

STUDIES in MENTAL INEFFICIENCY

Issued by the Central Association for the Care of the Mentally
Defective (Incorporated), 24, Buckingham Palace
Road, S.W. 1.

VOL. II. No. 1.

JANUARY 15TH, 1921.

PRICE 1/- POST FREE.

Contents.

VOCATIONAL TESTS FOR DEFECTIVES.	Elizabeth L. S. Ross, M.A.
THE WORK OF LOCAL VOLUNTARY ASSOCIATIONS AND POSSIBLE FUTURE DEVELOPMENTS.	Aphra L. Hargrove.
NEWS AND NOTES.	LAW REPORT.
CORRESPONDENCE.	
REVIEWS OF RECENT BOOKS.	RECENT PUBLICATIONS.
NOTICES.	

Vocational Tests for Mental Defectives.

ELIZABETH L. S. ROSS, M.A., B.Ed., Carnegie Research Scholar, Edinburgh
University.

A VISIT to any good Special School or Institution will convince even the most casual observer that, whatever be the limitations of mental defectives where the more 'literary' subjects of the school curriculum are concerned, in practical ability they seem to approach normal. The tests for twelve years and upwards on the Terman Revision of the Binet Scale involve almost exclusively language ability, rote memory, appropriateness, clearness and adequacy of detail in imagery, power of conceptual thought and reasoning, those peculiarly human qualities of mind which mark off, from the defective or immature, the normal completely developed intelligence. On the other hand experiments on animal learning have shown what a high degree of practical ability may exist in the entire absence of any conceptual thought and with very inferior powers of manipulation and exploration.

Proceeding down the scale from normal individuals of adult intelligence level, we should expect to find among the subnormal group a large number who can be trained to produce very efficient practical work involving little or no abstract thought, but only relatively simple problems concretely presented. A still smaller group will be fit only for work involving sensori-motor habits of various degrees of precision, complexity and speed, while any adaptations necessary are made by others more intelligent. A few others, if suitable provision is made, can do mechanical work involving only some simple movement such as turning a handle or pushing a barrow while directed by others. These groups, however, can never be marked off sharply from each other unless in a very arbitrary way, but the usual occupations provided for defectives, such

INDEX
THROUGH

as cobbling, brushmaking, gardening and especially domestic work in its various branches, give ample opportunity for each individual to be engaged in work demanding the maximum of which his intelligence is capable. As Dr. Turner pointed out in a recent article in this journal, this is one very strong argument in favour of the large institution with all grades of cases.

Unfortunately there is another circumstance which makes the problem of vocational guidance more complex, for we have to reckon, not with a certain flat level of mental development in each individual as represented by the Mental Age, but with a very uneven development in many cases, that is, with "special abilities and disabilities." We now admit that it is of little use to say of any individual that he "has a good memory," or "good power of concentration;" without definitely stating what specific kind and direction of memory or attention is being referred to, excellence of one form being no guarantee of a corresponding degree of excellence in another. Also, in some one restricted field a defective may be capable of "practical judgment" or even of conceptual thought, while showing a low degree of intelligence in others.

