THE
MATURATION OF THE COLLEGE STUDENT
as evidenced by retests with
The National Council Tests

by

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SECTION A

INTRODUCTION

As a part of the general movement of mental measurements and the development of norms for the various age levels, the question of the limit of mental growth has been a point of considerable interest and variation of opinion. Terman (52), under the compulsion of his intelligence quotient technique, assumed the age of sixteen as the age of mental maturity. The results of the army testing led to a quite popular opinion that the limiting age of the growth of intelligence is around thirteen and one half years. Doll (18), basing his opinion upon the analysis of the army scores, held that the mental growth limit of the average individual is thirteen years. Dearborn (17), in a later discussion, puts the mental age of adults at fourteen and one half years. Otis (42) held that the increments after the age of sixteen were "inappreciable." In 1918 Pressy (43) brought out his point scale with norms up to seventeen years. Brooks (7) found an increment in his re-test data up to fifteen, his highest age.

Numerous studies reported from high schools using the Alpha tests, show increasing medians at successive ages. Freeman (23) reported a study by Johnson in which retests of high school students show increments up to the age of eighteen. In 1926 Thorndike (57) reported an extensive study on "The Improvement of the Intelligence Scores from Thirteen to Nineteen." In this study, eight thousand five hundred sixty four (8564) individuals were retested. Practice effects were

calculated out and an increase of ten and five tenths (10.5) points for grade X, eleven and seven tenths (11.7) points for grade XI, and eleven and five tenths (11.5) points for grade XII were established. He concludes his study by asserting that, "The doctrine that ability to improve one's score as a measure of intelligence necessarily ceases at fourteen to sixteen, should be abandoned. Indeed there seems evidence that this ability improves, in case of those who are subject to intellectual education, beyond the age of eighteen." Doctor Teagarden's (51) study reports that the general slope of her growth curve would indicate that it would be practically flat at the age of eighteen. However she found no cessation of growth between seventeen and one half and eighteen years. "Assuming equal selection for all ages there seems no reason for thinking that with average intelligence cessation of development occurs before eighteen years of age." Wooley (67) reported in 1926 on her studies upon children in industry. "Our results give us no data for setting a limit in years to mental development in either sex. The memory and substitution test suggests that in the comparatively simple and routine processes both sexes reach maturity at sixteen or seventeen years. - - - It is in general true, as one would expect, that the easier the test, the earlier an approximately adult status is reached, - - - The superior group seemed to be able to perform on first trial with a degree much nearer to that of their ultimate capacity than the inferior group."

Immediately after the close of the war we find a wide use of Alpha tests by colleges in all parts of the country. The following report of Noble and Arps (41) of their findings at Ohio State University, will be taken as typical of the general condition. It will be remembered, of course, that the upper class scores are not retests.

High School	Mean Score
Freshmen - - - - -	98.2
Sophomores - - - - -	114.2
Juniors - - - - -	122.6
Seniors - - - - -	126.3
College	
Freshmen - - - - -	130
Sophomores - - - - -	137
Juniors - - - - -	144
Seniors - - - - -	144
Graduates - - - - -	157

A more recent study by Martens (35) compares the scores in the American Council Tests of two hundred ninety-six (296) candidates for teacher's certificates, who had completed four years of college work, with five thousand and seventy-seven (5077) scores made by the Freshmen on the same form. He found a mean of 161 for the teachers as compared with the mean of 129 for the college freshmen. Ellis (21) has earlier reported a retesting study in which one hundred twenty-one (121) students who took the Miller Form A in 1922 were re-

tested in 1925. These, together with a group of American Council scores which were equated into an equivalence with the Miller scores, show no improvement in the final score. On three of the tests he finds an improvement of .5 S.D. of the Freshmen distribution.

Cawdry (16) was able to secure retests upon three hundred seven (307) college students in the Thorndike examinations. While his reliabilities are not high, he does find an increase of 1.68 over an interval of one year, a loss of .4 over two years, and a gain of 2.16 points over three years.

In addition to such quantitative studies we find, in recent years, a growing appreciation of the significance of maturation, an increased emphasis upon it as a fact and as a principle of motivation. Its critical importance in the field of Education is obvious. Wheeler (62) insists that motivation is the basic condition of learning. Others who have expressed discontent with the traditional law of learning are finding comfort in such embryological studies as Coghill's (11) who finds that maturation is a continuous process. The work of Tracy (61) and Child (10) point out that maturation must precede exercise. Any attempt to evaluate a theory of the dynamics of behavior must find its basis in some theory of maturation. In the light of these quantitative studies as to the age of maturity and considering the more detailed embryological studies, which give the topic a theoretical importance, a study of the maturation of the college student appears opportune.

SECTION B

DATA OF THE STUDY

For a number of years a "Psychological Examination" has been the first step in the process of matriculation into the University of Kansas. Since the fall of 1925, the University has used the forms prepared by the American Council of Education. Records exist of approximately fifteen hundred scores in each of the forms of 1924, 1925, 1926, 1927, and 1928.

During the scholastic year of 1927-28, as part of the laboratory practice in the Psychology classes, seventy individuals were retested. The variations of the retest scores from the score of the initial testing were so extreme, it seemed worth while to enter upon a more extensive retesting program. In pursuance of that program the following retest data have been compiled.

1. Ninety-nine pairs of scores, Alpha tests, with a time interval of approximately one year, have been secured from young men ranging in age from sixteen to twenty-five who were living at that time at the Kansas State Reformatory at Hutchinson.

2. Ninety-seven pairs of scores, Alpha tests, with a time interval varying around one year, of young men whose ages range from eighteen to twenty-seven. These men had been living during the time interval at the Kansas State Penitentiary at Lansing, Kansas.

3. Two groups of Freshmen, forty-seven in number, at

Friends University. These two groups were retested under different time conditions at the beginning of their second semester's work. The forty-seven of the one group are included in the one semester group given below.

4. Two hundred ninety of the 1928 Freshmen men at the University of Kansas were retested nine weeks after their initial tests. These data are invalidated by the fact that the time of retest was cut twenty percent. Except for a comparison within the group itself, the data have not been used.

5. One hundred thirteen Freshmen at Friends University were tested at two-thirty in the afternoon and retested on a different form the following morning at nine-thirty. The 1929 and 1928 forms were used.

6. Retests of one hundred nineteen students of varying classes were taken four weeks after their initial examination in the fall of 1929.

7. Ninety-six students, tested in the fall of 1928, were retested four weeks later. Because of inadequate instructions, the examination procedure of these tests varied from the standard form, and except for a comparison within the group itself the data have not been utilized. Forty-one students of this group were retested on the same form used in their initial testing. Fifty-five were retested on a different form.

8. Retests were made of six hundred thirty-one students at Friends University and the University of Kansas. These

are distributed over the following time intervals:

One year - - - - -	249
One year and one semester	115
Two years - - - - -	117
Two years and one semester	20
Three years - - - - -	<u>130</u>
Total - - - - -	631

All together we have a grand total of retests of 1343 college students. In addition to this we have retests of 196 men at Lansing and Hutchinson which make a grand total of 1539 retests.

9. In addition to the retest scores we have secured the academic histories of four hundred thirty-five Freshmen of the 1928 examinees at the University of Kansas. They were chosen at random from the ten deciles. We have also at hand, the detailed academic histories, of work done between tests, of one hundred nineteen sophomores, fifty-two Juniors, and sixty-eight Seniors.

SECTION C

RENDERING THE SCORES COMPARABLE

The scores of the initial tests and the retests of the data compiled are distributed among the six forms of the American Council Tests, 1924, 1925, 1926, 1927, 1928, and 1929. These tests have been undergoing, during the past years, a period of experimentation, hence the raw scores are not at all comparable. The 1924 edition consisted of nine subtests viz., Completion, Arithmetical Reasoning, Artificial Language, Proverbs, Reading, Opposites, Grammar, Estimating, and Reasoning. The time allowed for taking the test was one hundred twenty-five minutes. The 1925 edition consisted of the following subtests: Completion, Arithmetic, Artificial Language, Analogies I, Analogies II, Number Completion, Absurdities, and Opposites. The time allowed for taking the test was one hundred two minutes. The 1926 edition consisted of seven subtests: Opposites, Proverbs, Arithmetic, Artificial Language, Number Completion, Completion, and Analogies. The time allowance was sixty minutes.

The 1928 and 1929 editions consisted of five tests of the same type as the 1927 edition. The same time allowance, sixty minutes, was made. There were, however, modifications in the time allowance for individual subtests and some modifications of scoring.

When we approach the problem of making these scores

comparable we find two procedures which are, after all, but different presentations of the same data. These are the "Variability Scale", in which each raw score is stated in terms of its standard deviation, and the "Percentile Scale". Otis (42) has pointed out the following correspondence of the two scales.

Mean plus $3\frac{1}{2}$ sigma = 99.98 in percentile rank

" " 3 " = 99.87 " " "

" " $2\frac{1}{2}$ " = 99.4 " " "

" " 2 " = 97.7 " " "

" " $1\frac{1}{2}$ " = 93. " " "

" " 1 " = 84. " " "

" " $\frac{1}{2}$ " = 69. " " "

Mean = 50. " " "

Mean Minus $\frac{1}{2}$ sigma = 31. " " "

" " 1 " = 16. " " "

" " $1\frac{1}{2}$ " = 7. " " "

" " 2 " = 2.3 " " "

" " $2\frac{1}{2}$ " = .6 " " "

" " 3 " = .13 " " "

" " $3\frac{1}{2}$ " = .02 " " "

This correspondence has been utilized by McCall (36) in his T Score technique and in the construction of his tables. He has turned percentile ranks into T Scores. His T Scale extends from minus five sigma to plus five sigma. A "T" is one tenth of a sigma hence there are one hundred

T between his upper and lower limits. In actual practice, T Scores usually range from fifteen to ninety. The gross scores of the 1927 form (16554 cases), as reported by Dr. Thurstone in the "Educational Record" for April 1928, consolidate into T scale units ranging from fifteen to ninety. The gross scores of the 1926 form, based upon 5137 individuals as reported in the "Educational Record" for April 1927, consolidate into a range from 18.5 to 85.5. The 1928 scores, based upon the records of 30653 students as reported in the "Educational Record" for April 1929, consolidate into T scores with a range of 14.5 to 89. The 1929 form, based upon the scores of 7640 individuals reported from a similar source, consolidate into a range of 13.5 to 84.

A common criticism of investigations based largely upon the statistical procedure has been that the refinement of statistical technique has developed altogether out of proportion to the crudities of the original measurements. Because of the numerous possibilities for error, both in the original and in the retests, it was thought that the comparisons would have more significance if the raw scores could be converted into units which, while statistically adequate, would yet be as gross a unit as possible. Accordingly, the gross scores, as reported in the "Educational Record", for the forms of 1926, 1927, 1928, and 1929 were converted by the McCall technique into standard deviation or "T" scores. Because McCall, in his definition of a T Score, has based

his scales upon the twelve year mean, and in order to avoid any ambiguity, it has seemed proper to call the units thus obtained in this study the Tc scores which mean the T score of the college population. These computations may be seen in Tables I-II-III-IV. It will be noticed that the scores have been reported in groups of ten. No attempt was made to interpolate T score within these groups.

The problem of standardizing the scores for the 1924 and 1925 forms was complicated by the fact that Dr. Thurstone's reports in the Educational Record had not included a gross score. It was necessary to reduce each of the subtests to Tc scores. The scores made by the individual, in each of the subtests, were transformed to Tc scores and the mean of these subtests was computed to constitute his total Tc score. The question immediately arose as to the necessity of using the entire nine subtests of the 1924 form and all of the eight tests of the 1925 form. All of the forms, from the 1924 to the 1928, have four tests in common: Artificial Language, Arithmetic, Completion and Opposites. After some empirical comparison of the means of various combinations with the gross scores, the four subtests, common to all forms, were chosen with the addition of the Proverbs test for the 1924 and the Geometric Analogies for the 1925 form. The statistical procedure by which the Tc scores of these subtests were ascertained can be found in Tables V a-b-c-d-e, and Tables VI a-b-c-d-e.

SECTION D

ANALYSIS OF INITIAL SCORES OF THE 1928 GROUP

It seems obvious that any study of the maturation of the college student should be preceded by a careful analysis of the group at the time of the initial examination. In accordance with this logic, the studies of this section were undertaken.

The September examinations of 1928 were taken by one thousand four hundred thirty-one individuals. An examination of Chart A reveals the following facts:

Total number	- - - - -	1431
Tc range	- - - - -	21 - 80 Tc
Median Tc	- - - - -	50.5
Age range	- - - - -	15 - 35 years
Median age	- - - - -	19 years
r of age and Tc scores = $-.04$		

Of these one thousand four hundred thirty-one individuals, eight hundred seventy-five (875) were Freshmen. Chart B reveals:

Age Range	- - - - -	15 - 35 years
Median Age	- - - - -	18 years
Tc Range	- - - - -	21 - 80 Tc
Median Tc	- - - - -	46.5
r of age and Tc scores = $-.07$		
r of age and Tc (18-22 yrs.) = $-.199$		

The mean scores tabulated by ages are:

Age	Frequency	Mean Score
15	2	69.
16	16	50.59
17	142	51.34
18	290	48.12
19	204	46.19
20	95	45.64
21	66	45.98
22	30	45.81
23	11	49.18
24	7	58.42
25	3	49.16
26	1	29.5
27	3	42.
28	2	51.5
29	0	
30 (and over)	3	59.6

The distribution exhibits very nicely the factor of selection. The curve declining to age nineteen (See Plate I) and its gradual ascent to the age of twenty-five, indicates that those who have completed their college preparatory work before the conventional age of eighteen, are more alert than those who have not been able to break the "lock step of education" and have arrived at the University, as a matter of administrative routine, at the age of eighteen or nineteen. The ascending curve from nineteen to twenty-five indicates that a higher degree of intelligence is required each year to break the inertia of existence and get students back into school after a period of absence.

Colvin (12), in his survey of Massachusetts High School Seniors, found the following age-score data of the students graduating that year.

Plate I

Age - Score Relationship

Age Groups - Plate II
Kansas University Freshman

Curve of Tc Scores

Plate III

Kansas University Freshman
Fall 1928

90

80

70

60

50

40

30

20

10

21.
25.5
29.5
32.5
35.
37.5
40.
42.
44.
46.5
48.5
50.5
52.5
54.5
56.
58.
60.
61.5
63.5
65.5
67.
69.
71.
73.
78.
80.

Age	Mean Score
19	41.7
18.5	43.9
18	45.1
17.5	46.3
17	47.
16.5	49.
16	55.6
15.5	55.
14.5	77.5

The contrasting curves of these two groups, Massachusetts High School Seniors and Kansas University Freshmen, can be seen on Plate I. Of the High School Seniors, only the slope of the curve is significant. There has been no attempt to convert Colvin's scores into equivalence with the National Council scores. If we can assume that the High School Senior of Kansas is comparable to his classmate in Massachusetts, we are then compelled to conclude that the attractive power of the University of Kansas is not as potent a selective agency as is high school graduation. Of the eight hundred seventy-five (875) Freshmen, one hundred forty-two (142) of them are advanced one year, sixteen (16) are advanced two years and two (2) are advanced three years. Certainly if only the more alert High School graduates matriculated in the University we would find a much more decided descending curve on Plate I and a much more significantly negative coefficient of correlation.

It is the custom at the University of Kansas to classify all the examinees, irrespective of their college standing, into deciles which are based upon the total score. Decile

rating indicates for the Freshman, then, not his comparative place among his classmates, but his place in a more or less heterogeneous group of which approximately eight hundred are Freshmen and six hundred are students advanced from freshman standing. For the purpose of a more detailed study, fifty Freshmen were selected by chance from each of the ten deciles. This original group of five hundred shrunk, through several processes of attenuation, to an ultimate four hundred thirty-five. The academic histories of these four hundred thirty-five were carefully studied to ascertain whether or not any of the factors of their college preparation might show a relation to their Tc scores.

It had been suggested that the fact of "emotional blocking" might have had a decided influence upon the scores of certain individuals. The novelty of the situation, the fact of anxiety, the whole experience of university orientation, might produce a condition not the most advantageous for making good scores. It was additionally suggested that those students who had been subjected to previous testings and were somewhat acquainted with testing procedure and familiar with the testing situation would be the least likely to be influenced by this "emotional blocking." They would possess that "test wisdom" which, we will find, is a decided asset in such a situation. The more progressive high schools employ testing in their own administrative procedure. If it is good logic to assume that the larger high schools are the more progressive, then the students from the larger high

schools would possess this "test wisdom" with its factors of advantage. With this consideration in mind a distribution of the scores was made which was based upon the size of the faculties in the schools where those scores originated. This information could be secured upon only three hundred seventy-seven of the cases. These data are found in Chart C. It will be noticed that the mean Tc score of those students coming from high schools with a faculty of twenty-five or more, is slightly lower than those from high schools whose faculties are composed of four or fewer teachers. If there was any emotional blocking it is quite evident that it was not confined to the students from the smaller high school.

It is at least thinkable that the type of work elected during the high school years may have had its influence upon the mental alertness of the various individuals. Scattergrams were accordingly worked out showing the relation of Tc scores to the number of units taken in Science, English, History, Vocational subjects, Mathematics, and Foreign Language. These are shown in Charts D-E-F-G-H-J. The correlations are all low.

r of Science Units and Tc Scores is	.037
r of English " " " "	.030
r of History " " " "	-.156
r of Vocation " " " "	-.151
r of Mathematics " " " "	.268
r of Foreign Lang. " " " "	.329

Scores which would have any significance are those of History

and Vocation, which show a small negative relationship, and Language and Mathematics with .329 and .268 as their respective correlations. Even were the negative correlation larger in regard to History, at least, there could be no doubt as to the causal relationship. He would be a hardy soul, indeed, who would venture to assert that the study of History makes boys and girls stupid!

It is fairly obvious that, in the competition for students existing between departments, the narrative element of History together with the lack of intricate detail in many of the History courses, make them attractive to students of low mental caliber.

The largest correlation is that of Foreign Language. Here the absence of any causal nexus is not so obvious. The tests themselves are strongly tinged with the linguistic flavor. The artificial language test, the completion test, the opposites test are to a large degree, measures of types of language facility. Hence it requires no great effort of one's credulity to believe that language training, attention to sentence structure, choice of synonyms in translation, subtle grammatical distinctions, would tend to develop the functions employed in solving these tests. The language handicap has long been recognized as an appreciable cause of error in testing on the lower levels. Perhaps one of the important deficiencies of the less alert college student is his lack of a nice language facility. But even the language correlation is not large enough to be other than

suggestive. Perhaps a study of the contrasting groups would reveal conditions of some significance. The means of the high school work of the highest one hundred and the lowest one hundred individuals of the group were ascertained. The results show that the Mean Freshman of the highest hundred attended a high school whose mean salary for teachers was \$1671. The mean number of students was 517. He had secured credit during his high school career for the following units of work:

English	- - - - -	3.71	units
Vocation	- - - - -	3.07	"
History	- - - - -	2.95	"
Language	- - - - -	2.60	"
Mathematics	- - - - -	2.59	"
Science	- - - - -	2.15	"

The Mean Freshman of the lowest hundred graduated from a high school whose mean salary was \$1666.75. The student body numbered 436.16. He presented for entrance into the University of Kansas the following preparatory units:

Vocation	- - - - -	4.02	units
English	- - - - -	3.74	"
History	- - - - -	3.20	"
Mathematics	- - - - -	2.19	"
Science	- - - - -	2.05	"
Language	- - - - -	1.43	"

Again there is something of the same condition, a tendency for the less alert student to crowd into courses of Vocational subjects and History, and to avoid courses in

Foreign Language. But even in these contrasting groups the differences are not clear cut. Only the most tentative conclusions could be drawn. On the whole, it would seem that we have found only some pertinent suggestions in the academic history of these selected Freshmen, which might explain the differences in their intelligence scores.

The writer believes that a correlation of credit points earned in the college preparatory period would show a significant correlation with the size of the intelligence scores. From the data at hand, however, it would seem to be impossible to find any common multiple which would render the grades of different teachers, departments, and schools at all comparable.

Our general conclusion for this investigation may be that, from the entire combination of influences of the high school situation, we have been unable to tease out any factors which are definitely and peculiarly the exclusive factors of maturation.

SECTION E

THE ADVANTAGE OF THE SAME FORM FOR INITIAL TEST AND RETEST

A number of retests were made with the same form as the original tests. By the method of equated groups it has been possible to measure the effectiveness of the use of the same form as a factor of advantage in the final score. We can also trace the fading of this factor with time. We can compare equated groups who were retested with the same and with different forms over the following time intervals:

1. Immediately after the first test.
2. After a three weeks' interval.
3. After a nine weeks' interval.
4. After one semester's interval.
5. After a one year interval.

The Advantage of the Same Form in an Immediate
Retesting

These data were secured in February 1929 by Professor Isabel Crabb and Professor Austin C. Cleveland at Friends University.

On the basis of their initial scores taken in September 1928, one hundred Freshmen were approximately equated into two groups. The initial test was made with the 1928 form. In retesting, the experimenters used the 1927 form.

One group, which will be designated as the "S" or study group, was assembled an hour before the other, "N" or non-study group. It was explained to the S group that in one hour they would be given a psychological examination. As

preparation for that event they would be allowed to study on the form during that hour. They could use scratch paper but were to make no marks upon the form itself; they could distribute their time among the tests as they pleased; they were to study intently for one hour. At the close of the hour they handed in the forms, passed to another hall, and in company with the N or non-study group, went through the standardized procedure of the test. The study group took no results of the hour of study, in scratch paper form, with them to the final examination.

In order to make the comparison equitable, the writer is conscious that the N group should have spent an hour, likewise, upon a still different form. Since the experiment was not, at the beginning, specifically planned for this purpose and since the additional forms were not available at the time of the experiment, we must accept the results for what they are worth. The writer believes that such a procedure would not have changed the results to any great degree. From the two groups we were able to equate exactly thirty-four pairs. The data of this equated group can be found in Table VII. The contrast of these two groups is as follows:

Retest Mean of S Group - - - - - 56.91

S.D. - - 7.4

S.D.M. - - 1.269

Retest Mean of N Group - - - - - 51.01

S.D. - - 6.66

S.D.M. - - 1.142

(Gain from hour study) D. - - - - - 5.9

S.D.D. - 1.7

E.C. - 1.24

The Four Weeks Interval

Among the laboratory students who were retested there was a group composed of those who had recently entered the University. From these we can equate two groups of thirty-eight (38). One group was retested on the same form, the other on a different form from the one used in the initial test four weeks previously. The data for these groups can be seen in Table VIII. We note:

Mean of same retest group - - - - - 59.53

S.D. - - 10.21

S.D.M. - - 1.65

Mean of different retest group - - - - 56.2

S.D. - - 8.99

S.D.M. - - 1.46

(Advantage for same form) D. - - - - 3.33

S.D.D. - - 2.2

E.C. - - .66

The Nine Weeks Interval.

During the ninth week after the initial tests, one hundred ninety (190) freshmen men were retested. One hundred seventeen (117) used the same form, seventy-three used another form. Because of the necessity of fitting our program to the University schedule we cut the testing time to forty minutes. One fifth was deducted from the standard time of each of the sub-tests. This fact will complicate any conclusion which might be drawn from the scores but probably does not impair any findings as to the

relative standing of the two groups. It might be argued that if one group gains a certain amount in forty minutes they would gain more in sixty minutes. The work of Ruch and Koerth (46), with the use of differently colored pencils during various periods of extended time, would indicate that the production curve is fairly well flattened out during the final periods of each sub-test. We do not believe that any extension of time would have increased the difference significantly. For the purpose of our comparison, two groups of fifty each were equated exactly. By referring to Table IX we find:

Retest mean of the same form - - - - 50.77

S.D. - - 9.29

S.D.M. - - 1.31

Retest mean of different form - - - - 46.6

S.D. - - 7.64

S.D.M. - - 1.08

(Advantage of same form) D. - - - - 4.17

S.D.D. - - 1.69

E.C. - - .88

One Semester Interval.

Of the laboratory students who were retested in March, fifty of them had received their initial tests in September. These were retested on the same form. We have data on forty-seven students at Friends University who were tested in September on the 1928 form and retested in February on the 1927 form. The Friends students are Freshmen, the Kansas Univer-

sity students, in the main, are Sophomores. From these two groups thirty pairs are equated. Reference to Table X shows:

Mean of retest on same form - - - - - 54.7

S.D. - - 8.24

S.D.M. - - 1.5

Mean of retest on different form - - - - 51.6

S.D. - - 7.42

S.D.M. - - 1.35

(Advantage of same form) D. - - - - - 3.1

S.D.D. - - 2.01

E.C. - - .55

One Year Interval.

Of the one hundred eighty who were retested after one year, eighty-eight used the same form (1926). From these, forty-one pairs were equated. By reference to Table XI we find the following:

Same retest mean - - - - - 57.52

S.D. - - 7.97

S.D.M. - - 1.24

Different retest mean - - - - - 58.21

S.D. - - 8.92

S.D.M. - - 1.39

(Advantage of same form) D. - - - - -.69

S.D.D. - - 1.86

E.C. - - .13

The writer would have preferred to have based the equating of the groups on more data than the initial scores. Perhaps a correction is needed in terms of the coefficient of reliability of the tests. He does not know this coefficient

between the various annual form of the National Council Test. Since, however, the Tc scale procedure is presumed to equalize the different scorings it should presumably increase the reliability of the test. So in spite of the possibility of error in equating the groups, we believe that the consistently decreasing differences, together with the fairly good reliabilities of the means, justify us in the confident statement that in one year's time any advantage which may result from the use of the same form has completely vanished. A summary of the facts can be found in Table XII and a graphic representation of them on Plate IV.

Retest Scores of Equated Group

Plate IV

SECTION F

THE "PRACTICE EFFECT"

In any consideration of test scores as indices of maturation we must continually keep in mind that we are measuring a condition which is supposedly more or less static or permanent. Although a child's height will increase with advancing months it is not a matter of daily fluctuation. We must also not forget that we are measuring this presumably fixed or slowly changing endowment by a function or group of functions which may fluctuate under the influence of diverse factors. As an analogy, let us assume that we are compelled to measure a child's "altitudinal maturation" or height by his ability to reach certain marks upon a wall. It is obvious that in addition to the length of the bones, the tibia and fibula, the femur, the length of spine, the humerus, the radius, the ulna, the phalanges et al, many other factors will enter into the situation. The pelvic alignment, the flexibility of clavicle and scapula in the shoulder ensemble, the general condition of metabolism of the organism, the motivation of the child, will be conditioning factors of the final score. Assume that one child has acquired the trick of standing, in ballet dancing style, squarely on the end of her toes. It is evident that her score will be altogether out of proportion to her actual skeletal maturation which is usually measured in "height".

In measuring intelligence we judge maturation by a group of products which are conditioned by several factors in addition to that of maturation. Chance errors, especially at the time of the initial test, are much in evidence. The writer knows individuals who have explained low initial scores upon the basis of distraction due to the novelty of the situation, anxiety, fatigue, illness, lack of effort and in one case, intoxication. These factors must be admitted, endured and ignored. When initial testing is confined to a single session we have no reliable technique by which they can be "partialled out." We can find comfort in this study, however, by noticing that the scores produced each fall by incoming Freshmen have always exhibited a fairly symmetrical surface. While the chance error is in evidence it has produced no extraordinary skewness on the low side of our distribution.

Another factor is more serious. It is that of "test wisdom" or a technique in taking tests, the possession of which is a tremendous asset. The writer knows a ninth grade boy who, because of the family interest in mental measurements, has been the victim of many testings from early infancy. His score on the National Council tests would give him a mental alertness high among the college freshmen of the nation. No small factor of advantage in his case is that he can "get the idea" in a very hasty reading of the directions. He possesses, through frequent testings, that

technique for taking tests, a test wisdom which is, we believe, something entirely different from his mental alertness when applied to other situations. Like the ballet dancing girl he has acquired the trick of standing squarely on the end of his intellectual toes and of utilizing all of his inches to make a "high mark".

This test wisdom is commonly designated as the practice effect. We will reserve to our final section our discussion of the practice effect as, in itself, a phase of maturation and will confine our discussion at this time to an evaluation of its influence upon our retest scores. Granting that it exists, several pertinent questions demand consideration. Does it arise after a single testing? Does the facility, like swimming or bicycle riding ability, remain with us indefinitely or does it fade with time? How much of the gain of the retest must be allotted to the influence of this practice effect and how much to maturation?

By happy chance, not planned in the outlining of this study, it has been possible to repeat Thorndike's procedure in considering the same question. It will be remembered that Thorndike, in his high school retesting program, found among the scores of his second tests numerous individuals who for some reason had not taken the first test. He assumed that these were equal in ability to the others and that the superiority of the score of the second-time tested students was due to the practice effect of the previous testing.

At the time of the testing of the 1927 examinees at the University of Kansas, the students were asked to designate whether or not they had ever taken a similar examination. It was somewhat surprising to learn that, in these days of a plethora of tests, the great majority reported no such experience. Of these we were able to find forty-nine (49) Seniors, two hundred forty-six (246) Juniors, and one hundred eighty-seven (187) sophomores. We can find no reason for assuming these students to be any less intelligent than the students of the same college standing who had undergone a second testing. If we grant this, then the superiority of the retest scores over the initial scores of the new arrivals can be due to nothing else than "practice effect" of the first testing. From the data on hand at that time we were able to make the following comparison. The data, in detail, may be found in Tables XIII-XIV-XV.

