CHAPTER II
CHAPTER II

HISTORICAL BACKGROUND OF THE MEASUREMENT OF INTELLIGENCE

A crude method of intelligence testing for the sake of amusement as a part of literacy activities can be traced in ancient India in the form of puzzles, Riddles and Maze-solving during Muslim Rulers and Hindu Kings and also in the stories of Birbal and in epics like Mahabharatha.

Human mind is in complexity, and human traits can not be defined in clear cut ways nor can they be so measured. Vernon is of the opinion that "In spite of many efforts, no psychologist has been able to devise a test which is truly univocal." (Vernon, P. 133). The variation in mental and physical traits exhibited by groups of individuals have been the subject of systematic research which began with the scientific study of human growth nearly a century ago.

Scientific study in this area was initiated by Sir Francis Galton and his followers who attempted to identify and measure variability in human nature. Studies of individual differences in psychological traits have been surveyed by Ellis who concluded that laws governing variability were
complex and could not be summarised in a few simple statements. Careful observations of the experiments on sensory discrimination and motor movements of individuals and records were made of these individual differences in Wundt's laboratories by his pupil Cattell and their full significance was recognised. Then notable researches were made in physiology, anthropology and psychology by eminent scientists in the nineteenth century. It was in this era that Charles Darwin published his famous theory of differences between species. This theory stimulated his cousin Francis Galton, to take up the study of differences among individual behaviours. In 1883 he announced to the world the possibility of measuring intellectual abilities by simple psychological tests. He designed apparatus for testing a person's muscular, auditory and other sense discriminations.

Thus the concept of mental tests was of English origin but it was taken over almost exclusively by foreign investigators like Ochrrn and Ebinghaus in Germany and Boas and Guilbert in America and later on by Bourdon, Binet and others in France. During the first quarter of nineteenth century Karl Pearson and Spearman earned credit for their significant contribution in mathematical formulate to this field.

1. Standardisation of Intelligence tests of twentieth century:

French psychologist Alfred Binet gave for the first time to the world a mental foot rule. His first scale in 1905
consisted of 30 simple tests in the form of "oral and written answer" type and Thorndike justified in calling them 'Standardised Interview'. There was a lot of criticism against 1905 scale. So Binet with the co-operation of Simon revised it in 1908 and the tests were arranged in order of their difficulty. This scale was again revised in 1911.

Alfred Binet's greatest contribution to mental testing is the concept of 'Mental Age'. Consequently intelligence could be measured in terms of mental age. He gave a novel concept of age-grade scale to the world and he is regarded as the father of intelligence tests.

2. Revision of Binet-Simon Test:

Stanford University in U.S.A. revised the Binet-Simon tests in 1916 by Terman and named after it as Stanford-Binet test of Intelligence. In 1937 he, in collaboration with Merill published the second revision of the tests. Another thorough revision of the tests was done by Cyril Burt in England. He found that the tests required reassessment both in the order of difficulty and in the age of assignments. He therefore introduced certain requirements of procedure and statistical devices. Other notable revision of the Binet-Simon tests are those of Goddard, Kuhlmann and the point scale of Yerkes, Bridges and Hardwicks.

Binet's tests have two practical disadvantages to be of wide use. One of these that the tests are highly verbal
and that they are individual tests. They are not of great use to deaf and illiterate children. Secondly, they being individual tests can not be conveniently applied to a large group of testees at a time. To remedy the first defect, psychologists devised other types of tests called performance tests for the use of all grades and ages, both for normal and defective subjects. Pintner and Paterson prepared a performance scale for the use of deaf children. Porteus-Maze tests, Healy's picture completion tests, Koh's Block design tests, Knox Cube, and Seguin Form Board test of Good-enough's Draw-A-Man test, Collins - Drever's performance test etc., a few of them. To remedy the second disadvantage of Binet's scale, psychologists framed group tests by which they could test a large number of children at a time.

During World War I America was to face an urgent necessity of recruiting a large number of able bodied and powerful men for different duties of the Army. A test by which a number of candidates could be tested quickly for the purpose of army classification was presented by American Psychological Association which became the famous Army Alpha test, the first of a long series of 'Group test' designed to receive wide utility. This test being a verbal test could not be applied to illiterates and foreign speaking soldiers. Hence appeared another series of tests called Army Beta test. Thus World War I gave a decided impetus for the emergence of the group test movement, first in America and then in other -
countries. After the War, these tests were released for general use in schools and colleges too. The Otis, the simplex and the National intelligence tests are of the same type as Army Alpha tests.

