INTELLIGENCE TESTS IN CHILDREN

Archibald D. Smith, B.A., M.D., F.A.C.P.
Brooklyn, N. Y.

Intelligence tests properly belong in the domain of psychiatry and psychology, and my reason for trespassing on this domain is: In my work among children the frequent request to assign a cause for the slowness in talking, some speech defect, or retardation in school, led to this study of intelligence tests as a complement to the physical examination and a reliable family and personal history.

Until the last few years there have been scarcely any tests satisfactory for testing the intelligence; the investigator asked some questions about reading and writing, doing simple sums in arithmetic, the day of the month, and the name, age and address of the subject, without much regard to the previous training or environment.

So many mental tests have been proposed that the medical man without special training is confused as to which system to choose. It seems as though no one system was fitted for all cases; and yet in working with children one is impressed by the wider range of applicability of the Binet-Simon tests over all others. Many modifications of the Binet-Simon tests have been made, and they are so numerous that one is inclined to be somewhat skeptical as to the need for so many of these modifications. In this work I have, therefore, adhered to the original Binet-Simon tests as given out by the authors.

Stigmata of degeneration are important, as well as the appearance, manner, carriage and gait. Those patients who realize their short comings are the most hopeful. A child who scribbles aimlessly on being asked to write a word is more defective than one who admits that he cannot.

The Royal College of Physicians of London defined as

feeble-minded those "persons who may be capable of earning a living under favorable circumstances, but are incapable from mental defect existing at birth or from an early age of competing on equal terms with their normal birth fellows, or of managing themselves and their affairs with ordinary prudence." It is a marked improvement at the present time that we are able to say instead of in general terms such as those just quoted, in more or less exact terms about how much the mental age of the subject differs from normal.

The first set of tests are those of Prof. Sante de Sanctis, Professor of Experimental Psychology in the University of Rome; they are good tests, and can be used by any examiner.

These tests are six in number, and in the tests different colored balls, wooden cubes, pyramids, etc., a card with a triangle, oblong and square on it, as well as some questions, are used. The subject is timed for each test. A general classification can be made by these tests such as

1. There is a high degree of intellectual defect when the child does not get beyond the second test.
2. There is a moderate degree of defect when he does the fifth with difficulty and many errors.
3. There is a mild degree when he fails at the sixth only.

A child who does all with normal rapidity is not defective.

The Kraepelin reckoning test is useful in getting evidence of the unduly rapid onset of fatigue in an exhausted or abnormally constituted brain. It consists of successive pairs of different numbers for fifteen minutes. At the end of each minute a mark is made. At the conclusion the examiner adds up the number of sums, counts the correct and incorrect and what is more important counts the number of sums done in each successive minute.

Abelson has evolved a small number of tests, aiming to correlate the results by the degree of competence for work in the ordinary world rather than by school records. One of his principles is that the result must be marked by either time or for accuracy, but never in both ways; in most of them he uses a stop watch. The chief tests are tapping, crossing out rings, memory for commissions, a discrimination of lengths test and a test with geometrical figures; also counting out sets of dots, memory for sentences, and memory for names.

All of the above tests give us a rough estimate only of the degree of mentality. When we come to the Binet-Simon
tests we are dealing with a method of measuring intelligence which gives us approximately accurate results, just as the percentage method of infant feeding tells us approximately what the food contains.

Binet and Simon in 1906 proposed thirty tests, in which no account was taken of the age of the child or his training. In a paper published in 1908 they evolved a set of tests for each age of the child and nearly eliminated the element of training, presenting, therefore, "a measuring scale of intelligence." This has been modified again, and the same number of tests (five) used for each age except four years, which has only four tests.

