The number of existing studies on wastage in education does not correspond to the magnitude and urgency of the problem. In most countries research in this field lags behind others of lesser importance; and in India, in particular, the available studies are few, and of a rather recent date. The majority of the studies reviewed here are monographs dealing with the problem of withdrawal from a particular institution, college or university; and very few of them are representative of a large number of students. Some of them, however, treat the subject with a more scientific approach. With regard to the analysis of the causes of wastage the literature is especially scarce. Various causes of wastage are mentioned by several investigators, but very few of their reports reflect the findings of field work in an attempt to obtain first-hand information from the students themselves.

I LITERATURE ON WASTAGE IN PRIMARY EDUCATION

Chitkara\(^1\) summarises the studies on wastage in Indian education published up to 1961 laying special emphasis on

\(^1\) R. S. Chitkara, \textit{op. cit.}\)
the concepts evolved and the methods used in the measurement of wastage. Using the simplest and oldest method of computing wastage, the mere counting of diminution in number from one class to another, wastage is calculated from primary education up to the degree course for the whole of India during the academic years 1955 to 1957. From these figures the following conclusions are drawn: 1. Wastage decreases progressively from primary education to degree course. 2. In every stage of education wastage also decreases, although at a lower rate, from one academic year to the next. 3. Wastage in primary education is considerably higher among girls than among boys; this difference, however, diminishes notably during the school period, and by the end of the degree course wastage among girls is lower than among boys in almost the same proportion.

But a more scientific method of calculating wastage is evolved by the author in which due account is taken of other factors influencing wastage such as stagnation, diminution in numbers due to death etc.

For the calculation of stagnation the following formula is offered:

\[
\text{Stagnation Index} = 100 \left( \frac{A+2B+3C+4D}{A+B+C+D} - 1 \right)
\]

where A, B, C, represent the number of students who are reading in the class where the stagnation is calculated, for the first, second and third year respectively, and D
represents the number of students who are reading in that class for the fourth and more years.

The Satara Study

Under this title the investigation conducted by the Gokhale Institute of Politics and Economics, Poona, among 72 primary schools of the Satara district is reviewed by Chitkara. This study covered a total of 1,778 cases of wastage and 1,264 cases of stagnation that occurred during the five-year period (1941 - 1945) under investigation. By comparing the number of students who left school from the original class, this survey draws the conclusion that in each class the average percentage of those students who were promoted and of the students who left school from that class remained fairly constant from year to year.

A formula is devised to calculate the number of students who remained in the class at the end of the year, and its application yielded the following results:

Out of every 10,000 students entering the school system, 3,612 leave the school without completing Class IV, giving a wastage of 36.12 per cent. It is

interesting to note that the traditional method of calculating wastage when applied to the figures (of this study) would place the wastage at 45.7 per cent.³

It is also pointed out that the extent of stagnation is still greater than that of wastage and the summary of the findings of the survey are as follows:

Of every 10,000 students entering the school system, 6,388 pass Class IV and the remaining 3,612 leave the school without passing this standard. Of these 3,612 students, 1,932 leave in Class I, 706 in Class II, 504 in Class III, and 470 in Class IV; 1,810 pass with three or more attempts.⁴

From the financial point of view, i.e. in terms of the number of years spent in school by those students who are withdrawn prematurely, the study found out that of the total of student-years spent by the whole group of students, 27 per cent (13,539 student-years) are spent by those who are withdrawn before Class IV is completed. Thus the original percentage of wastage placed at 36.12 is now further reduced.

The Poona Study

This study was carried out by the Research Unit

³ Chitkara op. cit., p. 3
⁴ Ibid. p. 4
attached to the Directorate of Education of Maharashtra State in the primary schools of the Poona District. The sample selected was a group of 1,000 students who entered Standard I in 1955 and their progress for four years was followed up in order to ascertain their position at the end of the fourth year. Of these 1,000 students, 414 had left school before reaching Standard IV, leaving a clear wastage of 41.4 per cent. At the end of four years only 211 students (21.1 per cent) had appeared for the final examination of Class IV.

Utilised School Years. For the study of the efficiency of the school system a new concept is introduced in this investigation, that of the utilised school years. If the whole group of 1,000 students had followed the ordinary course and reached the end of Standard IV in four years they would have utilised a total 4,000 years in all. However, since 414 students left school at various stages before appearing for the final examination of Standard IV, there is a total of 957 school years that were not utilised by the group as a whole, leaving the number of utilised years at 3,043 or 76.1 per cent of the total.

Actual and Effective Utilization. Not all the school-years utilised in school by a group can be considered useful from the point of view of passing an examination, therefore a distinction must be made between actual utilisation and
effective utilisation. A student may actually utilise two school-years in passing the final examination of a given class but of these two years only one is effectively utilised. On this basis the effectively utilised school-years of the whole group of 1,000 students were calculated to be 2,008 as against 3,043 actually utilised school-years. The effectiveness of the school system is calculated by means of a mathematical formula to lie at 66 per cent. In this formula the newly found concepts of effective and actually utilised years are used. The wastage, therefore, according to this formula is 34 per cent.

**Educational Credits.** Another concept elaborated in this study is that of educational benefits or credits. For successful completion of Standard I, II, III and IV students are given a credit of 1, 2, 3, and 4 respectively. For every failure in Classes I to IV only half of the respective credit that would accrue to the students was given, for it is assumed that a student who works during the year and appears for the examination has derived some benefit from his work, eventhough it cannot be measured in terms of success in the examination. Those students, however, who were absent from the examination or withdrew from school prematurely were given no credits.

Thus the educational credits that the 1,000 students earned during the four years are calculated. In an ideal
setting, in which every student would work at maximum efficiency and consequently passed all the four examinations at the first attempt, the total number of credits earned by the whole group would be 10,000 according to the formula:

\[ N = 1,000 \times 1 + 1,000 \times 2 + 1,000 \times 3 + 1,000 \times 4 \]

But reality falls short of this ideal and the total of educational credits earned by the class as a whole turned out to be only 4,217.5 or 42.2 per cent of the total of possible credits. Thus the total amount of wastage reaches 57.8 per cent as against 34 per cent of apparent wastage.

II. LITERATURE ON WASTAGE IN SECONDARY EDUCATION

Another study reviewed by Chitkara\(^5\) is the investigation conducted by the Indian Institute of Education, Bombay. It covers a population of 2,565 students who were in Standard VIII in June 1949 in 34 schools of Maharashtra State. These students were followed up to their graduation or withdrawal from school before completing the course of studies.