61 Seniors (retested after 3 years) Mean Tc - 57.9

S.D. - - 9.6
S.D.M. - - 1.23

49 Seniors (initial test) Mean Tc - - - - - 54.4

S.D. - - 8.15
S.D.M. - - 1.16

Difference (due to practice effect) - - - - - 3.5

S.D.D. - - 1.69
E.C. - - .74

36 Juniors (retested after 2 years) Mean Tc - 57.15

S.D. - - 10.43
S.D.M. - - 1.74

246 Juniors (initial test) Mean Tc - - - - 52.54

S.D. - - 8.4
S.D.M. - - .53

Difference (due to practice effect) - - - - 4.61

130 Sophomores (retested after 1 year) Mean Tc - 55.3

S.D. - - 9.4
S.D.M. - - .82

187 Sophomores (initial test) Mean Tc - - - - 50.3

S.D. - - 8.8
S.D.M. - - .64

Difference (due to practice effect) - - - - 5.0

S.D.D. - - 1.04
E.C. - - 1.7

These differences with their very good reliabilities give us the measurement for the "fading of a facility".

One year - - 5.0

Two year - - 4.6 (used as 4.5 for ease of computation)

Three year - 3.5

After these corrections had been established we were enabled to check them by the examination of the Friends University Freshmen repeated on a different form eighteen hours after the first test. The gain of second testing over the first was found to be 5.14 Tc. It would seem that in establishing our correction for practice at the end of one year at a figure which is approximately equal to the practice effect for one day, we have met every demand of scientific conservatism.

SECTION G

RELATION OF TIME INTERVAL AND GAINS

Having established the fact that no deduction need be made for repeating the same form after one year, and having established a correction for practice, we have now to notice the relation of the gains to the time interval between the tests and retests.

Three Year Interval

We have retests for one hundred thirty (130) individuals with a time interval between tests of three years. These are distributed among the following classes:

Seniors	- -	90
Juniors	- -	22
Sophomores	-	<u>18</u>
Total	-	130

Ignoring class lines we find by referring to Table XVI the following statistical facts:

Retest mean	- - - - -	57.42
S.D.	- -	10.11
S.D.M.	- -	.88
Initial test mean	- - - - -	50.83
S.D.	- -	7.5
S.D.M.	- -	.675
Difference	- - - - -	6.59
S.D.D.	- -	1.1
E.C.	- -	2.15

Two Year and One Semester Interval

For this time interval we have twenty (20) individuals, seven Juniors and thirteen Sophomores. It is a very small group with very low reliabilities. Referring to Table XVII we find:

Retest Mean - - - - - 51.45

S.D. - - 7.23

S.D.M. - - 1.61

Initial test Mean - - - - - 47.87

S.D. - - 4.33

S.D.M. - - .96

Difference - - - - - 3.58

S.D.D. - - 1.87

E.C. - - .68

Two Year Interval

In this grouping we have one hundred seventeen (117) individuals. Divided upon class lines:

Seniors - - - 21

Juniors - - - 68

Sophomores - 28

Total - - 117

By referring to Table XVIII we find the data for the following summary:

Retest Mean - - - - - 57.25

S.D. - - 9.77

S.D.M. - - .9

Initial Test Mean - - - - - 50.17

S.D. - - 8.07

S.D.M. - - .74

Difference - - - - - 7.08

S.D.D. - - 1.14

E.C. - - 2.23

One Year and One Semester Interval

For the one year and one semester interval we have one hundred fifteen (115) students. All are Sophomores. Table XIX reveals the following:

Retest mean - - - - - 54.08

S.D. - - 8.69

S.D.M. - - .81

Initial test mean - - - - 48.21

S.D. - - 7.23

S.D.M. - - .67

Difference - - - - - 5.87

S.D.D. - - 1.05

E.C. - - 2.01

One Year Interval

The group retested after one year consists of two hundred forty-nine (249) individuals distributed among the classes as follows:

Sophomores - - 203

Juniors - - - 11

Seniors - - - 35

Reference to Table XX shows the data of which the following is a summary.

Retest mean score - - - - - 56.74

S.D. - - 9.05

S.D.M. - - .57

Initial test mean score - - - 49.44

S.D. - - 8.6

S.D.M. - - .54

Difference - - - - - 7.3

S.D.D. - - .78

E.C. - - 3.36

One Semester Interval

For the one semester group we have ninety-seven individuals. Unfortunately fifty of these were retested on the same form as the initial test. In order not to complicate our score we will confine our study in this section to the remaining forty-seven. These are all Freshmen. Table XXI shows these data:

Retest mean score - - - - - 50.88

S.D. - - 7.48

S.D.M. - - 1.09

Initial test mean score - - 47.3

S.D. - - 8.27

S.D.M. - - 1.2

Difference - - - - - 3.58

S.D.D. - - 1.62

E.C. - - .79

Here we find a group totally at variance with the tendency of the other groups.

Four Weeks Interval

In this group we have one hundred eighteen (118) individuals. By referring to Table XXII we find the facts for the following summary.

Retest mean score - - - - - 59.54

S.D. - - 10.85

S.D.M. - - .99

Initial test mean score - - - - - 54.00

S.D. - - 9.28

S.D.M. - - .85

Difference - - - - - 5.53

S.D.D. - - 1.3

E.C. - - 1.53

One Day Interval

This group of one hundred thirteen (113) Freshmen at Friends University were retested with a Zwischenzeit of about eighteen hours. From Table XXIII we find:

Retest mean score - - - - - 50.01

S.D. - - 9.87

S.D.M. - - .92

Initial test mean score - - - - - 44.86

S.D. - - 9.42

S.D.M. - - .88

Difference - - - - - 5.15

S.D.D. - - 1.27

E.C. - - 1.45

An examination of the appended Chart K and its accompanying graph (Plates V and VI) reveals the fact that for some reason the students with the one, three, and five semester

Plate V

Gains and Time Interval

intervals show an entirely different type of gain than those of the two, four, and six semester groups. This non-conforming tendency can be explained by two factors. In the first place it can be attributed to the vagaries of small numbers. The second explanation appears when we notice the quality of their initial scores. In a following section it will be established that the amount of gain seems to be very definitely a function of the size of the initial score. Those who make high scores, make high gains; those who make mediocre scores, make small gains. Now the initial mean of the one semester group is 47.3 Tc and the initial mean of the two year and one semester interval is 47.87 Tc; both are very low means. There is also the conjectural explanation that the mid-year retests may lack some of the enthusiasm which is to be expected in the fall after a summer vacation. The three semester group, numbering one hundred fifteen, with a respectable initial score and a fair reliability, cannot be disposed of so summarily. Mr. L. Roberts, graduate student in Psychology of the University of Kansas, has made an interesting study of the scholarship quality of two hundred graduates of the University of Kansas; one hundred from the College of Liberal Arts and one hundred from the School of Engineering. The average scholarship in terms of average credit points, for the eight semesters, is tabulated in the following table.

Engineers				College						
First Semester	-	-	-	1.60	First Semester	-	-	-	1.51	
Second	"	-	-	-	1.60	Second	"	-	-	1.57
Third	"	-	-	-	1.36	Third	"	-	-	1.50
Fourth	"	-	-	-	1.41	Fourth	"	-	-	1.62
Fifth	"	-	-	-	1.41	Fifth	"	-	-	1.61
Sixth	"	-	-	-	1.54	Sixth	"	-	-	1.69
Seventh	"	-	-	-	1.53	Seventh	"	-	-	1.74
Eighth	"	-	-	-	1.71	Eighth	"	-	-	1.81

These data bring out quite distinctly the "sophomore slump" so frequently recognized in college tradition. When we superimpose the curves of scholarship upon the curve of gains in Tc scores (Plate VI) we find a most significant uniformity in the third semester drop. Since the curve of intelligence score gains does not represent the same individuals and since the personnel of Mr. Robert's study is not at all identical with this study, it seems certainly more than mere chance that the third semester should establish itself as the low water mark in three types of intellectual activity. We will reserve our discussion of this coincidence for a further section.

Ignoring the erratic scores of the odd semester groups our maturation curve, as evidenced by the scores corrected for practice exhibits the ear marks of the learning curve which have been typical since the days of Bryan and Harter. They are the marked initial rise with the gradual flattening into something of a plateau followed by another rise not quite so sharp.

When, however, the entire group of five hundred thirty-three (533) scores (which constituted the entire body of the

data during the summer of 1929) was thrown together in an attempt to find the relation of the gains to the time interval an r of plus .067 was secured. When the one, two, and three year scores were combined, after our correction for practice had been made, we secured an r of plus .15. Even when our scores had been appropriately "doctored" we did not find a correlation of any significance. In spite of the fact that the means show some correspondence with the time intervals, the large range of the gains, the large standard errors and the marked individual variations, make any mathematical expression of that relationship quite insignificant.

SECTION H

GAINS IN RELATION TO SEMESTER HOURS EARNED BETWEEN TESTS

The conclusion of the previous section seemed to be that the raw gains were so erratic that the time interval between tests could not be considered as the causal explanation. Our corrected scores, however, indicate something of the regular learning curve. Our problem in this section is to examine the possibility of the influence of semester hours upon gains. An examination of Plate VII with the accompanying Tables XXIV, XXV and XXVI, shows that there is a gradual increase in the mean score as we progress through the college classes. We must note, however, that the mean of the Freshmen group is based upon initial scores. The mean of each of the other groups is based upon retest scores. Hence any superiority which the upper classes may exhibit can be explained on the basis of "practice effect" and selection as well as maturation. We are able to distribute our data into groups with a varying number of semester hours earned between tests. Reference to Tables XXVII-XXVIII-XXIX (Data for the forty-five hour group is identical with the three semester group and may be found in Table XIX) shows that we have ninety individuals with ninety hours between tests, one hundred eleven with sixty hours, one hundred fifteen with forty-five hours, and two hundred ninety-five with thirty hours between tests. A summary of results follows:

Plate VII

Mean Tc Scores of Classes

Hours	Number	Mean Gain	S.D.D.	Cor. for Practice
30	295	7.00	.72	2.00
45	115	5.87	1.05	2.33
60	111	7.38	1.14	2.88
90	90	6.90	1.28	3.40

An inspection of the gains will reveal for us the general tendency which is indicated in Plate VIII. If we assume that the thirty, sixty, and ninety hours have consumed one, two, and three years of time we may make our "correction for practice" as is revealed in the last column of the preceding summary and also in the curve on Plate IX.

It would seem, however, that we are not altogether justified in assuming that the thirty, sixty and ninety hours have, in every case, occupied the standard amount of time. No small number of students have been compelled, because of semester absences, to use more than the standard time to gain their hours. This fact is brought out in the following paragraphs.

Within each class group we have individuals retested after one, two, and three years. It is interesting to note the increase of gains corresponding to the increase of college hours (and time) between tests.

Seniors - (Tables XXIV a, XXIV b, XXVII)

35	-	one year	int.	-	30 hrs.	-	mean gain	5.9	-	Cor.Pr.	.9
21	-	two	"	"	-	60	"	"	7.79	-	"
90	-	three	"	"	-	90	"	"	6.9	-	"

Plate VIII
Gains and Hours
Earned between Tests

Plate IX

Juniors - (Tables XXV a, XXV b, XXV c)

11	-	one year int.-	30 hrs.	-	mean gain	5.22	-	cor.pr.	.22
68	-	two	" " - 60	" -	" "	7.13	-	" "	2.63
22	-	three	" " - 60	" -	" "	7.8	-	" "	4.3

Sophomores - (Tables XXVI a, XXVI b, XXVI c)

203	-	one year int.-	30 hrs.	-	mean gain	7.6	-	" "	2.6
28	-	two	" " -	" " -	" "	6.4	-	" "	1.9
18	-	three	" " -	" " -	" "	3.6	-	" "	.1

The scores of the last column are the gains corrected for practice.

The curves corresponding to these data may be seen on Plates X-XI-XII. They are capable of diverse interpretations. The Sophomore curve indicates that, with college hours held constant, the time interval between tests causes a decline. Our partial correlations studies below will substantiate this. When we apply our practice correction we find that this is not a mere "fading of facility" but is a genuine drop in the maturation score. The significant interpretation would be that stimulation and not time causes growth. This conclusion will be reenforced, in a later section, by the results from Lansing and Hutchinson.

The Junior group indicates that, in spite of the fact that during the three years between tests the number of college hours only equaled that of the two year group, their maturation had continued over the time interval. Perhaps the superiority of the Juniors, who earned sixty hours in

Plate X

Seniors with Varying Hours
and Time Interval between Tests

Plate XI

Juniors with Varying Hours
and Time Intervals between Tests

30 hrs.
1 yr.

60 hrs.
2 yr.

90 hrs.
3 yr.

Plate XII

Sophomores with Varying Time Intervals between Tests

three year's time, over the Sophomores who earned thirty hours in three year's time, as well as their superiority over the Juniors who earned sixty hours in two years time, is not so much the mere advantage of a gross number of hours or a gross amount of time but is rather due to the fact that these sixty hours stretched over the three years were so spaced as to gain the utmost stimulation. There is a possibility that the superior motivation of the upper class student may explain the continued growth of the Junior over a three year interval. The Sophomore is still struggling with his groups, he frequently fails to connect the requirements made upon him with his goals. Often he is in a disgruntled attitude. The Junior, on the other hand, has selected his major study; he can see graduation as an accomplishment of the comparatively near future. Even if circumstances should compel him to remain out of school for a semester, he still retains the student's assimilative attitude which makes stimulation possible.

The Senior curve exhibits again the somewhat initial rise of the typical learning curve.

SECTION I

CORRELATIONS

The problem of this section is to ascertain by correlation technique whether or not there are any factors of the college environment which are exclusively associated with scores and gains.

The first problem is something of an excursion into a by path from the main study. The writer was interested in learning the value of the tests as prognostic of scholarship. Then the query arose as to whether the test at the close of an academic period correlated any more closely with the quality of the students scholarship than the test at the beginning of the period. At this phase of the study we had at hand the detailed academic histories of ninety-nine Senior College students. Because the hours were not constant we resorted to the partial correlation technique and utilized the three factors: test scores, semester hours, and credit points. We will designate: Test scores as 1, Semester Hours as 2, and Credit Points as 3. Using the initial test as the basis of our comparison we have:

r of 1 and 2 equals $-.63$ (scores and hours)

r of 1 and 3 equals $.34$ (scores and credit points)

r of 2 and 3 equals $.45$ (hours and credit points)

r of 12.3 equals $-.21$

r of 23.1 equals $.48$

r of 13.2 equals $.39$

Our significant correlation is the last one. Scholarship and test scores, with hours held constant, correlate with a positive coefficient of thirty-nine.

Using the final scores as a basis we have:

r of 1 and 2 equals .001

r of 1 and 3 equals .39

r of 2 and 3 equals .45

Resorting again to the partial correlation technique we find:

r of 12.3 equals -.21

r of 23.1 equals .48

r of 13.2 equals .44

It is an interesting coincidence that the r of 12.3 is the same in both cases. The conclusion of the study shows:

r of 13.2 of the initial test is .39

r of 13.2 of the final test is .44

Thus we find that the final test score shows itself only slightly superior to the initial score as an index of scholastic quality.

Our first thought was that the gains might be proportionate to the total number of semester hours earned at the time of the retest. This idea was explored by partial correlations using the variables: (1) gains - or difference between initial test and retest scores, (2) total semester hours at the time of retesting, (3) time interval between tests. Gains were tabulated in .5 To steps; time in one half year intervals (one semester used as a half year); and

hours grouped as follows:

0 - 15	46 - 60	76 - 90
16 - 30	61 - 75	91 - 105
31 - 45		

At the time of this calculation we had data on five hundred thirty-two (532) individuals. Designating time as 3, hours as 2, and gains as 1, we have:

r of 3 and 2 equals .555

r of 1 and 3 equals .0676

r of 1 and 2 equals .0136

Partialing gives us:

r of 13.2 equals .07

r of 12.3 equals .028

r of 23.1 equals .555

Certainly the above coefficients can not be construed to express any other than a chance relationship.

The next suggestion was that the influential factor might be the number of semester hours earned between tests. Following the same procedure we find:

r of 3 and 2 equals .837

r of 1 and 3 equals .03

r of 1 and 2 equals .14

Partialing gives:

r of 13.2 equals -.117

r of 12.3 equals .172

r of 23.1 equals .838

Here we find a suggestion that semester hours earned between tests are possibly associated with gains in scores but the

coefficient of correlation is too small to be of any significance.

The next hypothesis was that the large "practice effect" of those tested over the one year interval was tending to conceal any relationship which might exist and that the utilization of our "correction for Practice" might reveal a more significant correlation. Accordingly we selected the students with the one, two, and three year intervals and ignored those with the one, three, and five semester intervals. This left a total of three hundred forty-six (346) cases. Five T_c was deducted from the gains of all individuals with a time interval of one year; four and five tenths T_c from the gains of individuals with a two year interval; and three and five tenths T_c from all those with a three year interval. With gains designated as 1, hours 2, and time 3, we have these correlations:

r of 2 and 3 equals .803

r of 1 and 3 equals .151

r of 1 and 2 equals .194

Partialing gives:

r of 23.1 equals .71

r of 13.2 equals -.007

r of 12.3 equals .122

Again this time, with our scores appropriately "doctored" we find a correlation of no significance.

Next it was thought that perhaps the social activities of college life might be as effective as the curricular

activities. From the current number of the college annual we were able to obtain information as to the various "student activity" interests of forty-eight of the Seniors in our data.

A social index was devised on the following basis:

Membership in social fraternity or sorority - 3 points

Membership in professional fraternity - - - - 2 "

Membership in any other organization - - - - 1 "

The correlation of this index and the gains was $-.12$

Our next suggestion was that the quality of scholarship as measured by credit points might be found to show a relationship. Accordingly, detailed information was secured for sixty-eight (68) Seniors, fifty-two (52) Juniors, and one hundred nineteen (119) Sophomores. A total of two hundred thirty-nine (239). Partial correlations were made with the four factors numbered as follows: gains 1, hours 2, credit points 3, time interval 4. These zero correlations were found:

r 12	equals	.11	(gains and hours)
r 13	"	.16	(gains and credit points)
r 14	"	.09	(gains and time)
r 23	"	.86	(hours and credit points)
r 24	"	.98	(hours and time)
r 34	"	.81	(credit points and time)

Correlations of the first order are found to be:

r 14.3	equals	-.06	{ gains and time - cr.pts. held constant }
r 24.3	"	.94	{ hours " " " " }
r 12.3	"	-.05	{ gains " hours " " }
r 14.2	"	-.09	{ " " time - hours held constant }
r 34.2	"	-.32	{ cr.pts. " " " " }
r 13.2	"	.13	{ " " gains " " }

(Other six first order correlations are not used)

Correlations of the second order which are concerned with the problem of gains are as follows:

r 12.34 equals .001 - gains and hrs.- cr.pts. and time con.

r 13.24 " .107 - " " cr.pts.- hrs. " " "

r 14.23 " -.05 - " " time - cr.pts. " hrs. "

The significant correlation of gains and credit points, with hours and time held constant, is only .107. Again we find what appears to be only a chance relationship.

In the above computations it must be remembered that out of the entire group of two hundred thirty-nine (239), one hundred nineteen (119) or one half are Sophomores. It is with this one year group that the so called practice effect is most conspicuous. We must recognize that this test wisdom represents a very specialized capacity. It develops very rapidly and fades slowly for the first year. It is obvious, then, that these erratic changes in scores will effectually and hopelessly conceal the more steady and fundamental increment of capacity. When we examine the status of our Seniors we find a different condition. We know that the practice effect has faded considerably in three years. We know also that, with the accumulation of approximately ninety hours of college credit, a greater number of credit points will accrue to each student and the differentiation of scholastic capacity can be made with a nicer discrimination. When we combine our entire group it will be readily seen that the Sophomores, who constitute half the group, with their large and chance controlled practice effect will effectually conceal whatever

relationship might be revealed by the increasing number of credit points of the Juniors and Seniors. Since we cannot partial out the practice effect our only procedure is to compute the correlations of the Sophomore, Junior and Senior groups separately. If we find the correlation between credit points and gains, greater for the Juniors than for the Sophomores and greater for the Seniors than for the Juniors, we can conclude that with the increase in academic standing, the gains in test scores are representing less and less the growth of test wisdom and more and more that genuine maturation which is the object of our concern.

In pursuance of this hypothesis we were able to establish the following groups with the designated classification and time interval.

119 Sophomores - one year interval

52 Juniors - two year interval

68 Seniors - three year interval

In our Sophomore group, designating gains as 1, hours as 2, and credit points as 3, we find:

r of 1 and 2 equals .01

r of 1 and 3 equals .04

The correlation is not high enough to justify the partialing procedure. It is very evident that the practice effect and chance errors are over balancing and concealing any influence which might come from either semester hours or credit points.

In the Junior group we have the following correlations:

r of 1 and 2 equals .13

r of 1 and 3 equals .28

r of 2 and 3 equals .66

Correlations of the first order gave:

r of 12.3 equals -.07

r of 13.2 equals .26

r of 23.1 equals .65

Here we find no evidence of any increase in the significance of hours but a very emphatic increase in the significance of the credit points.

In the Senior group are found these correlations:

r of 1 and 2 equals .2

r of 1 and 3 equals .41

r of 2 and 3 equals .47

Partialing gives:

r of 12.3 equals .009

r of 13.2 equals .36

r of 23.1 equals .43

In this we find an increasing significance in the credit points, a correlation of plus .36. The question at once arises as to just how significant is a correlation of plus .36. In this regard it is interesting to note the decreasing correlation of credit points and hours. In the Junior year we find this correlation to be .65; in the Senior year it is only .43. If, with the very definite relationship

between hours and credit points, we find the correlation decreasing and at the same time we find the correlation of gains and credit points increasing, we must assume that there is some definite relationship between these two factors.

In concluding this section we may summarize our findings as this: that we have been able through the correlation technique to find no fixed association between time and gains or between semester hours and gains; we do find a very definite correspondence between the quality of the student's scholarship and the gain made in undergoing a second psychological examination.

SECTION J

THE LOCATION OF THE GAINS

The purpose of this section is to learn just where, in the group, the large and small gains are located. The first question, then, is whether or not the entire group moves up uniformly. Again the correlation formula reveals, from the data on hand in July 1929, the following:

61 Sr.	- 3 yr.	int.	- r	of	initial	test	and	retest	-	.78
36 Jr.	- 2	"	"	- r	"	"	"	"	"	.92
130 Soph.	1	"	"	- r	"	"	"	"	"	.85
113 Fr.	- 1 day	"	"	- r	"	"	"	"	"	.86

(Data for Freshmen was secured Sept. 1929)

This shows a fairly good uniformity but with room for considerable variation.

Our next inquiry was whether or not the size of the initial score would show any correspondence to the amount of the gain. Using our sixty-one Seniors whose retest scores were available during the summer of 1929 we find an r of the initial scores and gains of plus .124, indicating that the amount of the gain bears a little relation to the size of the score.

It will be remembered that the T_c scores are standard deviation units. All scores in the thirties are minus 2 S.D. scores; all in the forties are minus 1 S.D. scores; all in the fifties are plus 1 S.D. scores; and all in the sixties are plus 2 S.D. scores. It is interesting to know the mean

gains over the various time intervals for each of these groups. If we omit our scores in the twenties and seventies where our frequencies are insignificant we find the information which is tabulated in Table XXXIII and graphically depicted on Plate XIII. It will be seen that the high and low sections (those with initial scores in the thirties or sixties seem to have a gradient entirely different from that of those individuals who are grouped more closely to the mean. An interesting question immediately demands consideration. Does college life offer more stimulation to the extreme student, either high or low, than it does to the mediocre? It will be noticed that those students whose initial test scores are in the plus 2 S.D. group show no indication of the sophomore slump. The minus 2 S.D. group show the same retardation at the one and one half year interval as the other groups but the slump continues and reaches its maximum depth at the two year interval. The indication is that the slower student finds his period of intellectual orientation a more extended process than do the more alert groups, and that for him the more permanent growth shows itself as a result of a longer period of stimulation. The rather extraordinary gains of this group, both for the one day and the one year interval, brings the suspicion that the initial scores are too low. It is quite probable that here the initial scores were depressed by emotional blocking. A very legitimate skepticism of their own capacity produces the consequent feeling of

Gains

11

10

9

8

7

6

5

1 DAY

↑ Practice

1 year

1½ yrs.

2 yrs.

3 yrs.

Plate XIII

Gains Classified
on Basis of
Initial Score

- I.T. in 30's
- I.T. in 40's
- I.T. in 50's
- I.T. in 60's

inadequacy. Familiarity with the technique of testing, during the second testing, dispells to some extent this retarding emotional tension and brings the score up to its legitimate level. The relative uniformity of the plus 1 S.D. and the minus 1 S.D. is quite evident. With the exception of the eccentric gain of the minus 1 S.D. group of the one year interval we find their curves almost parallel.

The next question has to do with the relation of age and gains. We have noted in an earlier section that there is a tendency toward a negative relationship between age and initial score. The scholastically advanced individuals who reach college a year or two sooner than the regulation age, very naturally make a higher test score. All in all, the college population is somewhat selected and age norms can not be expected to be indicative of the general population. In the following chart we have classified students by their age at their initial tests and have specified the gains of the one, two, and three year groups. An examination of the chart and of the curve on Plate XIV indicates a gradual retardation from sixteen to nineteen inclusive, then an acceleration. The nineteenth year probably marks the low point because of the absence of the factor of selection. The nineteen year old is retarded one year in his arrival at college. He is probably somewhat slower than the others but yet his record predicts a moderately successful college career. He may be slower than the eighteen year old but not slow enough to be eliminated. The students of

twenty years or over are those ambitious persons who are coming back into school after a period of enforced absence. The chart, giving ages with the corresponding gains and frequencies, follows:

Age	1 yr. gains	2 yr. gains	3 yr. gains
16 years	9.1 Tc no. 5	10.0 Tc no. 2	10.0 Tc no. 7
17 years	8.3 Tc no. 53	8.0 Tc no. 23	7.8 Tc no. 29
18 years	9.0 Tc no. 82	7.6 Tc no. 41	9.0 Tc no. 28
19 years	6.7 Tc no. 44	7.2 Tc no. 16	8.2 Tc no. 23
20 years	7.1 Tc no. 29	10.5 Tc no. 10	6.1 Tc no. 8
21 years	7.0 Tc no. 10	10.1 Tc no. 5	1.5 Tc no. 2

The rather erratic nature of the data on this chart brings the suggestion that perhaps the quality of the student, as evidenced by his initial score, is a more significant factor than his age. Accordingly, we have prepared Table XXXIV and Plates XV-XVI-XVII. An inspection of these curves reveals these facts: that in the one year interval the nineteenth year seems to be uniformly the low water mark; that in the two year interval each S.D. group has its own age of least acceleration; that in the three year interval the critical age has shifted to twenty years. However, the general tendency of gradual retardation to the age of nineteen seems fairly well defined.

Plate XV

One Year Gains

Distributed by Ages

Gains

14

Plate XVI

13

12

11

10

9

8

7

6

5

4

— I.T. in 30's
— I.T. in 40's
— I.T. in 50's
— I.T. in 60's

Two Year Gains
Distributed by Ages

16 yr

17 yr

18 yr

19 yr

20 yr

21 yr. (Age at I.T.)

Plate XVII
Three Year Gains
Distributed by Ages

SECTION K

THE EQUATED GROUPS PROCEDURE

The previous section established the fact that the amount of gain in the retest is a function of the quality of the student as revealed by his initial test. By the equated groups technique we are able to hold constant this qualitative factor and to measure the effect of the time element.

Against the one day group we are able to equate five groups of the following time intervals: four weeks, one year, one year and one semester, two years, and three years. The frequency of each group is sixty-two. Tables XXXV to LX show the process of equating and give the data of which the following is a summary.

1 day	-	mean gain	5.77	-	S.D.	2.96	-	S.D.M.	.37
4 weeks	-	"	"	6.54	-	"	3.67	-	" .46
1 year	-	"	"	7.52	-	"	3.41	-	" .43
1½ year	-	"	"	6.84	-	"	3.75	-	" .47
2 years	-	"	"	7.48	-	"	4.07	-	" .51
3 years	-	"	"	8.69	-	"	4.06	-	" .51

If we consider the gain of the one day group due wholly to practice effect, the superior gain of the other groups should be due to maturation. We notice, then, these excess gains over the one day group:

4 weeks	-	excess gain	.77	-	S.D.D.	.59	-	E.C.	.47	
1 year	-	"	"	1.75	-	"	.57	-	"	1.1
1½ years	-	"	"	1.07	-	"	.59	-	"	.64
2 years	-	"	"	1.71	-	"	.63	-	"	.97
3 years	-	"	"	3.12	-	"	.63	-	"	1.78

Plate XVIII, a curve of the gains of each group, reveals the gradual ascent with the "sophomore slump" still very much in evidence. This curve would seem to be a more nearly accurate picture of the maturation of the college student than any of the other curves, for the following reasons. In Section J, Plate XIII, it was definitely established that the amount of gain is a function of the quality of the student as indicated by his initial test. An inspection of Plate XIX reveals that our erratic one and five semester groups (Section G), in addition to being few in number, are low in quality. The three semester group is only slightly lower in quality than the one year group (49.44 Tc as compared to 49.81 Tc). In spite of this approximate equality we find the "sophomore slump". The larger gain of the four weeks group is clearly due to the quality of their initial score, 54 Tc, which is the highest mean of any of the time interval groups. The equated groups technique stabilizes this qualitative variation.