The ordinary Intelligence Scales are helpful within very wide limits as a basis for vocational guidance, but taken alone they are quite inadequate. Neither can the present "trial and error" method of choosing employment be considered at all satisfactory. We provide usually a more or less generalised course of handwork for our defectives up to about the age of 11 or 12, where we are fortunate enough to get them admitted to our special schools much before that age. Beyond this stage, where we can, we give some form of workshop instruction in perhaps two branches, and as time goes on, try to arrange that each pupil will take up as his lifework that for which he has shown greatest aptitude. In many cases no doubt this plan may appear to work quite well, but it is far from ideal, and mistakes may be made more frequently than we know. To begin with, it assumes that the field of choice ought to be only among the various forms of manual work, and this view holds, not merely for defectives, but for most of our industrial and reformatory school cases, with the result that the child who seems fairly intelligent and yet makes little progress in practical work has very often rather an unhappy time. Secondly, circumstances may prevent our being able to try the individual at just that form of industrial work for which he is physically and psychologically best fitted, and he may thus be compelled to pass his life as a square peg in a round hole. Thirdly, the trial and error process itself often entails a great waste of time and energy on the part both of teachers and taught, and the training of defectives is under the best of conditions an expensive process. Fourthly, we frequently have to admit to our schools cases considerably over 12 years of age concerning which there can be obtained no reliable information such as would guide in choice of employment, and we cannot afford to lose any time in deciding what will be the most profitable form of training. And apart from this, the economic side of the question, careful vocational guidance will do so much towards the happiness of these defectives. We ought to have fewer disciplinary cases since much of the laziness and rebellion showing itself from time to time in certain individuals is probably but the reaction following on a period of work really unsuitable in its nature. As a class, these defectives have such poor understanding of their own characteristics and abilities, and express themselves so badly, that many of the docile type will be working at much less than their maximum of efficiency and remain undiscovered.

We have yet to find some type of work suitable for those defectives who, while ranking as high-grade in intelligence, seem to have no aptitude for any

form of manual work nor interest in concrete problems though they may have good rote memory and language ability and have made fair progress on the literary side of the school curriculum. Fortunately these cases are not very frequent, yet we do meet them and they may be a continual source of annoyance to a whole workshop if they are compelled to attend there.

We wish then to be able to sort out, with a fair degree of accuracy, between the ages of 11 and 14 if possible, those defectives that will never be of much use in manual work, whether because of low intelligence or a special disability. Then in the case of each pupil remaining we should like, as a result of careful observation and a study of his reactions to suitable psychological tests, to be able to say within certain limits what type of manual work would be best for him, due regard having been paid to physical capacity, level of intelligence and temperament.

“Practical Ability,” as Ballard* has pointed out, is a complex product, and is dependent on many separate factors each of which may be present in varying degree, determining the qualitative as well as the quantitative character of the total ‘ability.’ Degree of sensory acuteness or defect is an important basic condition, and similarly with strength and speed of motor ability. A certain minimum of efficiency along these directions is a pre-condition to the presence of any degree of practical ability worth noting. Of great importance also are the capacity to build up sensori-motor habits of various degrees of complexity, speed and precision, and the capacity for practical judgment in the various types of concrete situations. That there are many defectives capable of fairly complex reasoning in the solution of concrete problems is quite to be expected since all the elements involved are either present in space at the moment, so clear and stable in consciousness, or else the images necessary are closely associated with these present elements and, therefore, easily aroused and probably fairly distinct and detailed because of their gradual formation in the course of repeated experience and manipulation. It is in this sense largely that manual training is mind training, giving as it does some of the most favourable conditions for the formation of concepts.

We come then to the consideration of what seem to be the most suitable tests to use in the case of defectives. (1) We must assume that an adequate medical examination will have supplied information as to the existence of any sensory or motor defects likely to impair general or special efficiency. (2) We shall require one or more sensori-motor tests to estimate, either together or in isolation, the degree of precision, speed and complexity of co-ordinations that can reasonably be expected from the individual and, if possible, the effect of practice on his original efficiency. (3) We must present a few typical concrete problems to test power of practical judgment by observation of the individual’s method of procedure and degree of success. (4) Either by observation of behaviour in the above tests or by means of specially devised methods we should find out whether or not the individual possesses those “temperamental characteristics” essential to success in manual work considered as a vocation.

Several good sensori-motor tests are already available, for example, the tapping test in the form used by Healy, various forms of card-sorting, and the ‘plunger’ test devised by McDougall. The various form-board tests used by Healy, Pintner and others help us in estimating ability to solve problems concretely presented. These and similar tests are probably too short in duration,

* “Mental Tests” chap. XI.

and the conditions of work too unlike the day to day realities of the workshop or kitchen, for us to be able to obtain from them any more than a rather unreliable cross-section view of the subject's emotional attitude to the different types of industrial work and his habitual method of response. Probably the only tests we have as yet for the express purpose of investigating those "temperamental characteristics" bound up with industrial success are the graded maze tests devised by Porteus.