Out of these 2,565 students only 545 had passed the S. S. C. Examination at the first attempt by the end of the fourth year. The apparent wastage was, therefore, 78.8 per cent. In order to find out the causes of wastage, as many as 204 students were interviewed. The findings of this study are fundamentally the same as those of "The Ahmedabad Study".

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\(^5\) Ibid. p. 6
to be reviewed later, and consequently they are omitted here.

Three more studies are reviewed by Chitkara. In addition to the Ahmedabad Study, already mentioned, the studies are those conducted in the Fergusson College of Poona and in the M. S. University of Baroda. All these three studies will be reviewed in the present investigation.

The author summarised the causes of wastage and stagnation as found out by the studies reviewed. The most important one is poverty. Most parents cannot pay the school fees or they need the financial help of their children. About 65 per cent of the causes of wastage are of this nature. The second cause of wastage in order of importance is the inefficiency of the educational system. Other causes are the indifference of parents towards the education of their children, specially of their daughters, and in a small number death, truancy and others. From among the reasons for stagnation in school mentioned in the study the majority reflect on the inefficiency of the educational system or teaching methods adopted by the teachers.

The Ahmedabad Study

Desai and Desai have done valuable work in measuring the extent of wastage and stagnation in secondary education in Gujarat. The sample selected for this study is a group of students, 1,384 strong, representative of a student
population of 10,368 who had enrolled in Standard V of the schools of Gujarat during the academic year 1948-49.

Wastage. Wastage is calculated in this investigation in three ways, apparent wastage, clear wastage and real wastage. All the students who joined the Standard V and by the end of seven years had not successfully completed their schooling by passing the S. S. C. Examination constituted apparent wastage. The students who abandoned school before even reaching the S. S. C. class constituted clear wastage. Real wastage, a new concept evolved by the authors, takes into account the partial benefit derived by the students who did not reach the S. S. C. class but cleared some of the intermediate examinations. The method used in calculating real wastage is thus explained by the authors:

Considering the secondary school to be made up of seven grades, a pupil passing Standard X and then leaving school in Standard XI could be given $\frac{6}{7}$ credit, one passing Standard IX $\frac{5}{7}$ credit and so on.\(^6\)

The calculation of stagnation is mainly limited to the study of the stages of secondary education at which it is greatest.

The findings of the study are as follows: 1. The apparent wastage amounts to 80.3 per cent of the total number of school entrants, as only 273 students were able to pass the S. S. C. Examination at the first attempt seven years

\(^6\) Desai and Desai, op. cit., pp. 18-20
after their enrollment in school. 2. Apparent wastage is slightly higher among girls than among boys. 3. There is no significant difference between apparent wastage among students coming from urban and rural areas. However, students coming from socially and economically higher classes have a lower percentage of apparent wastage than those coming from a lower classes.

**Clear Wastage.** The 582 students who abandoned studies at various stages of their secondary education leave a clear wastage of 42.1 per cent. This figure, however, needs correction for it does not include the rather large number of students who are known to discontinue after their first failure in the S. S. C. Examination. Considering, therefore, all these cases, it is concluded that a minimum of 50 per cent of clear wastage is a more correct figure. The analysis by factors shows that clear wastage is higher among girls than among boys. By classes it is highest in Standard V, in which class 30 per cent of the cases of discontinuance of studies take place. This class and the next account for 50 per cent of the clear wastage in secondary education. Age is another factor that reveals interesting details. The older a student is when entering a school the less chance he has to complete his secondary education. Age is more responsible for withdrawal of girls than of boys.

**Stagnation.** Stagnation is greatest in the S. S. C. class in which as many as two fifths of the students fail.
Standard V shows the second highest number of failures as most of the students who are not fit for secondary education are eliminated at this stage. Stagnation is lower among girls than among boys. It is interesting to note that most of the students who were detained twice in the same class discontinued their studies.

The study of the subjects in which students fail shows that by far the majority of failures occur in English. Other subjects in which the number of failures is still considerable are in order of importance History and Geography. Mathematics is also responsible for a number of failures.

According to the method of calculating real wastage referred to before, it is found out that in secondary education the total amount of wastage can be placed at 31.3 per cent.

III. LITERATURE ON WASTAGE AFTER SECONDARY EDUCATION

Wright and Jung\(^7\) study the reasons why capable high school students do not pursue their studies further than school graduation. By "capable" students the authors understand those students who rank in the upper tenth of the graduating class. The study was conducted among all the

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capable students of the schools of the State of Indiana who were in the graduating class in June, 1955. In selecting this exclusive group for the enquiry it was hoped to analyse better the problems of students drop-outs between school and college, for this type of students should be the first candidates for higher education and their loss is considered more lamentable than that of students of lower ability.

Wastage. The total number of students ranking in the upper ten per cent in all the schools of Indiana in 1955 was 3,479 (2,343 girls and 1,136 boys) out of whom 1,011 (or 843 girls and 168 boys) did not study beyond school graduation. This represents 30 per cent of the total number of students; and by sexes, 15 per cent of the boys and 36 per cent of the girls. The authors note that this figure is considerably lower than the presumed 50 per cent of non-continuing students.

Causes of Wastage. In order to find out the reasons for this wastage in manpower the students themselves, their parents and the school authorities were interviewed. The following points were examined: size of the schools; age of the students at the time when they were in the graduating class; educational, financial and general background of the family; interest of the students in academic work; guidance; marriage; health and other factors.

The reasons given by the students for not continuing their studies were in many cases a fusion of factors. The
investigators took pains to analyse these reasons in an effort to find out the predominant reason. The results of this study are as follows:

**Boys.** In the case of boys the reason accountable for more cases of failure to continue studies was what was called "terminal" i.e. that boys considered school graduation as an end in itself. "Terminal" included a variety of factors like wanting to earn more money, having other plans in mind such as joining the armed forces, engaging as full-time employees in the jobs they already held while in high school as part-time workers, finally, in some cases, desire to be financially independent. Financial reasons accounted for the second largest number of failures, and indifference towards studies on the part of the youths themselves was the reason for failure ranking third in importance. These three reasons alone were responsible for 78.2 per cent of all the cases. Other reasons mentioned were, marriage, being needed at home, parental opposition and health.

