The Binet-Simon Measuring Scale for Intelligence:

What It Is; What It Does; How It Does It; With a Brief Biography of its Authors, Alfred Binet and Dr. Thomas Simon

By

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OBJECTS OF THE COMMITTEE: To disseminate knowledge concerning the extent and menace of feeble-mindedness and to suggest and initiate methods for its control and ultimate eradication from the American people.
THE BINET-SIMON MEASURING SCALE FOR INTELLIGENCE.

BY MISS ELIZABETH S. KITE.

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INTRODUCTION.

There has seemed to be a very great need for a clear and concise statement of the Binet-Simon Measuring Scale for intelligence. This for several reasons. The chief one, perhaps, is the widespread, if not general, lack of knowledge as to what the Scale is, what it does, how it does it, its reliability, its limitations. Also it seems desirable to have a word or two said with respect to the men who created it, especially concerning their scientific training and standing.

Another reason is that in many quarters the value of the Scale has been questioned and its use discouraged because of a lack of knowledge concerning it.

Perhaps no one in this country can speak with greater authority on the interpretation and use of the Scale than Miss Elizabeth S. Kite, owing to her practical experience in its use and her familiarity with the work and writings of Alfred Binet on the origin, development and application of the Scale. Miss Kite’s translation of Binet’s work will issue from the press during 1916.

The following exposition of the Measuring Scale has been written by Miss Kite for the Committee on Provision for the Feeble-Minded. In its preparation she has had the valuable assistance of Miss Eleanor Gray, formerly Dean of Women at the State Normal School, Bellingham, Washington. Miss Gray has made a special study of the Binet-Simon Measuring Scale. She has devoted nearly a year to a critical study of Miss Kite’s translation of Binet’s Work and has materially aided in giving the translation its final form.

It is the purpose of the Committee to give this pamphlet the widest possible circulation in the hope that the movement now beginning to take shape all over the country in behalf of the Feeble-Minded may be thereby stimulated and more intelligently directed.
I.
HISTORY AND DEVELOPMENT OF THE SCALE.

In October, 1904, the French Minister of Public Instruction appointed a Commission for the purpose of organizing classes for backward children in the public schools of Paris. This Commission was authorized to take the necessary measures for providing special instruction for such children, but nothing was said about the important question of who should decide what children possessed the qualifications necessary for admission into these classes or even what these qualifications should be. Nor was this surprising, for in the mind of the Minister himself very hazy notions existed of what really constituted a normal mentality and still less was he able to suggest means for obtaining this knowledge. The Commission, to use Binet’s own words, “was appointed to do a work of administration, not of science.” (Page 163, Vol. CI.)

Probably no one then living in Paris was as familiar with normal child psychology as was Alfred Binet, who was a member of the Commission. For years he had been experimenting upon children in the schools of Paris; at the same time he was making profound studies of the developing mentality of his two daughters, who had already served as subjects for a small volume upon child psychology.

His work with school children had covered an extensive field of experimentation, including measurements of the head, height and weight, studies in memory, power of attention, sense perception, etc. In all these Binet was actuated by the one desire to find indications for measuring the intelligence. Having exhausted external methods without attaining the desired result, he had already begun to turn his mind into deeper channels when he was called to take his place on the Commission.

The practical need of discovering a means of measuring the intelligence was thus brought forcibly home to him. He saw the difficulties that stood in the way of securing a just basis for commitment to a special class. He realized that if left to personal impression, to feeling or to any form of subjective appreciation, injustice would inevitably creep in. There must be no chance for personal prejudice, incompatibility of disposition, or any similar motive to influence a teacher to get rid of a troublesome child. “It can never be a mark of distinction,” Binet says, “to have passed through a
special class” (Page 165, Vol. CI), therefore the rights of the child must be safeguarded. That the line must be drawn upon a scientific basis was clear, but how establish such a basis?

It was then that Binet, in collaboration with Dr. Simon, began the laborious undertaking of working out the Measuring Scale which he gave to the world through the pages of “L’Annee Psychologique” in its initial form in 1905, then, more highly crystallized, in 1908.

Before putting his “Echelle métrique de l’intelligence,” before the public, Binet demands that we “come to an understanding of what is meant by that very comprehensive word the intelligence.” To quote direct (L’Annee Psychologique, Vol. XIV, Page 196):

“Nearly all phenomena of which psychology treats are manifestations of intelligence; a sensation, a perception, are intellectual manifestations just as much as reasoning. Must we then put on test all psychology?

“A little reflection has shown us that this would indeed be lost time. What difference, for instance, if the organs of sense function normally? What difference if certain ones are overly acute, or others respond to no stimulus or only weakly so? Laura Bridge- man, Helen Kellar and other unfortunates were blind as well as deaf mutes, which did not in the least prevent their being very intelligent. . . . The same is true of memory. . . . One can have good sense and lack memory. The reverse is also frequent.

“There is in the intelligence, it seems to us, a fundamental organ, one whose lack or whose alteration is of very great import for practical life, and that is the judgment, otherwise called good sense, the practical sense, initiative, the faculty of adaptation. Judge well, understand well, here lies the essential force of the intelligence. A person may be either feeble-minded or an imbecile if he lacks judgment; with good judgment he could never be either. The rest of the intellectual psychology seems of comparatively small importance by the side of judgment. . . . It results from all this that in the scale which we present, we accord the first place to judgment.”
II.

THE SCALE.