The question immediately arises as to how the three year gain of 8.69 Tc should be divided between practice effect and maturation. If we take the "excess gain" of 3.12 Tc as the measure of maturation we are assuming that

Plate XVIII

Gains disclosed by Equated Groups
Procedure Plotted against Time Intervals

Initial Scores and Retests

Plate XIX

white — initial score
black — gain

the practice effect of three years is equivalent to that of eighteen hours.

As an introduction to our consideration of this question, may we quote Thorndike (58), pages 11-12? "All scientific measurements of intelligence which we have at present are measures of some product produced by the person or animal in question or of the way in which some product is produced. 'A' is rated more intelligent than 'B' because he produces a better product, essay written, answer found, choice made, completion made and the like, or produces an equally good product in a better way, more quickly or by inference rather than by rote, memory or by more ingenious use of the material at hand." May we quote again (58), page 463, "It is not, at present, possible to distinguish at all accurately, within the general gain in intellect with ages from 0 to 15 years or later, the share of mere maturity, mere inner growth, from the share of the experience and training which age implies. The reasons for this failure are much the same as for the failure to distinguish the shares of original capacity and environmental circumstances in the determination of intellect. We lack tests which measure maturity by itself and tests which measure training by itself. We also lack extensive investigations using the partial correlation technique with such imperfect symptoms of maturity and training as are available." And now from Koffka (52), page 39, "In any consideration of development we are con-

fronted with this opposition of inherited and acquired traits. Whether this opposition can be bridged over, whether that which is inherited must first have been acquired by our ancestors in the course of racial development are questions which we shall here leave out of consideration. Yet this opposition is found in the development of every individual; a fact which we can note in passing without further explanation."

In these quotations we have established the fact that in the testing of "intelligence" we are measuring the products of an intelligence which can be defined only in terms of actual performance. We have brought forth again an age old difficulty; that of differentiating native and acquired traits and we have echoed the hopelessness in proposing such a question.

Just as we have the general condition in which it is impossible to differentiate between maturation and learning, we have also the more detailed difficulty of differentiating between "practice", "inner growth", and "learning" in the analysis of intelligence scores. It seems to the writer that practice effect increases scores of intelligence tests through its influence upon the factor of speed of reactions rather than upon the factor of altitude or level or degree of difficulty of the reactions. In response to questioning students retested over a short interval they explain their gain by the fact that they can "get the idea" in a very short space of time. This means that more and more, the

initially insignificant features of the configuration have become the cues of the perceptual pattern and the comparatively few and gross reactions have been supplanted by the more numerous but more precise reactions. In analogy tests, for example, the practiced individual reacts not by floundering among the big ideas of the task, such as the idea of relations "just as - - - so also", but responds to the more minute details of the particular situation. The individual has learned; he has "extended his insight into a given situation and has increased the complexity of his reactions." He responds to the "constant but abstract features of a changing stimulus pattern." Certainly here is evidenced a "differentiation of energy patterns of the nervous system" and we are justified in classifying the more minute changes, the differences in organization or the development under stimulation of dormant cells, as maturation. Returning to Plate XVIII we can say that the sharp initial rise of our curve is due to a maturation comparable to that of rats, or chickens, or goldfish, which "learn" to respond to a pattern of lights or shades of gray. The slower gains of the later periods come from the more deliberate ascent from one level of difficulty to another, which constitute an index of a change of "altitude" of intelligence. So instead of the rather labored unconvincing distinction of "practice effect" and "maturation" it is much simpler to consider the entire curve a growth process. Certainly the maturation which

results from controlled stimulation is just as truly maturation as that "inner growth" which comes through those factors of stimulation which are beyond control. However, we must recognize that this maturation is of a rather specific type which is accompanied by an insight into a particular situation.

If we refer again to the data of Mr. Roberts, given in Section G, and plot his curve on the same surface with our maturation curve (Plate XX) we find a most unusual parallelism between scholarship in each of the semesters and the To gains of the corresponding semesters.

Plate XX

SECTION I

DO COLLEGE YEARS CONSOLIDATE OR DIFFERENTIATE ?

In the history of mental measurement, considerable interest has been exhibited as to the varying size of the standard deviations with the various age groups. In the present study the information has an interesting bearing on the question which forms the caption of this section.

From the data presented in Section G (Tables XVI to XXIII) we have assembled the information which is tabulated in the following table and is depicted graphically on Plate XXI.

Group	Range of I.T.	Range of R.T.	Standard Deviation	
			I.T.	R.T.
1 day	26.0 - 72.0	28.0 - 73.5	9.42	9.87
4 weeks	34.0 - 77.5	35.0 - 86.0	9.28	10.85
1 semester	28.0 - 64.5	35.0 - 69.0	3.27	7.48
1 year	16.0 - 72.5	28.0 - 80.0	8.6	9.05
1½ years	23.0 - 69.5	35.0 - 80.5	7.23	8.69
2 years	34.5 - 66.0	35.0 - 84.0	8.07	9.77
2½ years	39.0 - 56.0	34.5 - 61.0	4.33	7.23
3 years	34.5 - 77.0	28.0 - 82.0	7.5	10.11

If Plate XXI is compared with Plate V of Section G, it will be obvious that a close relation exists between the amount of gain and the size of the standard deviation. Or, speaking more precisely, the size of the standard deviation seems to be a function of the size of the mean.

Plate XXI

S.D. of Retest Scores at

Varying Time Intervals

S.D.

11

10

9

8

7

6

5

4

3

1 Day ↑
4 Weeks

1 SEM.

1 yr.

3 SEM.

2 yr.

5 SEM.

3 yr.

The answer to our caption question, then, seems to be that college tends to differentiate between individuals rather than to consolidate them into a "college type".

SECTION M

THE LANSING AND HUTCHINSON STUDIES

This study developed while we were searching for a group of young people of about college age whom we might test over a two semester interval and in this way have a check against the gains of our college environment. When we were unable to gain access to such a group we turned to the penal institutions in the hope that this type of group might be selected from the general population of these institutions. Our requests were received with fine courtesy and the annoyance of the necessary break in routine, to give a test to these groups, was incurred with a most pleasing spirit of cooperation. Our thanks are due to the officials of these institutions: the State Penetentiary at Lansing, Kansas and the Reformatory School at Hutchinson, Kansas.

In as much as the men of these institutions are examined with the Alpha tests upon their entrance into the institutions, our problem was to select one hundred men of approximate college age who had been in the institution about one year. We were able to get ninety-nine in Hutchinson and ninety-seven at Lansing. The age range of the Hutchinson group is from sixteen to twenty-five years. The age range of the Lansing group is from eighteen to twenty-eight years. The mean age of the former group is 19.7 years, of the latter 23.6 years. The mean time between tests at Hutchinson was 15.1 months; at Lansing it was 8.69 months. The tabulation

of the initial and retest scores are found in Tables XLI and XLII. The scores are raw scores of the Alpha tests.

A summary of the Lansing results are:

Retest Mean Score - 62.5 - S.D. 32.6 - S.D.M. 3.3

Initial Mean Score - 59.5 - S.D. 32.8 - S.D.M. 3.3

Gain - 3.0 - S.D.D. 4.66 - E.C. .23

From the Hutchinson study we find:

Retest Mean Score - 64.5 - S.D. 34.0 - S.D.M. 3.41

Initial Mean Score - 56.2 - S.D. 35.6 - S.D.M. 3.57

Gain - 8.3 - S.D.D. 4.93 - E.C. .3

Very little use can be made of these data as a check against the gains of college students. The level of attainment is all together too low to draw any conclusion. If, however, we make the somewhat doubtful assumption that Class B and Class A, of the Army Alpha, may be called college quality we might study this selected group. From each institution we find eleven men who would be classed A or B in the army rating. The data for these twenty-two cases are given in the following table: for Lansing -

Age 21	-	Initial Score	139	-	Retest Score	135
" 22	-	"	112	-	"	118
" 25	-	"	141	-	"	128
" 21	-	"	137	-	"	135
" 22	-	"	148	-	"	135
" 19	-	"	127	-	"	130
" 25	-	"	104	-	"	103
" 28	-	"	116	-	"	100
" 20	-	"	126	-	"	102
" 20	-	"	105	-	"	121
" 27	-	"	122	-	"	125
Mean age	22.7	Mean I.T.	125.18	Mean R.T.	121.09	

For Hutchinson -

Age	17	-	Initial Score	162	-	Retest Score	164
"	24	"	"	111	"	"	100
"	22	"	"	112	"	"	119
"	17	"	"	109	"	"	131
"	22	"	"	122	"	"	130
"	24	"	"	123	"	"	91
"	22	"	"	154	"	"	151
"	22	"	"	104	"	"	93
"	18	"	"	176	"	"	61
"	19	"	"	131	"	"	158
"	25	"	"	128	"	"	139
Mean age			20.9	Mean I.T.	130.17	Mean R.T.	121.54

If we combine the groups from the two institutions we have:

Initial test mean (raw Alpha) - 127.68

Retest mean " " - 121.31

Difference or Loss - 6.37

We have from this small group the fact of a loss of 6.37 Alpha points in about a year's time. The writer was able to observe no signs of loafing or lack of motivation at the time of the retest in either institution. Taking the figures for what they are worth, it would appear that maturation for this age is a matter, not of automatic inner growth but, of the type of stimulation.

SUMMARY

- I. This study is an attempt to learn something of the maturation curve of college students by the procedure of repeating, after differing time intervals, the psychological examination which is taken upon matriculation into the University of Kansas. The data of this study include the retests of 1539 individuals with time intervals between tests varying from one day to three years; and an analysis of the college preparatory work of 431 Freshmen.
- II. The National Council Tests are used in both the initial test and the retest, except for two groups in the Kansas Penal Institutions at Lansing and Hutchinson, Kansas. These groups, totaling one hundred ninety-six, used the Alpha tests.
- III. The scores of the various annual forms of the National Council Tests are rendered comparable by McCall's T score technique.
- IV. Our analysis of the college preparatory history of four hundred thirty-one Freshmen has revealed fairly definitely but not decisively that:
 1. The high scoring individuals have had more work in foreign language and mathematics.
 2. The low scoring individuals have had more work in vocational subjects and history.
 3. From the ages of fifteen to twenty years a negative relation of age and score is shown; the younger the individual, the higher the score. From twenty to

thirty years of age the general but erratic tendency shows itself in an increase of score with years.

4. The size of the high schools in which the students prepared for college does not seem to be a significant factor in their scores.

V. Just as the effect of coaching on the particular items of the Stanford Binet Tests seems to disappear within a year (27) so any advantage which comes from the use of the same form in retesting seems to fade within a year.

VI. The practice effect has been the most complicating factor of this study. We have indications that its influence fades somewhat slowly through three years. Our data would indicate that its influence after a three year interval is .7 as potent as its influence after one year; and that its influence after two years is .9 of that of one year. Our calculated practice effect for one year is practically equivalent to our empirically discovered effect of one day. The suggestion was made in a later section that this rapid initial acceleration may, of itself, be considered a phase of maturation. It is probably due to the development of the factor of speed and not a change in the level of intelligence.

VII. If we make no attempt to separate practice effect from maturation we find the conditions which are shown in the following table:

Time interval	Number	Gain in Tc score
3 years	130	6.59
2½ "	20	3.53
2 "	117	7.08
1½ "	115	5.87
1 "	249	7.30
1 semester	47	3.50
4 weeks	118	5.53
1 day	113	5.15

VIII. When we organize our material on the basis of semester hours earned between tests we have the following results:

Hours between tests	Number	Mean gain
30 hours	295	7.00
45 "	115	5.87
60 "	111	7.38
90 "	90	6.90

IX. The correlation and partial correlation technique revealed the following facts:

1. On the basis of the academic histories of ninety-nine Senior College students we find:
 - a. Initial scores correlate with credit points (semester hours held constant) with an r of plus .39
 - b. Retest scores correlate with credit points (semester hours held constant) with an r of plus .44
2. The zero correlation between gains and social activities gives an r of minus .12

3. Partial correlations reveal:

- a. Gains correlate with time between tests (hours held constant) with an r of minus .117
- b. Gains correlate with hours earned between tests (time held constant) with an r of plus .172
- c. Gains correlate with credit points (time and hours held constant) :

Entire group - r equals .107

Sophomore group - r " .04

Junior group - r " .26

Senior group - r " .36

X. In the attempt to locate the large and small gains within the group it was found:

- 1. The amount of the gain correlated with the size of the initial score with an r of plus .129
- 2. Those whose initial scores are in the plus 2 S.D. group and minus 2 S.D. made much larger gains than those of the plus 1 S.D. and minus 1 S.D. groups.
- 3. It is noted that there seems to be a general tendency for the gains to decrease with age up to nineteen and twenty years. Above twenty the gains seem to increase with age. This conclusion is not clear cut and definite. When we attempt to consider the quality of the initial test with age gains we find many erratic curves.

XI. The equated groups procedure equalizes the qualitative differences and reveals the following facts:

Time Interval	Gain in Tc
1 day	5.77
4 weeks	6.54
1 year	7.52
1½ year	6.84
2 years	7.48
3 years	8.69

XII. A study of the average scholarship per semester of one hundred graduates of the School of Liberal Arts reveals the same "sophomore slump" which is evidenced in all of the gain curves.

XIII. The retests of one hundred ninety-six young men confined in the penal institutions of Kansas included twenty-two individuals who might be considered of college caliber. These twenty-two, over approximately one year's time, lost 6.37 points on the Alpha test.

XIV. The size of the standard deviations of the various groups seems to vary with the size of the mean of the group.

CONCLUSION

It is commonly assumed that an "intelligence test" is composed of a battery of miscellaneous tests which are representative samplings of intellectual products, and that the number and quality of these products produced within a definite time unit are criteria for intelligence. It is not our purpose to discuss the accuracy of these assumptions or to question the validity of the tests. Maturation, in this study, is nothing else than an interpretation of the ability to make scores in the National Council Tests under standardized procedure.

We have no data which will separate "inner growth", which apparently means unstimulated growth, from stimulated growth or "learning".

The ability to make test scores increases during the college years. Judging by our data from Lansing and Hutchinson we can say that college environment is more conducive to "maturation" than that of a penal institution.

The factor of individual differences is very much in evidence. Extreme differences between initial and retest scores are frequent. They are as frequent in the one day and the four weeks intervals as in the groups with the longer intervals. Any attempt at serious guidance of the student, based upon the result of a single testing, carries with it the probability of a serious injustice to the student.

The curve of the gains resembles very much the "typical learning curve". We find the sharp initial rise, followed by a general flattened effect of the curve, which in turn is followed by another ascent. A retest at the beginning of the sophomore year, of course, measures the maturation of the freshman year. The decreased gain of the two year interval and the decided slump of the three semester interval group indicates a retardation of growth during the sophomore year and are cause for serious speculation and further investigation. Mr. Roberts studies which deal with an entirely different personnel, in an entirely different line of investigation, emphasize the same tendency. Perhaps the freshman year is the year of social orientation while the sophomore year is the year of serious intellectual and attitudinal orientation in college life. If such should prove to be the case we will have a psychological justification as well as an administrative justification for the strict differentiation of the Junior and Senior Colleges. Additional studies are needed to establish the fact of this condition.

Additional retests at the close of the senior year are needed to ascertain whether or not the curve continues its ascent during the fourth year of college.

We have found no evidence that the mere fact of time - of mere existence on a college campus - causes an increase in capacity to make test scores. There is some (but not decided) indication that the amount of stimulation measured

in terms of semester hours may be one cause of the gains. There is a very decided indication that by the time the student has reached his fourth year, his scholastic record as evidenced by his accumulated credit points is a significant index of his maturation. The stimulation accumulating through prolonged hours of study, the tensions produced by more vivid goals, the cooperative attitudes which make possible more effective stimulation from all phases of the college environment, all of those factors which combine to make scholarship, have a growth effect upon the individual.

The amount of gain seems to be conditioned by the size of the initial score. Rather paradoxically the high and low initial scores make the largest gains. It will be remembered that those of the plus 2 S.D. group gain 5 Tc over the one day group of the same quality. The minus 2 S.D. group gain 2.95 Tc over the one day group of the same initial standing, while the plus 1 S.D. and minus 1 S.D. groups gain a scanty 2 Tc or less over the one day group of their position. Has college adjusted itself to the needs of the two extremes and left the mediocre student to rather shift for himself?

Our frequencies in each particular age group are not large enough to draw conclusions with much confidence. We do find, however, a general decrement of gain with age to the age of nineteen. The few numbers which we had who were twenty or over at the time of their initial test, indicate that the amount of gain increases with age.

On the whole, the mean gains do not seem to be large. If we take our most favored group, the plus 2 S.D., we find in three years a gain of 5.13 Tc over the one day group, a gain just slightly greater than one half of a standard deviation. Taking the curve in which we have the most confidence, our equated groups curve, we find in three years an excess gain over the one day group of 3.12 Tc. But the gain appears as large during the college years as in the lower ages. Miss Teagarden (51) formed a composite score of the Binet, Alpha, Pressy and Stenquist tests through the T score procedure. Her age means are as follows:

Age	T Score
13	48
14	47
15	51
16	54
17	53
18	56

Here we have a gain in five years of eight T scale units, an annual increment of 1.6 T units. When we compare this with our three year gain in college we find no marked flattening of the maturation curve through the college years.

If we accept the increase in capacity to make test scores as evidence of maturation, we may say that the college student matures quite rapidly at first; slumps somewhat during the period of stress and strain of college adolescence, the sophomore year; with the Junior year he begins another upward climb. We leave him climbing.

NOTE

In the statistical manipulation of this study, no attempt has been made to use other than the standardized procedure.

$$\text{Mean} = \frac{\text{sum of measures}}{\text{number}}$$

$$\text{S.D.} = \sqrt{\frac{\text{sum of FD}^2}{\text{number}} - c^2}$$

$$r = \frac{\frac{\text{sum of } x'y'}{\text{number}} - cxcy}{\text{SDx SDy}}$$

$$\text{S.D.M. (standard deviation of mean)} = \frac{\text{S.D.}}{\sqrt{N}}$$

$$\text{D. (difference)} = M_1 - M_2$$

$$\text{S.D.D. (standard deviation of difference)} = \sqrt{(\text{SDM}_1)^2 + (\text{SDM}_2)^2}$$

$$\text{E.C. (experimental coefficient)} = \frac{D}{2.78 \text{ SDD}}$$

There has been no smoothing of curves nor any correction for attenuation.

TABLE I
Tc Scaling of 5137 scores
for 1926 Form

Gross Score	Frequency	No. exceeding plus + reaching	Percent	Tc Scale
10-19	8	5133	99.922	18.5
20-29	18	5120	99.669	23
30-39	34	5094	99.162	26
40-49	79	5037.5	98.053	29
50-59	100	4948	96.320	32
60-69	136	4830	94.023	34.5
70-79	178	4673	90.967	36.5
80-89	229	4469.5	87.005	38.5
90-99	225	4242.5	82.387	40.5
100-109	268	3996	77.788	42.5
110-119	267	3728.5	72.531	44
120-129	268	3461	67.374	45.5
130-139	337	3158.5	61.485	47
140-149	274	2853	55.538	48.5
150-159	302	2565	49.931	50
160-169	299	2264.5	44.082	51.5
170-179	343	1943.5	37.833	53
180-189	275	1634.5	31.818	54.5
190-199	253	1368	26.630	56
200-209	243	1117.5	21.753	58
210-219	213	889.5	17.315	59.5
220-229	169	698.5	13.597	61
230-239	123	550	10.706	62.5
240-249	126	423	8.230	64
250-259	85	317.5	6.180	65.5
260-269	69	240.5	4.681	67
270-279	51	180.5	3.513	68
280-289	46	132	2.569	69.5
290-299	33	92.5	1.800	71
300-309	27	62.5	1.216	72.5
310-319	14	42	.817	74
320-329	17	36.5	.710	74.5
330-339	5	15.5	.301	77.5
340-349	6	10	.195	79
350-359	3	5.5	.107	80.5
360-369	1	3.5	.068	82
370-379	1	2.5	.048	83
380-389	2	1	.015	85.5

TABLE II
Tc Scaling of 16554 Scores
for 1927 Form

Gross Score	Frequency	No. exceeding plus $\frac{1}{2}$ reaching	Percent	Tc Scale
0-9	7	16550.5	99.978	15
10-19	50	16522	99.806	21
20-29	134	16430	99.250	25.5
30-39	265	16230.5	98.045	29.5
40-49	394	15901	96.055	32.5
50-59	563	15422.5	93.164	35
60-69	747	14767.5	89.208	37.5
70-79	885	13951.5	84.278	40
80-89	1030	12994	78.494	42
90-99	1169	11894.5	71.852	44
100-109	1245	10687.5	64.561	46.5
110-119	1352	9389	56.717	48.5
120-129	1298	8064	48.713	50.5
130-139	1267	6781.5	40.659	52.5
140-149	1130	5583	33.726	54.5
150-159	1054	4491	27.129	56
160-169	894	3517	21.245	58
170-179	770	2685	16.219	60
180-189	574	2013	12.160	61.5
190-199	506	1473	8.898	63.5
200-209	340	1050	6.343	65.5
210-219	283	738.5	4.461	67
220-229	213	490.5	2.960	69
230-239	156	306	1.848	71
240-249	92	182	1.099	73
250-259	72	100	.604	75
260-269	36	46	.277	78
270-279	14	21	.1268	80
280-289	6	11	.0664	82
290-299	1	7.5	.0453	83
300-309	3	5.5	.0332	84
310-319	3	2.5	.0151	86
320-329	1	.5	.00302	90

TABLE III
Tc Scaling of 30653 Scores
for 1928 Form

Gross Score	Frequency	No. exceeding plus $\frac{1}{2}$ reaching	Percent	Tc Scale
0-9	11	30647.5	99.982	14.5
10-19	60	30612	99.866	20
20-29	168	30498	99.494	24.5
30-39	383	30222.5	98.595	28
40-49	583	29739.5	97.019	31
50-59	883	29006.5	94.628	34
60-69	1103	28013.5	91.389	36.5
70-79	1334	26795	87.413	38.5
80-89	1592	25332	82.641	40.5
90-99	1739	23666.5	77.207	42.5
100-109	1893	21850.5	71.283	44.5
110-119	1906	19951	65.086	46
120-129	2014	17991	58.692	48
130-139	2012	15978	52.125	49.5
140-149	2000	13972	45.581	51
150-159	1935	12004.5	39.162	53
160-169	1790	10142	33.086	54.5
170-179	1703	8395.5	27.388	56
180-189	1469	6809.5	22.214	57.5
190-199	1354	5398	17.610	59.5
200-209	1089	4176.5	13.625	61
210-219	966	3149	10.273	62.5
220-229	765	2283.5	7.449	64.5
230-239	561	1620.5	5.286	66
240-249	462	1109	3.817	67.5
250-259	323	716.5	2.337	70
260-269	225	442.5	1.443	72
270-279	139	260.5	.849	74
280-289	82	150	.489	76
290-299	43	87.5	.285	77.5
300-309	31	50.5	.164	79.5
310-319	16	27	.088	81.5
320-329	10	14	.045	83
330-339	6	6	.019	85.5
340-349	3	1.5	.0048	89

TABLE IV
Tc Scaling of 7640 Scores
for 1929 Form

Gross Score	Frequency	No. exceeding plus $\frac{1}{2}$ reaching	Percent	Tc Scale
0-9	2	7639	99.986	13.5
10-19	8	7634	99.921	18.5
20-29	17	7621.5	99.757	22
30-39	63	7581.5	99.234	26
40-49	111	7494.5	98.095	29.5
50-59	173	7352.5	96.236	32.5
60-69	230	7151	93.599	35
70-79	343 _m	6864.5	89.849	37.5
80-89	399	6493.5	84.993	39.5
90-99	417	6085.5	79.653	41.5
100-109	458	5648	73.926	43.5
110-119	507	5165.5	67.611	45.5
120-129	487	4668.5	61.106	47
130-139	514	4168	54.554	49
140-149	522	3650	47.774	50.5
150-159	497	3140.5	41.106	52
160-169	463	2660.5	34.823	54
170-179	443	2207.5	28.893	55.5
180-189	383	1794.5	23.488	57
190-199	349	1428.5	18.697	59
200-209	282	1113	14.568	60.5
210-219	237	853.5	11.171	62
220-229	210	630	8.246	64
230-239	175	437.5	5.726	66
240-249	112	294	3.848	67.5
250-259	77	199.5	2.611	69.5
260-269	59	131.5	1.721	71
270-279	51	76.5	1.001	73.5
280-289	21	40.5	.530	75.5
290-299	16	22	.287	77.5
300-309	9	9.5	.124	80
310-319	5	2.5	.0327	84

TABLE V a

Tc Scaling of 16803 Scores for Completion Test
of 1924 Form

Gross Score	Frequency	No. exceeding plus $\frac{1}{2}$ reaching	Percent	Tc Scale
0	38	16784	99.886	19.5
1	58	16736	99.601	23.5
2	113	16650.5	99.092	26.5
3	174	16507	98.238	29
4	249	16295.5	96.979	31.5
5	363	15989.5	95.158	33.5
6	450	15583	92.739	35.5
7	523	15096.5	89.844	37.5
8	619	14525.5	86.445	39
9	749	13841.5	82.375	40.5
10	827	13053.5	77.685	42.5
11	874	12203	72.623	44
12	928	11302	67.261	45.5
13	979	10348.5	61.587	47
14	975	9371.5	55.772	48.5
15	979	8394.5	49.958	50
16	886	7462	44.408	51.5
17	883	6577.5	39.144	53
18	834	5719	34.035	54
19	745	4929.5	29.337	55.5
20	735	4189.5	24.933	56.5
21	618	3513	20.907	58
22	526	2941	17.502	59.5
23	483	2436.5	14.500	60.5
24	422	1984	11.807	62
25	394	1576	9.379	63
26	321	1218.5	7.251	64.5
27	230	943	5.612	66
28	225	715.5	4.258	67
29	168	519	3.088	68.5
30	136	367	2.184	70
31	99	249.5	1.484	72
32	82	159	.946	73.5
33	38	99	.589	75
34	28	66	.392	76.5
35	28	38	.226	78.5
36	9	19.5	.116	80.5
37	11	9.5	.056	82.5
38	3	2.5	.014	86.5
39	1	.5	.0029	90

TABLE V b

Tc Scaling of 17411 Scores for Arithmetic Test
of 1924 Form

Gross Score	Frequency	No. exceeding plus $\frac{1}{2}$ reaching	Percent	Tc Scale
0	349	17236.5	98.997	26.5
1	895	16614.5	95.425	33
2	1478	15428	88.610	38
3	1891	13743.5	78.935	42
4	2080	11758	67.532	45.5
5	2084	9676	55.574	48.5
6	1885	7691.5	44.176	51.5
7	1699	5899.5	33.883	54
8	1351	4374.5	25.124	56.5
9	1144	3127	17.959	59
10	807	2151.5	12.357	61.5
11	615	1440.5	8.273	64
12	422	922	5.295	66
13	271	575.5	3.305	68.5
14	202	339	1.947	70.5
15	111	182.5	1.048	73
16	84	85	.488	76
17	29	28.5	.163	79.5
18	9	9.5	.054	82.5
19	3	3.5	.020	85.5
20	2	1	.0057	88.5

TABLE V c

Tc Scaling of 16715 Scores for Artificial Language Test

of 1924 Form				
Gross Score	Frequency	No. exceeding plus $\frac{1}{2}$ reaching	Percent	Tc Scale
0-4	360	16535	98.923	27
5-9	711	15999.5	95.719	33
10-14	1426	14931	89.326	37.5
15-19	2892	12772	76.410	43
20-24	2690	9981	59.712	47.5
25-29	2506	7383	44.169	51.5
30-34	2023	5118.5	30.622	55
35-39	1525	3344.5	20.008	58.5
40-44	1217	1973.5	11.800	62
45-49	470	1130	6.760	65
50-54	322	734	4.391	67
55-59	175	485.5	2.904	69
60-64	137	329.5	1.971	70.5
65-69	137	192.5	1.151	71.5
70-74	124	62	.370	77

TABLE V d

Tc Scaling of 16771 Scores for Proverbs Test

Gross Score	Frequency	of 1924 Form		Percent	Tc Scale
		No. exceeding $\frac{1}{2}$ plus reaching			
0	219	16661.5		99.347	25
1	596	16254		96.917	31.5
2	1001	15455.5		92.156	36
3	1441	14234.5		84.875	39.5
4	1592	12718		75.833	43
5	1699	11072.5		66.021	46
6	1744	9351		55.756	48.5
7	1668	7645		45.584	51
8	1462	6080		36.253	53.5
9	1315	4691.5		27.973	56
10	1105	3481.5		20.759	58
11	899	2479.5		14.784	60.5
12	759	1650.5		9.841	63
13	535	1003.5		5.983	65.5
14	401	535.5		3.193	68.5
15	335	167.5		.998	73.5