**Girls.** The reasons given by girls for not continuing their schooling were the same as those of the boys, but the rating in order of importance as well as the percentages were different. Marriage accounted for as many as 30 per cent of the failures. Next came indifference. The third reason was "terminal". Other reasons were: parental opposition or indifference, being needed at home, and the last health.
Wastage by factors. The distribution of students who did not study further than high school by family income shows the following findings: 43.4 per cent had an income exceeding $5,000; as many as 37.3 per cent reported an income of $3,500 to 5,000; and 19.2 per cent had an income lower than $3,500.

Analysing other factors it is pointed out that 70 per cent of the youths who did not study further lived in communities in which the attitude towards going to college was favourable. It is considered as a weak point in the guidance programme, that, while most of the students had discussed the topic of further education with the school guidance system, most of them had not received any guidance from their parents. One half of these students knew nothing of the scholarships available to capable students; most of them were also ignorant of other resources available in the community. A very large number of these students had not talked with college representatives about possible help to be derived from college. This, however was believed to be more the outcome of the mental attitude of the students themselves who did not consider themselves as possible college candidates.

IV. LITERATURE ON WASTAGE IN HIGHER EDUCATION IN INDIA
Poona University
Deshmukh and Kamat\(^8\) conducted a study among the

\(^8\) A. G. Deshmukh and A. R. Kamat, (contd. p. 29)
students of the Faculties of Arts and Science of Fergusson College in order to investigate the amount of wastage and stagnation in that college, as an indication of the extent of wastage in the whole of the Poona University.

The students selected for this study were all the freshmen who enrolled in the college during the three-year period from 1949 to 1952. To facilitate the investigation the entire B. A. course is divided into two natural and independent stages sc. from the First Year up to Intermediate, and from the Intermediate class up to the degree examination.

Wastage. Of the total number of 408 freshmen on whom the calculations are based 15.9 per cent were not able to proceed beyond the first year in college, and a further 17.2 per cent who proceeded further gave up the course without passing the Intermediate Examination. In all during the first stage of the B. A. courses 33.1 per cent of the original freshmen abandoned studies. Nearly 70 per cent of all the cases of withdrawal took place before passing the Intermediate Examination. For the second stage, namely from Intermediate to degree examination the clear wastage was 14.5 per cent. For the whole B. A.

course i.e. from First Year to degree examination the amount of clear wastage was found to be 44 per cent.

**Wastage by Factors: S. S. C. Marks.** From the analysis of the clear wastage by factors the following facts are inferred. The study does not seem to prove the assertion that a high percentage of marks obtained at the S. S. C. is a guarantee of success in college, in fact:

The chance of a student's completing the college course definitely increase with the increase in the marks obtained at the S. S. C. Examination. But there does not appear to be a well-defined barrier below which he cannot succeed at all. It is clear, however, that in the case of students who have less than 45 per cent marks at the S. S. C. Examination the chances of completing the college course are as low as one in five.⁹

**Age.** Wastage increases with the advance in age at entry, and so when the age is 19 and above wastage is as high as 70 per cent. It also shows that students who join college at a later age also have a lower percentage at the S. S. C. Further analysis of data manifest that these students were already retarded in school, they come from rural background and belonged to backward communities.

**Sex.** Among men the wastage is remarkably higher than among women, the respective percentage of wastage being 51 and 42. As an explanation of this fact it is pointed out that women have a slightly better performance

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⁹ Ibid. p. 34.
than men at the S. S. C. Examination (53.4 per cent as against 51.1 percent), women are younger than men when entering college (the respective average ages are 17.2 and 18.5), the proportion of city students among women is higher than among men (72 per cent and 53 per cent respectively), and female students entering Arts Colleges are mostly members of more advanced communities. Finally it should be considered that while men tend to give up studies at a younger age, women do so at a later age. This fact in its turn may need a further explanation, and the study advances this one:

Many of them (men) are subject to the pressure that they must start earning as soon as possible and those who do not show promise in college are urged to go in for some vocation or job. Women students who are not subject to such pressure can persist even repeated failures. While the pressure of seeking employment on men would begin to operate from the early stages of education the "marriage" effect on women should appear more clearly in later stages (or higher stages). 10

Caste. Students belonging to higher castes contribute to wastage less than those belonging to lower castes. Members of backward castes have the highest percentage of wastage. Further analysis of these factors reveals that the students who belong to backward castes joined college at a later age and have the lowest marks at the S. S. C. Examination.

10 Ibid. p. 35-36.
School. Wastage seems to be higher among the students that come from the schools in the mofussil. But deeper study of the data shows that:

It is in the higher marks groups that the wastage among local students is lower as compared with non-local students. Secondly, as stated above, the proportion of women students among local students is much higher, and it is the better performance of local women students which substantially contribute to the higher proportion of successful local students.¹¹

Guardian’s Address. The addresses of the guardians indicate that usually students from local addresses perform better. But there are also cases in which students from certain districts have a better performance. Although the information relating to the income of the guardian is very unreliable it seems that the higher the income of the guardian the more chances a student has of completing his college education.

Based on the previous calculations of wastage in Fergusson College, which has as a whole a better performance in the university examinations than most other colleges affiliated to the university, the wastage for the whole of Poona University can be placed at about 50 per cent.

Stagnation. In the calculation of stagnation those students who left college after Intermediate for the faculty of Law and other such exceptional cases, like external

¹¹ Ibid. pp. 36-37.
students, are not considered. The total number of students who completed the whole B. A. course were 283 out of whom 168 (or 59 per cent) completed the first stage in the minimum period of two years, and remaining 115 (or 41 per cent) showed a delayed progress, taking an average period of 3.63 years to complete the stage. For all the 283 students, the average period works out to 2.66 years.

The second stage was completed by 185 students who took a period of time ranging from two to five years. Of these students 161 (or 87 per cent) completed the stage in the minimum period of two years. The remaining 24 (or 13 per cent) required an average period of 3.46 years. The average period for the whole group of 185 students being 2.19 years.

Considering the two stages together, out of 185 students who eventually completed them 117 (or 63 per cent) did so in the minimum period of four years. The remaining 68 (or 37 per cent) took from five to nine years. The average period for the whole group of 185 students works out to 4.66 years.