1. Its Component Parts.

The Binet-Simon Measuring Scale is composed of mental tests which measure the intelligence. These tests are short, direct questions bearing upon simple matters of every-day life, gradually becoming more difficult and involving new mental processes as the age of the child increases. To quote from Dr. H. H. Goddard's article in "Reference Hand Book of the Medical Sciences" on "Tests of Intelligence":

"In his own article (Vol. XI) Binet lays down the criterion for a test of intelligence; he says 'If one succeeds in finding a test easy to repeat and precise, which shows a development parallel with that of the intelligence, one will then have done a great service to pedagogy in furnishing a test of intelligence, a criterion with which it will be possible to judge and measure the intelligence of people.' The plan is simple, its execution difficult in the extreme. . . . In the Scale we find an illustration of what Binet means by 'a test easy to repeat and precise, which shows a development parallel with that of the intelligence.' For example, the ability to copy a square drawn on paper. Ability to copy this is absent at the age of two; it shows very slightly at three, is better at four and rises to practical perfection at five. Beyond the age of five it presents no difficulty to the normal child. It is thus assigned by Binet to the age of five as a suitable test. . . .

"It is evident that such questions as the copying of the square would not measure the intelligence beyond the age of five, because the square is copied perfectly at about that time. For children of ten or of the other ages, other questions must be found which reach their perfection at a later age. Binet's plan is perfect and he has worked it out with marvelous success. . . . It is largely to the Binet-Simon Measuring Scale that we owe our knowledge that the mind does develop of itself and that a child who has never been in school may nevertheless be intelligent in proportion to his age."
2. Record Blank Used in Noting Result of Tests.

1911 Revision, Vineland Training School.

Name, Beckie W.  Born 1890.  Admitted . . . . . . . . . .
Examined March 8, 1913.  Mental Age, VIII.
(For explanation see p. 10 et. seq.)

At Age III
1. Point to nose, eyes, mouth.
2. Repeat "It rains. I am hungry."
3. Repeat 7 2.
4. See objects in pictures.  1.  4.
   Enumerate.  2.  5.
   3.  6.
5. Know name.

At Age IV
1. Know sex—Boy or girl? Girl or boy?
2. Name key, knife, penny.
3. Repeat 7 4 8.
4. Compare lines—which is longer?

At Age V
+1. Compare 3 and 12 gram, 6 and 15 gram weights, correctly.
+2. Copy square.
+3. Repeat, "His name is John. He is a very good boy."
+4. Count four pennies.
+5. "Patience."

At Age VI
+1. Is it morning or afternoon? Afternoon or morning?
+2. Define (in terms of use) fork, horse, table, mamma.

+3. Put key on chair; shut door; bring box.
+5. Choose prettier face in 1 & 2; 4 & 3; 5 & 6.

At Age VII
+1. Count 13 pennies.
+2. Describe action pictures. (See III 4.)
+3. See what is lacking in pictures; eyes, nose, mouth, arms.
+5. Recognize red, blue, green, yellow. (Time allowed, 6 sec.)

At Age VIII
+1. Compare (Time allowed, 20 sec.)
   Butterfly and Wood and Paper and
   Fly   Glass   Cloth
   —2. Count backward 20 - 1. (Time allowed, 20 sec.)
+3. Name days.  M. T. W. T. F. S. S. (Time allowed, 10 sec.)
—4. Count value of stamps.  3 1c.; 3 2c. (Time allowed, 10 sec.)
+5. Repeat 4 7 3 9 5.
At Age IX

+1. Make change 20c—4c.
—2. Definitions, in terms better than use. (See VI 2.)
+3. Know date.
   (Time allowed, 15 sec.)
—5. Arrange weights. (2 out of 3 times correct.) (1 min. each.)
   +1. 18, 15, 12, 9, 6, 3.
   —2. 15, 18, 12, 9, 6, 3.
   —3. 15, 12, 18, 9, 6, 3.

At Age X

—1. Know money; 1c. 5c. 10c. 25c. 50c. $1. $2. $5. $10.
—2. Draw design from memory after being shown for 10 seconds.
+3. Repeat 8 5 4 7 2 6. 2 7 4 6 8 1. 9 4 1 7 3 8. (1 out of 3 correct.)
   (1st Series time 20 sec.)
   (2 out of 3.)
   +a. (Missed train.)
   +b. (Struck by playmate, etc.)
   +c. (Broken something.)
   —a. (Late to school.)
   —b. (Important affair.)
   —c. (Forgive easier.)
   —d. (Asked opinion.)
   —e. (Actions vs. words.)
   (Time allowed, 1 min.)

At Age XI

—1. See absurdity. (3 out of 5.) (Time allowed, 2 min.)
a. Unfortunate painter.
b. Three brothers.
c. Locked in room.
d. R. R. accident.
e. Suicide.
—2. Make sentence using Philadelphia, Money, River. (See X 5.)
—3. Give sixty words in three minutes.
—4. Rhymes. (Time allowed, 1 min. each.)
   (3 Rhymes with each word all correct.)
   day
   mill
   spring
—5. Put dissected sentences together. (Time allowed, 1 min. each.)
   (2 out of 3 correct.)
   a.
   b.
   c.

At Age XII

+1. Repeat
   +2 9 6 4 3 7 5. —9 2 8 5 1 6 4. —1 3 9 5 8 4 7.
—2. Define Charity.
   Justice.
   Goodness.
3. Repeat, “I saw in the street a pretty little dog. He had curly brown hair, short legs and a long tail.”
—4. Resist suggestion (Lines).
   1. 2. 3. 4. 5. 6.
—5. Problems: (a) Hanging from limb. (b) Neighbor’s visitors.
3. Discussion of Some of the Tests.

