and this term may be allowed to include "policeman" for the purpose of this test, if this is the meaning naturally attached to the word by the child.

The three alternative words are from those suggested by Terman (Anglicised).

TEST V.

Repeating five digits.

Procedure.—Tell the child to listen and say after you just what you say. Then read the following series of digits one at a time. Each series should be read slowly and distinctly with a perfectly uniform emphasis and time, *viz.*, about two per second. Avoid rhythm.

3-1-7-5-9; 4-2-3-8-5; 9-8-1-7-6.

Supplementary instructions.—Do not warn the child how many digits you were going to repeat. Before reading each series get the child's attention. Do not stare at the child while he is repeating the digits.

Scoring.—The test is passed if the child repeats correctly one series out of the three series given. The order must be correct.

Remarks.—This test is easy to give and lends itself readily to standardisation. It is in part a test of immediate memory but depends chiefly on attention, since there is no association between the digits. The test is given in Year VIII by Binet, who is followed by Goddard. Terman and others put it in Year VII but experience in India assigns it to Year VIII.

TEST VI.

Knox cube test.

Material.—Five cubes of the same colour and size (each about an inch square). Four of these are placed about two inches apart in a row on the table.

Procedure.—Take the fifth cube in the hand and say to the child, "Watch carefully and do as I do." Then tap the four cubes with the fifth cube in a certain definite order and at a certain definite rate (about one tap a second) always beginning with the cube on the child's left (or the examiner's right if he is facing the child). Then lay the fifth cube down immediately in front of the child and say "do that."

Repeat the process tapping the cubes in a different order each time.

The order of tapping the cubes is as follows (the cubes are thought of as numbered from the left of the child or right of the examiner):—

A 1234	E 1432	I 13124
B 12343	F 1423	J 143124
C 12342	G 13243	K 132413
D 1324	H 14324	L 142341

Supplementary instructions.—Start at Series A and proceed until the child fails, then give at least three more series before relinquishing the test.

Do not tell the child whether he is successful or unsuccessful in any series.

Scoring.—Any five series must be correctly imitated by the child for a pass at this age.

Remarks.—This test with other performance tests is described in “ A book of Performance Tests ” by Pintner and Paterson. q.v

It has been used successfully in India.

It has the merit of requiring very simple material, being easily administered and easily understood by the child. It requires standardisation for the different ages in India. Provisionally a pass in five series has been assigned to year eight and in six series to year ten, but this may require modification in the light of results.

Notes.

Two of the Standard Revision tests for this year have been omitted, namely Test 5—Vocabulary and alternative Test 2—Dictation.

Much trouble and ingenuity was expended by experimenters in India in attempting to frame a “ vocabulary ” suitable for use with Test 5. The difficulty, however, of compiling any one list of words which should be suitable for translation into the various vernaculars is insuperable. This omission is the less regrettable as the addition of the vocabulary test would tend to overweight the linguistic side of the scale. The test is not sufficiently different from test 5.

Alt. 2 is purely an educational test and as such was omitted by Binet from the later revisions of his scale and in all other revisions.

YEAR IX.

TEST I.

Arranging five weights.

Procedure.—Five weights identical in size and appearance must be provided, weighing respectively 3, 6, 9, 12 and 18 grams. Five cardboard boxes filled with the requisite amount of sand and shot may be used. The contents of the boxes must not rattle.

Place the boxes in an irregular group before the child and say “You see these five boxes. They all look alike, do they not? but some of them are heavy, some less heavy and some lighter still. Each box has a different weight. Now I want you to find the heaviest box and put it here, then the next lighter one next to it, and so on till the lightest one is at the end. Do you understand? Right.” While giving the instructions, point to the five places on the table where the boxes will lie.

Supplementary instructions.—If the child is at a loss the instructions may be repeated but nothing should be added. Do not give the child any hints by question or otherwise as to how he should find the weight of the boxes.

Give three trials, shuffling the boxes each time. Do not repeat the instructions until it is clear that the child has not understood them the first time. Simply say: “Good; now again.”

Scoring.—The test is passed if the boxes are arranged in the correct order twice out of three attempts. Time will be saved in scoring if the boxes are marked at the bottom, preferably by letters, *e.g.*, B, i, n, e, t, rather than numbers which the child might see when arranging the boxes.

Remarks.—The test is of value as showing the power of the child to deal with “things” rather than mental abstractions. It calls for judgment and care. It is also naturally interesting to the child.

TEST II.

Reasoning.

Procedure.—Give the child a card on which the following is printed or typed:—

“Three boys are sitting in a row; Lachman is to the left of Ram; Hari Das is to the left of Lachman; which boy is in the middle?”

Say to the child “Will you read this out loud please?” When the child has finished reading say: “Now, look carefully again at what you have read and try and give me the answer to the question.”

Supplementary instructions.—The child may be helped to read the card correctly if he makes a mistake in reading it. When the answer is given the child should be asked to give his reasons for it.

Scoring.—A correct answer must be supported by some explanation however ill-worded which shows that the child has reached it by reasoning and not merely by guesswork.

Remarks.—This is one of Burt's reasoning tests. It has been substituted for Terman's first test for age nine, giving the date, because the latter has been found by experience to be unsuitable for Indian conditions owing to the variety of calendars used in India. Binet's original test, naming the months, is unsuitable for the same reason.

The test demands power of visualisation and simple reasoning.

TEST III.

Repeating four digits reversed.