Stagnation by Factors: S. S. C. Marks. The analysis of stagnation by factors shows the following interesting results:

At all stages (pre-Intermediate, post-Intermediate, and the four year degree course) the average period for completing the course for delayed and undelayed cases together decreases with increase in the S. S. C.
Examination marks. The pattern is not so consistent if one considers only the delayed cases ... Moving up the S. S. C. Examination marks one finds that there is no "safe" S. S. C. Examination percentage against delay in progress until the 70 per cent is crossed. 12  

Age. There is a marked increase in the average period needed to complete the course of studies as the age at entry increases. The pattern, however, is not uniform in the various age groups. The reason for this, as it was noted before, is that older students have a lower percentage at the S. S. C. Examination. It is interesting to note that the only marked exception to the rule is provided by the lowest age group (15 and below). As an explanation it is suggested that these students were too immature to adapt themselves to the college life.  

Sex. The influence of sex in stagnation in college offers a peculiar pattern. In the first stage of college studies 69 per cent of the women complete the two period in the normal time as against 51 per cent of the men. But in the second stage the opposite happens, while the percentage of women who complete it in two years is 82, that of men is 91. Taking the whole four-year course together the difference between the sexes almost disappears. The percentage of women who complete the course in the minimum period of four years is 65 and that of the men 62 per cent.  

There are more cases of delay among students of the Poona city schools than among those coming from the schools

12 Deshmukh, loc. cit.
in the mofussil and this is true of all the stages of college education.

The Maharaja Sayajirao University of Baroda

The problem of wastage in the M. S. University is studied by Bhanot. The report covers the entire student population of freshmen who enrolled in the Faculties of Arts, Commerce and Science of the M. S. University during the four-year period of 1951-1954.

Wastage. Wastage and stagnation are not calculated in the traditional method which is considered as "too facile, complacent and fraught with dangers", but new and more scientific techniques are evolved. Apparent wastage (also called crude wastage) is worked out for each year of the degree course as well as for each one of the intermediate stages such as from F. Y. to Inter; from Inter to degree examination and from F. Y. to degree examination and it lies between two limits worked out according to the following formulae:

\[
L_1 = 100\left(\frac{\text{Outright failures}}{\text{Number enrolled}}\right); \quad L_2 = 100\left(\frac{\text{Outright failures}}{\text{Number undergoing full course}}\right)
\]

Thus the apparent wastage in the Faculty of Arts ranges between 6.44 per cent and 15.11 per cent.

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A more accurate way of calculating the total amount of wastage is used by the author in which the work put in by the students who passed out intermediate stages is taken into account. This new formula is called by the author "Sensive Index of Wastage" and it includes the concept of academic credits. When a student passes out an examination he is given one academic credit, but this credit is halved if the student takes an additional trial or misses that particular examination once. If additional trials are taken or more chances are missed this credit is again halved. The sensitive index of wastage lies between these two ratios:

\[
\begin{align*}
(a) & \quad 100 \left(1 - \frac{\text{Total academic credits}}{\text{Total initially enrolled}}\right) \\
(b) & \quad 100 \left(1 - \frac{\text{Total academic credits}}{\text{Cumulative number of students who underwent each successive year of the course}}\right)
\end{align*}
\]

Faculty of Arts. According to the formulae just explained the apparent wastage in the Faculty of Arts is calculated to range between 6.44 per cent and 15.11 per cent. And the real wastage between 10.74 per cent and 50.62 per cent.

On the most charitable basis, therefore, one may say that there appears to have been a wastage of between 10 to 30 per cent during the 4 year period under scrutiny, and that it is quite likely that the real wastage involved lay between 30 and 50 per cent if we also consider the contribution made by "Leavers". Obviously there is no ground for complacency as far as overall output of graduates is concerned in the Arts Faculty.14

14 Ibid. p. 8
Faculty of Commerce. In the Faculty of Commerce the apparent wastage ranges between 14.61 and 20.00 per cent, and the real wastage between 22.89 per cent to 33.63 and 42.22 per cent to 53.48 per cent.

The sensitive wastage amongst Commerce students is even greater in range and extent than amongst Arts students, though the Crude Wastage figures are deceptively low in its case. .... Again, despite the extent of Waste being greater in the Commerce Faculty its range is small, and the Index of Wastage appears to be fairly steady from year to year. It seems, therefore, that during the 4 year period under study, the Commerce Faculty attracted a more homogeneous lot of students. And that once having joined, the Commerce students tended to persist and to remain in the Faculty of Commerce, as compared to the Faculty of Arts.15

Stagnation. Stagnation and attainment are also calculated in a new and more scientific manner. For that the following concepts are used, actually used years, profitably used years and putative or optimum years. The optimum years are worked out with reference to the number of students who actually completed each separate year of the degree course (irrespective of whether they passed an examination at the end of the year or not). The actually used years and the profitably used years are also calculated for the whole batch of students.

The index of stagnation is calculated with reference to the students who are in the class at the beginning of each year of the course and not merely to the number who first joined the course. So that several factors are taken

15 Ibid. p. 8-9.
into consideration at the same time, i.e. the number of students first entering a class, the number of those who remained in the class after each successive year of the course, the number of trials taken by each student for passing the relevant periodical examinations, and the total time spent by the class as a whole for completion of the course in question. Following are the formulae used:

\[
\text{Index of stagnation} = 100 \left(1 - \frac{\text{Total optimum years}}{\text{Actually used years}}\right)
\]

\[
\text{Index of attainment} = 100 \left(\frac{\text{Profitably used years}}{\text{Actually used years}}\right)
\]

**Faculties of Arts and Commerce.** Stagnation for the Faculty of Arts during the four-year period under consideration tended to be above 10 per cent on the whole and in the Faculty of Commerce it varied from 14 to 17 per cent. By classes, in Arts:

Stagnation is lowest in the final year, but seems to be about equally distributed amongst the other classes, implying that the weak student remains weak throughout and is unable to "catch up" with the courses. In Commerce stagnation tends to be higher in the First Year and lowest in the final B. Com. Year, showing that many students who join the Commerce Course find themselves out of their depth at first, but when they reach the final year, they attain good mastery over their subjects, and then do pass out successfully in large numbers".

