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# THE SCIENTIFIC STUDY OF THE MIND OF A CHILD AND ITS BEARINGS ON EDUCATION

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One of the most remarkable movements of the twentieth century in India has been the increased importance attached in the public mind to the study of the child. Progressive countries like America, France and England have spent lots of money to carry on some of the experiments, which are indispensably necessary to arrive at the truth. And the so-called public have realised the fact that the child does not exist for education but the education is to be suitably adapted to meet the individual needs and capabilities of the child. We are not going to throw all our children into machines, which produce lawyers, doctors, headmasters, inspectors etc. but fit our education to meet the various needs of the budding human beings, which will give them the best chance of realising themselves.

But despite all this enthusiasm we seem to have not clear insight into the goal we are aiming at. We have certain theories no doubt but most of us—the theory builders—are groping in the dark and are glad of any chance-rays, which show the way, though imperfectly. There was a time when psychology was not included in the domain of science and hence there was always more idle talk than methodical investigation but experience brought home to the humble path-seekers the truth that an ounce of fact is

always more valuable than a ton of theory. Very little or practically nothing has been done in India in the field of Educational Psychology. Indians, who have not only brains but see into things



MISS S. B. GUPTA.

minutely will, I am sure, make valuable contributions if they once can amalgamate their theoretical philosophy with practical, scientific research.

Any education to be worthy of its name must take into consideration the facts as follows :—

1. The individual child—functions of its mind, its mental factors, capacities and capabilities.
2. Its needs as an individual being as well as a social being.
3. The adaptation of the child with all its faculties to the world outside.

Here I am concerned only with one of these viz. No. 1 and shall say a few words.

1. The individual child—functions of its mind, its mental factors, capacities and capabilities.

The functions of every mind are threefold, (a) Cognition (b) Emotion (c) Volition.

(a) With a child cognition begins after the stage of "pure sensation" and as soon as sensation reaches or results in the stage of perception. Perception in an extensive field lead to conception. With conception comes the economy of cognition, where the symbol serves for the absent object, and many are grouped into one.

Theoretically after the stage of conception comes that of Judgment and Reasoning, but practically all these are intermingled with each other. Perhaps the first spark of reasoning appears, when a child passes from the stage of pure sensation to that of perception, that is, when the child locates the objects of its sensation.

*Cognition* is a common factor to every other mental function. Without cognition there can be no emotion and no resultant into action. Even in the case of an instinct the child has to perceive before the feeling appears.

*Emotion*—In a primitive man this is stronger than cognition. Civilisation has taught man to divide himself into two ; the ordinary man with all his passions, desires and impulses, and the critic man, who guards over the former and helps to check those feelings which are considered unsocial and uncivilised. The child in its infancy resembles the primitive man much more than the civilised. Hence, to be a worthy member of a civilised society, the child has to learn to modify and purify his impulses by reasoning, and emotion by intelligence.

*Volition* or will is the means for outward carrying out of the inward amalgamation of Cognition and Emotion. I see a lion, I recognise it to be a lion (cognition), remember what a lion can do (cognition), feel frightened (emotion), wish to fly (volition) and run away (action).

We have seen before that a child at the beginning of its life is more ruled by its emotion than intelligence. But the closer acquaintance with the world outside proves a rude blow to its pet wishes and the child by experience learns to check impulses more and more. The ideal state of mind is of course the well-balanced mind in which all the functions have equal share and the head is not overpowered by heart nor is the heart dry and barren, having starved out-right.

A child's mind is a complex factor, influenced by many other factors. We can divide these factors under three different heads, (a) Individuality or Personality (b) Heredity (c) Environment or Training. All the functions of a child's mind are as important in the field of education as these factors.

#### (a) Individuality or Personality

Every child is a unique being in this world. There is no other child born

like it. Each being fashions himself with certain colour and shape but none know how he comes to possess that wonderful gift of uniqueness which makes him what he is. Whatever the circumstances are—hereditary or environmental—he will stand against and defy all and grow straight and tall, clean out of all puny beings like a young plan in a mass of cactuses, none knowing how it gathered its grace and beauty, “Washing bottles in a drug-shop was, if a common story is true, adequate to decide Faraday’s career and the voyage on the *Beagle* is reported to have made Darwin a naturalist for life. But if all the youths of the land were put to work in drug-stores and later on sent on scientific investigations the results would not be a million Faradays and Darwins or even a million chemists and naturalists”\*

The fact of individuality is present in every children, but with some it is stronger than in others. With some it is so strong that like stately swans they live in dirty water and yet never gather any on their pure, white plumage. In some this personality is so weak that it is disturbed by every passing breeze, yet it never dies—it flickers, gets dimmer but burns and manages to continue as best it can. Happy is the teacher, who can find this light within her child and help it to burn its brightest, and lucky is the child, who meets such a teacher.