Procedure.—Say to the child:—

“Listen carefully. I am going to read some numbers; and I want you then to say them to me backwards. For example if I should say 1-2-3, you would say 3-2-1. Do you understand?” Then read the following three series, one series at a time with perfectly uniform emphasis:—

6 5 2 8.

4 9 3 7.

3 6 2 9.

Supplementary instructions.—It is not permissible to repeat any series. Do not start reading till the child says he understands what he has to do. If he repeats the first series forward instead of backwards, then the instructions should be repeated. Before each series ask the child to listen carefully and to be sure to repeat the numbers backwards.

Scoring.—The test is passed if one series out of three is repeated correctly.

Remarks.—This test was first suggested by Bobertag in 1911 and is included in the Stanford tests. It is primarily a test of attention. Of successful responses some are the result of breaking up the series, *e.g.*, 6 5 and 2 8 remembered separately, others of mental imagery, the figures being pictured as sounded in order in the mind as they are repeated.

TEST IV.

Giving similarities.

Procedure.—Say to the child:—

“I am going to name two things which are alike in some way, and I want you to tell me how they are alike.

(a) A mango and an orange—how are they alike?

(b) Iron and silver—how are they alike?

- (c) A boat and an ox-cart—how are they alike?
 (d) A sword and a gun—how are they alike?
 Alternatives (b) A mango and a pawpaw.
 (d) A tonga and a motor car.”

Supplementary instructions.—No assistance such as “what is a boat used for” may be given. If the child gives the difference instead of the similarity it is permissible to say “No. ‘I want you to tell me how they are alike.’”

Scoring.—Two out of four likenesses must be given to pass the test. Any real likeness may be accepted as satisfactory, *e.g.*, in shape, utility, origin, etc.

Remarks.—This was one of Binet’s early tests and has always proved satisfactory. The fact that the majority of failures result from “differences” being given instead of “similarities” shows that it is not primarily a test of observation but of simple intelligence, of the power of forming associations. For this reason it is interesting to keep a record of the answers given as showing the ability to form single or more complex associations: for example the answer “both are hard” to the question about the “iron and silver,” though it may be accepted as correct is obviously of less value than “both are found in the ground” or “both can be melted” or “both are used to manufacture things.”

It has been found necessary to change the objects given by Ferman for this test. Coal is not used in many Indian houses, and though “charcoal” has been suggested as a substitute there is something of a quibble in asking its likeness to wood. Again boats in some parts of India and motor cars in others are unfamiliar objects. The similarities suggested are based on tests actually given with success.

(The tests may be re-arranged in order of difficulty.)

TEST V

Interpretation of pictures.

Procedure.—Have ready three pictures each containing several figures but comprising some single idea. Hold the first one before the child and say “Look at this picture and tell me what you see.”

Scoring.—Two pictures out of three must be successfully described for a pass in this test. It is not enough for the persons and things in the picture to be enumerated. The occupations of the persons should also be given; *e.g.*, “a man is going with a letter,” “a babu is running.” More than this cannot be expected at this stage. Any general interpretation of the idea conveyed by the picture belongs to Year XII, and answers of this kind should be given a XII year credit.

Remarks.—The Stanford pictures were used in the experiments in India. The scenes which they represent are quite alien to Indian

children, and the test was not at all equivalent to the same test set in the United States. It is improbable that any one uniform set of pictures will really suit children in all parts of India. But if a good series is found, then the ideas which they express might suitably be accepted in all provinces, the actual figures and scenery being altered to suit local conditions; this would be a closer effort at standardisation than the use of any one set of pictures familiar to children in Bengal but alien to those in Bombay or Madras. Meanwhile there does not seem to be any particular reason why one series of pictures should be used. Probably in advanced alternative readers in local use, pictures will be found which are not familiar to the children and yet convey a scene which they might reasonably be expected to explain.

(This test has been adopted from Binet. The instructions have been changed in order to simplify the translation into the vernacular. Experiments showed that a literal translation of Terman's instructions made the test too difficult.)

(The types of answers given by children of different ages should be recorded. Copies of pictures found suitable might be sent.)

TEST VI.

Repeating sixteen words.

Procedure.—Say to the child. “Now listen. I am going to say something and when I have finished saying it, I want you to repeat it. Do you understand? Listen carefully to what I say and then repeat the words I said.”

Then read a sentence containing twenty words slowly and distinctly. When the child has repeated it or tried to do so, then proceed to give two other sentences prefacing each with the remark:—“Repeat just what I say.”

It is clearly impossible to suggest three sentences which will contain exactly sixteen words in different Indian vernaculars. The sentences must therefore be concocted locally. They should each contain two simple ideas expressed in very simple language: that is to say, the second part of each sentence should not follow inevitably from the first half. The following typical sentences may be used as models:—

(a) The mango tree makes a cool pleasant shade where the coolies are sitting.

(b) If I get a holiday next week, I hope to go by train to my home.