Broadly speaking, we may say that about 15 per cent stagnation exists in all the Faculties of the M. S. University, when the Degree courses as a whole are considered. The Efficiency of Performance may be said to be 75 per cent on the whole, as far as output of graduates by all the Faculties is concerned. 16

16 ibid. p. 8-10
Following the same method adopted in the previous study, Bhanot\textsuperscript{17} investigates the extent of wastage and stagnation in the Faculties of Medicine and Technology of the same M. S. University of Baroda. In spite of the double selection that takes place in these faculties, first when the student applies for admission to the Faculty of Science, and afterwards when admission is sought to the Faculties of Medicine and Technology, wastage is found to be still high. Following is the summary of the findings of the study of wastage in the Faculty of Medicine:

Very broadly, therefore, we may say that in the Medical Faculty there was wastage of between 20 per cent to 45 per cent, and further that there was Stagnation of between 15 per cent to 21 per cent. As against this the ultimate average attainment lay between 73.93 per cent and 86.61 per cent which is to say that only three out of twenty students in the Medical Faculty failed to achieve their goal eventually. However, their ultimate success was at the cost of considerable additional expenditure of time and energy, when compared to their more normally progressive fellows.\textsuperscript{18}

In the Faculty of Technology (Textile Section) wastage is chiefly prevalent in the first year and the range lies between 22.5 per cent to nearly 53 per cent. Stagnation is high in the two first years, being about

\begin{flushright}
\textsuperscript{17} I. V. Bhanot, "Wastage and Stagnation in the Faculty of Medicine, and Technology, of the M. S. University of Baroda", \textit{The Maharaja Sayajirao University Statistics Series} (Baroda: Faculty of Science, 1961) No. 2.
\end{flushright}

\begin{flushright}
\textsuperscript{18} \textit{op. cit.} p. 4
\end{flushright}
per cent throughout. The average stagnation is calculated to lie between 16.02 per cent and 34.43 per cent except in the third and final years where it is nil.

Wastage in the Engineering Section of the Faculty of Technology lies between 10 per cent and 30 per cent, being highest in the first year. Stagnation is high in the first years of the course because of the large numbers of students who fail to pass in the First Year Examination. It decreases, however, as the students progress towards the degree examination.

V. LITERATURE ON WASTAGE IN HIGHER EDUCATION IN OTHER COUNTRIES

Syracuse University College of Liberal Arts

Method. In an attempt to find out reasons others than academic for leaving college, Holmes conducted an enquiry in the College of Liberal Arts of the Syracuse University. The student population covered in the study was the group of freshmen who enrolled in the faculty in the fall of 1956. They were 1050 out of whom 169 (55 men and 114 women) had left the college during or at the end of the freshmen year.

The enquiry was conducted by means of a questionnaire to which nearly half of the college leavers responded. From these responses (19 men and 56 women) the following conclusions were reached.

19 Charles H. Holmes, "Why They Left College", Reprinted from: College and University, Spring, 1959
The large majority of the leavers (90 per cent) received some financial help from their parents to cover up the expenses of their education. Nearly the same number of students lived in housing operated by the institution. They were not satisfied with the housing arrangements.

Only thirty per cent of the respondents expressed satisfaction with the counselling offered to them. Twenty per cent were dissatisfied with the classroom instruction and personal contact with the faculty.

**Analysis of Wastage.** Analysing the drop-outs by the reasons given for joining college the following results were obtained: One half of the students admitted they had chosen Arts as a preparation for further careers. Nearly one half also felt that, although they had completed only one year towards this end, their studies had been worthwhile as a preparation for further careers. One half of the students said also they had gone to college in order "to learn more about studies in general", and a great percentage of them thought that a Liberal Arts College, at least up to the first year, fulfilled this purpose well. Others desired to go to college in order to acquire culture. Some of them in order to gain knowledge about a certain field. The author concludes that in his opinion these reasons for attending an Arts College are applicable not only to the SU students but to all those who attend any
liberal Arts institution in America.

**Causes of Wastage.** The students who discontinued gave the following reasons for withdrawal: One third said they wanted to join other educational institutions. However, facts proved that only 84 per cent of all the leavers did join other institutions.

One third of the respondents mentioned as a reason for their withdrawal dissatisfaction with the institution. But the author points out that other more comprehensive studies list this reason as one of the few top-reasons for both voluntary and non-voluntary withdrawal.

Fifteen per cent of the respondents had withdrawn for marriage. This was the only clear-cut reason for withdrawal. All the others being a combination of patterns.

Financial reasons seemed to rate about the same level as marriage. Illness as a reason for withdrawal seems to be a little lower than this average, as was also the case with obtaining employment and being caught in the draft.

**Florida State University I**

**Apparent Wastage.** The Department of the Florida State University published a historical study of 1,001 students who had enrolled in the FSU as freshmen in the
fall of 1950. Of these students 307 (or 30.7 per cent) graduated from the same institution by the end of the fourth year May, 1954. 180 students were due to graduate at the end of the 1954 summer course, another group of 520 were still enrolled in the FSU but were not due for graduation in 1954. Thus the total percentage of students who at the end of four years were still in the university (or had graduated in due course) was 37.7 of the first entrants.

Three hundred ninety-one (39.1 per cent) of the student population here studied withdrew before completing two semesters of work or before the beginning of the sophomore year. Eighty (8.0 per cent) students completed four semesters or two years of work before withdrawing from the University. Over one half of the students here studied - 53.4 per cent to be exact - withdrew before the beginning of the third year of work.21

Transfers. However, not all the students who withdrew from FSU discontinued studies, but a good number of them had asked transcripts of credit to be sent to other institutions or to themselves. Their total number was 183. The investigation does not mention what percentage of these students eventually graduated from other institutions, it only affirms that "it cannot be inferred that all those

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21 Ibid, p. 9
who requested those transcripts of credit be sent to other colleges and universities matriculated in the second institution". And as for those who asked the transcripts be sent to themselves, "the use to which these transcripts were later put to is not know".22

Clear Wastage. The third group of students, namely those who did not re-enroll in FSU nor asked for transcripts, are presumed to have discontinued their studies. The number of such students is 440 (or 44.0 per cent). To this number should be added that of the students still enrolled in FSU who will not graduate and that of the students who requested transcripts but did not graduate from the other institution. However, the figures of these cases are not given in the investigation.

The study analyses the figures of withdrawal and it draws these conclusions:

A larger proportion of students making high ACE scores graduate than those making low ACE scores. Among students who stayed in the University a given length of time the quality of work, in general, was higher among those making high ACE scores than among those making low ACE scores.23

In other words it seems that on an average from the intelligence point of view, best students graduate and those who drop-out are not precisely the best students.