TABLE V e

Tc Scaling of 16834 Scores for Opposites Test of 1924 Form

Gross Score	Frequency	No. exceeding		Percent	Tc Scale
		$\frac{1}{2}$ plus reaching			
0	517	16575.5		98.464	28.5
1	697	15968.5		94.858	33.5
2	1314	14963		88.885	38
3	1420	13596		80.765	41.5
4	1441	12165.5		72.267	44
5	1514	10688		63.490	46.5
6	1530	9166		54.449	49
7	1400	7701		45.746	51
8	1340	6331		37.608	53
9	1152	5085		30.206	55
10	1014	4002		23.773	57
11	839	3070.5		18.239	59
12	634	2339		13.894	61
13	525	1759.5		10.452	62.5
14	365	1314.5		7.803	64
15	310	977		5.803	65.5
16	237	703.5		4.179	67.5
17	174	498		2.958	69
18	114	354		2.102	70.5
19	83	255.5		1.517	71.5
20	75	176.5		1.048	73
21	50	114		.677	74.5
22	41	68.5		.407	76.5
23	20	38		.225	78.5
24	12	22		.130	80
25	8	12		.071	82
26	4	6		.035	84
27	4	2		.011	87

TABLE VI a
Tc Scaling of 15888 Scores for Completion Test
of 1925 Form

Gross Score	Frequency	No. exceeding plus $\frac{1}{2}$ reaching	Percent	Tc Scale
0	92	15842	99.710	22.5
1	143	15724.5	98.970	26.5
2	384	15461	97.312	30.5
3	501	15018.5	94.527	34
4	756	14390	90.571	37
5	852	13636	85.825	39.5
6	1047	12636.5	79.534	41.5
7	1050	11588	72.935	44
8	1135	10495	66.056	46
9	1030	9413	59.245	47.5
10	1098	8349	52.549	49.5
11	955	7322.5	46.083	51
12	975	6357.5	40.014	52.5
13	873	5433.5	34.198	54
14	853	4570.5	28.760	55.5
15	646	3821	24.049	57
16	664	3166	19.927	58.5
17	460	2604	16.389	60
18	540	2104	13.242	61
19	359	1754.5	11.042	62
20	303	1323.5	8.330	64
21	241	1051.5	6.618	65
22	257	802.5	5.051	66.5
23	148	600	3.776	68
24	167	442.5	2.785	69
25	107	305.5	1.922	70.5
26	83	210.5	1.249	72.5
27	47	145.5	.915	73.5
28	57	93.5	.588	75
29	30	50	.314	77.5
30	17	26.5	.166	79.5
31	10	13	.081	81.5
32	3	6.5	.040	83.5
33	3	3.5	.022	85
34	1	1.5	.009	87.5
35	0	1	.006	88.5
36	0	1	.006	88.5
37	1	.5	.003	90

TABLE VI b

Tc Scaling of 15887 Scores for Arithmetic Test
Of 1925 Form

Gross Score	Frequency	No. exceeding plus $\frac{1}{2}$ reaching	Percent	Tc Scale
0	112	15831	99.647	23
1	237	15656.5	98.549	28
2	418	15329	96.487	32
3	702	14769	92.962	35.5
4	906	13965	87.902	38.5
5	1211	12906.5	81.239	41
6	1443	11579.5	72.886	44
7	1514	10101	63.580	46.5
8	1600	8544	53.779	49
9	1528	6980	43.935	51.5
10	1408	5512	34.695	54
11	1199	4208.5	26.490	56.5
12	1097	3060.5	19.264	58.5
13	814	2105	13.249	61
14	623	1386.5	8.727	63.5
15	452	849	5.343	66
16	284	481	3.027	68.5
17	189	244.5	1.539	71.5
18	87	106.5	.670	74.5
19	48	39	.245	78
20	15	7.5	.072	82

TABLE VI c

Tc Scaling of 15889 Scores for Artificial Language Test
of 1925 Form

Gross Score	Frequency	No. exceeding plus $\frac{1}{2}$ reaching	Percent	Tc Scale
0-4	524	15627	98.351	28.5
5-9	913	14908.5	93.829	34.5
10-14	1545	13679.5	86.094	39
15-19	3252	11281	70.998	44.5
20-24	2663	8323.5	52.385	49.5
25-29	2390	5797	36.484	53.5
30-34	1816	3694	23.248	57.5
35-39	1287	2142.5	13.484	61
40-44	855	1071.5	6.743	65
45-49	268	510	3.209	68.5
50-54	153	299.5	1.885	71
55-59	97	174.5	1.098	73
60-64	50	101	.635	75
65-69	34	59	.371	77
70-74	42	21	.132	80

TABLE VI d

Tc Scaling of 14949 Scores for Analogies II Test
of 1925 Form

Gross Score	Frequency	No. exceeding plus $\frac{1}{2}$ reaching	Percent	Tc Scale
0	343	14777.5	98.852	27.5
1	455	14378.5	96.183	32.5
2	599	13851.5	92.658	35.5
3	700	13202	88.313	38
4	620	12542	83.898	40
5	511	11976.5	80.115	41.5
6	408	11517	77.041	42.5
7	393	11116.5	74.362	43.5
8	410	10715	71.677	44.5
9	416	10302	68.914	45
10	498	9845	65.857	46
11	534	9329	62.405	47
12	611	8756.5	58.575	48
13	654	8124	54.344	49
14	739	7427.5	49.685	50
15	806	6655	44.518	51.5
16	871	5816.5	38.909	53
17	930	4916	32.885	54.5
18	886	4008	26.811	56
19	903	3113.5	20.827	58
20	837	2243.5	15.007	60.5
21	750	1450	9.699	63
22	501	824.5	5.515	66
23	343	402.5	2.692	69.5
24	175	143.5	.960	73.5
25	56	28	.187	79

TABLE VI e

Tc Scaling of 16711 Scores for Opposites Test
of 1925 Form

Gross Score	Frequency	No. exceeding plus $\frac{1}{2}$ reaching	Percent	Tc Scale
0	367	16527.5	98.901	27
1	609	16039.5	95.981	32.5
2	1082	15194	90.922	36.5
3	1305	14000.5	83.780	40
4	1428	12634	75.602	43
5	1356	11242	67.273	45.5
6	1402	9863	59.021	47.5
7	1391	8466.5	50.066	50
8	1393	7074.5	42.334	52
9	1199	5778	34.579	54
10	1002	4677	27.957	56
11	977	3688.5	22.072	57.5
12	704	2848	17.042	59.5
13	570	2211	13.230	61
14	431	1710.5	10.235	62.5
15	352	1319	7.893	64
16	266	1010	6.043	65.5
17	244	755	4.518	66
18	147	559.5	3.348	68.5
19	104	434	2.597	69.5
20	84	340	2.034	70.5
21	72	262	1.567	71.5
22	71	190.5	1.140	73
23	58	126	.754	74.5
24	50	72	.430	76.5
25	39	27.5	.029	79.5
26	6	5	.029	84.5
27	1	1.5	.008	87.5
28	0	1	.005	89
29	0	1	.005	89
30	1	.5	.0029	90.5

TABLE VII

The Study and Non-study Groups Equated

Study Group		Non-study Group	
Initial Tc	Retest Tc	Initial Tc	Retest Tc
64.5	71	64.5	63.5
61	65.5	61	58
57.5	67	57.5	62.5
57.5	60	57.5	60
56	65.5	56	58
53	56	53	54.5
53	67	53	54.5
53	52.5	53	54.5
51	60	51	61.5
51	63.5	51	52.5
51	65.5	51	54.5
51	61.5	51	56
49.5	52.5	49.5	48.5
49.5	63.5	49.5	50.5
49.5	56	49.5	54.5
48	60	48	44
48	52.5	48	52.5
48	54.5	48	52.5
46	52.5	46	50.5
46	52.5	46	48.5
44.5	54.5	44.5	46.5
44.5	46.5	44.5	48.5
42.5	58	42.5	44
42.5	56	42.5	48.5
42.5	56	42.5	48.5
40.5	46.5	40.5	48.5
40.5	50.5	40.5	48.5
40.5	52.5	40.5	37.5
40.5	44	40.5	40
36.5	58	36.5	40
36.5	50.5	36.5	50.5
34	56	34	46.5
28	40	28	37.5
56	67	56	58
Means	47.45	56.91	No. 34
S.D.	7.79	7.4	47.45
S.D.M.	1.336	1.269	51.01
D. of retests	5.9	S.D.D. 1.7	7.79
		EC 1.24	6.66
			1.336
			1.142

TABLE VIII

Four Weeks Equated Group

Retested on Same Form				Retested on Different Form			
Name	No.	Initial Tc	Retest Tc	Name	No.	Initial Tc	Retest Tc
Bx	4	60	60	KF	11	59.5	67
Bx	6	46.5	52.5	Bx	3	46.5	53
Bx	7	52.5	65.5	Cx	1	52.5	47
Cx	3	60	71	Bx	1	60	54.5
Cx	7	37.5	40	Jx	3	36.5	47
Cx	9	60	69	KP	1	59.5	63.5
Cx	10	52.5	56	Sx	1	52.5	58
Hx	3	50.5	63.5	Sx	6	50.5	58
Jx	1	69	75	KM	8	70	75
Jx	2	44	52.5	Cx	2	42	50
Kx	1	46.5	52.5	KF	2	44.5	52.5
Lx	4	73	80	Cx	12	73	72.5
Lx	7	52.5	60	Lx	1	52.5	62.5
Mx	1	37.5	56	Hx	1	37.5	42.5
Mx	3	60	67	Dx	1	60	61
Mx	4	48.5	48.5	Ox	3	48.5	56
Mx	11	56	67	KB	19	56	63.5
Nx	1	37.5	44	Nx	5	37.5	42.5
Nx	4	44	44	KH	16	44.5	50.5
Nx	2	52.5	58	Bx	8	52.5	64
Nx	6	63.5	65.5	Kx	4	63.5	61
Ox	2	48.5	61.5	Wx	3	48.5	50
Px	3	42	60	Hx	5	42	50
Sx	5	40	48.5	Rx	4	40	45.5
Sx	8	58	69	Kx	2	58	58
Tx	1	42	46.5	Sx	2	42	44
Tx	2	54.5	60	Rx	1	54.5	62.5
Sx	9	58	73	Ex	2	58	61
Bx	5	71	78	KT	3	70	78
Lx	5	50.5	52.5	KB	13	51	52.5
Nx	3	52.5	58	KL	4	53	56
Px	2	52.5	50.5	KM	7	53	52.5
Rx	3	67	80	KE	1	67.5	71
Sx	1	48.5	58	KC	7	48	50.5
Wx	2	54.5	65.5	KB	9	54.5	61.5
Wx	4	40	48.5	KB	18	40.5	46.5
Wx	5	44	54.5	KM	30	44.5	46.5
Wx	7	46.5	50.5	KT	4	46	48.5
38							
Means	-	52.13	59.53			51.85	56.2
S.D.		9.06	10.21			9.34	8.99
S.D.M.		1.47	1.65			1.5	1.46
D. of Retests	=	3.33	S.D.D. 2.2	EC	.66		

TABLE IX

Freshmen boys - Equated group - Nine weeks interval

Initial Tc Retest Tc (same form) Initial Tc Retest Tc (dif. form)

71	67	71	56
46.5	40	46.5	40.5
50.5	50.5	50.5	44.5
58	58	58	49.5
46.5	48.5	46.5	46
54.5	56	54.5	53
35	40	35	31
25.5	35	25.5	28
42	44	42	42.5
60	69	60	53
60	63.5	60	51
44	35	44	44.5
44	52.5	44	44.5
52.5	58	52.5	46
56	56	56	51
42	40	42	44.5
35	40	35	38.5
46.5	44	46.5	38.5
44	48.5	44	46
67	67	67	64.5
40	44	40	38.5
42	44	42	42.5
48.5	46.5	48.5	46
48.5	54.5	48.5	53
44	50.5	44	46
54.5	54.5	54.5	53
52.5	50.5	52.5	57.5
50.5	54.5	50.5	42.5
46.5	56	46.5	48
60	69	60	56
56	63.5	56	56
48.5	50.5	48.5	53
48.5	56	48.5	44
71	67	71	66
48.5	48.5	48.5	46
48.5	44	48.5	46
50.5	54.5	50.5	51
37.5	50.5	37.5	38.5
52.5	56	52.5	48
32.5	35	32.5	28
54.5	50.5	54.5	53
61.5	61.5	61.5	56
42	37.5	42	40.5
50.5	50.5	50.5	44.5
40	32.5	40	34
40	37.5	40	44.5
40	37.5	40	38.5
54.5	56	54.5	56
44	50.5	44	49.5
54.5	50.5	54.5	51
50	Means- 50.53	48.86	46.6
	S.D. 9.54	9.17	7.64
	S.D.M. 1.34	1.29	1.08
	D. of retests 3.93	S.D.D. 1.72	EC .82

TABLE X

Equated Group - One Semester Interval

Same Form for Retest		Different Form for Retest	
Initial Tc	Retest Tc	Initial Tc	Retest Tc
32	38.5	28	37.5
32	38.5	34	35
36.5	47	36.5	50.5
37.5	46.5	36.5	40
40	42	40.5	42
40	40	40.5	40
42	46.5	42.5	48.5
42	63.5	42.5	48.5
44	48.5	44.5	48.5
44	54.5	44.5	46.5
45.5	48.5	46	48.5
45.5	51.5	46	50.5
48.5	58	48	54.5
48.5	58	48	52.5
50.5	63.5	49.5	54.5
50.5	58	49.5	54.5
50.5	54.5	49.5	50.5
50.5	60	49.5	48.5
50	54.5	51	56
50.5	58	51	54.5
53	53	53	54.5
52.5	60	53	54.5
54.5	58	54.5	58
54.5	54.5	54.5	58
56	63.5	56	58
56	63.5	56	58
61.5	67	61	58
61.5	65.5	62.5	69
65.5	65.5	64.5	63.5
58	61.5	57.5	56
30			
Means - 48.42	54.7	48.35	51.6
S.D. 8.28	8.24	8.25	7.42
S.D.M. 1.5	1.5	1.5	1.35
D. of Retests 3.1	S.D.D. 2.01	EC .55	

TABLE XI

An Equated Group of Sophomores - One year Interval

Retested on Same Form			Retested on Different Form		
Name No.	Initial Tc	Retest Tc	Name No.	Initial Tc	Retest Tc
C 2	50	62.5	B 4	50	58
E 5	53	62.5	B 8	53	58
C 18	56	62.5	B 10	56	65.5
S 47	59.5	67.5	B 15	59.5	65.5
F 21	53	62.5	B 16	53	62.5
A 2	42.5	56	B 18	42.5	56
G 19	50	53	B 22	50	61.5
C 24	61	68	C 5	61	74.5
M 38	67	71	C 20	67	73
P 7	58	68	C 36	58	71
B 25	44	51.5	D 8	44	51.5
I 3	50	61	D 9	50	59.5
W 32	56	61	E 18	56	65.5
M 46	38.5	38.5	F 22	38.5	52.5
K 16	56	62.5	H 14	56	63.5
A 12	36.5	47	H 21	36.5	58
F 8	48.5	50	J 2	48.5	44
G 5	48.5	53	K 4	48.5	46.5
D 12	54.5	56	L 8	54.5	60
G 11	48.5	54.5	L 9	48.5	61.5
L 6	65.5	74.5	M 1	65.5	65.5
D 13	45.5	54.5	M 7	45.5	69
H 10	48.5	50	M 23	48.5	56
K 6	50	59.5	M 39	50	56
T 4	54.5	59.5	M 41	54.5	53
H 9	42.5	50	M 52	42.5	46.5
B 3	47	54.5	M 60	47	51.5
S 41	38.5	42.5	N 13	38.5	61.5
F 2	61	71	N 15	61	73
K 1	53	54.5	N 17	53	60
M 20	53	58	P 4	53	60
C 30	51.5	61	R 15	51.5	60
T 6	58	64	S 1	58	60
W 7	45.5	51.5	S 36	45.5	42
S 9	42.5	50	S 37	42.5	50.5
S 20	62.5	67	S 45	62.5	75
R 20	42.5	47	T 1	42.5	46.5
S 10	56	59.5	W 16	56	61.5
W 33	53	58	W 36	53	56
M 19	48.5	58	A 7	48.5	56
S 52	36.5	45.5	A 10	36.5	40
41					
Means -	50.89	57.52		50.89	58.21
S.D.	7.48	7.97		7.48	8.92
S.D.M.	1.16	1.24		1.16	1.39
D. of retests -.69		S.D.D. 1.86	EC .13		

TABLE XII

The Advantage of the Same Form in Retesting

- - - - -				
Time Interval -	Size of Group -	Advantage in Same Form -	S.D.D. -	EC
One hour	34	5.9 To	1.7	1.24
Four weeks	38	3.33 To	2.2	.66
Nine weeks	50	3.93	1.72	.82
One semester	30	3.1	2.01	.55
One year	41	-.69	1.86	.13

TABLE XIII

Seniors

Tested for First Time

To Score	Frequency
38.5	1
40.5	3
43.5	1
45.5	1
47	2
48	2
48.5	3
49	2
49.5	1
50	4
52	1
53	1
53.5	2
54	2
54.5	1
56	3
57	1
58	3
59	1
59.5	4
61	1
62	1
62.5	2
65.5	2
67	1
68	1
69.5	1
77.5	1
Total	49

Mean 54.4

S.D. 8.15

S.D.M. 1.16

Retests after Three Years

To Score	Frequency
28	1
32.5	1
42	2
44	1
44.5	1
46.5	1
48	1
48.5	3
50.5	2
52.5	3
54.5	2
56	5
58	9
60	7
61.5	6
63	1
63.5	4
65.5	2
69	4
71	1
75	2
78	1
80	1
Total	61

Total

61

Mean

57.9

S.D.

9.6

S.D.M.

1.23

D. 3.5

S.D.D. 1.69

EC .74

TABLE XIV

Juniors

Tested for First Time		Retests after Two Years	
To	Frequency	To	Frequency
32	2	35	1
34.5	3	45.5	1
36.5	3	46.5	2
38.5	4	47	2
40.5	9	48.5	2
42.5	11	50	1
44	10	50.5	4
45.5	15	51.5	1
47	11	52.5	2
48.5	14	54.5	2
50	27	56	2
51.5	20	58	2
53	15	59.5	1
54.5	17	60	1
56	15	61	1
58	15	61.5	2
59.5	10	63.5	1
61	10	65.5	3
62.5	9	69	1
64	6	73	1
65.5	3	78	1
67	7	80	1
68	1	84	1
69.5	1	Total	36
71	4	Mean	57.15
72.5	2	S.D.	10.43
74	2	S.D.M.	1.74
Total	246		
Mean	52.54		
S.D.	8.4		
S.D.M.	.53	D. 4.61	S.D.D. 1.8 EC .9

Sophomores

Total	130
Mean	55.3
S.D.	9.4
S.D.M.	.82

TABLE XVI

Three Year Interval

Initial Scores and Frequencies

Retest Scores and Frequencies

34.5 - - 1
 37 - - - 1
 38 - - - 1
 38.5 - - 1
 39 - - - 4
 40 - - - 2
 40.5 - - 5
 41 - - - 2
 42 - - - 3
 42.5 - - 2
 43 - - - 3
 44 - - - 4
 44.5 - - 2
 45 - - - 2
 45.5 - - 1
 46 - - - 3
 46.5 - - 2
 47 - - - 2
 47.5 - - 1
 48 - - - 2
 48.5 - - 4
 49 - - - 4
 49.5 - - 3
 50 - - - 7
 50.5 - - 5
 51 - - - 3
 51.5 - - 3
 52.5 - - 6
 53 - - - 6
 53.5 - - 1
 54 - - - 1

54.5 - - 2
 55 - - - 4
 55.5 - - 6
 56 - - - 1
 56.5 - - 2
 57 - - - 3
 57.5 - - 5
 58.5 - - 2
 59 - - - 1
 59.5 - - 2
 60 - - - 2
 60.5 - - 1
 61 - - - 2
 61.5 - - 2
 62 - - - 1
 62.5 - - 1
 64 - - - 1
 64.5 - - 1
 67 - - - 1
 67.5 - - 1
 68 - - - 1
 77 - - - 1

Total 130
 Mean I.T. 50.83
 S.D. 7.5
 S.D.M. .675

28 - - - 1
 32.5 - - 1
 37.5 - - 1
 38.5 - - 2
 42 - - - 4
 42.5 - - 3
 44 - - - 2
 45.5 - - 2
 46.5 - - 4
 47 - - - 2
 48.5 - - 7
 50 - - - 1
 50.5 - - 3
 51 - - - 1
 52.5 - - 12
 54.5 - - 4
 56 - - - 7
 58 - - - 14
 60 - - - 12
 61 - - - 1
 61.5 - - 13
 63.5 - - 9
 65.5 - - 3
 67 - - - 1
 69 - - - 5
 71 - - - 3
 73 - - - 1
 75 - - - 7
 78 - - - 1
 80 - - - 2
 82 - - - 1

Total 130
 Mean R.T. 57.42
 S.D. 10.11
 S.D.M. .88

D. 6.59 S.D.D. 1.1
 E.C. 2.15

TABLE XVII

Two Year and One Semester Interval

Initial Scores and Frequencies Retest Scores and Frequencies

39	1	34.5	1
41.5	1	40	1
44	1	42	1
44.5	2	44	1
45	1	46.5	1
46.5	2	47	1
47	2	48.5	1
47.5	1	50	1
48.5	1	50.5	1
49	1	52.5	2
49.5	1	54.5	2
50	1	56	1
50.5	1	58	3
51.5	1	59.5	1
53.5	1	61	1
56	2	61.5	1
Total No.	20	Total No.	20
Mean I.T.	47.87	Mean R.T.	51.45
S.D.	4.33	S.D.	7.23
S.D.M.	.96	S.D.M.	1.61
D.	3.53	S.D.D.	1.87
		E.C.	.68

TABLE XVIII

Two Year Interval

Initial Scores and Frequencies

Retest Scores and Frequencies

34.5	1
35	3
36.5	1
37	1
37.5	1
38.5	1
39.5	1
40	3
40.5	2
41	3
41.5	2
42	2
42.5	6
43.5	1
44	3
45.5	5
46	4
46.5	6
47	2
47.5	4
48	2
48.5	3
49	3
50	3
50.5	2
51	1
51.5	4
52	2
52.5	1
53	2
54	2
54.5	3
55	2
55.5	1
56	3
56.5	5
57.5	2
58	2
58.5	2
59.5	1
60	5
61	1
62	1
62.5	4
63.5	2
64.5	1
65	1
65.5	3
66	1
Total	117

35	1
40	1
42	1
44	2
45.5	3
46	1
46.5	3
47	2
48	2
48.5	8
50	3
50.5	7
51	1
51.5	1
52.5	6
53	1
54.5	9
56	7
58	5
59.5	1
60	7
61	1
61.5	4
62	2
63.5	6
65.5	7
67	3
69	4
71	3
73	3
74	1
78	2
80	2
82	1
84	1

Total 117

Mean R.T. 57.25

S.D. 9.77

S.D.M. .9

Mean I.T. 50.17

S.D. 8.07

S.D.M. .74

D. 7.08

S.D.D. 1.14

E.C. 2.23

TABLE XIX

One Year and One Semester

Initial Scores and Frequencies Retest Scores and Frequencies

23	1	35	2
26	1	37.5	2
35.5	1	38.5	1
36.5	1	40	2
38.5	3	42	1
39.5	2	42.5	1
40	1	44	5
40.5	4	45.5	6
41	1	46.5	3
42.5	9	47	3
43	1	48	1
44	11	48.5	12
44.5	1	50	2
45	1	50.5	6
45.5	5	51.5	5
46	3	52.5	9
46.5	2	54.5	3
47	8	56	9
47.5	4	58	7
48	2	59.5	1
48.5	7	60	8
49	2	61	3
49.5	4	61.5	3
50	5	62.5	1
51	1	63.5	3
51.5	4	64	3
52.5	3	65	1
53	1	65.5	1
53.5	1	67	5
54.5	4	69	1
55.5	2	71	2
56	4	73	1
56.5	1	80	1
57.5	1	80.5	1
58	4	Total	115
58.5	1	Mean R.T.	54.08
59	1	S.D.	8.69
59.5	3	S.D.M.	.81
62.5	1		
65.5	1		
68	1		
69.5	1		
Total	115		
Mean I.T.	48.21		
S.D.	7.23		
S.D.M.	.67		
		D.	5.87
		S.D.D.	1.05
		E.C.	2.01

TABLE XX

One Year Interval

Initial Scores and Frequencies

Retest Scores and Frequencies

16	1
29	1
29.5	2
32	3
34.5	4
35	3
35.5	7
37.5	3
38.5	7
40	6
40.5	4
42	3
42.5	10
44	16
45.5	11
46.5	7
47	10
48.5	24
50	14
50.5	6
51.5	12
52.5	6
53	16
54.5	13
56	17
58	11
59.5	4
60	3
61	5
61.5	3
62.5	3
63.5	2
64	2
65.5	3
67	3
69.5	1
71	2
72.5	1
Total	249
Mean I.T.	49.44
S.D.	8.6
S.D.M.	.54

D. 7.3
S.D.D. .78
E.C. 3.36

28	1
34.5	1
35	1
36.5	1
37.5	2
38.5	1
40	2
40.5	5
42	1
42.5	3
44	6
44.5	1
45.5	3
46.5	6
47	3
48.5	6
50	7
50.5	15
51.5	9
52.5	10
53	5
54.5	22
56	16
58	19
59.5	5
60	16
61	3
61.5	15
62.5	9
63.5	9
64	1
65.5	8
67	5
67.5	1
68	3
69	8
71	8
72	1
73	3
74.5	2
75	2
78	3
80	1
Total	249
Mean R.T.	56.74
S.D.	9.05
S.D.M.	.57

TABLE XXI

One Semester Interval

Initial Scores and Frequencies

Retest Scores and Frequencies

28	1	35	1
34	3	37.5	2
36.5	2	40	3
38.5	2	42	3
40.5	5	44	2
42.5	3	46.5	2
44.5	2	48.5	7
46	2	50.5	3
48	5	52.5	5
49.5	4	54.5	7
51	4	56	2
53	3	58	5
54.5	2	60	1
56	2	61.5	1
57.5	4	63.5	2
61	1	69	1
62.5	1		
64.5	1		
Total	47	Total	47
Mean I.T. 47.3		Mean R.T. 50.83	
S.D. 8.27		S.D. 7.48	
S.D.M. 1.2		S.D.M. 1.09	
		D. 3.58	S.D.D. 1.62
		E.C. .79	

TABLE XXII

Four Weeks Interval

Initial Scores and Frequencies

34	1
36.5	3
38.5	4
40.5	8
42.5	4
44.5	3
46	4
48	8
49.5	9
51	2
53	7
54.5	6
56	10
57.5	9
59.5	7
61	11
62.5	6
64.5	4
66	3
67.5	2
70	4
72	1
74	1
77.5	1
Total	<u>118</u>

Mean I.T. 54.00

S.D. 9.23

S.D.M. .35

D. 5.53

S.D.D. 1.3

E.C. 1.53

Retest Scores and Frequencies

35	1
37.5	2
40	2
42	2
44	3
46.5	4
48.5	9
50.5	5
52.5	8
54.5	7
56	3
58	10
60	6
61.5	13
63.5	10
65.5	3
67	10
69	2
71	4
73	3
75	2
78	3
80	1
84	1
86	4
Total	<u>118</u>