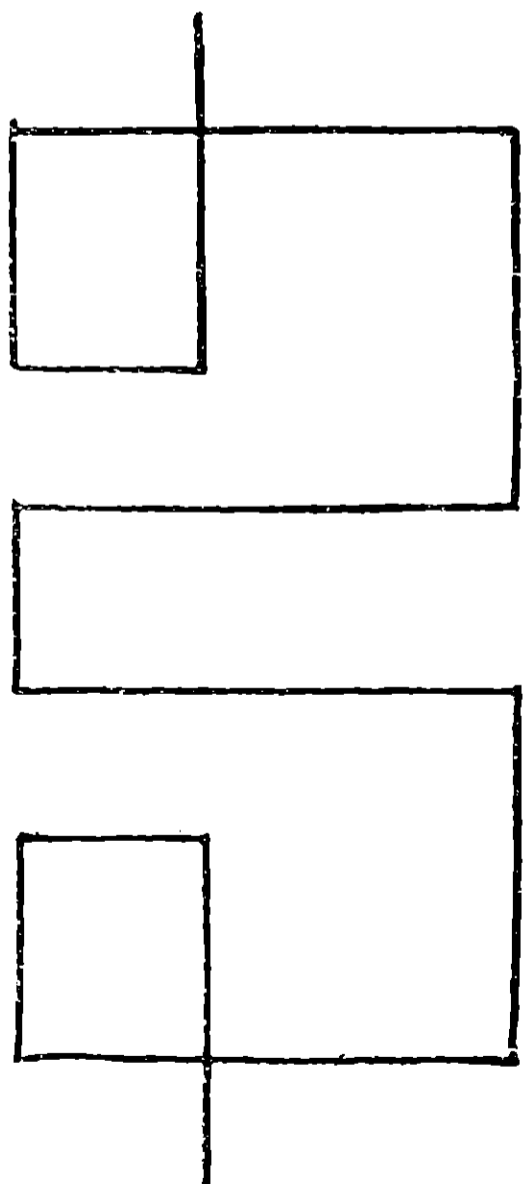
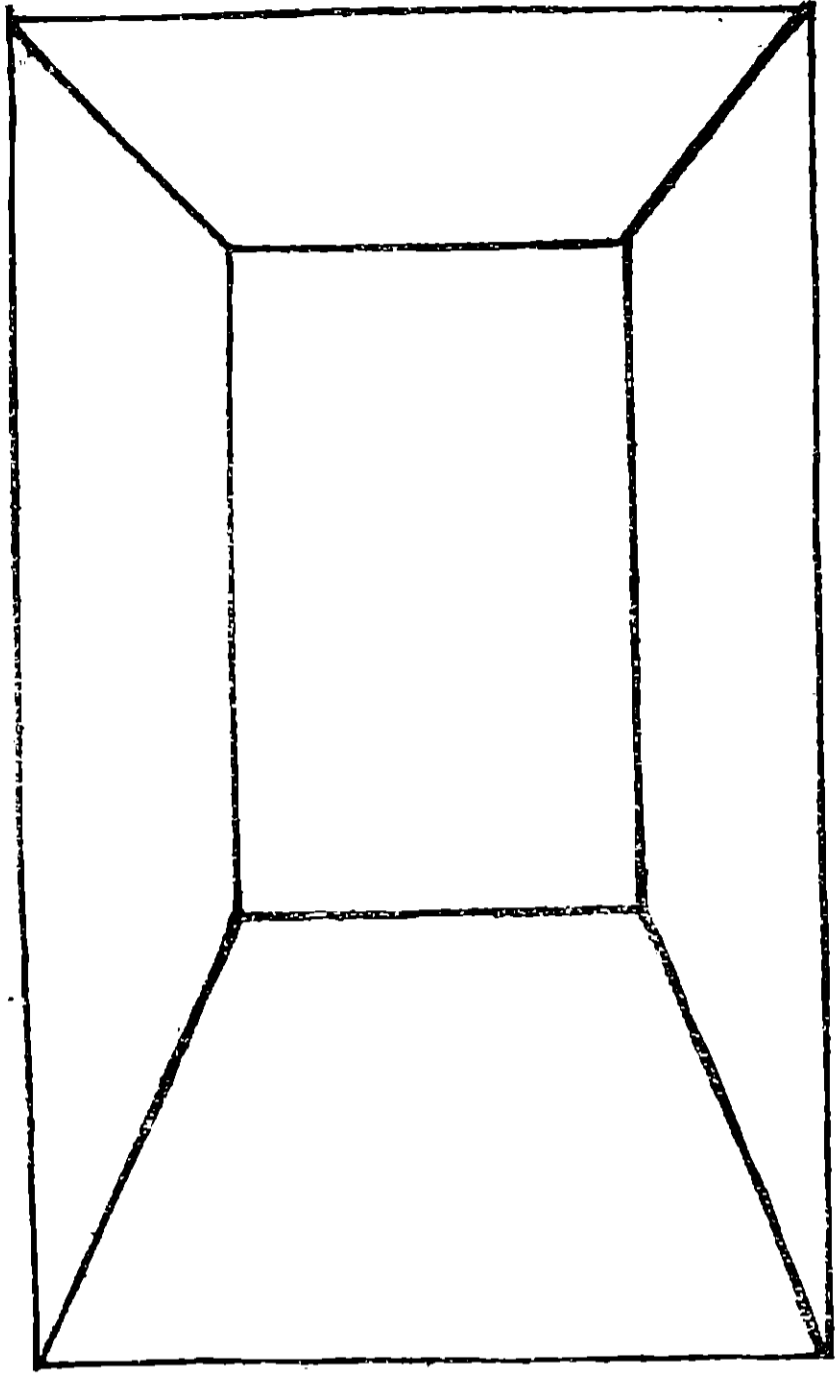
(c) It is past six o'clock and so dark that I cannot see to read.

Scoring.—The test is passed if one sentence of the three is repeated without mistake, or if two are repeated with not more than one mistake in each.