Early in 1920 the writer tried out a few of these tests on a small group of defective children of mental age ranging from about five-and-a-half years to nine-and-a-half, and chronologically ten to sixteen years old. For purposes of comparison the same set of tests was given to a group of normal children of approximately the same range of mental age. The results obtained are of some interest though for several reasons they cannot be considered as conclusive. Here we shall deal only with Healy's Tapping Test, the three Form Board Tests also used extensively by him, and the Porteus Tests, though one or two other tests were employed in the investigation. The class teachers gave an estimate of the "handwork" ability of each pupil on a five-point scale: Very Superior, Superior, Medium, Poor, Very Poor; and in addition a simple memory drawing test was given to each and the results ranked similarly.

I. Tapping Test: The subject is given a paper marked off by heavy black lines into 150 half-inch squares arranged in rows of ten. Using a pencil he is to tap once in each square as rapidly as possible for 30 seconds, taking care not to miss a square, touch a line, or tap more than once in each square. Two trials are given, and, in this experiment, the better of the two was taken as the score after correction had been made for errors. Healy claims that this test gives an estimate of co-ordination of motor and visual-perceptive powers, both for accuracy and rapidity.

II. The Form Board Tests:

(a) Introductory—"Mare and Foal" Picture Form Board: A certain number of pieces have been cut out following the natural lines of the objects in the picture, and also four pieces from the 'sky' portion of the picture. Two of these latter are right angled triangles together filling a triangular space, and the other two which approximate to diamond shape resemble each other rather closely but are not interchangeable. All these pieces are arranged in quite haphazard fashion beside the board and the child has to put them in their correct places as quickly as possible. A record is kept of the total number of moves and the time taken. Notes are made as to method of procedure, whether the moves seem planned, trial and error, or chance. A failure is recorded if the test is not completed within five minutes. (Healy allows ten minutes).

(b) Construction Test A: This is employed as an alternative test for year ten in the Stanford Revision of the Binet Scale and is illustrated in the handbook. The procedure followed was similar to that described above in the case of the Picture Board Form, and not Prof. Terman's.

(c) Construction Test B: This board contains six separate spaces into which eleven variously shaped pieces have to be fitted, thus presenting a problem slightly more difficult than Construction Test A. The procedure was similar to that for the other boards.

III. The Porteus Tests: The original series of mazes was used, as described and illustrated in the "Journal of Experimental Pedagogy," June, 1915,⁴ but only as far as the twelve year test. Porteus has since revised the scale, adding a

fourteen year test, substituting two new ones for years six and seven, omitting the four year test, and grading the five and six year tests one year lower. (See Monograph published by the Department of Research, Vineland, September, 1919, "Porteus Tests—the Vineland Revision.")

The results obtained may be briefly summarised but it must be kept in mind that the number of cases examined was small and the basis of estimation of practical ability rather meagre.

I. TAPPING TEST: It is probable that in the form used this test will give an index of adaptability to this type of situation, rather than of sensori-motor ability, unless fuller opportunity is given for practice. In the present instance it gave a correlation of .60 (P.E.=.08) with rank order in handwork, while the Binet rating (Terman revision) gave a correlation of .69 (P.E.=.08) with handwork. In any case, the score in this test will never by itself be of very much value but only when balanced by the findings of other tests.

II. FORM BOARD TESTS:

- (1) Of three defectives successful with all the Form Boards, two ranked "Superior" in both drawing and handwork.
- (2) Of six successful with two Form Boards, two ranked "Superior" in both drawing and handwork, while four were "Medium" in handwork, and two "Medium" and two "Poor" in drawing.
- (3) None of those five who were unsuccessful in all the three Form Boards ranked above "Medium" in drawing, while three ranked "Very Poor"; in handwork, one ranked "Superior," two "Medium" and two "Very Poor."