A more detailed consideration of the tests may be of interest:

After much experimentation Binet found that at three years the average child can correctly point to familiar objects when named before it (see question 1, III of Scale, page 8), such as parts of the body, etc., but that it is not until the fourth year that the name can be correctly given when a familiar object is presented to it. (See question 2, IV.) In like manner he discovered that in immediate repetition, when it was a question of words containing an idea, a three-year-old child can repeat six syllables and a five-year-old ten, but with figures, conveying no idea, a three-year-old could repeat but two, a four-year-old three, an eight-year-old five, and so on. The picture test was considered by Binet as one of the very best; by it he noted three widely different stages of development. The little child of three sees in the picture only objects, especially persons. He says "Man, boy, horse, wagon," etc., while normal children of seven invariably are first struck by the action portrayed. "That man's goin' to whop them children" was the characteristic answer given by a street urchin of six—which answer alone threw a flood of light upon his mentality. Interpretation of pictures comes at a much later date. Example: "That man is a prisoner—he is looking out of the cell window, longing to be free." "That man is looking out of the window" would be sufficient for a descriptive answer such as is expected of a child of seven, but the emotion "longing to be free" is the interpretation of an adult.

The first dawning of the power to judge is made evident by tests of comparison as of lengths, weights, copying of square and diamond, lack in pictures, etc. More difficult judgment tests, calling also for the power of comprehension, are the questions 4, X; 1, XI; 5, XII. Moreover, the tests are of such a nature that practically all of them when rightly interpreted show judgment. Thus it is a sign of good judgment for a child whose memory is poor to show dissatisfaction at his or her attempt at repetition, or to quickly correct an error, or even to say "I do not know." It is to be noted that seldom is a mental defective conscious of a lack of knowledge; on the contrary he is apt to manifest complete satisfaction over the most inadequate or even absurd replies. Most of the tests require a certain vocabulary, especially such as 2, VII; 1, VIII; 5, X; 2, 3, 4, 5, XI. But the possession of a good vocabulary is one sign of intelligence and the correct use of words is a test of judgment.

The average child of seven will define all words in terms of use as "a fork is to eat with," "a horse is to ride on," "a mamma is
to take care of you,"—while normal children of nine tend to express themselves in better form, even though their opportunities of culture have been the most meager; thus: "A fork is iron," "A horse is meat" or "A fork has four stickers," "A horse has four legs" are common answers from illiterate American children of nine years. Although the language is crude, the mental development is sufficient to call the test passed. "Automatism" as shown in these last answers is very common among children; thus having begun: "A fork is iron," they will often continue "A table is wood," "A chair is wood, a horse is meat, a mamma—" they hesitate, for generally the shock of the idea they are about to express recalls them to their senses—and they here give a turn as: "A mamma—she's your mother," or something similar. Some, however, follow the idea to its bitter end. Needless to say, automatism carried thus far is a very bad sign.

The game of "Patience" is a puzzle test, but so simple as to be readily solved by children of five. It appeals to the judgment and its use has been amply justified. It is composed of two visiting cards, one whole, the other cut diagonally into two pieces. The perfect card is placed before the child, then he is given the two pieces and told to put them together so they will reproduce the model. In the beginning Binet used the same idea in constructing a much more difficult test. He cut the second card into ten pieces, using the same procedure. This formed a real puzzle, too intricate, he found, for practical use in a rapid mental examination, therefore he discarded it.

4. ITS PRACTICAL APPLICATION.

By way of illustration of the use of the Scale we cannot do better than quote direct from Henry H. Goddard's pamphlet, "The Binet-Simon Measuring Scale for Intelligence. What It Is and How It Is Used." He gives the case of an intelligent but untrained teacher who appealed to him for help in determining the mental condition of an exceedingly dull pupil whom she suspected to be feeble-minded. He says:

"She was given a pamphlet of the tests and a few suggestions as to how to ask some of the questions and recommended to give the tests and send the answers to us for review. Here is the case:

"The boy was nearly thirteen years old. In the test for Age 3, he pointed to his nose, eyes and mouth, but he could not repeat 'It rains. I am hungry.' He repeated two figures, and he was able to point out some things in the pictures. He knew his own name.

"In Age 4, he answered all of the questions correctly.
"In Age 5, he compared correctly three and twelve grams, also six and fifteen. He did not copy the square, could not repeat 'His name is John. He is a very good boy'; could not count four pennies, said 'two—six—eight.' He did do the little game of 'patience.'

"In Age 6, asked if it was morning or afternoon he simply repeated the last word. This even when he was asked if it was afternoon or morning. In his definitions he said 'A fork is a fork,' 'a table is made out of wood,' 'a chair is made out of wood,' 'a horse is made out of wood,' 'mamma is made out of wood.' He could not do the three errands, of putting a key on a chair, shutting the door and bringing a box. He could not show his right hand and left ear. Showed his right hand and right ear. He did not choose the prettier of the two faces correctly. He always chose the one at the right. He could not count the thirteen pennies in Age 7. His description of pictures has been given in Age 3. He could not see what was lacking in the unfinished pictures, could not copy the diamond, and as to the four colors he said 'pink'—’white’—’white’—’pink.’ It was useless to go any further.

"So much for the tests and the results.

"Now let us see what our teacher has learned about her boy. He is thirteen years old and cannot go possibly beyond seven. He is at least six years backward. There is no longer any doubt about his dullness or even his feeble-mindedness. But however inexperienced she may be, she can count closer even than that. It is not at all likely that she has made any great mistake in her method of giving the tests in these early years. Let us see what she may be reasonably sure of.

"In Age 7, she is perfectly clear that he has failed in every one. The same is true of Age 6, unless she may be a little uncertain as to whether the answer 'a table is made of wood' and 'a chair is made of wood' may not be credited, but in all probability even she would recognize the automatism whereby he says the horse is made of wood and the mother is made of wood, which spoils the whole test. He has therefore done nothing beyond five.