22 Ibid. p. 19
23 Ibid. p. 11
Powell compared the characteristics of both leavers and non-leavers of a freshmen class in an attempt to study certain aspects of student mortality.

Using as an instrument to measure the intellectual ability of both the groups, the act test, the study reveals that non-leavers show an advantage over the leavers and that the difference observed is statistically significant.

Comparing the reasons for joining college as reported by the two groups it is noted that the non-leavers had a wider purpose in so far as they had given more reasons per student. They also appeared to have more interest in preparing themselves for a defined type of work. The difference observed is also found to be significant.

Other factors like participation in extra-curricular activities, health, employment did not reveal any significant difference between the two groups.

Generally speaking the group of freshmen who re-enrolled were more similar to those who transferred to other institutions than to those who dropped out.

The reasons given by drop-outs were in this order

24 Orrin Bert Powell, A Mortality Study of the Florida State University Freshmen Class of 1951: Characteristics of School Leavers and Non-Leavers.
of importance: Men: demands of the armed forces and financial problems. Women: Marriage and financial problems.

Sacramento State College

Wastage. A study on dropouts was published by the Student Personnel Division of the Sacramento State College. The total student population covered in the survey is 1,056 strong of whom 415 were freshmen and the remaining 641 were transfers. The percentage of drop-outs in the two groups of freshmen and transfers is the same (16 per cent) but men freshmen drop at a higher rate than women (19 and 14 per cent respectively) while this difference is very small in the case of transfer drop-outs.

Analysis of Wastage: Intelligence. Both the groups i.e. freshmen and transfers, were subdivided into subgroups i.e. students disqualified by the University, students who withdrew during the first term and students qualified but who did not enrol in the SSC again. Tabulations of the subgroups according to the results of the School and College ability Test, Verbal, Quantitative and Total and by the Sequential Test of Educational Progress in Reading and

Writing led to the following conclusions: The students who were disqualified by SSC tended to be of poorer quality than those of the other sub-groups. Women of all the sub-groups tended to be of higher quality than their men counterparts. Both male and female non-returnees who were qualified to re-enrol had equal or better average than those of the other sub-groups. The non-returning transfer students are psychometrically below average.

Faculty. The drop-outs surveyed in this study belonged to several faculties but the largest groups were from the Engineering and Business Faculties. Of the Engineering students nearly half did not return to the University for the following semester. While the non-returning students in the faculty of business were in relative proportion to their numbers.

Other factors. Of the influence of marriage and employment on drop-outs the survey states:

It would appear on the basis of these figures that marriage and employment are more closely related to dropping out among men than among women, and that both factors are associated importantly with substandard grades.

The students whose academic averages were so low that they were disqualified from further attendance are of some special interest. Of the total of 171 non-returning students, 71 or 41.5 per cent were dismissed as academic failure.26

26 Ibid.
Disqualification is much more frequent among men than among women.

Causes of Wastage. The survey makes a follow-up study of the voluntary withdrawals who had more than average entrance test scores in order to study the reasons for their dropping out from college. The findings of these interviews are:

The reasons more often given or in some cases inferred, in the order of frequency were financial (40 per cent), family, poor adjustment, lack of interest, illness, and dissatisfaction with the College. Other reasons included poor preparation, difficulty of courses, and commuting.27

Each one of these reasons offers a variety of details of interest and in most of the cases no one reason was responsible for the withdrawal but several of them combined in different degrees to produce the same effect.

Conclusion. A conclusion in the survey suggests as a major reason for the high rate of attrition of students from one semester to another, poor scholastic performance of the students, combined with a variety of factors contributing to this performance in studies. A more rigorous admission policy is suggested and a better guidance of the students in the choice of the particular field of studies for which they are more suited.

27 Ibid. p. 9
Sacramento State College II

Klingelhofer\textsuperscript{28} conducted another study in the same college in order to find out the possibility of predicting the mortality in college on other grounds than academic.

The instrument used in this study was the Allport-Vernon-Lindsey Study of Values. The results of this study show that:

The SSC has had a rather high rate of freshmen mortality which is only explained by academic failure. It was hoped that the AVL might enable us to predict dropouts with greater precision. No AVL scale succeeded in differential counting between continuing students and dropouts to a useful extent.\textsuperscript{29}

Arizona State College

The respective Deans of men and women of the Arizona State College published lists of drop-outs from various faculties and the reasons for their withdrawal.

Men: Wastage. There were 93 cases of withdrawal among men of which 46 were freshmen, 21 of sophomores, 20 of the junior year and 6 of the senior year. By faculties the distribution of drop-outs works out thus: business administration 23, Applied arts 22, division of general

\textsuperscript{28} E. L. Klingelhofer, \textit{Some AVL Correlates in Sacramento State College Freshmen.}

\textsuperscript{29} Ibid. p. 2
studies 17, forestry 11, liberal arts 5, science 3, education 3; others not mentioned had not yet declared their respective majors at the time of the withdrawal.

Causes of Wastage. The reason accountable for more failures was financial problems with 18 cases, then came personal and health problems, 17; work 16, personal problems 12, lack of interest in the course of studies 9, suspension by committee action 7, family responsibilities 5. Other reasons follow with very few cases each. Among them marriage which accounted for only 1 case of drop-out.

Women: Wastage. Among women there were 45 cases of withdrawal of which 33 took place in the freshmen year, 5 in the sophomore, 4 in the junior and 1 in the senior year. By faculties the drop-out distribution shows that Education had the highest number of cases with 18. General Studies and Liberal Arts, 12 each, Business Administration 9, science and applied arts, 3 each.

Causes of Wastage. The reasons mentioned for leaving college were: Personal health problems and personal problems 9 each, marriage, family problems 5, others were mentioned in small numbers.
Southeastern State College

Wastage. Slaughter gives some statistical data regarding drop-outs in Southeastern State College, Durant. They are as follows:

A recent study on drop-outs throws further light upon the extent to which selective retention is working at SSC. Of 1,486 undergraduates enrolled the first semester, 249 students (16.7 per cent) failed to enrol the second semester for reasons other than graduation.