3. A chronological outline of mental testing work in abroad:

(a) Age of experimental psychology.
- 1879 Wundt: Establishment of psychological Laboratory at Leipzing.
- 1890 James Meckeen Cattell: Use of 'Mental Tests' at Columbia University.
- 1895 Binet & Simon: Early work in Complex Mental Processes, France.
- 1900 Stern: Psychology of individual differences.

(b) The Foundation Period:
- 1901 Wissler: Correlation of Mental and Physical Traits
- 1902 Spearman: Two-factor theory of Intelligence.
- 1905 Binet-Simon: First published Scale Intelligence.
- 1906 De Sanctis: Development of Scale - Rome
- 1908 Binet-Simon: Revision of Scale on Age-Level basis
- 1911 Binet-Simon: Final Revision of Scale
- Johnson: English Translation of Binet's 1908 scale.
- Goddard: America's Revision of Binet's Scale.
- 1912 Treves and Saffiotti: Development of Scale for Testing (Italy)
(c) The Boon Period:

Portsus: Development of Maze Tests.

1917 American Psychological: Development of Army Test Association for selection of Army and Recruits of personnel

Pintner and Patterson: Performance Test

1918 Otis: Group Intelligence Test

1921 Burt: London Revision of Binet Scale.

1922 Kuhlmann: Revision of Binet Scale.

Otis: Self-Administering Test of Mental Ability.

Kohn: Block Test (Performance)

1924 Thurstone: American Council of Education Psychological Examination.

Philips: Australian Revision of Binet's Scale


(d) The period of Criticism - 1930 onwards:

1937 Terman and Merill: New Revision of the Stanford-Binet scale

1939 Wechsler: Bellevue Scale (Forms A & B)

1946 Wechsler: Bellevue Scale (Form II)

1960 Merill and Palmer: Revision of Stanford-Binet Revision

1967 Wechsler: Pre-school and primary school scale of intelligence (WPP SI)

4. A brief review of research in India:

Work on the development of tests in India started about fifty years ago with a few years of the beginning of similar work of Western countries. The first mental measurement handbook of India was published by the N.C.E.R.T. in 1966 which has reviewed about a hundred tests. In 1923, the Government of India tried to gather up the fragmentary work done by various workers in all parts of India. This is known as the revised series of mental (intelligence) Tests for Indian scholars.

Herbert Rice standardised a Hindustani Binet performance point scale in 1929. This was the first attempt of standardising an individual tests in India. The first defect with the scale is that the tests are collected from different scales and so it is difficult to compare the scale with other scales. Second defect which Kamath points out is that it is not comprehensive scale as it is only a point scale and not an age scale. A third defect is that no girls were tested and boys below the age of 5 were left out.

Pandit Lajja Shankar Jha (1933) adapted the simplex test of Richardson in Banaras for the age group 10 to 18+. He tried the test on 1000 pupils. The report of his work is found in Teachers' Training college of Banaras Hindu University. He also adapted Terman's group test of Mental Ability for the same age groups as that of the Simplex.
In 1938 V.V. Kamath standardised the Stanford-Binet scale of 1916 and brought out what is known as the Bombay-Karnataka revision.

Jalota of D.A.V. College at Lahore in 1943 prepared a verbal group test for the use of college students in Hindi, Urdu and English.

N.N. Shukla (1943) tried to see if the scale adapted by Kamat could also be applied to the children speaking different languages in India. He chose Gujarati speaking children for his work. He concludes that some changes are absolutely necessary before the scale could be applied to the Gujarati speaking children. Shukla translated Kamat's test and standardised it for Gujarati speaking children. The test gives fairly good results.

K.G. Desai (1954) has standardised a battery of Group Test in Gujarati. The battery includes tests on following directions, opposites, disarranged sentences, proverbs, logical inferences, number series, analogies, similarities, story completion and memory tests. The test is original one, gives very good results and is in practical use still throughout Gujarat.