Mean R.T. 59.53

S.D. 10.85

S.D.M. .99

TABLE XXIII

One Day Interval

Initial Test - Retest - Frequency Initial T. - Retest - Frequency

26	-	28	-	1	45.5	-	42.5	-	1
26	-	34	-	1	45.5	-	48	-	2
28	-	32.5	-	1	45.5	-	49.5	-	1
29.5	-	36.5	-	1	45.5	-	53	-	1
29.5	-	38.5	-	1	45.5	-	54.5	-	3
29.5	-	40.5	-	1	46	-	49	-	2
31	-	39.5	-	1	46	-	52	-	1
32.5	-	36.5	-	1	47	-	48	-	1
32.5	-	38.5	-	1	47	-	49.5	-	2
32.5	-	40.5	-	1	47	-	53	-	1
32.5	-	44.5	-	1	47	-	56	-	1
34	-	37.5	-	1	47	-	57.5	-	1
34	-	39.5	-	1	49	-	54.5	-	3
35	-	36.5	-	1	49	-	56	-	1
35	-	40.5	-	2	49	-	59.5	-	2
35	-	42.5	-	1	49.5	-	50.5	-	1
35	-	46	-	1	50.5	-	54.5	-	1
35	-	48	-	1	50.5	-	56	-	1
36.5	-	43.5	-	1	50.5	-	57.5	-	1
37	-	36.5	-	1	51	-	50.5	-	1
37.5	-	38.5	-	1	51	-	55.5	-	1
37.5	-	40.5	-	2	52	-	48	-	1
37.5	-	42.5	-	1	52	-	56	-	1
37.5	-	44.5	-	1	52	-	57.5	-	1
37.5	-	46	-	1	52	-	61	-	1
37.5	-	48	-	1	52	-	64.5	-	1
38.5	-	41.5	-	1	54	-	56	-	1
38.5	-	43.5	-	2	54	-	59.5	-	1
39.5	-	36.5	-	1	54	-	62.5	-	2
39.5	-	42.5	-	1	54	-	66	-	1
39.5	-	46	-	3	55.5	-	57.5	-	1
39.5	-	48	-	2	55.5	-	61	-	2
40.5	-	32.5	-	1	56	-	57	-	1
40.5	-	39.5	-	1	57	-	56	-	1
40.5	-	41.5	-	1	57	-	61	-	1
40.5	-	47	-	1	59	-	70	-	1
41.5	-	42.5	-	2	59.5	-	64.5	-	1
41.5	-	46	-	1	60.5	-	70	-	1
41.5	-	48	-	2	61	-	67.5	-	1
41.5	-	54.5	-	1	64	-	66	-	1
42.5	-	45.5	-	2	66	-	66	-	1
42.5	-	49	-	2	66	-	72	-	1
43.5	-	42.5	-	1	67.5	-	71	-	1
43.5	-	46	-	2	67.5	-	77.5	-	1
43.5	-	51	-	1	72	-	73.5	-	1
43.5	-	53	-	1					
44.5	-	43.5	-	1					

Total 113

Mean I.T. 44.86

Mean R.T. 50.01

S.D. 9.42

S.D. 9.87

S.D.M. .88

S.D.M. .92

D. 5.15 S.D.D. 1.27

E.C. 1.45

r of I.T. and R.T. = .86

TABLE XXIV

Senior Retest Scores

Tc - Frequency

28	1
32.5	1
37.5	1
42.5	3
44	2
45.5	2
46.5	7
48.5	4
50	1
50.5	5
51.5	2
52.5	12
54.5	3
56	3
58	17
59.5	1
60	10
61.5	12
63.5	12
65.5	8
67	1
69	7
71	6
73	2
75	4
78	4
80	4
82	1
Total	<u>146</u>

Mean 59.23

S.D. 9.81

S.D.M. .81

TABLE XXV

Junior Retest Scores

Tc - Frequency

35	1
40	1
42	1
42.5	2
44	2
45.5	2
46	1
46.5	4
47	2
48	2
48.5	4
50	1
50.5	8
51	1
51.5	1
52.5	7
53	1
54.5	9
56	5
58	3
59.5	1
60	6
61	1
61.5	8
62	2
63.5	5
65.5	4
67	3
69	3
71	2
73	1
74	1
75	2
78	1
80	1
82	1
84	1
Total	<u>101</u>

Mean 57.08

S.D. 9.61

S.D.M. .95

TABLE XXIV b

Seniors - Two Year Interval - Sixty Hours

I.T. Scores - Frequency

R.T. Scores - Frequency

37	1
39.5	1
46	1
46.5	1
47	1
47.5	1
49	1
50	1
51.5	1
53	1
54	1
56.5	1
57.5	2
58.5	1
59.5	1
60	2
65	1
65.5	1
66	1
<hr/>	
21	

Mean I.T. 53.62

S.D. 7.89

S.D.M. 1.72

D. 7.79

45.5	1
46.5	3
52.5	1
54.5	2
58	1
61.5	1
63.5	3
65.5	4
69	1
71	1
73	1
78	1
80	1
<hr/>	
21	

Mean R.T. 61.41

S.D. 9.98

S.D.M. 2.18

TABLE XXIV a

Seniors - One Year Interval - Thirty Hours

I.T. Scores - Frequency

R.T. Scores - Frequency

44	1
45.5	2
47	1
48.5	5
50	3
51.5	3
53	2
56	3
58	4
59.5	2
61	1
62.5	1
63.5	1
64	2
67	1
69.5	1
71	1
72.5	1
<hr/>	
35	

Mean I.T. 55.68

S.D. 7.56 S.D.M. 1.27

D. 5.9

45.5	1
50	1
50.5	2
51.5	2
52.5	2
54.5	2
56	2
58	3
59.5	1
61.5	4
63.5	3
65.5	2
67	1
69	2
71	3
75	1
78	2
80	1
<hr/>	
35	

Mean R.T. 61.58

S.D. 8.81 S.D.M. 1.48

TABLE XXV a

Juniors - One Year Interval

I.T. - Frequency

R.T. - Frequency

37.5	1
42.5	1
44	1
45.5	2
46.5	1
47	2
50	2
51.5	1
	<u>11</u>

Mean 46.09

S.D. 3.73

S.D.M. 1.12

42.5	1
44	1
50.5	3
52.5	1
54.5	4
56	1
	<u>11</u>

Mean 51.31

S.D. 4.08

S.D.M. 1.23

D. 5.22

TABLE XXV c

Juniors - Three Year Interval

I.T. - Frequency

R.T. - Frequency

42	1
44	2
45.5	1
46	1
48	1
49	1
50	3
50.5	1
51	1
52.5	2
54.5	1
55	1
56.5	1
57	1
57.5	2
60	1
64.5	1
	<u>22</u>

Mean 51.7

S.D. 5.58

S.D.M. 1.18

42	1
42.5	1
45.5	1
48.5	2
52.5	2
60	2
61.5	5
63.5	2
65.5	1
67	1
69	1
71	1
75	2
	<u>22</u>

Mean 59.5

S.D. 9.5

S.D.M. 2.25

D. 7.8

TABLE XXV b

Juniors - Two Year Interval

I.T. - Frequency

34.5	1
35	3
37.5	1
40	2
40.5	1
41	2
41.5	1
42	1
42.5	4
44	2
45.5	4
46	2
46.5	4
47	1
47.5	2
48	2
48.5	2
50	1
50.5	2
51.5	2
52	2
52.5	1
54	1
54.5	2
55	1
55.5	1
56	2
56.5	3
58	2
58.5	1
60	3
61	1
62.5	3
63.5	2
64.5	1
65.5	2

68

Mean 50.1
S.D. 8.25
S.D.M. 1.00

R.T. - Frequency

35	1
40	1
44	1
45.5	1
46	1
46.5	4
47	2
48	2
48.5	2
50	1
50.5	5
51	1
51.5	1
52.5	4
53	1
54.5	5
56	4
58	3
59.5	1
60	4
61	1
61.5	3
62	2
63.5	3
65.5	3
67	2
69	2
71	1
73	1
74	1
78	1
80	1
82	1
84	1

68

Mean 57.23
S.D. 9.9
S.D.M. 1.2

D. 7.13

TABLE XXVI

Sophomore Retest Scores

Tc - Frequency	Tc - Frequency	Tc - Frequency
28 - - - 1	48.5 - -13	63.5 - - 7
34.5 - - 1	50 - - - 9	64 - - - 1
35 - - - 1	50.5 - -12	65.5 - - 6
36.5 - - 1	51 - - - 1	67 - - - 5
37.5 - - 2	51.5 - - 7	67.5 - - 1
38.5 - - 3	52.5 - - 9	68 - - - 3
40 - - - 2	53 - - - 5	69 - - - 7
40.5 - - 5	54.5 - -18	71 - - - 6
42 - - - 2	56 - - -17	72 - - - 1
42.5 - - 4	58 - - -18	73 - - - 4
44 - - - 6	59.5 - - 4	74.5 - - 2
44.5 - - 1	60 - - -19	75 - - - 3
45.5 - - 4	61.5 - -12	78 - - - 1
46.5 - - 7	61 - - - 4	
47 - - - 5	62.5 - - 9	
		<hr/> 249
Mean 55.74	S.D. 9.04	S.D.M. .57

TABLE XXVI a

Sophomores - Three Year Interval

Initial Tc - Frequency	Retest Tc - Frequency
37 1	38.5 2
38.5 1	42.5 2
39 1	45.5 1
40.5 1	47 2
41 1	48.5 1
42 1	50 1
43 1	51 1
48 1	52.5 1
49 1	56 1
49.5 1	58 1
51 1	61 1
54 1	61.5 1
54.5 1	63.5 1
55 1	75 2
55.5 1	<hr/> 18
61 1	
62 1	Mean I.T. 49.33
67.5 1	Mean R.T. 52.97
<hr/> 18	S.D. - - - 8.71
	S.D. - - -10.67
	S.D.M. - - 2.05
	S.D.M. - - 2.51

TABLE XXVI b

Sophomores - Two Year Interval

Initial Tc - Frequency Retest Tc - Frequency

36.5	1	42	1
38.5	1	44	1
40	1	45.5	1
40.5	1	46.5	1
41	1	48.5	6
41.5	1	50	2
42	1	50.5	2
42.5	2	52.5	1
43.5	1	54.5	2
44	1	56	3
45.5	1	58	1
46	1	60	3
46.5	1	67	1
47.5	1	69	1
48.5	1	71	1
49	2	73	1
50	1		<hr/>
51	1		28
51.5	1		
53	1		
54.5	1		
55	1		
56	1		
56.5	1		
62	1		
62.5	1		
	<hr/>		
	28		

Mean I.T. 47.73

S.D. 6.72

S.D.M. 1.27

Mean R.T. 54.2

S.D. 7.99

S.D.M. 1.51

D. 6.4

TABLE XXVI c

Sophomores - One Year Interval

Initial Tc - Frequency Retest Tc - Frequency

16	1
29	1
29.5	1
32	3
34.5	4
35	3
36.5	7
37.5	2
38.5	7
40	6
40.5	4
42	3
42.5	9
44	14
45.5	7
46.5	6
47	7
48.5	19
50	9
50.5	6
51.5	8
52.5	6
53	14
54.5	13
56	14
58	7
59.5	2
60	3
61	4
61.5	3
62.5	2
63.5	1
65.5	3
67	2
71	1
	<u>203</u>

Mean I.T. 48.55

S.D. 8.48

S.D.M. .59

Mean R.T. 56.2

S.D. 8.95

S.D.M. .628

28	1
34.5	1
35	1
36.5	1
37.5	2
38.5	1
40	2
40.5	5
42	1
42.5	2
44	5
44.5	1
45.5	2
46.5	6
47	3
48.5	6
50	6
50.5	10
51.5	7
52.5	7
53	5
54.5	16
56	13
58	16
59.5	4
60	16
61	3
61.5	11
62.5	9
63.5	6
64	1
65.5	6
67	4
67.5	1
68	3
69	6
71	5
72	1
73	3
74.5	2
75	1
78	1
	<u>203</u>

D. 7.65

TABLE XXVII

Ninety Hour Group - Seniors - Three Year Interval

I.T.Scores - Frequency

R.T.Scores - Frequency

34.5	1
38	1
39	3
40	2
40.5	4
41	1
42	1
42.5	2
43	2
44	2
44.5	2
45	2
46	2
46.5	2
47	2
47.5	1
48.5	4
49	2
49.5	2
50	4
50.5	4
51	1
51.5	3
52.5	4
53	6
53.5	1
55	2
55.5	5
56	1
56.5	1
57	2
57.5	3
58.5	2
59	1
59.5	2
60	1
60.5	1
61	1
61.5	2
62.5	1
64	1
67	1
68	1
77	1
Total	<hr/> 90

28	1
32.5	1
37.5	1
42	3
44	2
46.5	4
48.5	4
50.5	3
52.5	9
54.5	4
56	6
58	13
60	10
61.5	7
63.5	6
65.5	2
69	4
71	2
73	1
75	3
78	1
80	2
82	1
Total	<hr/> 90

Mean R.T. 57.8

S.D. 9.56

S.D.M. 1.007

Mean I.T. 50.9

S.D. 7.6

S.D.M. .8

D. 6.9

S.D.D. 1.28

E.C. 1.93

TABLE XXVIII

Group with Sixty Hours between I.T. and R.T.

I.T. Scores - Frequency

R.T. Scores - Frequency

34.5	1
35	3
37	1
37.5	1
39.5	1
40	2
40.5	1
41	2
41.5	1
42	2
42.5	4
44	4
45.5	5
46	4
46.5	5
47	2
47.5	3
48	3
48.5	2
49	2
50	5
50.5	3
51	1
51.5	3
52	2
52.5	3
53	1
54	2
54.5	3
55	2
55.5	1
56	2
56.5	5
57	1
57.5	4
58	2
58.5	2
59.5	1
60	6
61	1
62.5	3
63.5	2
64.5	2
65	1
65.5	3
66	1
<hr/>	
111	

35	1
40	1
42	1
42.5	1
44	1
45.5	3
46	1
46.5	7
47	2
48	2
48.5	4
50	1
50.5	5
51	1
51.5	1
52.5	7
53	1
54.5	7
56	4
58	4
59.5	1
60	6
61	1
61.5	9
62	2
63.5	8
65.5	8
67	3
69	4
71	3
73	2
74	1
75	2
78	2
80	2
82	1
84	1
<hr/>	
111	

Mean I.T. 51.09
S.D. 7.78
S.D.M. .738

Mean R.T. 58.47
S.D. 9.97
S.D.M. .94

D. 7.38
S.D.D. 1.14
E.C. 2.32

TABLE XXIX

Group with Thirty Hours between I.T. and R.T.

I.T. - Frequency

I.T. - Frequency

R.T. - Frequency

16 - - - 1
 29 - - - 1
 29.5 - - 2
 32 - - - 3
 34.5 - - 4
 35 - - - 3
 36.5 - - 8
 37 - - - 1
 37.5 - - 3
 38.5 - - 9
 39 - - - 1
 40 - - - 7
 40.5 - - 6
 41 - - - 2
 41.5 - - 1
 42 - - - 5
 42.5 - -12
 43 - - - 1
 43.5 - - 1
 44 - - -17
 45.5 - -12
 46 - - - 1
 46.5 - - 8
 47 - - -10
 47.5 - - 1
 48 - - - 1
 48.5 - -25
 49 - - - 3
 49.5 - - 1
 50 - - -15
 50.5 - - 6

51 - - - 2
 51.5 - -13
 52.5 - - 6
 53 - - -17
 54 - - - 1
 54.5 - -15
 55 - - - 2
 55.5 - - 1
 56 - - -18
 56.5 - - 1
 58 - - -11
 59.5 - - 4
 60 - - - 3
 61 - - - 6
 61.5 - - 3
 62 - - - 2
 62.5 - - 4
 63.5 - - 2
 64 - - - 2
 65.5 - - 3
 67 - - - 3
 67.5 - - 1
 69.5 - - 1
 71 - - - 2
 72.5 - - 1
 295

Mean I.T. 49.27
 S.D. 8.46
 S.D.M. .49

Mean R.T. 56.27
 S.D. 9.135
 S.D.M. .53

28 - - - 1
 34.5 - - 1
 35 - - - 1
 36.5 - - 1
 37.5 - - 2
 38.5 - - 3
 40 - - - 2
 40.5 - - 5
 42 - - - 2
 42.5 - - 5
 44 - - - 7
 44.5 - - 1
 45.5 - - 5
 46.5 - - 7
 47 - - - 5
 48.5 - -13
 50 - - -10
 50.5 - -17
 51 - - - 1
 51.5 - - 9
 52.5 - -12
 53 - - - 5
 54.5 - -24
 56 - - -20
 58 - - -21
 59.5 - - 5
 60 - - -19
 61 - - - 4
 61.5 - -16
 62.5 - - 9
 63.5 - -10
 64 - - - 1
 65.5 - - 8
 67 - - - 6
 67.5 - - 1
 68 - - - 3
 69 - - - 9
 71 - - - 9
 72 - - - 1
 73 - - - 4
 74.5 - - 2
 75 - - - 4
 78 - - - 3
 80 - - - 1
 295

D. 7.00
 S.D.D. .72
 E.C. 3.49

TABLE XXX

Academic Data - 119 Sophomores - One Year Interval

Name No.	Total Hours	Total Cr.Pts.	Gain	Name No.	Total Hours	Total Cr.Pts.	Gain	Name No.	Total Hours	Total Cr.Pts.	Gain
A 2	30	34	13.5	H 10	30	54	1.5	S 9	30	36	7.5
A 7	28	53	7.5	H 12	25	65	6.5	S 10	27	44	3.5
A 10	30	49	3.5	H 14	30	64	7.5	S 20	25	55	4.5
A 9	27	27	10.5	H 21	30	25	21.5	S 21	30	60	3.
A 11	25	35	6.5	H 22	25	55	9.5	S 29	28	53	25.
A 12	28	35	10.5	H 25	29	37	1.5	S 37	30	25	8.
B 3	30	48	7.5	H 30	30	47	6.5	S 39	30	28	3.
B 4	34	61	8.	I 3	29	48	11.	S 41	30	38	4.
B 8	30	59	5.	J 5	28	59	8.	S 52	24	36	9.
B 10	30	49	9.5	K 1	28	44	1.5	S 45	30	83	12.5
B 13	30	71	7.5	K 2	30	50	11.	S 47	30	74	7.5
B 15	30	72	6.	K 6	29	45	9.5	S 50	31	36	2.
B 16	32	57	10.5	K 9	30	27	12.	T 1	25	49	4.
B 18	27	33	2.	K 12	26	43	11.	T 3	29	42	6.5
B 25	30	52	7.5	K 16	30	56	6.5	T 4	30	72	5.
B 36	30	41	6.	L 4	25	26	4.	T 6	30	52	6.
B 37	30	50	4.	L 6	30	47	9.	T 7	28	41	6.
B 33	30	28	4.	L 8	30	57	3.5	T 8	33	55	5.
C 2	30	42	12.5	L 9	30	42	13.	W 1	30	60	16.
C 5	30	70	13.5	L 10	27	34	11.	W 7	25	37	6.
C 11	28	23	7.5	M 1	31	93	0	W 9	30	73	14.5
C 18	30	43	6.5	M 7	30	17	23.5	W 13	30	78	15.
C 20	31	57	6.	M 19	28	52	9.5	W 16	25	42	5.5
C 24	28	62	7.	M 20	30	50	5.	W 17	27	36	7.5
C 29	27	37	8.5	M 21	30	43	4.5	W 25	30	70	9.5
C 30	30	38	9.5	M 22	22	17	0	W 32	30	66	5.
C 36	30	50	13.	M 23	32	58	7.5	W 33	30	73	5.
D 9	28	49	4.5	M 25	24	34	8.5	W 35	30	33	9.
D 12	30	55	1.5	M 38	27	61	4.	W 36	27	31	3.
D 13	30	20	9.	M 39	22	30	6.				
D 14	30	48	4.	M 43	28	33	11.				
E 5	30	45	9.5	M 46	28	39	0				
E 18	30	62	9.5	M 52	30	45	4.				
F 2	28	69	10.	M 60	30	21	4.5				
F 8	30	54	1.5	N 2	30	27	0				
F 14	22	33	16.	N 13	30	38	23.				
F 21	30	62	9.5	N 15	31	76	12.				
F 22	26	28	14	N 17	30	62	7.				
G 1	30	47	9.5	P 4	30	50	7.				
G 5	30	52	4.5	P 7	30	39	10.				
G 9	30	20	10.5	R 2	28	32	9.				
G 11	27	39	6	R 10	27	36	6.				
G 19	30	31	3.	R 15	30	30	8.5				
H 6	35	68	6	R 20	30	52	4.5				
H 9	27	22	7.5	S 1	29	82	2.				

TABLE XXXI

Academic Data - 52 Juniors - Two Year Interval

Name	No.	Tot.Hrs.	Tot.Cr.Pts.	Gain	Name	No.	Tot.Hrs.	Tot.Cr.Pts.	Gain
FB 4		84	146	15.	M 5		63	134	5.
FB 12		64	173	14.	M 8		76	121	6.
FB 13		64	159	2.5	M 11		74	133	9.5
FB 14		68	103	7.	FM 3		67	143	7.5
B 21		55	51	8.	FM 5		60	73	6.5
FB 17		59	95	3.5	FM 9		61	97	2.5
FB 15		60	69	9.	FM 13		69	168	2.
C 9		45	67	7.	N 5		62	90	13.
C 27		63	79	4.	FO 1		45	68	2.5
D 17		61	90	8	O 1		70	107	5.
E 4		74	152	4.5	FP 1		60	98	5.5
E 15		73	156	7.	FP 4		63	96	7.5
G 6		77	108	3.	P 18		53	54	8.
EG 1		58	145	18.5	FR 1		61	113	10.5
G 15		52	50	5.	FR 9		59	87	13.
FH 21		50	40	6	S 40		54	59	7.
H 3		56	58	6.5	FS 11		60	91	6.
H 17		46	32	5.5	FU 1		58	97	9.
FH 23		61	86	4.	FW 2		61	67	6.5
FH 22		56	97	2.	W 8		63	139	19.5
J 1		63	101	9.5	W 11		55	61	12.5
J 3		65	98	6.5	W 12		68	81	7.
K 5		68	109	15.	W 15		52	24	7.5
K 14		50	54	8.	FW 7		60	143	4.
K 17		60	117	15.5	W 29		53	54	5.5
K 18		73	110	13.5	Y 4		72	102	2.5

TABLE XXXII

Academic Data - 68 Seniors - Three Year Interval

Name No. Tot.Hrs. Tot.Cr.Pts. Gain	Name No. Tot.Hrs. Tot.Cr.Pts. Gain
------------------------------------	------------------------------------

B 6	93	141	5.
B 16	97	81	1.
B 27	114	263	3.
B 28	106	174	8.
B 30	105	181	13.5
C 1	105	224	7.5
C 3	107	210	8.
C 15	105	186	13.5
FC 12	86	151	10.
FC 15	90	136	8.
FC 20	91	133	8.
FC 25	77	218	8.5
C 31	106	148	8.5
C 33	103	294	11.5
FD 7	85	186	7.5
E 10	103	148	5.5
E 12	100	97	6.
E 16	115	244	17.
F 5	103	215	5.
F 20	103	206	8.5
G 18	90	78	11.5
G 21	108	207	7.5
FH 4	92	85	6.
H 5	107	223	4.
H 15	107	170	2.5
FH 13	90	112	10.5
H 19	105	194	6.5
H 20	109	152	12.
FH 17	96	206	12.
H 34	80	59	7.5
FH 25	93	225	14.
H 32	106	216	7.
FJ 4	97	194	7.5
J 8	107	187	13.

FK 1	90	152	3.
K 8	97	196	18.5
K 15	102	127	10.
L 2	107	137	9.
L 5	111	140	10.
L 11	83	78	8.
M 28	105	154	3.
M 44	107	306	18.5
M 51	102	150	13.
M 56	105	113	14.
N 4	114	193	10.
N 7	103	168	1.5
N 8	114	244	10.5
O 2	98	133	2.
FP 6	101	187	9.5
P 17	106	149	10.
R 19	109	173	5.
R 21	82	88	4.
S 4	79	90	10.
S 14	99	243	8.
S 15	114	322	16.5
S 17	109	256	16.5
S 19	106	194	10.
S 12	100	132	7.
S 46	111	155	9.
S 51	109	278	2.5
T 12	90	85	7.5
FV 2	81	93	1.
V 3	108	244	14.
W 2	90	242	6.
FW 1	99	147	5.5
W 5	105	132	13.5
W 24	108	232	4.
FW 13	114	64	6.

TABLE XXXIII

Gains Tabulated on Basis of Initial Test

Time Interval	I.T. 30-39.5	I.T. 40-49.5	I.T. 50-59.5	I.T. 60-69.5
1 day	No.- 8 M. Gain 8.37 S.D. 6.15 S.D.M. 2.17	No.- 32 M. Gain 5.32 S.D. 3.5 S.D.M. .62	No.- 40 M. Gain 5.83 S.D. 3.5 S.D.M. .55	No.-23 M. Gain 6.06 S.D. 4.12 S.D.M. .9
1 year	No. - 27 M. Gain 9.66 S.D. 5.88 S.D.M. 1.13	No. - 87 M. Gain 7.75 S.D. 4.5 S.D.M. .48	No. - 97 M. Gain 7.19 S.D. 3.6 S.D.M. .37	No. - 23 M. Gain 7.63 S.D. 3.78 S.D.M. .78
1½ year	No. - 7 M. Gain 9.07 S.D. 4.92 S.D.M. 1.86	No. - 54 M. Gain 6.49 S.D. 4.0 S.D.M. .54	No. - 36 M. Gain 7.0 S.D. 4.0 S.D.M. .67	No. - 4 M. Gain 8.75 S.D. 2.96 S.D.M. 1.48
2 year	No.- 9 M. Gain 8.67 S.D. 4.03 S.D.M. 4.03	No.- 46 M. Gain 7.0 S.D. 3.77 S.D.M. .55	No.- 36 M. Gain 7.38 S.D. 3.6 S.D.M. .60	No.- 16 M. Gain 11.0 S.D. 5.9 S.D.M. 1.47
3 year	No.- 5 M. Gain 9.1 S.D. 3.4 S.D.M. 2.42	No.- 39 M. Gain 7.38 S.D. 4.7 S.D.M. .75	No.- 55 M. Gain 7.72 S.D. 7.4 S.D.M. .56	No.- 13 M. Gain 11.19 S.D. 3.98 S.D.M. 1.1

TABLE XXXIV

Age Means

Age	Interval	I.T.-30's	I.T.-40's	I.T.-50's	I.T.-60's
16	1 year		9.5 No.2	8.8 No.3	
16	2 "			13. No.1	7.0 No.1
16	3 "		5.7 No.2	11.7 No.5	
17	1 year	12.1 No.6	8.7 No.17	7.5 No.20	8.3 No.7
17	2 "	7.7 No.2	8.5 No.8	5.7 No.9	12.1 No.4
17	3 "	6.7 No.2	8.0 No.8	7.0 No.14	11.3 No.4
18	1 year	9.5 No.12	8.2 No.31	8.0 No.35	10.7 No.4
18	2 "	14.0 No.1	6.1 No.24	8.1 No.9	11.5 No.7
18	3 "	16.0 No.1	9.4 No.9	7.7 No.14	11.0 No.4
19	1 year	8.8 No.7	6.7 No.17	6.4 No.16	5.5 No.3
19	2 "	11.5 No.2	6.3 No.5	7.0 No.8	4.5 No.1
19	3 "	9.0 No.2	9.1 No.9	6.7 No.11	15.0 No.1
20	1 year	12.2 No.2	6.8 No.13	7.0 No.9	6.1 No.5
20	2 "	11.7 No.2	8.9 No.5	9.5 No.3	
20	3 "		6.8 No.3	4.7 No.4	9.5 No.1
21	1 year	8.0 No.1	17.8 No.3	6.5 No.6	
21	2 "		10.7 No.2	7.5 No.2	14.0 No.1
21	3 "	0 No.1		3.0 No.1	

TABLE XXXV

One Day Group

Name	No.	I.	Test	-	Gain	Name	No.	I.	Test	-	Gain	Name	No.	I.	Test	-	Gain
FA	3	47	2.5			FF	4	47	10.5			FL	2	45.5	7.5		
FA	4	46	6.			FF	5	45.5	9.			FL	3	60.5	9.5		
FA	5	56	1.			FG	3	52	4.			FL	7	45.5	2.5		
FB	2	38.5	5.			FG	4	39.5	6.5			FM	6	49	10.5		
FB	8	47	9.			FH	2	47	2.5			FM	2	49	7.		
FB	10	43.5	2.5			FH	3	64	2.			FM	4	57	4.		
FB	18	37.5	5.			FH	5	49.5	1.			FM	11	54	8.5		
FB	19	37.5	1.			FH	6	49	5.5			FM	15	59	11.		
FC	2	34	3.5			FH	7	42.5	6.5			FM	17	54	8.5		
FC	3	54	12.			FH	11	37.5	8.5			FM	20	55.5	2.		
FC	4	45.5	9.			FH	15	47	6.			FP	5	55.5	5.5		
FC	5	40.5	6.5			FH	19	59.5	5.			FP	9	54	5.5		
FC	6	54	2			FH	24	47	1.			FP	11	55.5	5.5		
FC	7	53	11.5			FJ	1	52	9.			FR	7	66	0.		
FC	8	67.5	3.5			FJ	2	66	6.			FS	9	52	5.5		
FC	9	43.5	7.5			FJ	3	41.5	6.5			FS	10	61	6.5		
FC	14	50.5	7.			FJ	5	39.5	6.5			FV	4	50.5	4.		
FC	16	39.5	8.5			FJ	8	50.5	5.5			FW	3	51	4.5		
FD	4	39.5	6.5			FO	2	45.5	4.			FW	4	67.5	10.		
FD	3	49	5.5			FK	8	49	5.5			FR	6	42.5	3.		
FL	10	41.5	1.			FK	10	49	10.5								

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TABLE XXXVI

Four Weeks Group

Name	No.	I.	Test	-	Gain	Name	No.	I.	Test	-	Gain	Name	No.	I.	Test	-	Gain
KB	21	48	6.5			KH	7	48	10.			KF	2	44.5	8.		
KD	6	46	2.5			KT	4	46	2.5			KH	3	61	10.		
KB	2	56	4			KG	1	53	8.5			KM	30	44.5	2.		
KP	8	38.5	3.5			KH	22	40.5	8.			KL	8	48	4.5		
KG	8	46	6.5			KE	2	48	13.5			KM	2	48	4.5		
KF	2	44.5	8.			KC	9	64.5	8.5			KS	22	57.5	.5		
KK	13	36.5	12.			KC	1	49.5	8.5			KS	23	54.5	12.5		
KS	7	38.5	1.5			KK	7	49.5	5.			KV	2	59.5	7.5		
KM	17	34	3.5			KD	2	42.5	1.5			KM	15	54.5	5.5		
KA	6	54.5	12.5			KS	16	38.5	5.5			KM	18	56	7.5		
KO	1	46	.5			KC	7	48	2.5			KB	19	56	7.5		
KB	18	40.5	6.			KF	11	59.5	7.5			KM	25	54.5	3.5		
KB	9	54.5	7.			KF	2	48	.5			KS	19	56	7.5		
KB	3	53	5.			KR	3	53	10.5			KV	5	66	14.		
KE	1	67.5	3.5			KS	12	66	12.			KM	21	53	8.5		
KS	1	42.5	6.			KK	8	40.5	10.			KZ	1	61	10.		
KB	13	51	1.5			KM	24	40.5	14.			KV	4	49.5	8.5		
KF	9	40.5	6.			KC	2	51	7.			KS	17	53	7.		
KL	12	38.5	21.5			KH	16	44.5	6.			KM	27	67.5	10.5		
KM	29	49.5	3.			KR	6	49.5	5.			KE	5	42.5	0.		
KH	2	40.5	8.			KK	2	49.5	1.								