"In Age 5, she is perfectly sure he cannot count four pennies and that he cannot repeat the sentence. There is no mistaking the fact that he cannot copy a square. She perhaps attributes his inability to repeat the sentence in Age 3 and in Age 5 to difference. We may allow this. If she credits him with having answered No. 4 in Age 3 in seeing something in the pictures and his comparing the three and twelve grams and the little game of patience, he would be 4², so that she knew pretty well that he is about four and a half, at least not over five. And without any doubt, she knows vastly more about the boy than she ever knew before, and the test has been to her of immense value, as it assures her of the truth of her suspicion.

"Perhaps the reader will say this child is an extreme case. It is not an extreme case in the sense that it is unusual. Any teacher who uses the Scale will find a great many cases of this kind. For the sake of illustration, let us assume a case, namely, that this boy
was six years old instead of thirteen. Then there would be some doubt. He would be approximately two years backward. Is he feeble-minded? This we could not tell. It would require the expert to judge whether it is a case of simple backwardness or of mental defect. Our inexperienced teacher could not decide this. She must recognize her inability to use the test to such a fine point."

In conclusion, Dr. Goddard incidentally answers a question often asked, "Can the result obtained in the use of the Scale by an untrained person, be of any real value?" He says, "In the hands of an untrained person it is still of great value and will show more than could otherwise be determined about the child." Elsewhere in the same article he urges, however, that the untrained person must be made to fully realize his own lack of training and therefore liability to error and consequently he must refrain from making too close a deduction. With this precaution it is unlikely that serious trouble could ensue from any such use of the Scale.

Let us give another application of the Scale where a wider range of ability is shown. (See Record Blank, p. 8.)

Beckie was a robust girl of twenty-three, well formed and almost good-looking, except for an exceedingly low forehead. When the test was made she was in jail for criminal neglect of her two-year-old son. In the same cell was a mulatto girl whose interest was keenly aroused by the test and who was with difficulty induced to resist her impulse to correct Beckie's failures, being, although probably not normal, of higher mentality than she.

On the record sheet her replies are noted + or -, according as the corresponding test was passed or not. In every case where her replies were doubtful she was given the benefit. As she was in high good humor at the time and immensely pleased with her success (her failures made no impression whatever upon her), this record may be taken as marking the limit of her possible attainment. She answered correctly all the questions under VI. This, therefore, is her basal year.

In VII—

1. She had no difficulty in counting.

2. Barely passed; her descriptions were of the crudest sort.

3. Utter failure. She admitted the pictures looked "wrong," but could not see wherein, even when the mulatto girl, breaking through the restraint imposed upon her, protested, "Can't yer see that woman ain't got no mouth!"

4. Beckie had copied the square correctly, but failed completely on the diamond. She was permitted to make repeated attempts, but to no purpose.
5. She named the colors, calling, however, red "scarlet"; this was allowed to pass.

In VIII—
1. Asked the difference between the objects mentioned, her replies were entirely satisfactory.
2. She succeeded in counting backwards, but made several mistakes. The time was also too long.
3. She gave the days correctly.
4. She made a curious attempt at counting the cost of three one- and three two-cent stamps—arriving first at 7 cents, then at 8 cents as the result.
5. She repeated five figures correctly.

In IX—
1. She made change correctly.
2. Her definitions were only those of use. "A fork is to eat with, a chair is to sit on," etc.
3. She knew the date.
4. Made two mistakes in naming the months and took too much time.
5. Out of three trials she made one correct arrangement of the weights.

In X—
1. She did not know the higher denominations of money.
2. Could not draw the design.
3. Repeated six figures correctly.
4. Answered three out of five comprehension questions—but except for her memory, which was excellent, there was nothing more on the sheet she could do—she repeated correctly one out of three lists of seven figures each, question 1, year XII.

She had no creative ability, could not make the simplest sentence nor understand the nature of a rhyme, nor gather any idea from the absurdities. In three minutes, by constant urging, she was able to find five words only. Needless to say, all abstractions passed completely over her head.

Recapitulating, then, and starting with the basal year of VI, we find she passes

3 tests in Age VII.
2 " " " VIII.
2 " " " IX.
1 " " " X.
1 " " " XII.
According to the established method of procedure, this gives her a mental age of VIII.

Let it not be assumed for one moment that anyone—even the most devoted adherents of the Scale—could dream of actually comparing this young woman with a normal child of 8 years! She resembles a child, as someone has cleverly observed, as a caricature resembles the original. "As much," Binet says, "as an infirm subject can a healthy one, as much as an ungraceful and bizarre creature can resemble one that is all charm and grace."

And yet, for all practical purposes, the mind of Beckie is that of an eight-year-old child. In fact, she has a development really below that of a normal child of eight years. Only through the aid of an excellent memory—not at all unusual with subnormals—does she climb so high in the scale. This is not the place to report how completely the actual facts of her life, when investigated, substantiated the above diagnosis, but it can at once be seen the flood of light that the findings of the Binet-Simon Scale throw upon her irregular existence, and the definite assurance they give that society has no right to throw such a creature unprotected into the vortex of life and then punish her for her transgressions.
III.

USE OF THE SCALE.

1. REQUIREMENTS FOR ITS VALID USE.

Binet has given the requirements for a valid use of the Scale in his article in Vol. XVII, page 166 ff. of "L'Annee Psychologique". In brief summary they may be stated as follows:

1. If possible, avoid witnesses while giving the tests; they distract the child's attention and tend to make him self-conscious. If their presence cannot be eliminated, have the firmness to impose absolute silence. If they do not comply, a good experimenter has only one thing to do—discontinue the examination or dismiss the witness.

2. The attitude of the experimenter towards the child is of the utmost importance. First of all it must be friendly. Try to get into touch with him, stimulate his attention, his amour propre. Show satisfaction at all his replies, no matter what they are. Encourage without aiding, and without suggesting. All the tests are of measured difficulty, therefore change nothing in them; avoid too intently looking at the child. Naturally no one will be so ridiculous as to attempt to teach the child—it is a question now of determining a mental state—not of instructing.