Remarks.—The repetition of syllables was included in Binet's first series but was omitted in later editions. The test is restored in the Stanford Revision, children of six being required to repeat sixteen syllables and children of ten twenty-two. It is difficult to understand why Binet and Terman have used the syllable instead of the word as the unit. It is the word and not the syllable which the child hears and remembers. No child, for example, however defective would say "pleas" instead of "pleasant" or "holi" instead of "holiday." It is indeed much easier for a child to repeat a three syllabled word like "beautiful" with which it is familiar than a monosyllable like "weird" which conveys little or no meaning to it.

Binet's original test sentences contained two complete clauses, expressing in many cases two quite separate ideas, *e.g.*, "Mabel has just torn her frock: I have given two pence to that poor beggar." Burt comments unfavourably on this as confusing even the intelligent child. Dr. Simon thinks that the disjunction is "*ni voulu, ni essentiel.*" Probably the intention will be fulfilled by sentences of the type of those given as models, in which the sequence of ideas is not too simple and yet is natural.

The value of this test is doubtful. It has been retained in this series because it will be of interest to investigate how far the general assumption that the Indian child has an unusual power for verbal memorisation is justified. Hitherto the experiments made with this test have not shown that the immediate verbal memory of the Indian boy is unusually powerful.



Year X. Test I—Drawing diagrams from memory.

YEAR X.

TEST I.

Drawing diagrams from memory.

Procedure.—Lay face downwards on the table a piece of cardboard on which are drawn the two designs shown on the opposite page:—Provide the child with pencil and paper and then say:—

“ This card has two drawings on it. I am going to show them to you for ten seconds only. Then I will take the card away and let you draw from memory what you have seen. Examine both drawings carefully and remember that you will have only ten seconds.”

Then show the face of the card for ten seconds only, holding it at right angles to the child's line of vision and with the designs in the position given in the plate. Then tell the child to start drawing.

Scoring.—The test is passed if one of the designs is reproduced correctly and the other half correctly. “ Correctly ” means that the essential plan of the design has been grasped and reproduced. “ Half correctly ” means that some essential part of the design has been omitted or misplaced or that something has been added.

Remarks.—Binet says that the test requires attention, visual memory and a little analysis. ” Terman lays stress on the analysis required. The figure to the left is more difficult to retain in the memory than that on the right. Binet had them in the reverse order with the result that there were many failures to reproduce this right hand design, since a child instinctively looks to the left first. It would be interesting to note in India whether children accustomed to read Urdu commence by drawing the right hand design. If so the position of the designs should be reversed in their case. A child who has been taught drawing will do the test more successfully than one who has not; but otherwise the test appears to be suitable for this age, if too much stress is not laid upon neatness. (Specimens of answers for different ages should be kept.)

TEST II.

Detecting absurdities.

Procedure.—Say to the child:—

“ I am going to read a sentence which has something foolish in it (or some nonsense). I want you to listen carefully and tell me what is foolish in it. ”

Then read the sentence slowly, saying after each:—“ What is foolish in that?”

(a) A soldier wrote home to his mother “ I am writing this letter with a sword in one hand and a rifle in the other. ”

- (b) A cart*-driver said that the more luggage he had on his cart* the faster he could go.
- (c) A man received a letter from a friend in which he wrote, "If you do not get this letter just let me know and I will write you another."
- (d) One day the police found the body of a man cut into eight pieces. They thought he had killed himself.
- (e) A sowar was thrown from his horse by accident, struck his head against a stone and was instantly killed. They picked him up and carried him to hospital and they do not think he will get well again.

Supplementary instruction.—If no answer is given in thirty seconds the sentence may be repeated. Sometimes it is not easy to tell from the child's answer if he has detected the absurdity or not, then it is permissible to say:—"Explain what you mean. What is silly in the sentence I read?"

Scoring.—The test is passed if three out of the five absurdities are detected.

Remarks.—Success in this test depends almost entirely on common sense. Schooling is of little help.

The original absurdities of Binet were nearly all gruesome. Two of these (d) and (e) have been retained in a modified form to suit Indian conditions. (a) is taken from Ballard's group tests. The Stanford sentence about a road being uphill all the way home and all the way back was found unsuitable for some parts of India where the country is quite flat. (b) is one of the Stanford tests; a cart has been substituted for a train, as many Indian School children of ten know little about trains. For the same reason a sentence suggested by Goddard is substituted for one about a railway accident. It was also found by experiment that few Indian children would detect any absurdity in these sentences before the age of ten. The test seems rather harder for them than for American children. For this reason the scoring has been made easier by demanding three correct answers out of five for a pass instead of four out of five as in the Stanford tests. (Three out of five was the original requirement of Binet.) (Some suitable alternative absurdities would be useful.)

TEST III.

Naming forty-five words.

Procedure.—Say: "Now I want to see how many different words you can name in two minutes. When I say 'ready' you must begin and name the words as fast as you can and I will count them. Do you understand? Ready; Start."

Supplementary instructions.—If the child does not understand, say any words will do like "sky," "dog," "happy," "fat."

If there is a pause of fifteen seconds, say "Go on as fast as you can! any words will do."

* Use name of local conveyance.

If an ingenious child starts counting or making sentences, stop him at once and say "Counting (or sentences) are not allowed. You must name separate words. Go ahead."

Do not stare at the child while he is giving words.

Scoring.—The test is passed if forty-five words (excluding repetitions) are named in two minutes. Only real words are counted.

Remarks.—It is of interest to note down the character of the answers given. One common type of response of a low order is to name only things seen by the child at the time. This handicaps the child when, as is usually the case with school-rooms, there are few objects to be seen. Young children give generally detached isolated words. Binet has said "Little children exhaust an idea in naming it. They say for example, hat, and then pass on to another word without noticing that hats differ in colour, in form, have various parts, different uses and accessories and that in enumerating these they could find a large number of words."