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TABLE XXXVII

One Year Group

NameNo.	I.Test	Gain	NameNo.	I.Test	Gain	NameNo.	I.Test	Gain
M 60	47	4.5	KE 4	46.5	8.	D 13	45.5	9.
S 28	45.5	5.	S 39	45.5	3.	KB 7	60	11.
B 37	56	4.	S 43	51.5	12.	W 7	45.5	6.
F 22	38.5	14.	W 21	38.5	12.	M 19	48.5	9.5
S 28	47	3.5	B 12	47	7.5	A 7	48.5	7.5
R 5	44	8.5	R 1	64	5.	KW 6	56	13.
KC 3	37.5	6.5	F 3	50	2.5	KS 10	54	7.
KC 8	37.5	13.	W 10	48.5	9.5	B 15	59.5	6.
L 8	54.5	5.5	KH 12	42	10.5	T 4	54.5	5.
M 20	53	5.	W 1	38.5	16.	K 16	56	6.5
C 10	45.5	9.	B 13	47	7.5	W 16	56	5.5
G 1	40.5	9.5	S 47	50.5	8.	KE 6	54.5	5.5
KB 10	54.5	7.	W 35	47	9.	B 10	56	9.5
W 9	54.5	14.5	H 25	51.5	1.5	N 1	65.5	3.5
C 20	67	6.	C 34	67	4.	R 15	51.5	8.5
H 30	44	6.5	KM 4	42	10.5	N 15	61	12.
M 39	50	6.	M 22	40.5	0.	B 4	50	8.
KH 1	40	10.5	T 14	50	15.5	C 30	51.5	9.5
KS 13	40	4.	T 8	45.5	5.	C 34	67	4.
KS 21	48.5	6.	G 11	48.5	6.	M 52	42.5	4.
KK 10	41	8.5	H 6	48.5	6.			

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TABLE XXXVIII

One Year and One Semester Group

NameNo.	I.Test	Gain	NameNo.	I.Test	Gain	NameNo.	I.Test	Gain
G 20	47	1.5	F 12	47	11.	H 29	45.5	2.5
A 13	46	4.	W 31	45.5	4.5	D 20	59	6.
P 16	56	7.5	M 31	51.5	4.5	T 2	45.5	12.
W 37	38.5	4.	B 41	41	7.5	C 23	50	8.
V 1	47	14.5	I 1	47	3.5	B 14	49.5	6.5
L 15	44	7.5	P 13	65.5	7.5	H 39	57.5	6.5
E 8	36.5	5.5	W 38	49.5	2.	M 26	54.5	7.
L 12	38.5	8.	S 61	48	6.5	P 21	58.5	12.5
F 10	34.5	18.	F 16	42.5	10.	N 10	54.5	9.
Vm 5	54.5	3.5	D 19	39.5	7.5	S 58	55.5	8.5
W 23	45.5	7.	J 10	47	1.5	R 24	56	5.
C 8	40.5	8.	E 24	59.5	1.5	K 20	53.5	7.5
B 11	54.5	5.5	M 66	47	4.5	K 19	56	9.5
R 6	53	7.	F 24	52.5	3.5	D 11	59.5	5.
R 14	68	12.	T 13	62.5	4.5	C 37	52.5	3.5
M 33	42.5	8.	M 14	40.5	6.	B 26	59.5	5.
H 35	51	5.	M 67	39.5	15.	B 6	50	10.
K 23	40	5.5	S 38	50	8.	J 11	51.5	1.
B 35	40.5	8.	M 65	46	5.5	M 68	69.5	11.
M 17	48.5	4	P 1	48.5	15.	K 21	42.5	3.
R 11	42.5	10.	W 30	48.5	11.			

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TABLE XXXIX

Two Year Group

Name	No.	I.	Test	-	Gain	Name	No.	I.	Test	-	Gain	Name	No.	I.	Test	-	Gain
J	4	47	18.5			C	15	47.5	5.			M	30	45.5	9.		
H	17	46	5.5			N	11	45.5	12.5			FB	14	60	7.		
FH	23	56	4.			B	21	52	8.			G	16	45.5	3.		
KU	2	38.5	10.			J	1	41	9.5			Z	2	49	9.		
D	17	46.5	8.			KS	24	47	5.5			FP	4	48.5	7.5		
FM	9	44	2.5			FG	1	63.5	18.5			FW	7	58	4.		
FR	1	37.5	10.5			M	8	50	6.			FB	15	54.5	9.		
KS	11	36.5	10.			KM	14	48.5	7.5			FM	13	60	2.		
I	1	35	0.			C	27	42.5	4.			FP	1	54.5	5.5		
C	9	54	7.			KC	12	36.5	14.			G	6	55	3.		
M	5	45.5	5.			TH	21	46.5	6.			K	13	55.5	13.5		
KH	13	40.5	13.			FB	12	60	14.			K	7	55	14.		
F	6	54	7.5			FM	5	46.5	6.5			TH	22	56	2.		
KF	9	53	7.			KW	3	51.5	9.			FB	17	65.5	3.5		
C	26	65.5	3.5			F	25	65	15.			W	12	52.5	7.		
KW	2	44	16.			N	16	41	6.			KM	9	61	6.		
S	27	51.5	3.			FW	2	40	6.5			N	5	50.5	13.		
K	10	39.5	6.			FL	5	50.5	5.5			T	15	51.5	6.5		
FS	11	40	6.			KK	26	45.5	9.			FM	3	63.5	7.5		
F	7	50	4.5			FB	13	48.5	2.5			W	15	42.5	7.5		
S	40	41.5	7.			L	7	49	5.5								

TABLE XL

Three Year Group

Name	No.	I.	Test	-	Gain	Name	No.	I.	Test	-	Gain	Name	No.	I.	Test	-	Gain
FW	1	47	5.5			E	16	46.5	17.5			KB	17	44	4.5		
H	20	46	12.			KK	11	46	2.5			FB	4	60	15.		
B	28	55.5	8.			H	16	52.5	9.			N	4	44.5	10.		
G	18	39	11.5			FH	17	40.5	11.5			FA	2	48.5	13.		
E	10	47	5.5			F	20	47.5	8.5			TH	4	50	6.		
FH	13	44	10.5			F	5	64	5.			P	3	57.5	9.5		
L	3	37	10.			H	19	49.5	6.5			H	27	54.5	7.		
S	18	38.5	0.			E	33	48.5	11.5			S	15	58.5	16.5		
FJ	4	34.5	7.5			KL	10	43	1.			C	35	54	7.		
FV	2	53.5	1.			S	17	38	16.5			B	30	55.5	13.5		
J	8	45	13.			E	12	46.5	6.			C	3	55.5	8.		
B	9	40.5	8.			K	8	59.5	18.5			FB	6	53	5.		
B	29	55	10.5			KH	15	48	4.5			B	29	55	10.5		
FS	12	53	7.			C	28	52.5	5.5			KS	3	62	13.		
FC	15	67	8.			U	1	64.5	4.5			FM	14	51	9.		
FD	7	43	7.5			H	34	41	7.			FC	25	62.5	9.5		
T	12	50.5	7.5			P	10	40.5	4.5			FC	12	50	10.		
R	21	40	4.			C	17	50.5	9.5			FC	20	50	8.		
O	2	40	2.			C	15	44.5	13.5			FH	25	68	14.		
L	2	49	9.			S	32	49	1.			K	15	42.5	10		
M	56	42	14.			W	26	49	14.5								

TABLE XLI

Alpha scores from Lansing

Initial Test - Frequency	Retest - Frequency
--------------------------	--------------------

0-9	2
10-19	7
20-29	9
30-39	13
40-49	10
50-59	12
60-69	11
70-79	8
80-89	11
90-99	1
100-109	4
110-119	2
120-129	3
130-139	2
140-149	2
	<hr/> 97

Mean - 59.5
S.D. - 32.8
S.D.M. 3.3

0-9	5
10-19	4
20-29	4
30-39	9
40-49	11
50-59	21
60-69	10
70-79	6
80-89	9
90-99	3
100-109	5
110-119	1
120-129	5
130-139	4
	<hr/> 97

Mean - 62.5
S.D. - 32.6
S.D.M. 3.3

TABLE XLII

Alpha Scores from Hutchinson

Initial Test - Frequency	Retest - Frequency
--------------------------	--------------------

0-9	8
10-19	5
20-29	9
30-39	9
40-49	19
50-59	10
60-69	20
70-79	7
80-89	4
90-99	0
100-109	3
110-119	3
120-129	3
130-139	1
140-149	0
150-159	1
160-169	1
170-179	1
	<hr/> 99

Mean - 56.2
S.D. - 35.6
S.D.M. 3.57

0-9	1
10-19	4
20-29	10
30-39	7
40-49	14
50-59	10
60-69	12
70-79	15
80-89	7
90-99	9
100-109	1
110-119	2
120-129	1
130-139	3
140-149	0
150-159	2
160-169	1
	<hr/> 99

Mean - 64.5
S.D. - 34.0
S.D.M. 3.41

TOTAL GROUP - 1431

INITIAL SCORES & AGES

CHART A

	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total
21						1				1							2
25.5						1	2				1						4
29.5					3	2	4	1				1					11
32.5			2	4	11	6	2	3	1	1		1				1	32
35		2	3	12	17	7	5	2		1	1						50
37.5			5	22	15	12	8	4		1	2	2				1	72
40		1	10	32	31	9	9	3	4	5			1				105
42		1	7	27	21	19	12	7	3		1		1		1	1	101
44			11	22	22	14	15	9	4	2		1	1				101
46.5		2	11	27	30	20	15	9	3	2			1	1		1	122
48.5		1	15	22	19	17	12	7	5	2	1			1			102
50.5		2	12	22	20	12	6	11	8	2			1			2	98
52.5		1	12	36	16	15	12	1	5	2	1					1	102
54.5		1	13	29	17	20	20	6	2	4		1		2	1	1	117
56		2	10	28	19	15	7	2	2	2	3		1			2	93
58			11	21	18	16	7	3	2		2	1					81
60	1	1	8	6	14	8	12	3	1	5	3					1	63
61.5			9	7	5	7	3	2	2		2				1	1	39
63.5			3	3	8	9	4	4	3						2		36
65.5			3	4	9	2	1	3	2		1		1			3	29
67		1	1	1	5	7	1	1	2	1		1					21
69		1	1	2	3	7	1	1		1							17
71			2	3		2	1		1	1	2						12
73				3	2	4		1	1								11
75					2			1	1		1						5
78	1		1														2
80			1		1	1											3
total	2	16	151	333	308	233	159	84	52	33	21	8	7	4	5	15	1431
Mean	69	50.6	51.5	49.0	48.8	50.8	48.8	49.6	52.6	49.9	54.6	44.8	49.2	51	57	53.2	

FRESHMEN - FALL 1928

INITIAL SCORES & AGES

CHART B

	15	16	17	18	19	20	21	22	23	24	25	26	27	28	30	Total
						1										1
5.5						1	2									3
9.5					2	2	4	1				1				10
2.5			2	4	10	3	2	2	1							24
6		2	3	11	17	6	4	2								45
7.5			5	21	9	9	5	2			1					52
0		1	8	31	26	7	4		1				1			79
2		1	7	25	15	7	7	3	1				1			67
4			11	22	21	10		4					1			69
6.5		2	10	24	24	14	8	5	1	1						89
8.5		1	15	20	15	11	5	3	1		1			1		73
0.5		2	12	20	13	1	2	2	1	1					1	55
2.5		1	12	28	9	5	6		1							62
4.5		1	11	23	9	4	6	2	2					1		59
6		2	10	25	10	2	3		1	1						54
8			9	18	7	3	1	2								40
0	1	1	7	6	4	3	4			2						28
1.5			9	5	3	1	1				1				1	21
3.5			3	3	4	3	1	1	1							16
5.5			3	1	1	1		1							1	8
7		1	1	1	3					1						7
9		1	1	1	2					1						6
1			1	1			1									3
3						1										1
8	1		1													2
0			1													1
Total	2	16	142	290	204	95	66	30	11	7	3	1	3	2	3	875
Mean	69	50.6	51.3	48.1	46.2	45.6	45.9	45.8	49.2	58.4	49.2	29.5	42	51.5	59.2	

S.D.

INITIAL SCORES & NO. OF TEACHERS IN HIGH SCHOOL

CHART C

	25 or more	24 - 15	14 - 10	9 - 5	4 - 1	Total
21	1					1
25.5	1			1		2
29.5	2			1		3
32.5	5					5
35	12		1	3		16
37.5	7	5	3	5	1	21
40	18	5	3	9	2	37
42	12	1	1	5	5	24
44	16	1	6	4	5	32
46.5	13	3	6	8	3	33
48.5	11	2	7	4	3	27
50.5	10	3	4	6	1	24
52.5	9	4	7	7	3	30
54.5	18	4	3	3	5	33
56	8	7	4	4	4	27
58	8	2	3	4	1	18
60	11	2	2	2		17
61.5	6	1	1		1	9
63.5	1		1	2	1	5
65.5		1			1	2
67		2		1		3
69	1			1		2
71	1	1	1			3
73		1				1
78	1					1
80			1			1
Total	172	45	54	70	36	377
Mean	47.6	51.6	50.3	47.6	49.6	

INITIAL SCORES & SCIENCE UNITS

r=.037

CHART D

	0	1	1.5	2	2.5	3	3.5	4	5	Total
				2						2
.5		1				1				2
.5					2	1				3
.5		1	2	5	2	4		1		8
		5	1	5	2	4		1		18
.5		6	2	5	2	4		1		24
	2	10	2	11	5	3	4	1		38
		9	1	7	4	3	2			26
		8	3	12	7	6	2	1	1	40
.5		15	2	10	2	5		1		35
.5		7	2	9	1	8	2	1		30
.5		4	5	9	3	2	4			27
.5	2	14	4	5	3	9		1		38
.5	1	12	1	9	4	3	4	3		37
		6	2	12	3	5	1	3		32
		6	3	6	1	4	1			21
		6		9	2	2	1			20
.5		3	1	1	1	3	2	1		12
.5		1		1		2	1			5
.5		1		2			1	1		5
		1			1		1			3
		1		2						3
				1		1	1			3
					1					1
						1				1
							1			1
total	5	117	31	120	50	70	27	14	1	435

INITIAL SCORES & ENGLISH UNITS

 $r = .03$

CHART E

	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	Total
21		1		1							2
25.5		1					1				2
29.5		1	1	1							3
32.5		4	2	2							8
35		6	2	9	1						18
37.5		6	3	10	2	3					24
40		12	1	23	2						38
42		8	5	12	1						26
44		14	2	19	4			1			40
46.5		14	1	15	2	2	1				35
48.5		11		18		1					30
50.5		12	2	11	1	1					27
52.5		12		20	2		2		2		38
54.5		14	2	16	4	1					37
56		12	5	13	1		1				32
58	1	6	1	9	2	2					21
60		4	2	12	1	1					20
61.5		4	2	5		1					12
63.5		4		1							5
65.5		2		3							5
67		2		1							3
69				2		1					3
71		1		1		1					3
73				1							1
78				1							1
80				1							1
Total	1	151	31	207	23	14	5	1	2		435

INITIAL SCORES & HISTORY UNITS

 $r = -.156$

CHART F

	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	Total
21					1	1						2
25.5				1		1						2
29.5						1	1		1			3
32.5		1	1	2		2	2					8
35			3	5	1	3	5		1			18
37.5		1	2	1	9	5	2	2	1	1		24
40	2		3	7	10	6	5	3	2			38
42			7	5	6	3	5					26
44	1		2	5	13	6	8	2	3			40
46.5			8	6	14	4		2			1	35
48.5		1	6	7	6	4	6					30
50.5		1	9	2	6	4	2		2	1		27
52.5	2	4	8	4	10	7	1	1	1			38
54.5	2	2	5	8	11	5	3		1			37
56		2	8	3	7	5	2	2				32
58	2		2	1	7	2	2	3	2			21
60	1		2	5	3	2	1	2				20
61.5	2		3	1	2	3	1					12
63.5			2		3							5
65.5	1				3	1						5
67			1			1	1					3
69			1		2							3
71		1				2						3
73			1									1
78						1						1
80					1							1
Total	13	13	74	63	122	69	47	17	14	2	1	435

INITIAL SCORES & VOCATION UNITS

 $r = -.15$

CHART G

	0	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	9	Total
21				1				1										2
25.5										1					1			2
29.5		1				1		1										3
32.5						1	2	1		1	2	1						8
35				1	1	4	1	2	3		1	2	2	1				18
37.5	1	2		3		3	2	3	1	1	5	2	1					24
40		2		4	3	3	7	1	4	2	4	4	1	1		1	1	38
42			2	2	5	3	1	2	1	2	2	4		2				26
44	3	5	3	4		5	4	5	4	4	1			2				40
46.5	2		1	4	1	4	6	5	3	4	3	1		1				35
48.5	3		2	3		2	5	6	2	1	2	3			1			30
50.5	2	2	3	1	3		3	3	2	4	2	1				1		27
52.5	1	5		2	2	3	2	6	7	2	4	2			1		1	38
54.5	3	2		3	4	7	2	4	4	1	4	3						37
56		4	4	3	3	3	2	3	3		4	2				1		32
58	1	2	1	2	2		5	1	1	2	2			1			1	21
60	1	4		2	6	2		1	1	2						1		20
61.5		1	2	3		2	3	1										12
63.5		1				1		1			1			1				5
65.5	2	1			1					1								5
67						1			2									3
69			1	1	1													3
71		1			1		1											3
73									1									1
78			1															1
80	1																	1
Total	20	33	20	39	33	45	46	47	39	28	37	25	4	9	3	4	3	435

INITIAL SCORES & MATHEMATICS UNITS

 $r = .268$

CHART H

	0	1	2	2.5	3	3.5	4	5	Total
21			1		1				2
25.5			1	1					2
29.5		1	1	1					3
32.5		1	6	1					8
35		2	12	3	1				18
37.5		1	16	3	2	1	1		24
40		2	18	10	6	1	1		38
42		2	16	3	4	1			26
44			22	9	6	1	2		40
46.5			18	2	12	2	1		35
48.5			10	5	14	1			30
50.5	1	1	10	3	11	1			27
52.5			25	6	3	4			38
54.5		2	12	10	12	1			37
56			12	3	11	3	2	1	32
58			11	2	6	2			21
60			7	4	5	3	1		20
61.5			3	2	5	1	1		12
63.5			1	3	1				5
65.5			1	1	1		2		5
67			2			1			3
69			1		2				3
71					2	1			3
73			1						1
78					1				1
80					1				1
Total	1	12	207	72	107	24	11	1	435

INITIAL SCORES & LANGUAGE UNITS

r = .329

CHART J

	0	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	Total
21	1			1									2
25.5	2												2
29.5	1			2									3
32.5	2	3		1		1		1					8
35	8	2		6				2					18
37.5	6	7		9		2							24
40	10	10		10		6		1			1		38
42	4	8		9		3		2					26
44	6	10		14		6	1	2				1	40
46.5	2	9		11		12		1					35
48.5	2	3		16		4		4				1	30
50.5	4	2		10		7		2		1		1	27
52.5	1	1	1	16		13		6					38
54.5	3	7		10		11		5		1			37
56	1	4		12		5		7		1		2	32
58	2	1		9	1	5		2	1				21
60	2			4		7		5	1			1	20
61.5	2			7		2				1			12
63.5		2		1		1		1					5
65.5	3			1						1			5
67				2		1							3
69						1		1		1			3
71		1				1		1					3
73				1									1
78										1			1
80				1									1
Total	62	70	1	153	1	88	1	43	2	7	1	6	435

CHART K

Time Intervals and Gains

Interval	Number	Mean Gain	S.D.D.	Corrected for Practice
One Day	113	5.15	1.27	
Four Weeks	118	5.53	1.3	
One Semester	47	3.58	1.62	
One Year	249	7.3	.78	2.3
Three Sem.	115	5.87	1.05	
Two Years	117	7.08	1.14	2.58
Five Semesters	20	3.58	1.87	
Three Years	130	6.58	1.1	3.08

NAME LIST - One Day Interval

Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
FA-3	f	18	Fr.	1929	1928	122	139	47.0	49.5
FA-4	f	19	"	1928	1929	110	152	46.0	52.0
FA-5	m	18	"	1928	1929	178	180	56.0	57.0
FB-1	f	19	"	1929	1928	157	124	52.0	48.0
FB-2	m	20	"	1928	1929	74	104	38.5	43.5
FB-8	m	18	"	1929	1928	126	178	47.0	56.0
FB-9	m	22	"	1929	1928	47	70	29.5	38.5
FB-10	f	17	"	1929	1928	109	114	43.5	46.0
FB-18	f	19	"	1929	1928	78	92	37.5	42.5
FB-19	f	19	"	1929	1928	77	74	37.5	38.5
FC-1	f	22	"	1928	1929	58	77	34.0	37.5
FC-3	m	19	"	1929	1928	163	231	54.0	66.0
FC-4	m	19	"	1929	1928	114	166	45.5	54.5
FC-5	f	17	"	1928	1929	85	126	40.5	47.0
FC-6	f	18	"	1929	1928	160	177	54.0	56.0
FC-7	m	19	"	1929	1928	158	220	52.0	64.5
FC-8	f	17	"	1928	1929	249	263	67.5	71.0
FC-9	f	19	"	1929	1928	103	143	43.5	51.0
FC-14	m	19	"	1929	1928	146	185	50.5	57.5
FC-16	f	20	"	1929	1928	82	129	39.5	48.0
FC-17	f	18	"	1929	1928	50	75	32.5	38.5
FC-19	f	19	"	1928	1929	60	107	36.5	43.5
FC-22	f	18	"	1929	1928	74	61	37.0	36.5
FD-1	m	20	"	1928	1929	140	142	51.0	50.5
FD-3	m	18	"	1929	1928	130	163	49.0	54.5
FD-4	f	19	"	1929	1928	84	112	39.5	46.0
FD-9	m	19	"	1929	1928	59	101	32.5	44.5
FE-1	m	18	"	1929	1928	68	110	35.0	46.0
FE-1	f	18	"	1928	1929	52	84	34.0	39.5
FE-2	f	18	"	1929	1928	48	84	29.5	40.5
FE-3	f	18	"	1929	1928	80	91	39.5	42.5
FE-4	m	18	"	1929	1928	125	180	47.0	57.5
FE-5	m	18	"	1929	1928	115	163	45.5	54.5
FE-6	f	18	"	1928	1929	268	270	72.0	73.5
FG-3	f	18	"	1929	1928	152	170	52.0	56.0
FG-4	f	17	"	1929	1928	86	110	39.5	46.0
FH-2	m	21	"	1929	1928	123	135	47.0	49.5
FH-3	m	19	"	1929	1928	220	236	64.0	66.0
FH-5	f	19	"	1928	1929	131	141	49.5	50.5
FH-6	m	18	"	1929	1928	134	168	49.0	54.5
FH-7	m	21	"	1928	1929	96	137	42.5	49.0
FH-8	m	18	"	1929	1928	68	124	35.0	48.0
FH-9	f	18	"	1928	1929	110	138	46.0	49.0

NAME LIST - One Day Interval

Name No1	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
FH-11	f	17	Fr.	1929	1928	76	112	37.5	46.0
FH-12	m	19	"	1929	1928	49	65	29.5	36.5
FH-15	f	17	"	1929	1928	122	154	47.0	53.0
FH-19	f	17	"	1928	1928	194	227	59.5	64.5
FH-20	f	20	"	1929	1928	64	85	35.0	40.5
FH-24	m	18	"	1929	1928	128	124	47.0	48.0
FJ-1	m	18	"	1929	1928	156	205	52.0	61.0
FJ-2	m	16	"	1929	1928	234	262	66.0	72.0
FJ-3	f	18	"	1929	1928	99	126	41.5	48.0
FJ-5	m	18	"	1929	1928	80	110	39.5	46.0
FJ-8	f	19	"	1929	1928	149	175	50.5	56.0
FJ-9	f	18	"	1928	1929	82	53	40.5	32.5
FJ-10	m	25	"	1928	1929	77	102	38.5	43.5
FK-4	f	17	"	1929	1928	112	163	45.5	54.5
FK-6	f	19	"	1929	1928	32	53	26.0	34.0
FK-7	f	21	"	1928	1929	32	52	28.0	29.0
FK-8	m	18	"	1929	1928	138	165	59.0	54.5
FK-10	f	21	"	1929	1928	137	197	49.0	59.5
FL-2	f	17	"	1929	1928	119	157	45.5	53.0
FL-3	f	17	"	1929	1928	200	250	60.5	70.0
FL-7	m	18	"	1929	1928	114	122	45.5	48.0
FL-8	f	19	"	1929	1928	80	68	39.5	36.5
FL-10	f	19	"	1929	1928	92	97	41.5	42.5
FM-1	f	19	"	1929	1928	61	85	35.0	40.5
FM-2	f	17	"	1929	1928	139	171	49.0	56.0
FM-4	f	19	"	1929	1928	184	207	57.0	61.0
FM-6	f	17	"	1929	1928	138	192	49.0	59.5
FM-8	f	18	"	1929	1928	110	121	45.5	48.0
FM-11	f	17	"	1929	1928	163	211	54.0	62.5
FM-15	f	18	"	1929	1928	191	257	59.0	70.0
FM-17	m	17	"	1929	1928	165	214	54.0	62.5
FM-18	f	21	"	1929	1928	94	126	41.5	48.0
FM-19	m	20	"	1929	1928	68	99	35.0	42.5
FM-20	m	18	"	1929	1928	173	186	55.5	57.5
FN-2	f	20	"	1929	1928	58	88	32.5	40.5
FN-3	f	19	"	1929	1928	96	119	41.5	46.0
FO-2	m	19	"	1929	1928	110	139	45.5	49.5
FO-3	m	19	"	1929	1928	75	82	37.5	40.5
FP-2	f	18	"	1929	1928	90	97	41.5	42.5
FP-3	m	18	"	1928	1929	94	115	42.5	45.5
FP-5	m	18	"	1929	1928	178	209	55.5	61.0

NAME LIST - One Day Interval

Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
FP-7	f	18	Fr.	1928	1929	82	90	40.5	41.5
FP-8	m	18	"	1928	1929	108	104	44.5	43.5
FP-9	m	19	"	1929	1928	164	199	54.0	59.5
FP-10	f	17	"	1929	1928	63	68	35.0	36.5
FP-11	f	18	"	1929	1928	172	206	55.5	61.0
FR-4	m	18	"	1929	1928	95	165	41.5	54.5
FR-5	m	20	"	1929	1928	107	98	43.5	42.5
FR-6	f	18	"	1928	1929	92	117	42.5	45.5
FR-7	m	17	"	1929	1928	232	231	66.0	66.0
FR-8	m	18	"	1929	1928	117	94	45.5	42.5
FS-1	m	21	"	1929	1928	39	33	26.0	28.0
FS-2	f	20	"	1929	1928	78	87	37.5	40.5
FS-4	m	19	"	1929	1928	186	172	57.0	56.0
FS-6	f	18	"	1928	1929	79	97	38.5	41.5
FS-7	m	20	"	1929	1928	58	65	32.5	36.5
FS-8	m	18	"	1928	1929	41	80	31.0	39.5
FS-9	f	18	"	1929	1928	153	183	52.0	57.5
FS-10	f	17	"	1928	1929	208	241	61.0	67.5
FT-1	f	18	"	1928	1929	93	139	42.5	49.0
FT-2	m	21	"	1929	1928	84	120	39.5	48.0
FV-3	f	19	"	1928	1929	81	86	40.5	39.5
FV-4	m	18	"	1929	1928	146	160	50.5	54.5
FW-3	f	18	"	1928	1929	144	177	51.0	55.5
FW-4	f	16	"	1929	1928	247	291	67.5	77.5
FW-5	m	19	"	1929	1928	79	125	37.5	48.0
FW-6	m	18	"	1929	1928	79	108	37.5	44.5
FW-11	m	19	"	1929	1928	103	151	43.5	53.0
FW-12	f	17	"	1928	1929	113	139	46.0	49.0
FY-1	m	18	"	1929	1928	104	112	43.5	46.0