Premila Phatak (1955) made the pioneering study of Goodenough's Draw-a-Man Test and developed a new scoring method in her standardisation of the test for Gujarati children.
Pillai (1955) constructed the general mental ability test in Malayalam for school children.

Bhatia (1955) developed a battery of performance test for use of Indian children.

Prayag Mehta (1958) revised his own test of intelligence and standardised it for Rajasthani School going Children in the age range ten to fourteen years. The Test is in Hindi.

Kapate (1960) constructed a group Test of intelligence in Bengal for children of grades V and VI.

M.B. Buch (1960) has constructed and standardised a Test of Social intelligence for S.S.C. pupils of Gujarat.

A.K. Patak (1961) has constructed and standardised a Test of a group Test of intelligence in Marathi for ages 9 to 13 years on a random sample of 10738 boys and girls of Bombay, Poona, Ratnagiri, Thana and Surat Schools.

M.C. Joshi (1961) has developed a group Test of Intelligence in Hindi for School and College going students. His Test format is verbal Omnibus spiral group point scale. The Test was standardised on students of Grades VIII to XII.

Nafde (1961) prepared a non-verbal Test of intelligence on the model of NIP 70/23 and Test of Abstract reasoning (DAT). The Test was administered to 10,000 boys and girls mainly from the high schools in Bombay city.
Pandey (1961) prepared and standardised a group Test of intelligence for school going children in Nepal. The standardisation was done on 2674 students of classes VIII to X representing different social strata of Nepal.

C.L. Bhatt (1962) designed her scale for Gujarati - children of standards V to VII belonging to urban, semi-urban and rural cultures. The Test was partly Verbal and partly nonverbal.

Premalata M.G. (1962) battery of non-Verbal Test of intelligence was designed for children of seven to thirteen years of age. The test was standardised on a sample of 7841 boys and girls drawn from rural and urban areas of Mysore State.

Hundal and Singh (1963) devised their scales for Punjabi speaking children. They administered the scale on a random sample of 1882 students of age group thirteen to seventeen years selected from the schools in the Punjabi speaking areas of Punjab.

Mallin (1964) has worked on the first Indian adaptation of WAIS.

Bhattacharya (1964) divided a battery of four performance Test of intelligence for the eight to twenty-two age groups which included the Dear bon's Form Board Test, the Alexander's passalong Test, the Goddard's Cube construction
Test and the Koh's Block design Test. The battery was validated against verbal intelligence Scale prepared by Calcutta University.

Singhal (1965) has developed a battery of four sub-tests, namely picture Completion, reversed similarities, similar opposites and classification. Its target population comprised of students in the age range eight to fourteen years covering grades III, IV, and V. A simple of 2000 children of Schools run by Municipal Corporation in Calcutta and Delhi was used in the study.

The group Test constructed by J.M. Patel (1966) contained Verbal as well as figural items covering reasoning, perceptual, memory, numerical and spatial relations aspects of intelligence. The Test was standardised on a sample of students in the age range thirteen to sixteen studying in grades VIII to XI of schools in Gujarat.

Ahuja (1966) constructed group Test of intelligence in English for Bombay children in age groups thirteen to seventeen.

Kaul (1966) developed a group Test of intelligence in Urdu for 12 + to 16 + in Kashmir.

Oak (1967) has prepared a group Test in Marathi. He used the Omnibus spiral arrangement in his Test and standardised on 4350 boys and 3596 girls of classes VII to XI,
randomly selected from eighteen schools of Bombay City.

Bhavsar (1967) prepared a non-Verbal Test for high school students of Grades IX to XI corresponding to thirteen to eighteen years age group. A sample of 3184 boys and 2718 girls drawn from fortyfour schools of sixteen districts of Gujarat was used for standardisation.

Prabha Ramalingaswamy (1969) adapted the performance scale of WAIS. The test was standardised on a sample of 604 literate adults of both sex in the age group fifteen to fortyfive years representing Delhi population.

Bora (1969) developed an Omnibus type Verbal group Test of intelligence in Assam for pupils of class VII to X of schools in Assam.

K.G. Desai - C.L. Bhatt (1969) have developed a group test of intelligence for the age group thirteen to seventeen years of Gujarati pupils Ahmedabad.

M. Patel (1970) constructed only Verbal items of group Test related to series, analogy, synthesis and classification functions. This Test was standardised on 4471 students of 14 + to 16 + age, randomly selected from seventy schools in Gujarat.