3. All material required must be prepared beforehand. Two things are necessary: immediately a test is given, record the result by a + or −, according to whether it is passed or not; then, in a separate place write in detail the answer as it was given. It is allowable to have a second person do this, but it is not indispensable. It is advisable to note the grade of the child in school, the number of children in his class, the attitude of the child during the examination (natural, timid, inattentive, undisciplined, etc.), also the social condition of the parents—(misery, poverty, in moderate or easy circumstances, rich). If it chance that a special history attaches to the child, be sure to note it.

2. DANGERS ARISING FROM ITS IMPROPER USE.

One of the great hindrances in the public mind to the acceptance of the Scale, is the habit, almost universal among laymen, of
considering the tests and judging of their value apart from their arrangement in the Scale of years. Nothing is more common, apropos of the Scale, than the joking remark, now really too trite, “Why, I don’t believe I could pass the tests myself!” Let no one, however, take such remarks too seriously. Except for possible failure in the twelve-year memory test, no reasonably intelligent adult could possibly fail in an honest attempt to pass the test. To give a question here and there just for amusement, as one would give a puzzle, is in no way comparable to a serious use of the Scale. Moreover, it must be understood that for a psychological examination to possess real scientific value it must take place under conditions which insure absence of self-consciousness on the part of the one examined. With children and mental defectives this is easily attained. To attempt to use the Scale seriously on a normal adult is never advisable except under exceptional circumstances, when every probable cause of error has been carefully guarded against. The desire to appear well, which is a distinct trait of normal humanity, makes the subject self-conscious and fear of saying the wrong thing may keep him either stupidly mute or hurry him into an absurdity for which he blushes the next moment. This is not failing to pass the test, however, for self-consciousness is in itself a normal trait. It is when an absurd answer is accompanied with self-satisfaction that defect is made manifest.

3. LIMITATION OF ITS USEFULNESS.

The limitations of the test are of two kinds, real and imaginary. Of the real limitations: First, the tests are only satisfactory to the twelfth year. One of the chief disadvantages of this limitation may be clearly seen if we return to the description already given of the test applied (page 8). There we see that the girl of 23, whose basal year is VI, profits by a series of questions extending over six additional years and ends in having her mentality established as above VIII years. Had her basal year been X or XI, no such additional series is at our disposal to give her a like advantage. Second, Binet makes special note of the fact that the Scale as he gave it to the world, professed to be adapted only to children from the middle class in the public schools of Paris. For children in other conditions and living in other parts of the world certain changes would inevitably be necessary. For example, experience has shown that young children in America are more precocious than French children, which necessitates placing some of the tests at an earlier age. In Belgium it was found that for the highly cultivated, carefully trained children of the professional class, the Scale as a whole was
standardized two years below the found average; and tests subsequently made among this class of children in Paris produced similar results. (For complete analyses see Binet’s article, Vol. XVII.)

As for the fancied limitations of the Scale, most of them refer to natural limitations. The Scale cannot be blamed for not doing what is not in its nature to do. No one would think of discarding the yardstick, for instance, because it does not give the quality or value of the cloth it measures.

Binet says (page 183, Vol. XV):

“Our Scale resembles somewhat a measuring rod, which, instead of measuring the height, measures the intelligence; but just as an ordinary measuring rod gives no information regarding the normality of the corporal development, and might indicate the same number of centimeters for a normal child and for an adult hunchback, in the same way our scale of intelligence gives the actual level of an intelligence without analyzing it, and without informing us about the mentality.”

Experience and observation on the examiner’s part, as well as information concerning the subject’s past history, his heredity, etc., must come in to complete the final estimate.

4. A Consideration of Some of the Objections Urged Against the Scale.

1. It has been said that the Scale measures education rather than intelligence.

2. That it does not give any definite idea of the capacity for achievement.

3. That it does not determine the ability of an individual to adapt himself to his environment.

4. That it does not take into consideration mental habits or racial characteristics.

5. That when a mentally defective person whose age is, say 30 years, tests 9 years mentally, his native intelligence is not tested, because in all probability the extra twenty-one years’ experience enabled him to pass the nine-year tests.

Many more objections might be cited. Let these suffice.

In answer to objection No. 1, let Dr. Goddard speak. He says:

“Binet has been very successful in avoiding those things that are usually taught to children, and his questions involve the things that a child learns as he grows older without special teaching; that is, he learns them as his mind develops, without needing to be instructed in them. It is true some of the questions are somewhat affected by instruction, but so insignificantly that they do not appreciably affect the Scale.”
Innumerable times the writer has had proof of this. Instance, a young man over twenty, inmate of a workhouse, who since his seventh year had passed the greater part of his life in penal or correctional institutions. He had always played truant, and doggedly refused to learn in class, and yet he passed all the tests well, some even brilliantly, with the single exception of the Suggestion test. This he did, too, in spite of himself, for his attitude all the while was that of one thoroughly bored.

In striking contrast to him was a man of thirty, who barely reached the IX year level, although he had had the experience of life, outside an Institution, to aid him. He did not know the months of the year, nor all the pieces of our current money, and was helpless in making change. No normal man could have lived thirty years and failed to pick up such elementary knowledge, even though he had never been to school.

Objections Nos. 2 and 3 may be dismissed by recalling what was said about the yardstick—to object to its use because it does not describe the nature of the goods it measures or show how they may be employed, are not valid objections; other instruments must be called into play for these purposes.