The 248 drop-outs comprised 68 per cent men, 32 per cent women; 36 per cent freshmen, 23 per cent sophomores, 15 per cent juniors, 10 per cent seniors, and 16 per cent special students. For the classes, the drop-outs compared to the class enrollment as follows: 19.4 per cent of 460 freshmen, 20 per cent of 289 sophomores, 12.8 per cent of 296 juniors, 7.2 per cent of 333 seniors, 37 per cent of 108 special students. Of the men enrolled, 18.4 per cent dropped; of the women enrolled, 14 per cent dropped. The freshmen who dropped out were divided as 76 per cent men, 24 per cent women; sophomores 67 per cent men 33 per cent women; junior 74 per cent men, 26 per cent women; seniors 75 per cent men, 25 per cent women; special students 42 per cent men, 58 per cent women.

Causes of Wastage. Of the 81.1 per cent of the drop-outs which were accounted for, 28.1 per cent had non-academic and 53 per cent had academic reasons. Non-academic causes were as follows: 10 per cent had financial reasons, 6.4 per cent moved from the area of the college, 5.6 per cent had marital reasons, 3.6 per cent had illness and 2.5 per entered military service.

Academic difficulties accounted for a majority of the drop-outs. Ninety-nine drop-out students failed one or more courses the first semester. This number is 40 per cent of 249.

U. S. Department of Health, Education and Welfare

Method. The most comprehensive study on withdrawals from American institutions of higher learning was published by Iffert. The investigation covers a student population of over half a million men and women who enrolled as freshmen in the fall of 1950 in various types of institutions of higher education, namely, universities, liberal arts colleges, technical institutes, teachers colleges and junior colleges. These students are represented by a sample of 13,676 selected for the inquiry.

Questionnaires were used for this study, which were sent both to graduates and non-graduates indiscriminately. However, part-time student, students who were married at the time of the first enrollment, and foreign students were excluded from the investigation. Of the students to whom the questionnaire was sent 67.1 per cent responded. There was a very negligible difference between the rate of response

of men and women.

In this study the following points are investigated:

(1) Extent of college drop-out in relation to the economic status of the family, motivation of the students, academic performance, amount of self-help; participation in extra-curricular activities and residence of the students.

(2) The reasons students had for transferring to other institutions of higher learning or for withdrawal from college attendance.

(3) Implications of the findings with reference to recruitment, selection, admission, counselling, scholarship aid and other functions.

Wastage. The percentage of students graduating from four-year institutions in normal progression from the institutions of first registration was 39.5. The difference between the sexes was very insignificant, men had a little lower rate of graduation than women (38.8 and 40.5 respectively). For the liberal arts colleges alone the percentage was 41.3.

Taking into account the students who transferred to other institutions and graduated there in four years the figure of graduates rises to 51.3 per cent of the first entrants. And if those students who eventually graduated with a delayed progress of one or more years, are considered, then the total number of graduating students is 56.8 per cent, nearly 60 per cent.
The calculation of the withdrawals from the institution of first registration works out as follows: by the end of the first year 27.4 per cent of the men and 27.0 per cent of the women had withdrawn; by the end of the second year the total of withdrawals had risen to 39.6 per cent of the men and 44.1 per cent of the women; and by the end of the third year after first registration the total number of cases was 45.9 per cent of the men and 51.7 per cent of the women. In brief, after three years half of the number of students who had registered for the freshmen courses had already left the institution of first registration. The liberal arts colleges did not deviate much from the general pattern, the figures for the three years after the first registration work out as 28.0 per cent for the first year, 44.0 per cent for the second and 49.4 per cent for the third year.

By far the most critical period is the first year in college. The study shows that 273 per 1,000 students left college within the first year as against 283 per 1,000 during the next three years. Thus the chances of graduation for a student who reached the rank of junior are about 685 per 1,000.

Analysis of Wastage. Reasons for going to college.
Analysis of the cases of withdrawal by the reasons for going to college as given by the students shows that men gave the
highest mean rating of importance to occupational reasons while women gave academic reasons the highest rating. Men rated academic reasons second in importance, and women occupational reasons. These differences were found to be statistically significant.

The study under consideration has not been able to prove by evidence the truth of the impression that the stronger the motivation of students the more are their chances to remain in college. But it is noted that failure to find a significant relationship between students' rating of the importance of certain reasons for going to college and the length of permanence in college does not disprove the theory that motivation of students and their performance in college are positively related.

With regard to the student reaction to college facilities and services, the findings are that withdrawal from college is associated not so much with dissatisfaction as with inability, or unwillingness to endure dissatisfaction.

Subjects of Interest. The subjects of student interest and their influence on withdrawals are also surveyed. And the study indicates that high withdrawal rates frequently result when student interests in a particular subject are subjected to other considerations such as accessibility and cost in the selection of an institution of higher education.
Financial Factors. Lack of financial resources, although not the first in the list of reasons for withdrawal, is a major cause of transfer or of dropping out of college entirely. The median annual income of parents of non-graduating students was $437 less than that of parents whose children graduated. Similarly those students who drop out during or at the end of the first registration period would have a lower median family income than those who dropped out during the remainder or at the end of the first college year.

Working to earn college expenses was practised by men in about equal amount regardless of length of attendance, thus, as many as 44.5 per cent of the men earned part or the whole of their college expenses for a longer or shorter period of time; the remaining part of the men did not earn any part of their college expenses. Among women about 25 per cent only earned some of their expenses.

The reports of men for the last half of the freshmen year furnish a representative story of the relationship between earning expenses and persistence in college. The only group of men in which more than one-half earned some of their college expenses consisted of those who dropped out during or at the end of the second year. Of the nearly 4,000 men who survived the first registration period and entered the second, 4.7 per cent reported that they earned all of their college expenses. The percentage for graduates was 31 and the highest percentage, 7.8 was for the students with records of intermittent attendance.32

32 Ibid. p. 65
Other Factors. Other factors like housing and participation in organised extracurricular activities were shown to have little relation to the retentive power of the institutions. Students who lived in college dormitories had an average better performance, but other factors reduced the importance of this finding. Non-graduates did report more participation in extracurricular activities, but the difference between graduates and non-graduates was not significant.

Transfers. Out of the number of students who withdrew from the institution of first registration not all discontinued studies; the enquiry shows that 33.6 per cent of them transferred to other institutions and some of them graduated either in normal progression or with a delay of one or more years. Of the total number of transfers 24.0 per cent graduated eventually. Nearly 40 per cent of all the transfers occur during or at the end of the first year, and by the end of the second year the percentage of transfers had reached 83 per cent of the total of transfers. By type of institutions the liberal arts colleges lost the highest percentage of their students.