The following correlations found are interesting:

Form Boards with Handwork—64 P.E. .08

Form Boards with Porteus Age—60 P.E. .08

Form Boards with Mental Age—45 P.E. .11

One rather strange case was that of a girl aged 11 years with an I.Q. of 71 who failed in all three of the Tests even when shown the correct placing and given a second trial. Yet the same child passed the Porteus Test for year XII and ranked about medium in tapping, and a little below medium in handwork.

III. PORTEUS TESTS: As pointed out in the Monograph already mentioned and also in Part II of "Intelligence and Social Valuation," by Berry and Porteus (published by the Vineland Training School, May, 1920), from which we shall quote (pp. 66 seq.), these tests fulfil the chief requirements of one of our purposes. "They supplement the Binet examination by examining capacities which the latter does not test sufficiently," namely, "foresight, prudence, and the ability to profit by experience." They test these in a simple situation involving "no highly specialised manual dexterity" or "special memory." "The test is new to the child's experience so that the influence of previous practice is eliminated." They form a homogeneous series, and "in working through the whole of the mazes from six years to thirteen, the individual is confronted with a similar problem upwards of forty times so that, if he has any capacity to profit by experience, he has excellent opportunities for displaying it," and for readjusting his methods.

In the writer's investigation already noted, when the original series was employed and only as far as the year twelve test, the following correlations were found:—

Porteus Age with Mental Age—79 P.E. .05

Porteus Age with Handwork—76 P.E. .06

with which may be compared

Mental Age with Handwork—69 P.E. .08

Recently, in connection with another investigation, the writer has tried out the Revised Scale of Porteus Tests on about thirty cases. The conditions were much better than in the previous experiment for all were institution cases with good opportunity for industrial training as well as the usual educational handwork. The grade of achievement of most of them was well known throughout a considerable period of training and the industrial rating was the result of the independent judgments of several competent people. All the cases were put through the Stanford Revision of the Binet Scale within about a month of their doing the maze tests. The following correlations were obtained:—

Porteus (Vineland Revision) with Binet—71 P.E. .06

Porteus (Vineland Revision) with Industrial Rating—81 P.E. .04

Average of Porteus and Binet Ages with Industrial Rating—87 P.E. .03

Binet Age with Industrial Rating—81 P.E. .04

These results, though the cases are so few in number, certainly seem to bear out what Porteus claims: that when the Binet and the Proteus test ages are combined and the average taken, we obtain a better index of industrial ability. It is to be noted that with regard to his own series of tests, he considers failure as of more significance than success, since the capacity for self-restraint and the habit of pre-consideration are being tested only in a simple situation of very average difficulty. This, too, is born out by a detailed study of the individual cases. But it was in cases where the Binet rating alone might have given quite a false impression of practical ability that the Porteus finding seemed most interesting, notably in the case of two boys having mental ages of $8\frac{3}{4}$ and $6\frac{3}{4}$ respectively (I.Q.'s. 64 and 59), yet ranking $13\frac{1}{2}$ and 13 on the Porteus scale. Both these boys were handicapped in the intelligence tests by having specially poor rote memory. Though restless and inattentive in ordinary lesson work, they both do exceptionally good manual work.

There is much room for investigation work on this subject of vocational tests for defectives. The field is narrower than in the case of normal individuals, and the findings here should throw light on the wider problem. The procedure may seem to be over-elaborate, but when we have determined the best possible, set of tests they need to be applied only once to each case, say about the chronological age of 12—14 years, and probably only to those reaching a certain I.Q. Only thus will we be able to say which of our high grade defectives can safely be left at large even under guardianship, and only thus can we ensure that each of the others will find his most appropriate niche in the industrial colony of the future.

“There’s not a pair of legs so thin, there’s not a head so thick,
There’s not a hand so weak and white, nor yet a heart so sick,
But it can find some needful job that’s crying to be done,
For the Glory of the Garden glorifieth every one.”