Binet has already answered No. 4 when he urges that it be understood that his Scale was standardized for children of the middle class in the schools of Paris. It only requires that others arise endued with his love of truth as revealed by experiment, and with his patience and energy to follow in the lines laid down by him and provide a similarly accurate rule whereby all types of developing mentalities may be measured. (See Chap. V for description of how the Scale has been standardized for use in America.)

In answer to the Fifth objection, we quote from a paragraph in Vol. XVII of "L'Année," where Binet reviews an article written by H. H. Goddard, published in the Journal of Psycho-Asthenics, 1910. Binet says:

"The author has applied our method of intellectual level to the study of four hundred idiot, imbecile and moron children. By several different ways he has arrived at the conclusion that our method is good. . . . The author makes only one very interesting reservation, which we have ourselves noted; it is that the method permits of the classification of idiots, imbeciles and morons, who are under twenty years of age; above that age, the individual has acquired a sum of information which makes him appear more intelligent than he is in reality; thus, a feeble-minded subject, forty-five years old, whose intellectual development (according to our measure) does not surpass nine years, will show an evident superiority over one of fifteen years who likewise has an intellectual level of nine years."
5. Binet’s Answers to Criticisms of the Scale.

In Vol. XVII of L’Année Psychologique an article by Binet appears, part of which is devoted to replying to various criticisms that had been launched against the Scale. It is impossible here to undertake an analysis of the answers he gives; all we can do is to call attention to the fact that Binet weighed with care the objections offered and in the end announced his conviction that his Scale would stand and that his method was the one sure means by which an accurate measure of the intelligence could be obtained. Apropos of the measures employed by intelligent teachers in estimating the mentality of their children, he relates:

“I had the satisfaction to put three professors, critics of my tests, for a moment in my place, and asked them to show me how they would measure the intelligence of a group of children brought before them one by one. . . . They were forced of necessity to resort to tests, because there is no other method. . . . Their use of tests, however, was bad—that is the only justice I could render them.” (For a full description of the methods employed by these professors and Binet’s criticisms, see Vol. XVII, page 169 ff.)
THE PROBLEM OF STANDARDIZATION.

1. Method Employed.

To again quote from the article by H. H. Goddard in "Reference Hand-Book of the Medical Sciences":

"With the advent of experimental methods into psychology, the measuring of intelligence became a possibility, but the possibility did not become a reality for many years, principally because the psychological experiments were carried on with adults, where the problem of intelligence is enormously complicated. It was the genius of Alfred Binet that conceived the idea of measuring the intelligence of children during those years when the mental processes are comparatively simple and easily determined."

As already noted (Chapter I), it was in 1904 that the actual work of standardization began. By the friendly co-operation of the Public School officials of Paris, it became possible to secure the requisite number of normal children of the proper age upon whom to experiment.

The method of procedure of Binet and Simon for the standardization of the tests was to take only those children who were following the right grade for their years in school and who were neither specially brilliant nor specially dull in their class. The condition also was added that the children selected should be within two months of a birthday.

These conditions being secured, the two scientists proceeded to give the tests to groups of children of from 3 to 12 years of age, always, of course, testing each child singly, and paying the most minute attention to the procedure* and to the conditions surrounding the giving of each test. Thus the variation in the ability of each age in responding to a given test came out clearly against the background of an unvarying manner of presentation.

In actual practise it was Binet who put the questions, while Dr. Simon wrote the replies, carefully noting the exact words and any additional fact that seemed significant.

The final standardization was made upon hundreds of school children divided into groups of from twenty to forty for each age.

*That this procedure was not one established a priori by them can be amply proven from the records in L'Année. After trying many procedures, that one was finally determined upon which in practice best brought out the response of the child. The procedure thus established was rigorously followed during the work of standardization.
The given question was retained as suitable for the age at which the majority of the children answered it correctly, providing those of the preceding age had largely failed in the same question.

In the long process of experimentation, numerous tests were given; many which had at first seemed desirable were finally dropped, either because they were cumbersome or proved not to be sufficiently distinctive of a given age or were otherwise unsatisfactory. New tests were continually being tried, and either accepted or discarded as experience justified. When finally given to the world, therefore, the Binet-Simon Measuring Scale represented the most mature and deliberate conclusions derived from three years of actual experience with a vast number of school children.

During the time the two men worked together, it was always Binet's mind that conceived, planned and directed the operations and then crystallized the results. Dr. Simon's aid must, however, not be underestimated; his medical skill, keen mind and sympathetic nature formed the exact background best suited to develop and concentrate the genius of his fellow-scientist. The schools of Paris served them for a laboratory. All through his writings Binet has left the record of his gratitude for the intelligent co-operation given him by the directors and teachers of the different schools of Paris.

2. ADAPTATION OF THE SCALE TO DIFFERENT HUMAN TYPES.

There has been much talk of late about the adaptation of the Binet-Simon Measuring Scale to various types of human defect—for example, to the blind, and to deaf mutes. This is entirely possible, requiring first of all a change in certain tests to suit them to the condition under examination. Thus it is evident that the picture test could not be given a blind child—something else must be substituted. A basket filled with several familiar objects to be named was suggested. When this was tried out upon a dozen or more normal blind children it proved itself good as a test, but too difficult for children of three years. At four, one child succeeded, and at five nearly all passed the test. In a similar way all the tests would require standardization for each type before they could be used with certainty.
HISTORY OF THE SCALE IN AMERICA.

When, in the fall of 1906, H. H. Goddard, Ph.D., was called to fill the post of Director of the newly created Laboratory of Psychological Research at the Vineland Training School—he was already well known as a psychologist, but had no acquaintance with mental defect. Naturally, his first care was to read all available literature upon the subject. He received valuable aid from such standard works as Barr's "Mental Defectives," Seguin's "Idiocy," Shuttleworth's "Mentally Deficient Children," etc., but found nothing that treated the subject from a purely psychological standpoint.