Along with this personality we must take into consideration the natural endowments of a child. There are some endowments, which are present in some and not in all, as for example dexterity in sewing or weaving. But there are other endowments, which are common to all. The same opportunity being given every normal child is expected to learn to read

and write—some may excel others but all will learn. Then the question arises how is it that under the same circumstances one child learns quicker than the other. There must be something, which is present in greater quantity in one child than in the other. Then with some children there comes a stop and they can not go beyond that. “It is now pretty certain.....that nature is all-powerful in fixing the level of intelligence or general mental ability to which any of us attains. It is also reasonably well-established that throughout the years of growth this innate, general ability keeps with each of us a practically constant relation with the norm for other age and that none by taking thought can add a cubit to his stature.”

The natural endowments of a child can be classed under two heads:—

1. General abilities.
2. Special abilities.

Underlying these two is the common factor of intelligence. Whatever be the special abilities of a child it is always accompanied by a constant, general, intelligence factor.

#### (b) **Heredity**

A child no doubt gets its body from parents but how far does it get its mind? A posthumous child brought up away from its father’s relations walks, laughs and smiles in the same way as did his father. How did he learn them? Yet two children of the same parents are sometimes as different as black from white. The other day I met a child of three. Both her parents are deaf and dumb but the child is quite normal—she is the most talkative of the Class. She talked to me the whole time I was there. To me it seemed as if she talked for the very pleasure of talking. The child of a Mathematician inherits love for Mathematics, yet a child of musical parents

\* Intellectual growth in young children—By Susan Isaacs, 1930, P. 58-59.

may not have an ear for music. Many a disease which was formerly thought inherited is now found to be the result of environment.

Dr. Cyril Burt says:—"Going through my own collected case-sheets, I have catalogued every relevant feature in each child's family, every characteristic, which might be supposed to be hereditary and at the same time to have disposed him towards the commission of crime. The characteristics reported fall into four main groups—physical, intellectual, psychopathic and moral. The physical conditions include principally such illness or constitutional status as are indicated by the occurrence of epilepsy, tuberculosis, rheumatism, Chorea hyperthyroidism ..... Points of this kind were noted in a moderately high proportion, namely 53 times among the relatives of 100 delinquents. The intellectual conditions include mental deficiency, in-born dullness and extreme illiteracy or scholastic backwardness, where it seems assignable to a congenital cause. These intellectual weaknesses were observed rather less frequently than the physical—namely 35 times per 100 families".\*

I do not prove the doctrine of heredity by quoting these lines. But the authority is too trustworthy to be ignored. Even if we are immune from bigotry, we must take facts as they are. They certainly lay stress on the fact that the factor of heredity cannot be disregarded in the physical as well as the mental world.

### (C) Environment or Training

Dr. Burt has divided environmental conditions for his purposes, under the following headings:—

#### A—Home Conditions.

- (1) Poverty—(a) Overcrowding.
- (b) Absence of facilities for recreation at home.
- (2) Defective family relationships
- " (3) Defective discipline.
- (4) Vicious home.

#### B—Conditions outside the home.

- (1) Companionship.
- (2) Conditions of leisure.
- (3) Conditions of work—(a) lack of employment, (b) uncongenial employment (c) uncongenial school.

Nurture or training may not affect "G" factor but it certainly does "S" factors. A man is born with a certain amount of intelligence, which, whatever his training is, will remain unaltered but will help him in gaining experience of life. On the other hand a man is born with a "S" but unfavourable circumstances shrivel up the tender shoot and a boy, who could have been a splendid cobbler, turns out to be a fourth-class school teacher. Nurture helps men to know what he is, and to realise his potentialities fully. Nothing can be done unless the germ is there, but often many a good seed lies unknown because proper environment is not found. Besides power when not properly guided results in evil both for the possessor and for others with whom he comes in contact.