Good responses are those which take advantage of relationships, *e.g.*, which begin by enumerating clothes and their properties and then proceed to some other group of ideas.

It has been pointed out by Bobertag that a certain "intellectual nonchalance" is needed for a successful answer. Adults and logically minded children are apt to cling too long to one idea after the words associated with it become rare, and then proceed more slowly than those children who switch off quickly to another group of words as soon as one shows signs of exhaustion.

This may be said to militate against the utility of the test. But apart from the fact that any normal child of ten is easily able to produce forty-five words in two minutes, the test is of value in showing the comparative wealth of associations in a child's mind. That may be deduced from a study of the types of answer given.

Terman points out also the value of recording the number of words suggested in each half minute period. The backward and younger pupils may start rapidly and soon exhaust themselves. As a rule only the very intelligent improve the pace.

Burt found the average number of words given in successive half minutes by those who succeeded or nearly succeeded in the test to be:—

1st	2nd	3rd	4th
19.3	13.4	10.3	8.5

He suggests that it be taken at the end of the series and the children asked how each word or topic came to be thought of.

In the Stanford Revision the child is required to give 60 words in three minutes. The number of words has been reduced and the time in order to shorten the test. It was found that children became bored with it in the third minute.

(The number and words given by children of different ages should be recorded.)

TEST IV.

Reading for eight memories.

Procedure.—Say to the child “ I want you to read this to me as nicely as you can,” handing him at the same time a card on which is printed in clear type the following paragraph:—

“ There was a large fire in Calcutta last night which burned down three houses in the middle of the city. It took a long time to put it out. Seventeen people lost their houses, and property worth five thousand rupees was destroyed. While saving a baby who was asleep in bed a young student was burnt about the hands.”

Pronounce any word which the child cannot make out, not allowing more than five seconds hesitation in any case.

As soon as the child has finished reading put the card out of sight and say, “ Now I want you to tell me what you have read. Begin at the beginning and tell me anything you can remember.” When the child stops say, “ Anything else? Can you remember any more?”

Supplementary instructions.—Do not warn the child before he reads that he will be required to repeat what he has read. If he hesitates to repeat anything, thinking that he is required to reproduce the words he has read, encourage him saying “ Tell me in your own words anything you can remember. ”

Scoring.—The test is passed if the child is able to reproduce eight memories.

The memories are as follows:—

(1) *large fire*, (2) *in Calcutta*, (3) *last night*, (4) *burnt three* houses, (5) *in the middle* of the city, (6) It took a *long time* to put out, (7) *Seventeen* people were homeless, (8) *Five thousand rupees* worth of damage, (9) While saving a *baby*, (10) who was *asleep in bed*, (11) a young *student*, (12) was burnt about *the hands*.

The important idea in each of these memories has been placed in italics: if this is omitted but the memory otherwise reproduced a half mark may be scored, *e.g.*, the following would score half marks, (3) *yesterday*, (7) *fifteen* people lost their homes, (12) was badly burnt.

Remarks.—The test is based on the original test of Binet which, however, he subsequently omitted. It was replaced in the Stanford Revision. Terman makes it also a test of reading by requiring the passage to be read in 35 seconds with only two errors apart from the reproduction of the memories. This makes the test open to the many objections for which it was ruled out by Binet and others; it makes it partly a test of schooling. Terman defines it as a reading test on grounds which might be used to support the introduction of other purely scholastic tests.

But the test, if the reading requirements are omitted, has obvious merits. Success in the reproduction of memories requires attention and the power of retaining associated ideas. So much so that it is suggested that if the child has any difficulty (*e.g.*, due to late admission to school) in reading the passage for himself, there is no objection to the passage being read to him, though it is not likely that it will in this way make so clear an impression on his mind.

The actual text of the passage has been altered first in the Stanford revision and again to suit Indian conditions. Among other such changes may be noted an alteration in its form. In the Stanford revision the passage commenced with the name of a town (New York) and a date, thus suggesting a newspaper telegram. But Indian children of ten rarely see newspapers and are not accustomed to information conveyed in this form.

A doubt has been thrown on the suitability of this test for Indian schools owing to the impossibility of standardising the translation in many vernaculars. The language is, however, very simple and there is not sufficient justification to discard it until it has had a further trial.

TEST V.

Comprehension.

Procedure.—Say; “Now I want you to answer the questions.

- (a) When someone asks your opinion about a person you don't know very well, what ought you to say?
- (b) Why should we judge a person more by his actions than his words?
- (c) If you saw a man steal something from a shop, what should you do? ”

Supplementary instructions.—Each question may be repeated once if not understood but its form must not be changed. If no answer is given to a question in thirty seconds after repetition, then pass on to the next.

Scoring.—Two out of the three questions must be answered correctly. Types of correct answers are:—

- (a) “Tell him to ask someone else.” “Say I don't know him very well.”
- (b) “Sometimes people say things but don't do them.” “It is not what you say but what you do that counts.”
- (c) “Tell the shopkeeper,” “tell the police.”

Remarks.—Great difficulty has been found in suggesting a suitable third question in place of the original (c) (What ought you to do before undertaking anything very important?) to which there is no really reasonable reply, and the answers to which, when it has been tried in India, were very difficult to score.

(Suitable alternatives might be suggested.)

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YEAR X.

TEST VI.

Knox cubes.

As in year VIII-6, but at this stage six series must be copied correctly for a pass.

YEAR XII.

TEST I.