NAME LIST - Four Weeks Interval

Name No.	Sex	Age	Class. at R.%. I.T.	Forms		Raw Score		Tc Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
KA-2	f	23	Jr.	1928	1927	200	188	61.0	61.5
KA-5	m	20	Fr.	1928	1927	187	167	57.5	58.0
KA-6	f	18	"	1928	1927	168	212	54.5	67.0
KA-7	f	20	Jr.	1928	1927	236	240	66.0	73.0
KA-9	f	19	Fr.	1928	1927	31	51	28.0	35.0
KB-2	m	17	"	1928	1927	178	199	56.0	60.0
KB-3	m	19	"	1928	1927	154	168	53.0	58.0
KB-9	f	17	"	1928	1927	166	189	54.5	61.5
KB-13	m	20	Jr.	1928	1927	144	134	51.0	52.5
KB-14	f	21	"	1928	1927	221	240	64.5	73.0
KB-16	f	20	"	1928	1927	180	185	57.5	61.5
KB-18	f	19	Soph.	1928	1927	86	109	40.5	46.5
KB-19	f	20	Fr.	1928	1927	175	191	56.0	63.5
KB-21	m	24	"	1928	1927	125	141	48.0	54.5
KB-22	f	19	Soph.	1928	1927	191	171	59.5	60.0
KB-23	f	19	"	1928	1927	188	171	57.5	60.0
KB-24	m	18	Fr.	1928	1927	279	309	74.0	84.0
KC-1	m	19	Soph.	1928	1927	138	163	49.5	58.0
KC-2	f	20	Jr.	1928	1927	147	166	51.0	58.0
KC-6	f	19	Soph.	1928	1927	193	185	59.5	61.5
KC-7	m	19	Jr.	1928	1927	124	123	48.0	50.5
KC-9	f	17	Fr.	1928	1927	229	248	64.5	73.0
KC-11	m	19	"	1928	1927	184	198	57.5	63.5
KC-13	m	18	"	1928	1927	298	311	77.5	86.0
KD-2	m	24	"	1928	1927	97	90	42.5	44.0
KD-4	m	18	"	1928	1927	129	119	48.0	48.5
KD-6	m	22	Soph.	1928	1927	113	116	46.0	48.5
KD-7	m	192	Fr.	1928	1927	83	55	40.5	35.0
KE-1	f	18	"	1928	1927	245	233	67.5	71.0
KE-2	m	19	"	1928	1927	129	180	48.0	61.5
KE-5	m	20	Jr.	1928	1927	99	87	42.5	42.0
KE-7	m	21	Soph.	1928	1927	123	113	48.0	48.5
KF-2	m	19	"	1928	1927	108	130	44.5	52.5
KF-3	f	18	"	1928	1927	179	157	56.0	56.0
KF-4	f	19	"	1928	1927	183	196	57.5	63.5
KF-8	m	22	"	1928	1927	94	75	42.5	40.0
KF-9	f	18	"	1928	1927	83	101	40.5	46.5
KF-11	f	20	Jr.	1928	1927	199	219	59.5	67.0
KG-1	f	18	Fr.	1928	1927	151	133	53.0	61.5
KG-2	m	19	"	1928	1927	269	312	72.0	86.0
KG-8	f	47	"	1928	1927	119	132	46.0	52.5
KG-9	f	16	"	1928	1927	206	199	61.0	63.5
KH-2	m	20	"	1928	1927	80	116	40.5	48.50
KH-3	f	18	"	1928	1927	203	235	61.0	71.0

NAME LIST - Four Weeks Interval

Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
KH-5	f	22	Sr.	1928	1927	205	142	61.0	54.5
KH-7	f	19	Soph.	1928	1927	129	163	48.0	58.0
KH-11	f	17	Fr.	1928	1927	208	211	61.0	67.0
KH-16	f	20	"	1928	1927	111	122	46.0	50.5
KH-19	f	19	Soph.	1928	1927	218	189	62.5	61.5
KH-22	m	19	"	1928	1927	81	115	40.5	48.5
KK-2	m	19	"	1928	1927	131	124	49.5	50.5
KK-7	m	19	Fr.	1928	1927	133	141	49.5	54.5
KK-8	f	19	Soph.	1928	1927	85	124	40.5	50.5
KK-9	m	20	Jr.	1928	1927	196	212	59.5	67.0
KK-13	m	19	Fr.	1928	1927	65	116	36.5	38.5
KL-4	f	18	"	1928	1927	159	151	53.0	56.0
KL-6	m	22	"	1928	1927	173	164	56.0	58.0
KL-7	f	17	"	1928	1927	186	237	57.5	71.0
KL-8	m	17	"	1928	1927	127	138	48.0	52.5
KL-12	m	18	"	1928	1927	176	172	56.0	60.0
KM-2	m	20	Soph.	1928	1927	123	134	48.0	52.5
KM-6	f	18	Fr.	1928	1927	202	183	61.0	61.5
KM-7	f	19	"	1928	1927	159	136	53.0	52.5
KM-8	m	20	"	1928	1927	250	250	70.0	75.0
KM-11	f	18	"	1928	1927	194	217	59.5	67.0
KM-12	f	19	Soph.	1928	1927	66	91	36.5	44.0
KM-13	f	18	"	1928	1927	225	215	64.5	67.0
KM-15	f	20	"	1928	1927	164	179	54.5	60.0
KM-17	m	21	Fr.	1928	1927	59	66	34.0	37.5
KM-18	m	19	Jr.	1928	1927	177	193	56.0	58.5
KM-21	f	18	Soph.	1928	1927	159	187	53.0	61.5
KM-23	f	21	Jr.	1928	1927	217	251	62.5	75.0
KM-24	f	20	"	1928	1927	88	141	40.5	54.5
KM-25	f	36	Sr.	1928	1927	161	163	54.5	58.0
KM-27	m	20	Soph.	1928	1927	244	267	67.5	78.0
KM-29	f	24	Sr.	1928	1927	137	133	49.5	52.5
KM-30	f	19	Soph.	1928	1927	109	107	44.5	46.5
KO-1	m	20	"	1928	1927	116	108	46.0	46.5
KP-1	f	19	Jr.	1928	1927	199	194	59.5	63.5
KP-3	f	21	"	1928	1927	202	185	61.0	61.5
KP-4	f	17	Fr.	1928	1927	219	217	62.5	67.0
KP-5	f	17	"	1928	1927	206	204	61.0	65.5
KP-7	f	20	Jr.	1928	1927	185	167	57.5	58.0
KP-8	m	19	Fr.	1928	1927	72	80	38.5	42.0
KP-11	m	23	Soph.	1928	1927	183	142	57.5	54.5
KP-12	m	18	Fr.	1928	1927	258	312	70.0	86.0
KR-2	m	18	"	1928	1927	251	314	70.0	86.0
KR-3	f	18	"	1928	1927	156	192	53.0	63.5
KR-6	f	19	"	1928	1927	136	146	49.5	54.5
KS-1	m	23	Sr.	1928	1927	94	116	42.5	48.5
KS-2	f	23	Fr.	1928	1927	206	218	61.0	67.0

NAME LIST - Four Weeks Interval

Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
KS-4	m	19	Soph.	1928	1927	202	182	61.0	61.5
KS-5	f	19	Jr.	1928	1927	214	190	62.5	63.5
KS-7	m	24	Fr.	1928	1927	76	77	38.5	40.0
KS-8	f	18	Soph.	1928	1927	216	228	62.5	69.0
KS-9	f	18	"	1928	1927	137	130	49.5	52.5
KS-12	f	18	"	1928	1927	236	266	66.0	78.0
KS-14	m	21	Jr.	1928	1927	135	129	49.5	50.5
KS-15	f	17	Fr.	1928	1927	211	186	62.5	61.5
KS-16	f	18	"	1928	1927	78	92	38.5	44.0
KS-17	f	20	Soph.	1928	1927	154	175	53.0	60.0
KS-19	f	16	Fr.	1928	1927	175	199	56.0	63.5
KS-20	f	17	"	1928	1927	171	208	56.0	65.5
KS-22	f	21	Jr.	1928	1927	185	163	57.5	58.0
KS-23	f	16	Fr.	1928	1927	168	214	54.5	67.0
KS-25	m	21	"	1928	1927	80	63	40.5	37.5
KS-26	f	20	Jr.	1928	1927	179	201	56.0	65.5
KT-3	f	17	Soph.	1928	1927	252	264	70.0	78.0
KT-4	f	21	Jr.	1928	1927	119	116	46.0	48.5
KU-1	f	17	Fr.	1928	1927	61	113	36.5	48.5
KU-3	f	19	Sr.	1928	1927	222	228	64.5	69.0
KV-2	f	19	Soph.	1928	1927	195	218	59.5	67.0
KV-5	m	16	Fr.	1928	1927	232	272	66.0	80.0
KW-1	m	22	Sr.	1928	1927	179	199	56.0	63.5
KW-4	m	18	Fr.	1928	1927	136	166	49.5	58.0
KW-5	m	18	Soph.	1928	1927	176	180	56.0	61.5
KW-8	m	21	"	1928	1927	130	146	49.5	54.5
KW-9	f	20	"	1928	1927	163	155	54.5	56.0
KZ-1	m	18	"	1928	1927	200	234	61.0	71.0

NAME LIST - One Semester Interval

Name No1	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
FA-1	f	18	Fr.	1928	1927	147	138	51.0	52.5
FA96	m	18	"	1928	1927	152	142	53.0	54.5
FB-7	f	18	"	1928	1927	226	195	64.5	63.5
FB-20	f	17	"	1928	1927	84	69	40.5	37.5
FB-21	m	19	"	1928	1927	136	147	49.5	54.5
FC-10	f	20	"	1928	1927	151	141	53.0	54.5
FC-11	f	18	"	1928	1927	141	152	51.0	56.0
FC-13	m	16	"	1928	1927	185	172	57.5	60.0
FC-18	m	20	"	1928	1927	120	141	48.0	54.5
FC-21	f	29	"	1928	1927	82	80	40.5	42.0
FC-22	f	20	"	1928	1927	129	96	48.0	44.0
FC-24	f	19	"	1928	1927	63	74	36.5	40.0
FD-5	m	21	"	1928	1927	168	164	54.5	58.0
FD-6	f	17	"	1928	1927	83	78	40.5	40.0
FD-8	m	18	"	1928	1927	171	168	56.0	58.0
FD-10	m	18	"	1928	1927	114	122	46.0	50.5
FE-2	f	16	"	1928	1927	169	160	54.5	58.0
FG-2	m	18	"	1928	1927	130	140	49.5	54.5
FH-2	f	18	"	1928	1927	122	130	48.0	52.5
FH-10	f	18	"	1928	1927	207	168	60.0	58.0
FH-14	f	17	"	1928	1927	144	189	51.0	61.5
FH-16	f	18	"	1928	1927	78	84	38.5	42.0
FH-18	f	22	"	1928	1927	87	113	40.5	48.5
FJ-6	f	18	"	1928	1927	180	159	57.5	56.0
FJ-7	f	19	"	1928	1927	108	108	44.5	46.5
FK-2	f	18	"	1928	1927	54	77	34.0	40.0
FK-3	f	17	"	1928	1927	38	67	28.0	47.5
FK-5	m	19	"	1928	1927	97	118	42.5	48.5
FK-9	f	18	"	1928	1927	57	104	34.0	46.5
FL-1	f	18	"	1928	1927	179	162	56.0	58.0
FL-4	f	18	"	1928	1927	61	126	36.5	50.5
FL-9	f	18	"	1928	1927	124	130	48.0	52.5
FM-7	m	21	"	1928	1927	139	114	49.5	48.5
FM-12	f	17	"	1928	1927	217	238	62.5	69.0
FM-21	f	20	"	1928	1927	146	141	51.0	54.5
FN-1	m	18	"	1928	1927	123	135	48.0	52.5
FR-2	f	17	"	1928	1927	87	118	40.5	48.5
FR-3	f	19	"	1928	1927	138	126	49.5	50.5
FS-3	f	17	"	1928	1928	183	192	57.5	63.5
FS-5	m	19	"	1928	1927	74	84	38.5	42.0
FS-13	f	18	"	1928	1927	52	57	34.0	35.0
FV-1	f	18	"	1928	1927	157	141	53.0	54.5
FW-8	f	17	"	1928	1927	104	113	44.5	46.5
FW-9	m	20	"	1928	1927	91	113	42.5	46.5
FW-10	f	17	"	1928	1927	97	98	42.5	44.0
FZ-1	f	18	"	1928	1927	111	112	46.0	48.5
FC-1	f	19	"	1928	1927	189	135	57.5	52.5

NAME LIST - One Year Interval

Name No.	Sex	Age	Class.at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
A-2	f	18	Soph.	1926	1926	106	197	42.5	56.0
A-7	f	20	"	1926	1927	140	155	48.5	56.0
A-9	m	17	"	1926	1927	115	146	44.0	54.5
A-10	f	18	"	1926	1927	74	70	36.5	40.0
A-11	f	19	"	1926	1927	113	121	44.0	50.5
A-12	m	18	"	1926	1926	78	135	36.5	47.0
B-1	f	19	Jr.	1926	1926	163	180	51.5	54.5
B-3	m	21	Soph.	1926	1926	133	184	47.0	54.5
B-4	f	18	"	1926	1927	159	162	50.0	58.0
B-8	f	17	"	1926	1927	172	168	53.0	58.0
B-9	m	21	Sr.	1926	1928	217	194	59.5	59.5
B-10	f	17	Soph.	1926	1927	198	203	56.0	65.5
B-13	f	19	"	1926	1926	135	185	47.0	54.5
B-15	m	18	"	1926	1927	213	209	59.5	65.5
B-16	m	17	"	1926	1927	176	196	53.0	63.5
B-18	m	26	"	1926	1928	105	100	42.5	44.5
B-20	f	20	Sr.	1926	1928	193	163	56.0	54.5
B-22	f	17	Soph.	1926	1927	157	186	50.0	61.5
B-23	m	19	Sr.	1926	1927	296	255	71.0	75.0
B-25	f	19	Soph.	1926	1926	115	180	44.0	51.5
B-27	m	22	Sr.	1926	1926	141	168	48.5	51.5
B-32	f	20	"	1926	1927	236	232	62.5	71.0
B-33	f	19	Soph.	1926	1926	72	95	36.5	40.5
B-36	f	19	"	1926	1926	125	168	45.5	51.5
B-37	m	18	"	1926	1927	194	175	56.0	60.0
B-34	f	19	Sr.	1926	1927	200	234	58.0	71.0
C-2	f	21	Soph.	1926	1926	152	234	50.0	62.5
C-5	m	17	"	1926	1926	221	336	61.0	74.5
C-10	f	20	Sr.	1926	1927	127	146	45.5	54.5
C-11	m	18	Soph.	1926	1926	71	119	36.5	44.0
C-12	f	22	Sr.	1926	1927	246	265	64.0	78.0
C-18	f	18	Soph.	1926	1926	190	237	56.0	62.5
C-20	m	17	"	1926	1927	264	249	67.0	73.0
C-24	f	17	"	1926	1926	221	273	61.0	68.0
C-29	m	20	"	1926	1926	59	91	32.0	40.5
C-30	m	17	"	1926	1926	161	226	51.5	61.0
C-34	m	20	Sr.	1926	1927	268	233	67.0	71.0
C-36	m	19	Soph.	1926	1927	208	232	58.0	71.0
D-6	m	20	Sr.	1926	1926	147	160	48.5	51.5
D-8	m	19	Soph.	1926	1927	112	102	44.0	46.5
D-9	f	18	"	1926	1927	153	143	50.0	54.5
D-12	f	19	"	1926	1926	186	193	54.5	56.0
D-13	f	17	"	1926	1926	121	181	45.5	54.5
D-14	m	18	"	1926	1926	72	99	36.5	40.5

NAME LIST - One Year Interval

Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		Tc Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
E-1	f	19	Sr.	1926	1927	284	275	69.5	80.0
E-2	m	18	Jr.	1926	1926	114	191	44.0	56.0
E-5	m	18	Soph.	1926	1926	179	236	53.0	62.5
E-6	f	18	Sr.	1926	1927	168	156	51.5	56.0
E-11	m	20	"	1926	1927	207	183	58.0	61.5
E-18	f	18	Soph.	1926	1927	194	207	56.0	65.5
F-2	f	18	"	1926	1926	226	295	61.0	71.0
F-3	f	20	Sr.	1926	1927	150	133	50.0	52.5
F-4	f	22	"	1926	1927	214	212	59.5	67.0
F-8	m	18	Soph.	1926	1926	144	151	48.5	50.0
F-14	m	19	"	1926	1927	84	144	38.5	54.5
F-21	f	16	"	1926	1926	170	233	53.0	62.5
F-22	m	19	"	1926	1927	81	136	38.5	52.5
G-1	f	17	"	1926	1926	91	152	40.5	50.0
G-2	m	18	Jr.	1926	1926	154	188	50.0	54.5
G-3	m	18	"	1926	1926	155	188	50.0	54.5
G-4	m	21	Sr.	1926	1927	201	192	58.0	63.5
G-5	m	19	Soph.	1926	1926	146	177	48.5	53.0
G-9	f	17	"	1926	1927	114	148	44.0	54.5
G-11	m	20	"	1926	1926	142	184	48.5	54.5
G-19	f	18	"	1926	1926	153	178	50.0	53.0
H-4	f	21	Sr.	1926	1927	158	124	50.0	50.5
H-6	f	18	Soph.	1926	1926	145	186	48.5	54.5
H-9	m	19	"	1926	1926	103	152	42.5	50.0
H-10	f	20	"	1926	1926	142	154	48.5	50.0
H-12	f	19	"	1926	1926	167	207	51.5	58.0
H-13	m	19	Jr.	1926	1926	105	108	42.5	42.5
H-14	f	17	Soph.	1926	1927	193	197	56.0	63.5
H-21	f	17	"	1926	1927	79	168	36.5	58.0
H-22	f	17	"	1926	1926	173	233	53.0	62.5
H-25	f	18	"	1926	1926	160	179	51.5	53.0
H-30	m	17	Soph.	1926	1927	119	121	44.0	50.5
I-3	f	18	"	1926	1926	159	220	50.0	61.0
J-2	m	17	"	1926	1927	147	93	48.5	44.0
J-5	f	18	"	1926	1926	160	212	51.5	59.5
J-6	m	19	Sr.	1926	1926	179	199	53.0	56.0
K-1	m	23	Soph.	1926	1926	174	185	53.0	54.5
K-2	f	30	"	1926	1926	167	234	51.5	62.5
K-4	f	18	"	1926	1927	140	106	48.5	46.5
K-6	m	17	"	1926	1926	157	214	50.0	59.5
K-9	f	18	"	1926	1926	56	113	32.0	44.0

NAME LIST - One Year Interval

Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
K-12	m	17	Soph.	1926	1926	68.0	125	34.5	45.5
K-16	f	19	"	1926	1926	199	234	56.0	62.5
L-4	f	19	"	1926	1926	63	89	34.5	35.0
L-6	m	17	"	1926	1926	258	329	65.5	74.5
L-8	f	18	"	1926	1927	189	179	54.5	60.0
L-9	m	18	"	1926	1927	141	188	48.5	61.5
L-10	m	17	"	1926	1926	160	231	51.5	62.5
M-1	m	17	"	1926	1927	259	203	65.5	65.5
M-2	f	21	Sr.	1926	1927	191	186	56.0	61.5
M-7	m	18	Soph.	1926	1927	126	225	45.5	69.0
M-15	f	19	Sr.	1926	1927	143	122	48.5	50.5
M-16	f	17	"	1926	1927	303	269	72.5	78.0
M-19	m	17	Soph.	1926	1926	143	204	48.5	58.0
M-20	f	15	"	1926	1926	177	205	53.0	58.0
M-21	f	17	"	1926	1926	132	166	47.0	51.5
M-22	m	20	"	1926	1926	90	92	40.5	40.5
M-23	f	19	"	1926	1927	140	156	48.5	56.0
M-25	m	18	"	1926	1926	55	92	32.0	40.5
M-38	f	22	"	1926	1926	262	295	67.0	71.0
M-39	m	20	"	1926	1927	151	157	50.0	56.0
M-41	m	22	"	1926	1928	187	156	54.5	53.0
M-43	f	16	"	1926	1926	95	161	40.5	51.5
M-46	f	17	"	1926	1926	85	83	38.5	38.5
M-52	m	18	"	1926	1927	193	109	42.5	46.5
M-54	f	20	Sr.	1926	1926	135	128	47.0	45.5
M-60	m	19	Soph.	1926	1926	135	167	47.0	51.5
N-1	m	21	Sr.	1926	1926	128	151	45.5	50.0
N-2	m	19	Soph.	1926	1927	185	146	54.5	54.5
N-13	m	18	"	1926	1927	81	182	38.5	61.5
N-15	m	17	"	1926	1927	226	248	61.0	73.0
N-17	m	18	"	1926	1927	173	176	53.0	60.0
P-4	f	19	"	1926	1927	176	177	53.0	60.0
P-7	m	16	"	1926	1926	203	270	58.0	68.0
R-1	f	20	Sr.	1926	1927	246	223	64.0	69.0
R-2	m	18	Soph.	1926	1927	112	172	44.0	53.0
R-5	f	20	Sr.	1926	1927	116	137	44.0	52.5
R-10	f	24	Soph.	1926	1926	62	99	34.5	40.5
R-15	f	18	"	1926	1927	169	174	51.5	60.0
R-20	f	18	"	1926	1926	106	138	42.5	47.0
R-22	m	20	Sr.	1926	1926	168	202	51.5	58.0
R-25	m	18	Soph.	1926	1926	45	93	29.0	44.0
R-27	f	18	"	1925	1926	136	136	42.5	47.0
S-1	m		"	1926	1927	209	170	58.0	60.0
S-9	m	18	"	1926	1926	104	157	42.5	50.0
S-10	f	17	"	1926	1926	190	210	56.0	59.5
S-11	f	20	Sr.	1926	1927	143	205	48.5	65.5

NAME LIST - One Year Interval

Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
S-16	m	19	Soph.	1926	1928	4	38	16.0	28.0
S-20	m	19	"	1926	1926	237	265	62.5	67.0
S-21	f	17	"	1926	1926	137	151	47.0	50.0
S-28	m	18	Jr.	1926	1927	139	124	47.0	50.5
S-29	m	18	Soph.	1926	1926	133	308	47.0	72.0
S-31	f	18	Sr.	1926	1927	203	194	58.0	63.5
S-36	f	18	Soph.	1926	1927	122	87	45.5	42.0
S-37	m	18	"	1926	1927	102	120	42.5	50.5
S-39	f	17	"	1926	1926	126	147	45.5	48.5
S-41	f	18	#	1926	1926	84	109	38.5	42.5
S-43	m	20	Sr.	1926	1927	169	196	51.5	63.5
S-44	f	20	"	1926	1927	197	183	56.0	61.5
S-45	m	18	Soph.	1926	1927	230	255	62.5	75.0
S-47	f	18	"	1926	1926	210	267	59.5	67.0
S-48	f	20	Jr.	1926	1927	125	127	45.5	50.5
S-50	m	18	Soph.	1926	1926	69	78	34.5	36.5
S-52	f	19	"	1926	1926	78	124	36.5	45.5
T-1	f	17	"	1926	1927	104	109	42.5	46.5
T-3	m	17	"	1926	1926	168	204	51.5	58.0
T-4	f	17	"	1926	1926	185	216	54.5	59.5
T-6	f	17	"	1926	1926	200	242	58.0	64.0
T-7	m	19	"	1926	1926	155	192	50.0	56.0
T-8	f	22	"	1926	1928	122	120	45.5	50.5
T-11	m	25	Sr.	1926	1926	220	222	61.0	69.0
T-14	f	18	"	1926	1927	154	208	50.0	65.5
W-1	m	20	Soph.	1926	1927	88	145	38.5	54.5
W-3	m	18	"	1925	1926	40	104	34.5	42.5
W-7	m	18	"	1926	1926	122	167	45.5	51.5
W-9	f	20	"	1926	1927	186	222	54.5	69.0
W-10	f	20	Sr.	1926	1927	141	165	48.5	58.0
W-13	m	18	Soph.	1926	1926	179	277	53.0	68.0
W-14	f	18	Sr.	192 6	1927	178	189	53.0	61.5
W-16	m	20	Soph.	1926	1927	191	187	56.0	61.5
W-17	m	19	"	1926	1926	176	186	53.0	54.5
W-21	m	17	"	1926	1927	88	125	38.5	50.5
W-25	f	18	"	1926	1926	179	234	53.0	62.5
W-32	f	19	"	1926	1926	194	228	56.0	61.0
W-33	f	18	"	1926	1926	179	203	53.0	58.0
W-35	m	18	"	1926	1926	139	196	47.0	56.0
W-36	m	18	"	1926	1927	170	155	53.0	56.0
B-12	f	20	Jr.	1926	1927	135	140	47.0	54.5
H-7	m	23	"	1926	1927	121	131	45.5	52.5

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Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.	T. R.T.	I.T.	R.T.	I.T.	R.T.
KA-1	f	17	Soph.	1927	1927	105	147	46.5	54.5
KB-4	m	20	"	1927	1927	105	139	46.5	52.5
KB-6	f	18	"	1927	1927	110	158	48.5	56.0
KB-7	f	20	"	1927	1927	176	232	60.0	71.0
KB-10	m	16	"	1927	1927	144	180	54.5	61.5
KB-11	f	18	"	1927	1927	95	120	44.0	50.5
KB-12	f	17	"	1927	1927	166	218	58.0	67.0
KB-15	f	17	"	1927	1927	183	220	61.5	69.0
KB-20	m	21	"	1927	1927	113	171	48.5	60.0
KB-25	f	16	"	1927	1927	112	155	48.5	56.0
KC-4	f		"	1927	1927	129	164	50.5	58.0
Kc-8	f	19	"	1927	1927	68	127	37.5	50.5
KC-10	f	17	"	1927	1927	134	156	52.5	56.0
KD-5	m	18	"	1927	1927	183	176	61.5	60.0
KE-4	f	17	"	1927	1927	100	148	46.5	54.5
KE-6	f	18	"	1927	1927	146	178	54.5	60.0
KE-9	f	17	"	1927	1927	157	192	56.0	63.5
KF-1	m	18	"	1927	1927	120	195	50.5	63.5
KF-5	m	18	"	1927	1927	169	216	58.0	67.0
KF-12	f	17	"	1927	1927	105	173	46.5	60.0
KG-3	m	20	"	1927	1927	134	177	52.5	60.0
KG-4	f	19	"	1927	1927	158	210	56.0	67.0
KG-6	f	20	"	1927	1927	196	208	63.5	65.5
KG-7	m	18	"	1927	1927	90	154	44.0	56.0
KH-1	m	18	"	1927	1927	76	127	40.0	50.5
KH-4	m	19	"	1927	1927	112	158	48.5	56.0
KH-6	f	17	"	1927	1927	99	174	44.0	60.0
KH-8	f	19	"	1927	1927	37	65	29.5	37.5
KH-12	m	18	"	1927	1927	81	132	42.0	52.5
KH-14	m	18	"	1927	1927	152	170	56.0	60.0
KH-20	f	17	"	1927	1927	144	199	54.5	63.5
KH-21	m	18	"	1927	1927	129	179	50.5	60.0
KH-23	f	20	"	1927	1927	71	119	40.0	48.5
KJ-1	f	19	"	1927	1927	59	70	35.0	40.0
KK-1	m	24	"	1927	1927	77	172	40.0	60.0
KK-3	m	18	"	1927	1927	137	236	52.5	71.0
KK-4	m	21	"	1927	1927	34	61	29.5	37.5
KK-5	m	17	"	1927	1927	130	160	52.5	58.0
KK-10	f	18	"	1927	1927	77	112	40.0	48.5
KK-12	m	19	"	1927	1927	121	168	50.5	58.0
KL-1	f	19	"	1927	1927	127	169	50.5	58.0
KL-6	f	18	"	1927	1927	130	182	52.5	61.5

