CHAPTER I

INTRODUCTION.
BACKGROUND OF THE STUDY:

The value of intelligence tests in school and college practice has been the subject of a very large number of investigations which generally support the view that intelligence as measured through tests plays a significant role not only in overall school and college success, but also in (such specific areas as various) specific courses of study, ability to profit from study at various levels, success in professional studies and other related areas.

Investigations which support this point of view seem to fall under several categories.

(a) Correlational studies between success in school or college and intelligence.
(b) Studies of correlation between intelligence and subject areas.
(c) Studies of relative levels of intelligence at various levels of schooling or education.
(d) Studies showing levels of intelligence in the professions.

These studies are mostly normative and have brought out the following generalizations:

(1) The correlation between college or school/grades/marks and intelligence is positive and is of the order of approximately .5. Tyler\(^1\) reports correlation of

.4 to .6 between intelligence test scores and school marks. Anastasi has mentioned correlation coefficients of .5 and .6 between intelligence test scores (School College Ability Test) and achievement at High School and College levels respectively. Summaries by Kinney and Segal showed a median correlation of .44 between intelligence test scores and college scholarship. Durflinger reported a median correlation of .52 between intelligence test scores and college marks.

(2) Correlation between intelligence test scores and subject matter areas is positive and is of the order of approximately .6, with small variations above and below .6. Segal and Gerberich, Shanner and Kuder, Mac Phail and others.

(3) As we go up the educational ladder, a higher level of intelligence is required for the successful pursuit of studies at these higher levels.

The relationship of intelligence test scores and educational levels has been demonstrated by Proctor. He found that those who failed to go beyond the 9th grade had an average I.Q. of 105, while those who graduated from High School had a mean of 111 while those who went to college had a mean I.Q. of 116.

Studies by Embree and Wrenn indicate that the average Stanford-Binet I.Q. for college entrants was 118, for bachelor's degree recipients 126 while the mean I.Q. for persons receiving a Ph.D. averaged 141.

(4) There is a downward gradient of intelligence as we move from 'professional through managerial, clerical and skilled workers to unskilled labour'. Intelligence as related to 'professions' and professional studies has been fairly intensively explored. Some of these studies bear directly on the present work and may be quoted briefly.

Proctor tested 15,000 students, and ascertained the occupations of 945 out of these thirteen years later. When classified according to occupational levels the following results were obtained.

Table 1.1. **Intelligence in High School and Occupational Levels 13 Years Later.**

<table>
<thead>
<tr>
<th>Professional Levels</th>
<th>Mean I.Q.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Professionals (Doctors, Educators etc.)</td>
<td>115</td>
</tr>
<tr>
<td>(2) Managerial</td>
<td>108</td>
</tr>
<tr>
<td>(3) Clerical</td>
<td>104</td>
</tr>
<tr>
<td>(4) Skilled</td>
<td>99</td>
</tr>
<tr>
<td>(5) Semi-Skilled</td>
<td>97</td>
</tr>
</tbody>
</table>

In another study Deeg and Paterson determined the rating on one of the standardized occupational level scales for each of 219 men who had taken a group test of intelligence as children in 1918 and 1923. For the 1923 group, the younger ones at the time of the follow-up, the

correlation between test scores and occupational level rating turned out to be .57 and for the older (1918) group it was .71. This would suggest that there is some tendency for individuals to gravitate towards an occupational level in keeping with their measured intelligence.

In another study Tyler\(^1\), has reported that tests given to large number of men and women in the Armed Forces during both World Wars show that the 'professions' (Educators, Doctors, and Engineers etc.), probably because they require long period of advanced education, rank highest in intelligence test scores. Business and white collar occupations rank next highest; then come the skilled workers and semi-skilled workers and finally the unskilled worker.

The generalisations outlined above have led to a fairly wide use of intelligence tests in schools and colleges. Among other uses, tests of intelligence have been employed for selection, guidance, classification and admission to various courses of academic and professional study.

According to Detchen\(^2\), Chatham College requires that

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scholarship applicants take the College Board Scholastic 
Apptitude Test as a part of their scholarship examination. 
He further remarks that some of the students have also 
been taking the A.C.E. Psychological Examination for this 
purpose.

According to Mc Guire, applicants for admission 
to the University of Chicago are required to take an 
entrance or scholarship examination which is designed to 
provide evidence about the candidate’s ability to do 
academic work at the level required in the college of the 
University of Chicago.

According to Johnson, Marsh and Axelrod, intelligence 
is one of the criterion employed for selecting candidates 
for admission to teacher education curricula in San-
Francisco State College. Results on the S.C.A.T. or on 
the A.C.E. Psychological Examination taken at the time of 
entrance are furnished to the Education Division for use 
in weighting candidates on the intelligence factor.

The studies briefly quoted in the preceding para-
graphs point towards some of the uses of intelligence 
tests in school and college practice and one may suggest


2. Johnson, A.W., Marsh, F.G., and Axelrod, J., 'The Test-
that judiciously used, such tests may be of value in India. Selection for services, professional and academic courses, and general educational and vocational guidance are some of the areas in which intelligence tests may be profitably employed in our country. It may be expected that use of such tests will help to improve our educational efforts and generally place it on a surer and more scientific footing. The value of such measurement, according to Feder\(^1\), extends beyond college success into the realm of prediction of vocational success.

While it cannot be asserted that tests of intelligence are being widely employed in this country, they are being used in certain areas, presumably, with profit. Selection Boards for recruitment to the Armed Services, our Railway Establishment and also some business organizations are making regular use of intelligence tests, mostly for purposes of selection.