So we find personality, heredity and training, each plays an important part in the development of a child's mind. It is very difficult to say which of these is the most important. They are often intermingled and we can hardly pick out one saying this plays a more important part than the other.

Hence, to study any functions of a child's mind, it is necessary to take into

(\*The Young Delinquent, by Dr. Cyril Burt (1925) P. 49).

account the factors already mentioned. But I cannot take them in detail as that will make this article somewhat unwieldy.

Before we proceed further we must say a few words on.

- (a) General abilities  
and
- (b) Special abilities.

What are these General abilities? These are the endowments with which any child is born in this world and they exist either in greater or less quantities whatever other circumstance be. But Special abilities are endowments which are present in some and not in all and are mostly hereditary. As for instance the abilities to read, write and compose tolerably well are present in all the normal children but the abilities to be great poets, writers, actors or musicians are present in a special few.

Education to be worthy of its name must take into account not only all the abilities a child is born with but provide for such means, which will develop all the inherent capabilities to the full advantage, helping that child to be a valuable member of the society. To do so the occidental countries have prepared sets of tests to measure the intelligence Quotient as well as Special Abilities. Here below I shall just give examples to show how these tests are carried. Needless to say that I was either an experimenter or a subject experimented on in each of these tests.

### 1. Intelligence tests.

Aim—To measure general intelligence quotient of each child.

Procedure\* — Tolimson's "West Riding"

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\* I shall give a gist of class-notes as taken by me in the University of Leeds, the lecturer being Dr. LL. Wynn Jones, M.A. (Oxon), Ph. D. (Lipzig).

Tests of Mental Ability. Examiner's Manual, published by Hodder & Stoughton. Four dozen copies of Set Y and also of Set Z should be available so that any class in the elementary school from standard four upwards may be tested.

The experimenter should use Set Y and should try to form a critical estimate of the procedure. Score the answers of the pupils and find the correlation between the order according to school marks and that obtained from Set Y. If desired, the same pupils may be tested the following day using Set Z and the corresponding correlations calculated (vide *An Introduction to Theory and practice of Psychology* by Dr. LL. Wynn Jones, M.A. (Oxon), Ph. D. (Leipzig) Examiner in Psychology to the University of London). The correlation between two schools may be calculated and individual pupils may be picked up and tested according to Binet Simon Scale (Terman's Riverside edition).

Now the question may arise after all what is this General Intelligence? I, as a follower of prof: Spearman believe "what should be tested is the individual's efficiency on power in the operations, which are covered by the three quantitative laws or principles viz:—

- (a) Any lived experience tends to evoke immediately a knowing of its direct attributes and its experiences.
- (b) The presenting of any two or more characters tends to evoke immediately a knowing of relation between them.
- (c) The presenting of any character together with a relation tends to evoke immediately a knowing of the correlative character.

What are these relations? They are 10 in number.

(1) Relation of Evidence.

e.g. Maya is taller than Lata and



Lata is much taller than Benu. Compare Maya with Benu.

(2) Relations of likeness.

"Draw a line under the work which means the same or nearly the same as the work "command," obey, surrender, order, fire, run.

(3) Relation of conjunction.

$$7 \text{ plus } 18 = \quad ?$$

(4) Relation of space.

Cancel every 'e', every 'm' and every 'r' of the piece given below.

"The question of vocabulary is one which presents some difficulty. Although the memory of young boys is good, it is nevertheless undesirable to employ so many words that they can not be learnt perfectly. Further the words that are learnt first should be those most commonly employed by the classical authors whose works will be studied in the next stages."

(5) Relation of Time.

Striking an object and finding out whether the first interval is longer than the second.

(6) Relation Psychological.

You assume other persons have the same thought, feeling and capacity of action, when the same occasion arrives, e.g. Interpretation of pictures—old man and young girl dragging a barrow full of furniture. A seven year old child would merely give details of picture but a twelve-year old should see the story in it—sadness of old man leaving house with his daughter etc.

(7) Relation of Identity

Picture of left and right hands in all positions and ask the child to underline each picture of the right.

(8) Relation of Attribution.

"Tiger is to Fierce as lamb is to ?

(9) Relation of Causality.

"Prison is to Jail as water is to Prison, Drink, Tap, Bucket" which of the last four words is the answer ?

(10) The relation of Constitution.