NAME LIST - One Year Interval

Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
KL-9	m	22	Soph.	1927	1927	148	180	54.5	61.5
KL-11	m	18	"	1927	1927	152	176	56.0	60.0
KM-1	m	19	"	1927	1927	82	127	42.0	50.5
KM-4	m	18	"	1927	1927	85	137	42.0	52.5
KM-5	m	21	"	1927	1927	128	204	50.5	65.5
KM-10	m	17	"	1927	1927	59	132	35.0	52.5
KM-16	f	18	"	1927	1927	113	107	48.5	46.5
KM-19	m	18	Jr.	1927	1927	186	246	61.5	73.0
KM-22	m	18	Soph.	1927	1927	114	133	48.5	52.5
KM-31	m	17	"	1927	1927	97	164	44.0	58.0
KN-1	m	17	"	1927	1927	200	223	65.5	69.0
KN-2	m	19	"	1927	1927	178	185	60.0	61.5
KP-2	m	17	"	1927	1927	60	110	37.5	48.5
KP-6	m	18	"	1927	1927	136	182	52.5	61.5
KP-9	f	19	"	1927	1927	100	163	46.5	58.0
KP-10	f	17	"	1927	1927	162	182	58.0	61.5
KR-5	f	19	"	1927	1927	75	130	40.0	52.5
KS-10	f	17	"	1927	1927	148	186	54.5	61.5
KS-13	f	18	"	1927	1927	104	112	46.5	48.5
KS-18	f	18	"	1927	1927	77	90	40.0	44.0
KS-21	m	18	"	1927	1927	114	145	48.5	54.5
KT-1	f	18	"	1927	1927	94	102	44.0	46.5
KT-2	m	19	"	1927	1927	114	161	48.5	58.0
KT-7	m	17	"	1927	1927	91	163	44.0	58.0
KT-8	m	17	"	1927	1927	232	261	71.0	78.0
KV-1	m	28	"	1927	1927	140	192	54.5	63.5
KV-3	f	18	"	1927	1927	54	115	35.0	48.5
KV-4	f	18	"	1927	1927	93	121	44.0	50.5
KW-6	m	19	"	1927	1927	156	229	56.0	69.0
KA-4	f	20	Sr.	1927	1927	190	165	63.5	58.0
KC-3	m	26	Jr.	1927	1927	62	98	37.5	44.0
KL-2	m	19	Soph.	1927	1927	170	225	60.0	69.0
KM-28	f	17	Jr.	1927	1927	107	126	46.5	50.5

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Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
A-1	m	18	Soph.	1926	1927	141	125	48.5	50.5
A-4	f	21	"	1925	1927	90	70	43.0	40.0
A-13	m	17	"	1925	1926	81	148	46.0	50.0
B-5	m	21	"	1926	1927	27	54	23.0	35.0
B-6	m	17	"	1926	1927	150	175	50.0	60.0
B-14	m	18	"	1925	1927	109	156	50.0	56.0
B-11	f	19	Sr.	1926	1927	187	178	54.5	60.0
B-26	f	18	Soph.	1926	1927	212	179	59.5	60.0
B-31	f	17	"	1926	1927	205	233	58.0	71.0
B-35	f	18	"	1926	1927	99	110	40.5	48.5
B-40	f	20	Jr.	1925	1926	112	119	47.5	44.0
B-41	m	24	Soph.	1925	1926	60	141	41.0	48.5
C-8	m	24	Sr.	1925	1926	96	114	40.5	48.5
C-22	f	20	Soph.	1926	1927	201	211	58.0	67.0
C-23	m	19	Jr.	1926	1927	155	167	50.0	58.0
C-25	f	17	Soph.	1926	1927	114	63	44.0	37.5
C-37	f	18	"	1925	1926	155	194	52.5	56.0
C-38	f	17	"	1925	1926	117	210	46.5	59.5
C-39	m	17	"	1925	1926	114	126	49.5	45.5
D-2	f	19	"	1926	1927	112	114	44.0	48.5
D-11	m	21	Jr.	1926	1927	215	173	59.5	60.0
D-19	M-	20	Soph.	1926	1926	81	135	39.5	47.0
D-20	f	19	Jr.	1925	1926	182	260	59.0	67.0
D-21	f	18	Soph.	1925	1926	161	241	52.5	64.0
D-22	m	20	"	1925	1926	98	159	49.5	51.5
E-8	f	17	"	1926	1927	78	83	36.5	42.0
E-13	m	19	"	1926	1927	157	212	50.0	67.0
E-17	f	17	"	1926	1927	168	210	51.5	67.0
F-10	f	19	"	1926	1927	67	133	34.5	52.5
F-12	f	18	"	1926	1927	130	162	47.0	58.0
F-16	f	19	"	1926	1927	102	139	42.5	52.5
F-24	m	20	"	1925	1926	126	181	52.5	56.0
G-20	f	18	"	1926	1927	133	113	47.0	48.5
G-22	f	19	Sr.	1926	1927	147	92	48.5	44.0
G-23	f	21	Soph.	1925	1926	141	190	51.5	56.0
G-24	f	17	"	1925	1926	98	129	46.0	45.5
H-29	f	18	"	1926	1927	129	161	45.5	58.0
H-35	f	18	"	1925	1926	142	193	51.0	56.0
H-36	m	18	"	1925	1926	63	89	40.5	38.5
H-37	f	17	"	1925	1926	132	196	48.5	56.0
H-39	f	18	"	1925	1926	172	249	37.5	64.0
I-2	f	18	"	1926	1927	38	64	26.0	37.5
I-4	m	17	"	1926	1927	137	123	47.0	50.5
J-10	m	18	"	1926	1927	135	119	47.0	48.5
J-11	m	19	"	1926	1926	169	136	51.5	52.5
K-19	f	17	"	1926	1926	182	252	56.0	65.5
K-20	m	19	Jr.	1925	1926	117	221	53.5	61.0

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Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
K-21	f	17	Soph.	1925	1926	88	127	42.5	45.5
K-22	f	18	"	1925	1926	102	142	42.5	48.5
K-23	f	17	"	1925	1926	49	124	40.0	45.5
L-1	f	19	"	1926	1927	191	170	56.0	60.0
L-12	f	18	"	1926	1927	85	109	38.5	46.5
L-15	f	17	"	1925	1926	76	165	44.0	51.5
L-16	m	18	"	1925	1926	86	143	45.0	48.5
M-3	f	21	Sr.	1926	1927	151	171	50.0	60.0
M-12	m	18	Soph.	1926	1927	117	142	44.0	54.5
M-14	f	20	"	1926	1927	99	107	40.5	46.5
M-17	f	18	"	1926	1927	146	138	48.5	52.5
M-24	f	20	Sr.	1926	1927	125	75	45.5	40.0
M-26	f	17	Soph.	1926	1927	183	182	54.5	61.5
M-27	f	21	Sr.	1926	1927	200	167	58.0	58.0
M-31	m	18	Soph.	1926	1927	167	154	51.5	56.0
M-33	m	18	"	1926	1927	103	125	42.5	50.5
M-35	m	19	"	1926	1927	117	127	44.0	50.5
M-36	m	17	"	1926	1927	81	59	38.5	35.0
M-40	m	20	"	1926	1927	108	92	42.5	44.0
M-42	m	18	"	1926	1927	109	125	42.5	50.5
M-49	f	19	"	1926	1927	134	114	47.0	48.5
M-64	m	19	"	1925	1926	135	235	56.5	62.5
M-65	f	18	"	1925	1926	104	160	46.0	51.5
M-66	m	18	"	1925	1926	104	168	47.0	51.5
M-67	f	18	"	1925	1926	94	175	39.5	54.5
M-68	f	18	"	1925	1926	222	350	69.5	80.5
N-10	f	19	"	1926	1927	183	198	54.5	63.5
N-11	m	18	"	1926	1927	106	127	42.5	50.5
P-1	m	19	"	1926	1927	141	190	48.5	63.5
P-13	f	16	"	1926	1927	253	246	65.5	73.0
P-16	m	17	"	1926	1927	194	194	56.0	63.5
P-20	m	24	Sr.	1925	1926	81	138	44.5	47.0
P-21	f	16	Soph.	1925	1926	171	290	58.5	71.0
R-6	f	20	Sr.	1926	1927	173	177	53.0	60.0
R-11	f	21	Soph.	1926	1927	101	136	42.5	52.5
R-12	f	18	"	1926	1927	201	220	58.0	69.0
R-13	f	18	"	1926	1927	107	152	42.5	56.0
R-14	m	21	"	1926	1927	274	273	68.0	80.0
R-16	m	18	"	1926	1927	133	137	47.0	52.5
R-24	m	19	Sr.	1926	1927	191	188	56.0	61.0
R-26	f	19	Soph.	1925	1926	106	140	46.5	48.5
S-23	m	19	"	1926	1927	118	106	44.0	46.5
S-24	m	18	"	1926	1927	211	185	59.5	61.0
S-25	f	17	"	1926	1927	119	136	44.0	52.5
S-35	f	17	"	1926	1927	120	97	44.0	45.5
S-38	f	18	"	1926	1927	150	167	50.0	58.0
S-53	f	20	"	1925	1926	138	239	55.5	65.0

NAME LIST - One Year and One Semester Interval

Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		Tc Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
S-55	f	18	Jr.	1925	1926	132	143	48.0	48.5
S-56	m	18	Soph.	1925	1926	78	147	47.5	48.5
S-57	m	18	"	1925	1926	92	138	47.5	45.5
S-58	f	17	"	1925	1926	172	248	55.5	64.0
S-59	m	18	"	1925	1926	92	138	44.0	47.0
S-61	f	22	"	1925	1926	82	186	48.0	54.5
T-2	f	19	"	1926	1927	122	164	45.5	58.0
X-13	m	19	"	1926	1927	234	218	62.5	67.0
U-2	f	18	"	1925	1926	127	143	49.0	48.5
V-1	f	21	"	1926	1927	132	190	47.0	61.5
V-2	f	18	"	1926	1927	134	180	47.0	61.5
V-4	m	18	"	1926	1927	184	164	54.5	58.0
W-27	m	19	"	1926	1927	113	136	44.0	52.5
W-28	f	17	"	1926	1927	120	133	45.5	52.5
W-30	f	17	"	1926	1927	144	171	48.5	60.0
W-31	f	20	"	1926	1927	126	121	45.5	50.5
W-37	m	20	"	1925	1926	46	107	38.5	42.5
W-38	f	18	"	1925	1926	131	165	49.5	51.5
Y-1	m	20	"	1926	1927	110	98	44.0	44.0
Y-5	m	19	"	1925	1926	124	113	49.0	44.0
Y-3	f	18	"	1926	1927	146	152	48.5	56.0

NAME LIST - Two Year Interval

Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
A-6	f	20	Sr.	1925	1927	181	235	58.5	71.0
B-21	m	18	Jr.	1925	1927	146	171	52.0	60.0
B-38	m	20	Sr.	1925	1927	65	131	46.5	52.5
C-9	m	17	Jr.	1925	1926	153	222	54.0	61.0
C-19	m	20	Soph.	1925	1927	98	116	49.0	48.5
C-26	f	18	Sr.	1925	1927	206	222	65.5	69.0
C-27	f	18	Jr.	1925	1927	95	100	42.5	46.5
D-17	f	18	"	1925	1927	198	140	46.5	54.5
E-4	m	19	"	1925	1927	77	106	42.0	46.5
E-15	f	19	"	1925	1927	166	201	58.5	65.5
F-6	f	19	Sr.	1925	1927	154	185	54.0	61.5
F-7	f	17	"	1925	1927	127	145	50.0	54.5
F-9	m	22	"	1925	1927	94	109	47.5	46.5
F-23	f	18	"	1925	1927	214	271	65.0	80.0
G-6	m	17	Jr.	1925	1927	147	165	55.0	58.0
G-8	f	17	Soph.	1925	1926	131	126	50.0	45.5
G-10	m	20	Sr.	1925	1927	165	199	56.5	63.5
G-15	m	18	Jr.	1925	1927	114	133	47.5	52.5
G-16	m	21	Soph.	1925	1926	71	144	45.5	48.5
G-17	m	18	Sr.	1925	1927	149	202	53.0	65.5
H-1	f	19	Jr.	1925	1926	85	130	48.0	47.0
H-2	f	18	Sr.	1925	1927	129	107	46.0	46.5
H-3	m	17	Jr.	1925	1927	74	124	44.0	50.5
H-11	f	17	"	1925	1926	113	123	46.5	45.5
H-17	m	17	"	1925	1926	101	160	46.0	51.5
H-23	f	18	Soph.	1925	1926	137	157	51.0	50.0
I-1	f		Jr.	1925	1927	60	57	35.0	35.0
J-1	m	19	"	1925	1927	100	125	41.0	50.5
J-4	m	21	Sr.	1925	1927	103	203	47.0	65.5
J-9	m	20	Soph.	1925	1926	59	147	41.5	48.5
K-5	m	15	Jr.	1925	1927	176	223	58.0	73.0
K-7	m	19	Soph.	1925	1927	165	226	55.0	69.0
K-10	f	22	Sr.	1925	1926	54	122	39.5	45.5
K-12	m	18	Soph.	1925	1926	120	149	47.5	48.5
K-14	m	18	"	1925	1927	79	126	42.5	50.5
K-17	f	18	Jr.	1925	1927	165	266	62.5	78.0
K-18	m	18	"	1925	1927	144	223	55.5	69.0
L-7	f	19	Sr.	1925	1927	129	146	49.0	54.5
M-4	f	19	"	1925	1927	180	198	57.5	63.5
M-5	f	18	Jr.	1925	1927	118	127	45.5	50.5
M-8	f	18	"	1925	1926	114	156	50.0	56.0
M-11	f	17	"	1925	1927	137	184	52.0	61.5
M-30	f	18	"	1925	1927	104	149	45.5	54.5
M-50	f	17	Sr.	1925	1927	203	265	60.0	78.0
M-53	m	18	Jr.	1925	1927	103	137	47.5	52.5
M-55	f	19	Sr.	1925	1927	176	209	59.5	65.5
N-3	m	20	Jr.	1925	1927	147	204	55.5	65.5

NAME LIST - Two Year Interval

Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
N-5	m	16	Jr.	1925	1927	112	191	60.5	63.5
N-14	m	19	Soph.	1925	1927	108	146	46.0	54.5
N-16	f	17	Jr.	1925	1926	78	132	41.0	47.0
N-18	f	17	Sr.	1925	1927	185	246	60.0	73.0
O-1	m		Jr.	1925	1927	155	185	56.5	61.5
P-11	m	18	Soph.	1925	1927	141	230	56.5	71.0
P-12	f	18	"	1925	1926	90	153	40.5	50.0
P-14	m	19	"	1925	1926	85	116	43.5	44.0
P-15	m	18	"	1925	1926	108	145	46.5	48.5
P-18	f	18	Jr.	1925	1926	135	195	48.0	56.0
R-8	m	18	"	1925	1926	185	277	62.5	80.0
R-17	f	18	Soph.	1925	1927	83	121	40.0	50.5
S-6	m	18	Jr.	1925	1927	159	208	56.5	65.5
S-26	m	18	Soph.	1925	1927	81	107	41.0	46.5
S-27	m	17	"	1925	1926	121	187	51.5	54.5
S-40	m	18	Jr.	1925	1927	50	111	41.5	48.5
S-42	m	18	Sr.	1925	1927	198	203	66.0	65.5
S-49	f	17	Soph.	1925	1927	197	248	62.0	73.0
T-15	f	21	Sr.	1925	1927	106	164	51.5	58.0
W-4	m	22	Soph.	1925	1927	68	132	42.0	52.5
W-8	f	18	Jr.	1925	1926	203	301	64.5	84.0
W-11	m	20	"	1925	1927	131	169	45.5	58.0
W-12	f	17	"	1925	1926	136	211	52.5	59.5
W-15	m	18	"	1925	1926	62	155	42.5	50.0
Y-3	m	19	Sr.	1925	1927	164	195	57.5	63.5
Y-4	m	18	Jr.	1925	1927	77	146	46.0	48.5
Z-2	m	18	Soph.	1925	1926	122	200	49.0	58.0
KB-1	m	19	"	1926	1927	100	80	42.5	42.0
KB-8	m	18	Jr.	1926	1927	231	188	62.5	61.0
KC-12	m	18	Soph.	1926	1927	74	121	36.5	50.5
KE-3	m	18	"	1926	1927	183	164	54.5	56.0
KE-8	m	18	Jr.	1926	1928	101	125	42.5	50.5
KF-6	m	18	Soph.	1926	1927	104	150	42.5	46.0
KF-10	m	18	"	1926	1927	172	170	53.0	60.0
KH-10	f	21	Jr.	1926	1927	254	196	65.5	63.5
KH-13	m	17	"	1926	1927	90	148	40.5	54.5
KM-3	f	17	"	1926	1927	69	71	34.5	40.0
KM-9	m	18	"	1926	1927	227	217	61.0	67.0
KM-14	f	18	Soph.	1926	1927	146	155	48.5	56.0
KM-26	m	17	Jr.	1926	1927	126	149	45.5	54.5
KR-4	f	19	Soph.	1926	1927	231	219	62.5	67.0
KS-11	f	19	Sr.	1926	1927	75	103	36.5	46.5
KS-24	m	18	Jr.	1926	1927	138	131	47.0	52.5
KT-5	m	19	Soph.	1926	1927	192	176	56.0	60.0
KT-6	m	21	Jr.	1926	1927	165	177	51.5	60.0

NAME LIST - Two Year Interval

Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
KU-2	f	17	Soph.	1926	1927	82	110	38.5	48.5
KW-2	f	17	"	1926	1927	110	171	44.0	60.0
KW-3	m	18	Jr.	1926	1927	162	146	51.5	54.5
FB-12	f	21	Jr.	1927	1928	176	270	60.0	74.0
FB-13	m	18	"	1927	1928	113	149	48.5	51.0
FB-14	m	16	"	1927	1927	172	219	60.0	67.0
FB-15	m	17	"	1927	1927	148	196	54.5	63.5
FB-17	f	18	"	1927	1928	201	220	65.5	69.0
FG-1	m	20	"	1927	1927	198	281	63.5	82.0
FH-21	m	20	"	1927	1927	108	135	46.5	52.5
FH-22	m	17	"	1927	1927	151	163	56.0	58.0
FH-23	f	18	"	1927	1927	157	175	56.0	60.0
FL-5	f	17	"	1927	1927	128	153	50.5	56.0
FM-3	f	17	"	1927	1927	197	235	63.5	71.0
FM-5	m	19	"	1927	1928	100	152	46.5	53.0
FM-9	f	19	"	1927	1927	92	106	44.0	46.5
FM-13	m	17	"	1927	1929	170	214	60.0	62.0
FP-1	f	17	"	1927	1927	141	171	54.5	60.0
FP-4	m	27	"	1927	1927	117	155	48.5	56.0
FR-1	m	20	"	1927	1928	68	125	37.5	48.0
FR-9	m	20	"	1927	1928	52	125	35.0	48.0
FS-11	f	18	"	1927	1928	72	110	40.0	46.0
FU-1	f	19	"	1927	1927	54	175	35.0	44.0
FW-2	m	17	"	1927	1927	71	100	40.0	46.5
FW-7	m	17	"	1927	1929	169	218	58.0	62.0

NAME LIST - Two Years and One Semester Interval

Name No.	Sex	Age	Class. at R.T.	Forms		Raw Scores		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
A-5	f	18	Soph.	1925	1927	89	76	44.0	40.0
E-3	f	17	Jr.	1924	1927		169	53.5	58.0
F-13	m	22	"	1925	1927	96	103	44.5	46.5
F-15	m	18	Soph.	1925	1927	81	91	46.5	44.0
G-7	m	19	"	1925	1927	94	82	49.5	42.0
H-38	m	23	Jr.	1924	1926		136	45.0	47.0
J-3	m	17	"	1925	1927	156	169	51.5	58.0
J-12	f	18	Soph.	1924	1926	202	211	47.0	59.5
M-10	f	19	Jr.	1924	1927		136	49.0	52.5
M-29	f	18	Soph.	1925	1926	120	146	47.0	48.5
M-59	m	20	"	1925	1927	111	122	44.5	50.5
P-2	m	18	"	1925	1927	105	154	56.0	61.0
R-3	m	19	"	1925	1927	90	144	47.5	54.5
R-4	f	19	"	1925	1927	46	68	39.0	34.5
R-9	m	18	"	1925	1927	134	156	50.0	56.0
S-8	m	17	Jr.	1925	1927		161	50.5	58.0
S-54	m	18	Soph.	1924	1926		187	46.5	54.5
S-60	m	18	"	1924	1926		152	48.5	50.0
W-29	f	17	Jr.	1925	1927	150	186	56.0	61.5
Y-2	m	19	Soph.	1925	1927	88	136	41.5	52.5

NAME LIST - Three Year Interval

Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
A-3	f	18	Sr.	1924	1927	210	110	49.0	48.5
B-2	f	19	Soph.	1924	1927	190	166	51.0	59.0
B-24	m		"	1924	1928	288	147	55.5	51.0
B-28	f	18	Sr.	1924	1927		191	55.5	63.5
B-29	m	19	"	1924	1927	224	200	55.0	65.5
B-30	f	17	"	1924	1927		220	55.5	69.0
C-1	f	17	"	1924	1927	258	173	52.5	60.0
C-3	f	17	"	1924	1927	282	193	55.5	63.5
C-15	f	19	"	1924	1927	231	160	44.5	58.0
C-16	m	19	"	1924	1927		156	53.0	56.0
C-17	m	23	Jr.	1924	1927		176	50.5	60.0
C-28	f	25	Sr.	1924	1927		163	52.5	58.0
C-31	m	18	"	1924	1927	223	165	53.0	61.5
C-33	m	17	"	1924	1927		173	48.5	60.0
C-35	m	16	Soph.	1924	1926	202	224	54.0	61.0
E-10	m	17	Sr.	1924	1927	153	135	47.0	52.5
E-12	m	17	"	1924	1927	209	136	46.5	52.5
E-14	f	18	"	1924	1927		84	49.5	42.0
E-16	m	17	Sr.	1924	1927	196	199	46.5	63.5
F-5	f		"	1924	1927		226	64.0	69.0
F-11	m	18	Jr.	1924	1927	210	180	52.0	61.5
F-17	m	19	"	1924	1927		208	55.0	65.5
F-18	m	19	Sr.	1924	1927		108	48.5	46.5
F-20	f	17	"	1924	1927		158	47.5	56.0
G-12	m	17	Soph.	1924	1927		134	48.0	47.0
G-18	m	17	Sr.	1924	1927		122	39.0	50.5
G-21	m	18	"	1924	1927	233	179	52.5	60.0
H-5	f	17	"	1924	1927	254	177	56.0	60.0
H-8	f	16	"	1924	1927		114	51.5	48.5
H-15	f	17	"	1924	1927	286	177	57.5	60.0
H-16	f	17	Jr.	1924	1927	246	180	52.5	61.5
H-19	m	19	Sr.	1924	1927	204	155	49.5	56.0
H-20	m	18	"	1924	1927	189	168	46.0	58.0
H-27	m	18	Jr.	1924	1927	300	182	54.5	61.5
H-28	m	21	Soph.	1924	1927		118	49.5	48.5
H-32	f	16	Sr.	1924	1927	221	167	51.0	58.0
H-34	m	19	"	1924	1927		118	41.0	48.5
J-8	f		"	1924	1927		163	45.0	58.0
K-8	m	16	"	1924	1927	248	264	59.5	78.0
K-15	m	22	"	1924	1927	191	132	42.5	52.5
L-2	m	18	"	1924	1927	193	160	49.0	58.0
L-3	m	19	Soph.	1924	1926	206	135	37.0	47.0
L-5	f	16	Sr.	1924	1927		202	55.5	65.5

NAME LIST - Three Year Interval

Name No.	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
L-11	f	18	Sr.	1924	1927		165	50.0	58.0
M-6	f	17	Jr.	1924	1927		185	51.0	61.5
M-28	f	17	Sr.	1924	1927		170	57.0	60.0
M-32	f	19	Jr.	1924	1927		179	50.0	60.0
M-37	m	22	Soph.	1924	1927		252	61.0	75.0
M-44	m	18	Sr.	1924	1927	279	271	61.5	80.0
M-45	m	18	"	1924	1927		47	39.0	32.5
M-51	f	17	"	1924	1927		194	50.5	63.5
M-56	f	19	"	1924	1927		150	42.0	56.0
M-62	f	19	"	1924	1927		180	53.5	61.5
M-63	f	19	"	1924	1927		124	50.5	50.5
M-4	f	18	"	1924	1927		147	44.5	54.5
M-7	f	16	"	1924	1927		103	45.0	46.5
M-8	m	17	"	1924	1927	234	236	60.5	71.0
M-9	m	19	Soph.	1924	1926	189	89	39.0	38.5
O-2	m	17	Sr.	1924	1927	183	86	40.0	42.0
P-3	m	17	Jr.	1924	1927		215	57.5	67.0
P-6	m	21	Sr.	1924	1928		30	39.0	28.0
P-9	m	20	"	1924	1927	140	115	40.5	48.5
P-10	m	18	Soph.	1924	1926	174	126	41.0	45.5
P-17	f	16	Sr.	1924	1927		152	46.0	56.0
P-19	m	17	Soph.	1924	1926		103	42.0	42.5
R-18	m	17	Jr.	1924	1926		109	44.0	42.5
R-19	f	20	Sr.	1924	1927	248	167	56.5	61.5
R-21	m	22	"	1924	1927		23.0	40.0	44.0
R-23	m	17	"	1924	1926		128	43.5	45.5
S-4	m	18	Sr.	1924	1927		180	51.5	61.5
S-12	m	19	Jr.	1924	1927		239	57.5	71.0
S-14	m	18	Sr.	1924	1927		224	61.0	69.0
S-15	f	16	"	1924	1927		255	58.5	75.0
S-17	m	18	"	1924	1927		145	38.0	54.5
S-18	m	21	Soph.	1924	1926		84.	38.5	38.5
S-19	f	17	Sr.	1924	1927		223	59.0	69.0
S-32	m		Soph.	1924	1926	124	153	49.0	50.0
S-34	f	17	"	1924	1926		190	54.5	56.0
S-46	m	18	Sr.	1924	1927		189	52.5	61.5
S-51	f	17	"	1924	1927		177	57.5	60.0
T-12	m	18	"	1924	1927		161	50.5	58.0
U-1	f	18	Jr.	1924	1927		221	64.5	69.0
V-3	m	19	Sr.	1924	1927		164	44.0	58.0
W-2	m	18	"	1924	1927		185	55.5	61.5
W-5	m	17	"	1924	1927		251	61.5	75.0
W-18	m	18	Jr.	1924	1927		182	57.0	61.5

NAME LIST - Three Year Interval

Name No	Sex	Age	Class. at R.T.	Forms		Raw Score		To Score	
				I.T.	R.T.	I.T.	R.T.	I.T.	R.T.
Y-22	m	19	Soph.	1924	1926		104	40.5	42.5
Y-24	m	18	Sr.	1924	1927		191	59.5	63.5
W-26	m	17	Jr.	1924	1926		195	49.0	63.5
Z-1	m	20	Soph.	1924	1927		197	55.0	63.5
KA-3	m	18	Jr.	1925	1927	148	253	56.5	75.0
KA-8	f	18	Sr.	1925	1927	171	247	60.0	73.0
KH-17	m		Jr.	1925	1927	84	117	44.0	48.5
KE-7	m		Soph.	1925	1927	81	131	43.0	52.5
KG-5	m		Jr.	1925	1927	71	83	42.0	42.0
KH-15	f		"	1925	1927	137	136	49.0	52.5
KH-17	m		"	1925	1927	139	196	50.0	63.5
KK-11	m		"	1925	1927	103	116	46.0	48.5
KL-10	m		Sr.	1925	1927	73	91	43.0	44.0
KM-20	m		"	1925	1927	150	194	53.0	63.5
KS-3	m	19	Soph.	1925	1927	189	256	62.0	75.0
KA-2	f	18	Sr.	1926	1927	148	180	48.5	61.5
FB-3	m	20	"	1926	1927	172	137	53.0	52.5
FB-4	f	19	Jr.	1925	1927	193	254	60.0	75.0
FB-5	f	17	Sr.	1926	1927	332	270	77.0	80.0
FB-6	f	17	"	1926	1927	170	164	53.0	58.0
FB-11	m	19	"	1926	1927	141	132	48.5	52.5
FB-16	m	18	"	1926	1927	158	167	57.0	58.0
FC-12	f	19	"	1926	1927	182	171	50.0	60.0
FC-15	m	17	"	1926	1927	269	255	67.0	75.0
FC-20	f	19	"	1926	1927		168	50.0	58.0
FC-25	f	20	"	1926	1927	239	239	62.5	71.0
FD-2	m	18	Soph.	1926	1927	242	186	67.5	61.5
FD-7	f	20	Sr.	1926	1927		120	43.0	50.5
FH-4	m	19	"	1926	1927	154	151	50.0	56.0
FH-13	f	18	"	1926	1927	113	146	44.0	54.5
FH-17	f	18	"	1926	1927	96	138	40.5	52.5
FH-25	m	17	"	1926	1927	270	285	68.0	82.0
FJ-4	f	19	"	1926	1927	64	82	34.5	42.0
FK-1	m	21	"	1926	1927		161	55.0	58.0
FL-6	f	19	"	1926	1927	189	134	57.5	52.5
FM-10	m	17	"	1926	1927	91	67	42.5	37.5
FM-14	m	19	"	1926	1927	163	100	51.5	46.5
FM-16	f	19	"	1926	1927	90	134	40.5	52.5
FP-6	m	22	"	1926	1927		179	50.5	60.0
FO-1	f	19	Jr.	1926	1927	151	136	50.0	52.5
FS-12	m	18	Sr.	1926	1927		173	53.0	60.0
FV-2	m	20	"	1926	1927		143	53.5	54.5
FW-1	f	18	"	1926	1927	136	134	47.0	52.5
FW-13	m	20	"	1926	1927		109	40.5	46.5

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