Reasons for Transfer. The following paragraph summarises the reasons for students discontinuing studies:

Twenty-one possible reasons for discontinuing college attendance were listed on the questionnaire. The most
important reason for discontinuance reported by men was enlistment in the military services. Much of the period under consideration was one of active military action which possibly gave unusual emphasis to that reason for discontinuance. Lack of interest in studies ranked second in importance among men as a reason for leaving college and personal financial difficulties ranked third.

Marriage was the major reason for discontinuing college attendance among women students. Taking a full-time job was rated second in importance, and personal financial difficulties ranked third among women.

There is evidence in the weight given to reasons for discontinuance by men and women that rank in high school graduating class has more significance in the admission of women to college that it has for men.

The reasons for discontinuance listed on the questionnaire were purposely limited to those reflecting on the student rather than on the institution which he left. However, each dropout had an opportunity to write in other reasons. The great majority of the additional reasons referred to personal problems and deficiencies rather than deficiencies in the facilities of the institutions, further indication the importance of greater attention to the services which can assist in solving these problems.33

**University College, London**

Data regarding the amount of wastage in universities in England is given by Mallenson.34 The article emphasizes the special need to publish data of this kind as they do not usually find their way into the reports on rates of passes

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33 Ibid. op. cit. p. 105-106.

in the university examinations. A short summary is also given of previous studies and their findings as follows.

Review of Previous Studies. A statement of the University Grants Committee Report for the 1947-52 quinquennium; affirms that the casualty rate at the end of the first year among the 1950 freshmen was between 8 and 9 per cent over the whole university field, with some institutions having a rate much higher than average. Sir Alexander Carr Saunders in a paper read in the Home Universities Conference held in London, 1952, stated that of the 305 students who enrolled in the London School of Economics to read for the B. Sc. (Econ), 35 (11 per cent) transferred to other courses or withdrew for personal reasons; 63 (21 per cent) failed and left the school without a degree. Only 2 per cent of the total reached the third year and failed in the final examination, so that most of the elimination had taken place not later than the second year. Dale found a failure rate of 10 per cent in some smaller universities. The Science Masters Association meeting in 1955 held a discussion on the extent of failure at the first year institutions. It was said that:

About 20 per cent of the first year science students at Imperial College, London, failed to pass at the end of the first year. In other English and Welsh universities the rate was between 3 and 10 per cent.35

Other findings were: Of the students who enrolled in 11 universities for honours courses in physics only 68 per cent had completed the course in 1951. In 5 universities 22 per cent of the students who had enrolled for the physics special course had failed to get beyond the first year.

In the fullest account of its kind covering the students of a three-year period, Sir James Mountford, Vice-Chancellor of the University of Liverpool, gives the rates of failure and delay in all the faculties of the University broken down according to sex, and financial status etc.

Over the three years 71.1 per cent of the total entry made a satisfactory and undelayed progress through the university course. 15.8 per cent finally graduated but were delayed one or more years in their progress. 13.1 per cent of the entry abandoned their course entirely. 0.8 per cent of the entry abandoned their courses for some clearly exceptional reason such as death or serious illness, emigration, etc., leaving total of 12.3 per cent which could probably be regarded as academic failure.36

Wastage. In giving the data of University College failures the author sounds the warning that University College, being an institution for highly specialised studies, was bound to have a higher rate of failures than other institutions, and that many of these failures were likely to go to those other institutions to take other courses. The purpose of the survey is primarily to give data regarding the medical, social and personal backgrounds of the students.

36 Ibid. p.290.
The data covers two different stages of higher education, i.e. Intermediate and degree course. The admissions to the Intermediate were not so strictly selected as those of the degree course, and, therefore, the differences in rates of failure are very significant. The proportion of students failing the Intermediate in Arts, Science and Engineering are very high, 29.2 per cent, 28.0 per cent and 41.8 per cent respectively. In the M. B. course, which can be considered in most respects on a par with Intermediate, the rate of failure was 33.7 per cent over the three years. The discrepancies of failure rates between different departments are very great and broadly maintained year by year. In the degree course, out of 2,541 students who enrolled in the first year during the four-year period, 81.9 per cent graduated successfully. The total number of students who graduated in normal time was 73.5 per cent.

There were 129 students who reached the final examination and failed. There is evidence that very few of these students who reached that far did not stay to graduate. The total of these cases was 53 representing 2.1 per cent of the total entry.

Stagnation. A number of students who graduated with delay did so for other than academic reasons, in particular for illness. The majority, of delays, however, occurred on account of failure. There were altogether 175 of such
cases, out of whom 151 were delayed one year and 24 were delayed for longer.

Causes of Wastage. The analysis of the reasons for leaving the college shows that non-academic reasons account for 2.6 per cent of the total entry. The other cases of withdrawal are presumed to be for academic reasons and they are 15.5 per cent of the total entry. The casualties at the end of the first year represent 6 per cent of the total entry. 5.2 per cent of the total entry left at the end of the second year, and 3.4 per cent of the total entry left at the end of the third or fourth year. There were also some scattered cases of withdrawal in the fifth and later years.

Suggestion. Closing the article are some suggestions directed to decrease the number of failures and casualties. Mere selection of admissions, it is said, will not suffice. This selection would at most eliminate a small amount of first year failures. Other casualties, especially those for illness both mental and physical, would hardly be eliminated. It is suggested that a substantial reduction in the rate of failure and withdrawal must come from improved methods and techniques in managing difficulties of students, and modifications in university practice. In particular more flexibility in the British university system and more timely dismissal of undesirable students would help in
decreasing the number of failures.

Four factors of importance are indicated in this study influencing the difficulties students encounter in college. They are: lack of proper motivation, such as choosing a course of studies under pressure from parents or teachers; premature choice of faculty when the student could scarcely know the implications of his choice; lack of real academic ambitions of their own and going to college merely because a student is clever and grants are available. Social isolation of various kinds seemed to be responsible for failures. "At University College successful students tend to be all-rounders". Anxiety also influences failure in college. In this connection it was found out that those who suffered from some type of anxiety and sought help performed better than average. It is suggested that more help be given chiefly in the way of a more understanding attitude of teachers and guidance personnel towards student problems. Study techniques are not shown to freshmen with the required sufficiency. Thus many students study as many hours as other successful students and yet fail in the examination.