Dissected sentences.

Material.—Vernacular translations of the following disarranged sentences should be printed on three cards:—

For the started an we town early at hour.

To asked paper my teacher correct I my.

A defends dog good his bravely master.

Procedure.—Give the child a card and say “ Here is a sentence that has the words all mixed up so that they do not make any sense. If the words were changed around in the right order they would make a good sentence. Look carefully and see if you can tell me how the sentence ought to read,” and so on with the other two sentences, giving them in the order suggested above, and allowing a minute for each answer.

Supplementary instructions.—Do not hurry the child. Allow him to alter his answer as much as he likes within the requisite time. If he is unsuccessful with the first sentence read it out correctly to him somewhat slowly, pointing to each word as it is spoken. Do not give any other explanation or comment.

Scoring.—The test is passed if two out of the three sentences are correctly reproduced within the minute allotted to each. A sentence is not counted correct if a single word is omitted, altered or inserted. If an answer makes an intelligible sentence without being absolutely correct, half marks may be allotted to it. Examples of such partially correct answers are:—

For the town at an early hour we started.

Asked I my teacher to correct my paper.

A master bravely defends his good dog.

Remarks.—Terman states that this test “ satisfies the most important requirement of a test of intelligence namely the percentage of successes increases rapidly and steadily from the lower to the higher levels of mental age.”

The test does not lend itself so easily to translation. For example “ at an early hour ” may have to be replaced by two words only in an Indian vernacular. The word “ town ” has been substituted for “ country ” in the first sentence as the result of Indian experience.

The particular sentences given in the Stanford Revision have been used by Binet and others with a remarkable agreement in the results obtained. Nevertheless it may be found in India that other sentences must be substituted in order to avoid ambiguity.

In any case the form of the sentences given will depend upon the vernacular used. Possibly the future tense will prove better test

than the past for the first two sentences, since the past tense may be formed of two words.

(A few partially-correct answers in the vernaculars should be recorded.)

TEST II.

Reasoning Test.

Procedure.—Give the child a card on which is printed (in the vernacular):—

I started from the school and walked one hundred yards.

I turned to the right and walked fifty yards.

I turned to the right again and walked one hundred yards.

How far was I from the school?

Say to him: “Read this card carefully and then give me the answer to the question at the end of it?”

Supplementary instructions.—The child should read the problem aloud and then be allowed to puzzle out the answer in silence. No supplementary assistance should be given to him. The child may be allowed a second attempt if the first answer given is incorrect.

Scoring.—Half marks are given if the child answers correctly at the second attempt. The correct answer should be given by the child within one minute after he has finished reading the problem.

Remarks.—This is one of Burt’s Reasoning Tests for year 12. The author does not suggest any time limit for a reply but it is not unreasonable to suppose that a child of average intelligence will give the correct answer within one minute if it grasps the problem at all. The other tests given for this year by Burt are unfortunately not suitable for Indian schools. It would be well if other suitable tests could be devised on the model of those used by Burt.

This type of test is most useful as it depends for a correct reply on what is ordinarily called common sense. As a matter of fact Burt found a high correlation between the results of these tests and the intelligence of the children tested as judged by other measures, *e.g.*, examinations, though there was a far greater range of individual variation than with the Binet-Simon tests.

(The type of answers given by children of different ages should be recorded.)

TEST III.

Interpretation of picture.

Procedure.—Use four pictures.

Hold the first one before the child and say “Look at this picture and tell me all about it.” “Tell me its meaning.”

Supplementary instructions.—If the answer given is very brief, say “go on; explain what you mean.” Do not say any word of approval till the test is completed.

Scoring.—Three pictures out of four must be successfully described for a pass in this test. At this stage the description must convey in however incomplete a form the general idea which the picture is intended to convey, or one which it reasonably might be interpreted as conveying.

(The types of answers given should be recorded.)

TEST IV

Using three words in a sentence.

Procedure.—Say to the child:—

“Listen. I am going to take three words and make up a sentence which has all three words in it. The three words are:—birds, trees, nests. With these words I make up **the sentence, Birds build their nests in trees.** Now I am going to give *you* three words, and *you* must make up a sentence that has all the three words in it. The words are:—Boy, ball, river. Make up a sentence which has all the three words in it.”

Afterwards give in the same way:—

(b) work, money, men.

(c) road, bazar, garden.

Supplementary instructions.—If the child thinks that the sentence must consist of the three words only, explain “The three words must be put with other words so that they all form a sentence.” This is the only help that may be given.

If a sentence is not given in a minute, count that part of the test a failure and give the next set of words. Only *one* attempt can be allowed for each part of the test.

Scoring.—The test is passed if two of the three sentences given are satisfactory. In order to be satisfactory a sentence must fulfil the following requirements:—(i) It must either be a simple sentence or, if complex, must not contain more than two distinct ideas, *e.g.*, “The boy lost his ball and we went to the river” and (ii) it must not express an absurdity *e.g.*, “The boy has a ball and a river.”

Slight changes in one or more of the key-boards, *e.g.*, “rivers” for river are disregarded.

Remarks.—The test is known as the “Masselon experiment” after its inventor. It is a good test of the child’s power of forming associations.

The actual sentences given by the children should be recorded and will be found of interest. The dull child will generally express two ideas with the words, while the bright child will combine them in a single idea.

Binet gave one set of words only:—"Paris, river, fortune," which is distinctly difficult. A correct answer in this case must depend very largely on the child's education. It is not parallel in difficulty to the other two series.