The following summer he went to Europe for the purpose of visiting institutions and coming in touch with the leading students of the problem on the other side of the ocean. It was in Brussels, in the School of DeCroly, that he was introduced to the Binet-Simon Measuring Scale, which had recently appeared. To be quite honest, his first reaction was decidedly skeptical; it seemed really too absurd to attempt to measure the intelligence in that summary fashion. A sense of justice, however, soon made him examine the proposed Scale more closely and form the decision to try it out before condemnation. Returned to America, he made a translation of a part of the Scale as it was given in the volume for 1905 of L'Annee Psychologique, and began its use in the new Laboratory. When the revised form appeared three years later, he made a complete translation, which was applied to the inmates of the Training School, and with the most striking results. It was seen that the Scale, while conforming to the classifications according to industrial ability then in use in the School, went further and threw a flood of light upon the diagnosis of different states of mental defect, so that in a short time it was used to form the basis of a new classification, which has superseded the old. (For an account of this first experiment see Journal of Psycho-Asthenics, Vol. 15, 1910.) The next step was to apply the Scale to the 1500 and more children in the Vineland Public Schools. (See article in Pedagogical Seminary for June, 1911, and L'Annee Psychologique, 1912.) From this vast accumulation of data Dr. Goddard was able to standardize the Scale for American use. This was published in the Training School Bulletin, January, 1910, and revised in 1911. The form thus determined upon still remains in force in the Vineland Laboratory and is being used in
many other places.* Other translations and adaptations of the Scale have been made. It has been used as the basis for classification of inmates of reformatories, prisons, hospitals for the insane, almshouses, and in State surveys and public schools. It has been used in testing prostitutes, homeless men, army recruits, immigrants; in fact, every type where the question of mental defect might arise.

It is now being extended beyond the twelve-year limit by the Stanford Revision. (See "The Stanford Revision," by Louis M. Terman.)

Professor Yerkes of Harvard has made the Scale the basis of his Point Scale for measuring mental ability.

The following are some of the most important studies which have recently appeared where the Scale is used as the basis:

**BIBLIOGRAPHY.**


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*Between 1910 and 1914, 20,000 booklets and 80,000 record blanks were printed and distributed from the Vineland Laboratory alone. Copy of the scale, with Goddard’s explanation of its use and application can be secured from the Committee on Provision for the Feeble-Minded, Empire Bldg., Phila. Price, 15 cents.
WHO WAS ALFRED BINET?

Alfred Binet, who died in Paris on the 18th of October, 1911, following an acute attack of cerebral apoplexy, was without doubt one of the most eminent of contemporaneous psychologists.

He was born in Nice on the 11th of July, 1857, of an artist mother and a father who was a physician. Still very young, he went with his mother to Paris, where he first studied law, then medicine, and soon found himself directed towards the then new science of experimental psychology, which eventually absorbed his whole thought. For a time he continued to work in the biological laboratory of the noted scientist, Balbiani, who had become his father-in-law. It was here he prepared his thesis entitled "Contribution to the Study of the Sub-Intestinal Nervous System of Insects," for which he received his doctor's degree. The scientific rigor which in a remarkable degree characterized all his productions, finds its explanation in the habits of method thus early acquired.

The first psychological laboratory to be established in France was created by Binet in 1889, called Psychological Laboratory of the Sorbonne. He became its Director in 1894. In 1895 he began the publication of "L'Année Psychologique," which has appeared regularly since that time and ranks among the best publications of its kind. The most important of his works appeared in its pages. Although pre-eminently a psychologist, he was possessed of remarkable aptitudes in many other directions, any one of which he might have followed with distinction.

Besides his clinical and histological studies, he conducted at the same time philosophical dissertations and composed for the stage. In collaboration with his younger daughter, he wrote, shortly before his death, a psychological study of the technique of Rembrandt, in which his keenly artistic mind reveals itself.

It is a well-known fact that most of his works were prepared in collaboration with one or another of his pupils. Of his perfect generosity all his collaborators testify—for although his own part far outweighed theirs, he demanded no special recognition, and seemed, indeed, to forget himself. "He saw nothing," one of them has said, "but ideas that must be spread or facts which must be made known."
In 1900, in conjunction with some of the leading educators of Paris, Binet created the "Société Libre pour l'Étude Psychologique, de l'Enfant"—The Society for the Psychological Study of the Child)—of which he was the soul. In 1905 he established, rue Grange aux Belles, a school laboratory, which he equipped with his own instruments. The investigations there conducted were published in the Bulletin of the Society, which has appeared regularly since 1900. Moreover, he instituted, without remuneration of any kind, having obtained the necessary permission, the first schools in Paris for the benefit of backward children.

It would be impossible, in the short space here allotted, to even mention by name the many and varied works that have come from his hand. One more, however, must not be omitted; his studies upon Insanity, pursued with the collaboration of Dr. Simon. Half of Volume XV and the whole of Volume XVI of "L'Année" are devoted to these.

To have accomplished so much it was necessary that work should have been indeed easy for him, and to this all who knew him have abundantly testified. At the same time they bear witness to the unstinting labor which he bestowed upon every one of his varied productions. Dr. Simon, who collaborated with him on the Scale, says:

"Yes, work was easy for him, and he loved it, but it must not be thought that it was without labor that Binet accomplished the work he left behind him. It was my lot to realize this in several striking instances. That measuring scale of intelligence, for instance, which is contained today on a few pages and whose value is so great, represents three years of assiduous toil, and the syntheses of many thousands of pages; attempts abandoned or corrected; tables set up, then changed in form. One can indeed follow the work of elaboration in "L'Année," but it represents scarcely anything compared with what remains unused."*  

*The following are the titles, with the number of octavo pages of "L'Année," in which Binet has described the experiments and conditions out of which the Scale originated and where he has traced its development and made its application:


Upon the Necessity of Establishing a Scientific Diagnosis of Inferior States of Intelligence .......................... 28 pp. (L'Année Psych., 1905, 163-191.)