Tyagi\(^2\) reports that at the Services Selection Board for selection for the National Defence Academy, a battery

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of intelligence tests is administered to candidates as part of the selection procedure. Test scores are classified into six grades and the relationship of these grades to success has been reported as below:

Table 1.2. Intelligence and Success Intelligence and Grades.

<table>
<thead>
<tr>
<th>Categories of Intelligence</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Confirmatory Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number who Pass</td>
<td>11</td>
<td>38</td>
<td>137</td>
<td>111</td>
<td>39</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Number who Fail</td>
<td>11</td>
<td>39</td>
<td>149</td>
<td>200</td>
<td>126</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

Tyagi observes that candidates who secure grades 1, 2 and 3 on intelligence test do significantly better than others.

Deshmukh\(^1\) of Defence Science, reports that a high percentage of selected candidates who secure grades 1 to 4 on the intelligence tests are placed higher in merit by instructors at the National Defence Academy at the end of the training. He concludes that this definitely points to the contribution of intelligence to success.

Goshal\(^2\), conducted a study to find out the relative

1. Deshmukh. Ibid.
value of the various Psychological Tests used in the selection of Railway Apprentices. This selection is made by the Union Public Service Commission every year for the Mechanical Engineering and Transport Department of Superior Revenue, Establishment of Indian Railways. Psychological tests used for this purpose can be classified into two categories (a) tests for measuring intelligence (b) tests for measuring mechanical aptitude.

The relationship of intelligence test scores to overall performance in course work during the training was studied at two stages i.e., at the end of the first session, and at the end of the final session. The sample for this study was drawn from the Railway Apprentices selected and sent for training between 1950 and 1958. The relationship of intelligence test battery to performance in course work was studied and is reported below.

Correlation between
Intelligence and 1st Sessional assessment .26* (N = 83)
Intelligence and 2nd Sessional assessment .91 (N = 51)
*(Significant at the .05 level)

NEED OF THE STUDY:

Studies of relationship between intelligence and achievement taken in its broader meaning point in one
general direction and suggest that measures of intelligence can provide useful and usable information about individuals. Such information is widely used for various purposes in the U.K. and U.S.A.

In India, however, not only that measures of intelligence are not being employed on any scale, but it is perhaps also true that the part played by intelligence in different areas in which it may be profitable to use measures of intelligence, has not been explored in any detail. Specific information regarding intelligence and its relationship to achievement at college and university levels or the role it plays in the various professions and vocations, is wanting.

While it is possible to utilize such information as is available from the studies in the West and make it a guide for action, the proper thing to do would be to study the role which measured intelligence plays in the Indian environment. It need not be argued that psychological variables are very definitely affected by the social cultural environment and what is true for U.S.A. may not hold in the same degree for India. The present study has been undertaken with the aims of providing some information on one specific issue namely the intelligence level of students in some professional courses run by universities.
In the limited knowledge of the author this information is not available and the field has been explored but little. The author further feels, that one possible reason, for measures of intelligence not being as commonly employed in India as they perhaps should have been, is the non-availability of a suitable yardstick which may yield an acceptable and meaningful measure of intelligence - a measure which may be easy to interpret and use. There are few tests available in India which may be optimally useful at the college level and what is more the term I.Q. is somewhat loosely used - particularly at the adult stage.

It is quite well understood that, I.Q. norms to have the meaning which they should have, must be obtained from an "unselected population", which should represent all sections of the Indian life. This is clearly not within the realm of possibilities at the present time because a very large proportion of our population is not even literate and not accessible to the average research worker. What is more, such norms are likely to remain a distant goal for quite some time to come. A suitable, usable, easy to interpret scale is therefore needed and a second purpose of this study to attempt to present such a scale.

The present study is a modest attempt at providing,

(a) a scale usable at the under-graduate level,
(b) an index which will enable colleges and universities to conveniently and meaningfully categorize individual students,

(c) comparative data showing the level of intelligence of entrants to certain professional courses relative to the performance of the 'average' undergraduate.

It is aimed at making a comparative study of the levels of intelligence of entrants to courses in Engineering, Medicine, Law, Teacher's Training Courses, and the Diploma in Engineering.

To make the comparison easily comprehensible it will first be necessary to develop a usable set of norms which may be meaningfully used at the college and university stages.

PROCEDURE IN OUT-LINE:

(a) The first step was the preparation of a scale and the establishment of norms. For this purpose the A.C.E. Psychological Examination was chosen from among the various available tests. It was adapted to Indian conditions.

(b) After try out and item analysis the test was administered to students of B.A., B.Com. and
B.Sc. (Previous and Final Year) classes in four teaching universities of U.P. i.e., Aligarh, Allahabad, Benaras and Lucknow.

(c) Norms were established on the pattern suggested by David Wechsler in terms of 'Deviation I.Q.s.'

(d) The reliability of each sub-test and test as a whole was determined on the entire norming sample.

(e) The test was administered to the entrants to professional courses in the four universities mentioned earlier and comparison of the average ability of the professional groups were made.

(f) Evidence of validity which may be taken, in a sense, to be predictive validity is then presented.

This study has been undertaken with a view to providing a scale usable at the college and university levels and it is believed that this scale will be of some service to those who may need an index of intellectual ability suitable for college students. It is also expected to serve as a helpful tool in situations where intelligence is a criterion in selection and admission of candidates to various courses of study.
The indices developed in this study though derived in a similar manner may not be equated to I.Q.s., because the population from which the normative group was drawn, is a highly selected one. The norms therefore will be applicable to the university going population only.

LIMITATIONS:

No one is more conscious of the limitations of the work than the author which are, basically, the limitations of the author himself. They will be elaborated in appropriate places in the body of the work and in proper context. Among others the limitations arise from the difficulties of sampling, test administration and difficulties arising out of the use and adaptation of an instrument designed originally for another country.