The test was placed in Year X by Binet and in Year IX by Terman. Experiments in India show that a satisfactory answer cannot be expected before Year XI.

(Typical answers for different ages should be recorded.)

TEST V.

Repeating five digits reversed.

Procedure.—As in test IX-2.

The series are:—

3 1 8 7 9 6 9 4 8 2 5 2 9 6 1

TEST VI.

Paper and envelope test.

Material.

- (a) An envelope measuring $4\frac{3}{4}$ inches by $3\frac{1}{4}$ inches,
- (b) a piece of paper roughly folded to go into the envelope but not fit it exactly,
- (c) a piece of paper folded to fit exactly into the envelope, and
- (d) a plain piece of paper measuring $10\frac{1}{4}$ inches by 9 inches.

(Larger or smaller envelopes and pieces of paper may be used for this test provided that the relative proportions are preserved.)

Procedure.—Take the envelope and place in it in turn the two-folded pieces of paper. Point out to the child that the second piece fits the envelope exactly while the other does not.

Do not unfold either piece.—Hand the child the envelope and the plain piece of paper and say "Now I want you to fold this piece of paper so that it will go into the envelope exactly, as the second piece of paper did. First think carefully and then begin."

Scoring.—In order to accomplish this test correctly the child must fold the paper in three lengthways and then double it in half the other way, or *vice versa*.

The child may be allowed two attempts and be awarded half marks if he succeeds at the second attempt.

Remarks.—This test has been substituted for the "Ball and Field" test used by Terman. The finding of a lost ball in a field is doubtless a familiar occupation for American children, not so for Indian boys. Moreover a round field with a surrounding wall or hedge and a gate is not found in India. The Stanford test does not therefore present the same natural features and evoke the same

practical interest when given to Indian boys. On the other hand the placing of a letter in an envelope is an occupation which all Indian boys of twelve must have witnessed.

The object of both tests is the same, to detect the ability to act according to a reasoned plan. The presence of a plan is an essential feature of both tests,—while in the “paper and envelope” test the distinction between success and failure is far more sharply defined than in the “Ball and Field” test.

It has been observed that in both tests success is due to temperament as well as to intelligence. A quick but careless child will “make a shot” at either test without waiting to consider the best method of setting about it. The careful child will measure the paper by the envelope in this test.

[A few experiments only have been made with this test; and other alternatives to the “ball and field” test might be devised.]

YEAR XIV.

TEST I.

Finding a rule.

Procedure.—Give the child a card on which is printed :—

$$1 + 3 = 4 = 2 \times 2$$

$$1 + 3 + 5 = 9 = 3 \times 3$$

$$1 + 3 + 5 + 7 = 16 = 4 \times 4$$

Then give him a piece of paper and a pencil and tell him to write down the next two lines of the series and suggest a rule from it.

Scoring.—The test is passed if the series is continued correctly for two lines and the correct rule given within two minutes. (By “rule” generalisation is meant.) Half marks may be awarded for the completion of the series only.

Remarks.—The vocabulary test of Terman has been omitted. The above test which has been successfully tried in India is substituted for Test 5 “Arithmetical reasoning” in the Stanford scale which consists of three problems in Arithmetic such as are given to all Indian school boys long before they reach the age of fourteen. The test substituted has the merit of combining arithmetical reasoning with the power of induction.

TEST II.

Paper Test.

Procedure.—Provide yourself with two sheets of paper each about 6 inches square and a pencil. Say to the child, “here is a sheet of paper that I am going to fold into four” (fold the paper while the child watches). “Suppose now I cut out a small hole just here” (mark with the pencil this spot which should be in the middle of the edge of the last fold) “When the paper is unfolded again what would it look like? Mark this piece of paper to show me where it will be cut.” Place the folded paper in front of the child with the corner showing the fold towards him and the mark where the cut would have been on the upper side. The child must not touch the paper shown to him nor fold the other sheet.

Supplementary instructions.—Beware of saying “Draw the holes” as this suggests that more than one hole is required.

Scoring.—To satisfy this test two holes should be drawn in a line with each other, one near the centre of each half of the paper.

Remarks.—This is the original test devised by Binet and placed by him in Year XIII. Terman places it among the “adult” tests. Experience so far in India seems to place it in Year XIV. It is ob-

vious that success in it depends on the power of mental visualisation. Terman says that a solution is rarely arrived at by logical mathematical thinking.

(This test requires standardisation by age in India.)

TEST III.

Defining abstract words.

Procedure.—The words to be defined are *pity, revenge, charity, envy, and justice.*

Use the formula: “What is pity? What do we mean by pity?” and so on with the other words.

Supplementary instructions.—If the meaning of the response is not clear, ask the child to explain what he means. If the definition is in terms of the word itself, *e.g.*, “pity is to pity someone” then say, “yes, but what does it mean to pity someone?” Only supplementary questions of this kind are permissible.

Scoring.—The test is passed if three of the five words are satisfactorily defined. The definition need not be strictly logical nor the language elegant: it need only show the meaning: definitions by means of illustrations are accepted. Examples of satisfactory definitions are:—

(a) “To feel sorry for someone,” (b) “To pay a person back,
(c) “To give to the poor,” (d) “It is when you see a person who has something you want,” (e) “It is what you get if you go to Court.”

Remarks.—The words have been arranged in the Stanford Revision in the order of difficulty.

The test is essentially one of clear thinking. It requires some power of abstraction and generalisation.

(Typical answers should be recorded.)

TEST IV

Problem question.