This relation springs from one or other of the nine relations mentioned above.

Any child, who finds the correct relation in the problem presented can come to the solution and is expected to possess General Intelligence of certain quantity.

Thanks of the students of Psychology are due to Messrs. Binet and Simon, who not only formed some tests but standardised these tests to suit the mental age of children, by application of which both the mental age and Intelligent Quotient of the children can be formed.

Take an average child of 9. Give that child tests for the lower age. If he answers the questions meant for 7 and 8, he is to be credited for all those of 3, 4, 5, and 6. If he passes those of 8 and he is an average child he is expected to pass those for 9, but may fail. He might on the other hand pass in those for 10. He gets credit for any test he passes. If a child of 9 passes all the tests from 3 to 10 he is above the average. His mental age is 10 and his Intelligence Quotient is

$$\frac{10 \times 100}{9} = 111.1$$

I have said enough to show the nature of the Intelligence tests. Now I shall pass on to those which are applied to test special abilities of children.

## Psychological tests in Music.

C.E. Seashore obtained from the Columbia Gramophone Co., London, six 12" double records numbered A 7536 A 7537, A 7538, A 7539, A 7540, 53005—D together with a Manual of Instructions and Interpretation for Measures of Musical Talent. They test the (1) Sense of pitch (2) Sense of Intensity (3) Sense of Tune (4) Sense of Consonance (5) Tonal Memory and (6) Sense of Rhythm.

I shall say a few words just to explain what each of these means.

(1) Sense of Pitch—You hear two tones, which differ in pitch. You take a pencil and if the second one is higher than the first you record H, if lower L.

(2) Sense of Intensity—You hear two notes, if the second one is stronger or louder you record S, if the second one is weaker you record W.

(3) Sense of Tune—You hear 3 clickes, if the second interval is longer than the first, record L; if it is shorter record S.

(4) Sense of Consonance—You hear two combinations of tones each; one combination is better or worse than the other. If the second one is better, record B, if worse W.

(5) Tonal Memory—You hear a series of tones played twice. When they are played a second time one note is changed. You are to record by number, which one was changed.

(6) Sense of Rhythm.—You hear two Rhythmic tones. The second one is either the same or different. If same, record S, if different record D.

One, who intends to take up higher music or take up music as profession should first of all be tested by these tests. Because no amount of training will make an unmusical person musical.

Aesthetics and Art Judgment.

Colour Preference.

The experimenter prepares a set of squares of the colours viz Red, Orange, Yellow, Green, Blue, Indigo and Violet each measuring 4 X 4 cent. and a neutral gray card-board 20 X 20 cent. with two windows in the middle 3 X 3 cent. Each colour is to be compared with the other. The experimenter lays two colours on the table and the neutral gray frame over them. The child is allowed to see them only for two seconds and say which is the more pleasant.

Similar tests have been formed to test whether a child has been born with special taste for Arts or aptitudes for mechanical work.

These few examples will suffice for the subject under discussion. India has tried to modify some of these to suit her own needs, but very little or practically nil has been done in the way of original research or original contribution. These tests require methodical study and patient, persevering experiments for years and years. Will India, where civilisation dawned when half the world was in ignorance, lag behind?

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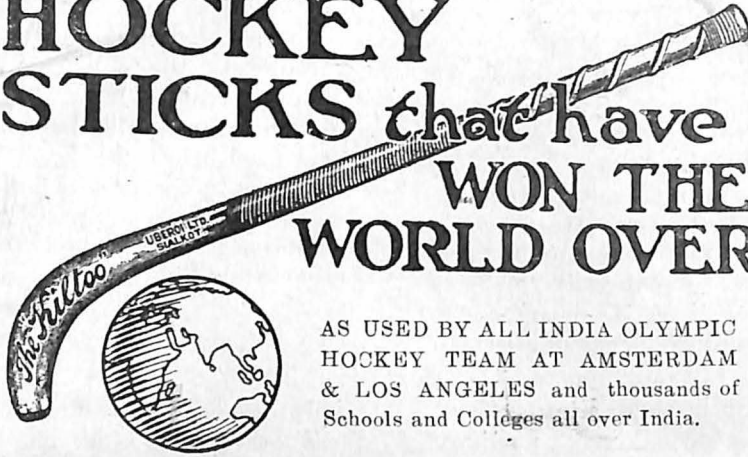
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