The scale was originally applied to the selection of the mentally defective children in the public schools of Paris. It was then applied to the diagnosis of feeble-minded conditions. It has also been applied to the examination of juvenile delinquents and criminals with the result that we now know some of them are certainly defective mentally. It has also been applied to applicants for enlistment in the United States Marine Corps: (The Detection of the Feeble-Minded applicant for Enlistment—Value of the Binet-Simon Scale as a Diagnostic Aid. By A. R. Schier, M.D., Acting Assistant Surgeon, United States Navy. United States Naval Medical Bulletin, July, 1913.) He says: "Of 100 applicants for enlistment in the United States Marine Corps tested by the Binet scale, 89 passed the 15-year tests and 11 were given a mental age of from 9 to 11 years by this scale. Three of the 11 given a mental age of from 9 to 11 years were perfect physically, and no mental defect was made evident by their appearance, behaviour, and manner of talking. The ordinary reading and writing test would have been passed by them and they would have been accepted for enlistment. The Binet scale in the examination of applicants for enlistment is practical and is a quick method of estimating their mental status, and therefore is an aid in the detection of mental feebleness which would otherwise pass unrecognized."

As with all instruments of precision certain definite rules must be followed in the use of the tests. When these rules are followed it is surprising how little the personal equation of the examiner varies the results. Henry H. Goddard, of the Vineland Training School in New Jersey, who examined 2,000 normal children with the help of five assistants from
the Research Laboratory of the Training School found that the results of the different investigators varied only slightly. He says: "There were obtained in these cases evidences of two things: first, that the Binet scale was wonderfully accurate; and second, that a child cannot learn the things that are beyond his intelligence." (Two Thousand Normal Children Measured by the Binet Measuring Scale of Intelligence. By Henry H. Goddard, Ph.D. Pedagogical Seminary, Vol. XVIII, No. 2.) On the other hand there are certain ones who claim that the results are not accurate. Stuart (Variability in the Results of Intelligence Tests. By D. D. V. Stuart, Jr., M.D., Assistant Psychiatrist, Johns Hopkins Dispensary, Journal of the American Medical Association, July 25, 1914) had nine defective children examined three times at varying intervals by different examiners. He says: "While the cases cited are too few in number to afford a basis for any general conclusions, it is nevertheless impossible to deny the significance of the results obtained. These show, as will be noted, variations of from one to three years in the estimated mentality of the individual subjects, the average being between one and two years. In no case did all three tests agree. If each successive examination showed progressively higher mentality the objection might be made that all cases in the table happened to be subjects who had not reached their limit of development when first tested, and that the special class training had improved their condition. The fact that the majority show apparent retrogression or remain stationary contradicts this, and the only conclusion possible is that the differences in the results were caused by the variability of the tests." Is it not possible that this difference in the results of the different examiners might be explained on this very ground, namely, that certain definite rules were not followed in the use of the tests?

In my work with the tests I have been so much impressed with this point that I am going to give an illustration:

In the three year test three pictures are used. The exact method of procedure should be:

The picture is placed before the child, and the child is asked, "What is that?" A very young child may reply, "It is a picture." Then the further question is asked, "What do you see there?" No further help is given, and the questions should be put in exactly those words. This definiteness ap-
plies to the method in all the tests.

Certain precautions are necessary before the start of the examination. The room used should be a quiet one, and should be used only for this examination during the tests. One other person besides the examiner and the child is a convenience for recording the answers of the child.

Never criticize the answers, but on the other hand, encourage the child even if the answers are not correct. It is only in this way that we are able to get the best out of the child.

Each subject should be tested with the tests which correspond to his age. One can readily tell from this whether it is necessary to go higher or lower, and the tests should be gone over until the child passes for a certain age.

In recording the result of examinations all details can be entered on the history blank marked No. I, which I now show you, and the summary is made on another sheet which I also show you, marked No. II.

On the history card it is the purpose to have sufficient data to enable another experimenter to judge of the accuracy of our results. In other words, the exact words of the child are set down as fully as is necessary to get the idea. It is difficult to write out fully the words in the test where the child repeats 60 words in three minutes, but each word can be represented by a line and marked off in groups of five, and a long line drawn at the end of each half minute.

The symbols used are self explanatory and are shown on chart No. II.

In estimating and scoring the results two rules are followed. The first is: "A child has the intelligence of that age, all the tests for which he succeeds in passing. And again: After determining the age for which a child passes all the tests a year is added to the intelligence age if he has succeeded in passing five additional tests belonging to superior age groups, two years are added if he has passed ten such tests, three years if he has passed fifteen, and so on."