M.C. Bhatt (1970) has adapted WISC for Gujarati population in her study.
Yadav (1970) has attempted the adaptation of WISC in Hindi for selected Schools of Delhi.

Nair (1970) developed a non-Verbal measure of Intelligence and standardised it on a sample of 5252 students of class VIII to X selected from twelve Educational districts of Kerala. Proportionate representation was given to Sex, rural-Urban residence school management in the sample. The Test is validated against the Raven's progressive Matrices.

Singh (1971) developed a battery of Test of measure Verbal, abstract and numerical reasoning abilities in students in the age range thirteen to twenty years.


Trivedi (1972) constructed non-Verbal group test of general ability for students of grades VII to IX in Haryana and was administered to 2483 students in the age range 12 to 14 + to study its Psychometric properties.

Mehrotra (1972) followed the Wechsler model in developing a group Test of intelligence for children of 11 to 17 years.

Upadhyay (1972) Prepared a group Test of intelligence for the age 8 + . The Twentyfive items Test in Hindi was administered to 312 school going students in Allahbad to work out the test reliability and percentile norms.
L.K. Patel (1973) has constructed a performance scale of intelligence for the age range 6 to 15+ in Gujarat. It was validated factorially following the principal axes method. The three curves of mental growth for boys, girls and the mixed group were found to be regular.

Pina Sheth (1981) has developed a test, adaptation of WAIS in her study for Gujarati population.

M.L. Joshi (1982) has adapted WPPSI for Ahmedabad School children.

Late Mrs. Tarulata Shah (1982) has constructed a non-verbal group test of intelligence for High school pupils of Gujarat. She has arranged the battery on spiral omnibus model.

A Tamil adaption of Otis self administering test has been developed by Phillip of Madras. It has been standardised on 2000 boys and girls and is suitable for ages 12 to 16+.

Satyananda has constructed and standardised a verbal group test of intelligence for the Kannada speaking children of High schools in Mysore. The battery has 100 items and the sub-tests are classification, always has, analogies, number series, arithmatic problems riddles, opposite and logical selection. The test has been standardised on 3000 children of both sex. Only Grade Norms have been provided.

The Faculty of Education and Psychology, University of Baroda has constructed a verbal group test in Gujarati for -
the age group 11 to 16+. This consists of eight sub-test with 117 items with good discriminating indices, with a wide range of difficulty values. The test has been validated against Desai's group test of Intelligence and with the rating given by teachers.

The Bureau of Psychology, Allahabad, has taken up the adaptation, construction and standardisation of various psychological tests and it was able to collect about two dozen of them. These include four verbal group tests for ages 12, 13, 14 and adults. Five non-verbal group tests and two attainment tests in Hindi, three mechanical aptitude tests (Detroit manual ability) Tweezer Dexterity and standness test and three personality tests (T.A.T.) Some experimental work on child guidance has also been done at the Bureau.

Reviewing variety of the tests, mention is made in some cases only to name the author and the respective test in chronological order.

Despite the over enthusiasm and occasional errors that have attended their development, mental tests stand today as the most important single tool psychology has developed for the practical guidance of human affairs.

The urgent need for well standardised tests of intelligence was recognised as early as 1939, when the Achary - Narendra Dev Committee report on the reorganisation of Primary
and secondary education recommended in very clear terms to construct and standardise tests of intelligence group as well as individual, verbal as well as non-verbal for different special abilities and aptitudes, applicable to people from all strata of society and thus to establish the practice of Educational and vocational guidance on a sound basis.

Lakshman Swamy Mudaliar’s report 1952-53 has also recommended that a central research organisation may be established for carrying out research in Educational Vocational guidance and for the preparation of tests with particular reference to Indian conditions and needs of pupils concerned and the opportunities available to them from time to time. The teacher will have to use different kinds of tests-intelligence tests, aptitude test, attainment tests etc. There is need for continuous research in these fields.

One of the most important uses of intelligence tests is that of predicting scholastic aptitude and since school work itself is predominantly verbal. Verbal tests are certainly the most useful and they correlate much better than pictorial or abstract ones with school work. The non-verbal tests have more values in scientific and technical and professional education.

The Individual test can be applied to only one person at a time and therefore, when a large number of pupils are