Procedure.—Say to the child “Listen and see that you can understand what I read.” Then read these three problems:—

(a) One man said to his friend if I buy a horse I shall be miserable because I shall have the expense of feeding it. If I do not buy a horse I shall still be miserable because I shall have no horse to ride, so in either case I shall be miserable. His friend replied “On the contrary you ought to be happy in either case, for if you do not buy a horse you will be happy because you will not have the expense of feeding it and.....” How do you think he finished his argument?

- (b) A Pahari* who had come to a town for the first time in his life saw a Babu riding along the street. As the Babu rode by, the Pahari said " Babu is lazy, he walks sitting down. " What was the Babu riding on that made the Pahari say " he walks sitting down? "
- (c) When you enter my house you will find a window in the wall on your right. When the sun sets it shines straight through this window on to the wall opposite. What direction are you facing when you stand in the doorway and look across the street? " North, south, east or west. "

Supplementary instructions.—It is permissible to re-read a passage if the child asks you to, but no other questions or assistance must be given.

Scoring.—Two answers out of three must be satisfactory. The only correct answer to (b) is a bicycle.

None of these three problems are found in the original Binet scale. (b) is from the Stanford Revision modified to suit India. (a) and (c) occur in Burt's reasoning tests for years 13 and 14.

(The kind of answers given should be recorded.)

TEST V.

Giving similarities, three things.

Procedure.—The procedure is the same as in IX-4, but with the following words:—

- (a) Cow, snake, bird.
- (b) Wool, leather, cotton.
- (c) Knife, paisa, nail.
- (d) Swim, run, fly.
- (e) Gun, sword, lathi.

Scoring.—Three satisfactory responses out of five are necessary for success. If the value of the response given is doubtful, *e.g.*, " All are useful, " a supplementary question, *e.g.*, " How are they useful? " may be asked. Such questions may of course only be added if the first answer is correct so far as it goes.

Remarks.—Of the sets of words given, (a) and (b) are from the Stanford series, (c) has only been slightly modified to suit Indian conditions, (d) has been substituted for Terman's (b) " Book, teacher, newspaper, " as it is hardly correct to describe these as alike, (e) has been substituted for Terman's (e) " Rose, potatoe, tree, " since the retention of this set would enable a child who had learned the three kingdoms to pass the test by saying " animal, " " vegetable " and " mineral " to questions (a), (e) and (c).

N.B.—The local substitute for a stupid fellow should be used.

TEST VI.

Knox Cubes.

As in VIII-6 but at this stage eight series must be imitated correctly to secure a pass.

YEAR XVI.

TEST I.

Giving differences between abstract terms.

Procedure.—Say to the child “What is the difference between:—

- (a) Poverty and misery.
- (b) Ignorance and stupidity.
- (c) Valuable and useful.
- (d) Character and reputation.”

Supplementary instructions.—The choice of terms depends a great deal on the vernacular used. For those suggested above:—

- (a) Pleasure and happiness,
- (b) Laziness and idleness,
- (c) Pity and kindness,

may be substituted.

Binet and Terman give “Evolution and revolution” for which no vernacular substitutes are likely to be found.

Scoring.—Three out of four differences must be given correctly. The reply should bring out real contrast or opposition between the ideas differentiated.

Remarks.—This is one of Binet’s original tests for year 13. Terman places this among the “Average adult” tests and a correspondingly higher type of answer must be expected.

(Types of answers may be recorded.)

TEST II.

Problem of the enclosed boxes.

Procedure.—Show the child a small box and say “Suppose this box had two smaller boxes inside it, and each of the smaller boxes contained one smaller box. How many boxes would there be altogether counting the big box?” To be sure the child understands repeat the problem as follows:—“First the large box, then two smaller ones, and each of the smaller boxes contained a still smaller box.”

Record the answer and then go on “Now supposing this box had two small boxes inside it, and each of the two boxes contained two smaller boxes. How many boxes would there be altogether?”

The third problem which is given in the same way supposes that there are *three* small boxes in the large box and each contains *three* smaller boxes.

YEAR XVI.

In the fourth problem there are *four* small boxes each containing *four* smaller boxes.

Supplementary instructions.—The problem must be given orally and the solution must be found without the help of pencil and paper. Note that the first problem only is stated twice. Only one half minute is allowed for each problem.

Scoring.—Three of the four problems must be answered correctly within the half minute allotted to each to secure success.

Remarks.—This test was invented by Terman and seems to depend for success on the power of constructive imagination. Terman states that the test was passed by fifty-five per cent. of high school pupils and sixty-five per cent. of unschooled businessmen; which would seem to show that success in it is not dependent on schooling.

It is easily set and easily scored.

(The time taken should be recorded.)

TEST III.

Repeating six digits reversed.

Procedure and Scoring as in Year IX (3).

The series used are:—

4-7-1-9-5-2:

5-8-3-2-9-4

7-5-2-6-3-8

Remarks.—Terman states that this test is passed by approximately half “average adults” and by three-fourths of “superior adults.” It shows no effect of schooling.

TEST IV

Reasoning test.

Procedure.—Give the child a card on which is printed:—

“ I heard the school clock strike yesterday ten minutes before the gun was fired. I did not count the strokes but I am sure it struck more than once and I think it struck an odd number.

I did not come to school in the morning and the school clock stopped at five minutes to five in the afternoon.

When do you think the gun fired?”

Tell him to read the card and then answer the question at the end.

Scoring.—The correct answer must be given within two minutes.

Remarks.—This is one of Burt’s reasoning tests for Year XIV but experiments show that it is not too easy for Year XVI

(The time taken should be recorded.)

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