The Development of Intelligence in the Child .......................... 89 pp. (L'Année Psych., 1908, pp. 1-90.)

Application of the New Methods to the Diagnosis of the Intellectual Level, Among Normal and Subnormal Children in Institutions and in the Primary Schools .......................... 81 pp. (L'Année Psych., 1905, pp. 245-336.)

In estimating the value of Binet’s psychological work it must be remembered that it is based upon facts which he himself collected. He often said that original material was the only kind that was of any value to him, because he then held firmly in mind all those varied influences surrounding the facts which were necessary for its correct interpretation. Malapèrt writes, in the notice he gives of him in “L’Education”:

“Binet joined to his particular gift of psychological observation a most vivid sense of scientific rigor; I mean to say, an extreme distrust in regard to a priori ideas, whether his own or those of others, and he insisted on the need of precise proofs, the scrupulous submission to the verdict of facts.”

Binet’s psychological experiments were carried forward along all lines, and though he by no means despised apparatus, even inventing some himself, “it is not,” Claperède says, “in instrumental experimentation that his renown has been made. . . . For us who knew him he always remained the skilled experimentor, who scarcely used as apparatus more than ‘a pen, a little paper and much patience.’”

In personal character Binet was of the most simple. Shrinking from notoriety, he could never be persuaded to attend even a congress of psychologists. Work was his proper element and caused him no effort. “I work,” he says, “quite naturally; like a hen lays eggs.” Claperède says of him:

“He was a virtuoso of work, a Paganini of Psychology. Under his fingers observations and experiments gave out all the sound of which they were capable. On the other hand, he was profoundly original. Too occupied with his own investigations to read much about those of others, he attacked problems with a complete absence of prejudice and a frankness eminently favorable to the discovery of new facts.”

Of his last days, Dr. Simon says:

“The desire which Binet most frequently expressed toward the end, when he felt himself ill, was to live long enough to write a ‘Treatise upon Psychology,’ where his philosophical thought might fully develop itself. He asked for this work four or five more years of life. A premature death put an end to his project. It is all the more to be regretted because such synthetic minds are rare and because Binet excelled in putting the world of ideas and mind into
language supple, clear and living, and like a dramatic action. He had analyzed, taken apart the machinery. He had examined the whole. He knew clearly what remained to be done in order to animate it. Without doubt if he had lived he would have realized a synthesis of the human mind in its living activity."

WHO IS DR. THOMAS SIMON?

Dr. Thomas Simon was a rising young physician and alienist in Paris when he began his work of collaboration with Alfred Binet on the Measuring Scale which bears their joint names.

He was born at Dijon, the 10th of July, 1873, studied medicine at Paris and in 1900 presented a thesis entitled "Documents Relative to the Correlation Between the Physical Development and the Intellectual Capacity," which received honorable mention. He was an interne, first at the Asylums for Insane of the Seine, then at the Colony of Vaucluse and the Clinical Asylum; in 1902 he was named assistant physician of the Public Asylums, Dury-les-Amiens, and in 1908 at Saint-Yon.

Speaking of him, A. Giroud, in L'Intérimédiaire des Educateurs, No. 17, says:

"Dr. Simon brings to his work not only extended knowledge, but also an objective method and vast experience. He was a friend of Binet and during long years they worked together and with perseverance and tireless activity followed their psychological investigations. . . . He has taken up the pedagogical work begun by Binet and since the latter's death has been made President of the 'Société Libre for the Psychological Study of the Child.'"
VII. CONCLUSION.

Such, then, were the two men associated in the elaboration of the Measuring Scale of Intelligence.

Of the value of their herculean labors there can be no doubt. They stand without a parallel in the history of human psychology.

"One need not be surprised," Dr. Goddard says, "that the Binet-Simon Measuring Scale for Intelligence has met with criticism and opposition. It is doubtful if any one, even of its most ardent advocates, read it over for the first time without feeling that it must be impossible for such a scale to be reliable; and it is only after repeated trials and continued discovery of the accuracy with which it reveals the facts, that one becomes convinced that it is not only of value but that it is of such remarkable accuracy that it supersedes everything else. So rapidly has this conviction grown and so widely has it extended that the criticisms that from time to time appear, arouse in those familiar with its use a smile and a feeling akin to that which the physician would have for one who might launch a tirade against the value of the clinical thermometer."

Let there be, however, no misunderstanding. While advocating its value so strongly, those who rely most upon its findings are the ones who first of all recognize its limitations, the limitations which, as already explained, pertain to its nature. "It is an error," Binet himself says, "to pretend that the Scale alone is sufficient to enable us to know the character of children; in reality it is made to aid observation, to complete and control it, but by no means to replace it." (Page 480, Vol. XV.)

What it does show is the degree of mental development. What degree of mental retardation indicates feeble-mindedness is quite a different matter. Let us, then, bring this article to a close with the prophetic words uttered by Binet in the preface of Vol. XI of L'Année, in which he gave the first outline of his Scale to the world:

"We have found," he says, "that it is possible to make mental phenomena submit to the rule of scientific methods and that these phenomena are susceptible of precise study on the condition that one guards against special causes of error.

"This is a conquest by no means insignificant, because it is destined in the future—such is my conviction—to revolutionize very many things in the actual organization of society."

(For a more thorough study of the life and works of Alfred Binet see the article by Dr. Thomas Simon in L'Année Psychologique, Vol. XVIII; also the one by Edward Clapérède in Archives de Psychologie, Vol. XI, November, 1911; page 376.)