

A STUDY OF ACADEMIC APTITUDE AND RELATIVE ACHIEVEMENT  
AMONG THE MAJOR FIELDS IN THE SCHOOL OF ARTS AND SCIENCES  
AT THE OKLAHOMA AGRICULTURAL AND MECHANICAL COLLEGE

A STUDY OF ACADEMIC ABILITY AND ACHIEVEMENT  
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## CHAPTER I

### INTRODUCTION

The great influx of students into the institutions of higher learning is providing the greatest challenge to educational leadership that has ever been known. The truly progressive educator is able to meet the problems of teacher recruiting, expanding plant facilities, securing additional financial appropriations and the countless other problems that beset one during such an educational bonanza; and, in addition, retains those humanitarian qualities which demand that he exert every effort to provide the type of guidance and personalized services which will lead each student to develop an intrinsic goal for personal achievement that is compatible with his aptitudes, interests, and abilities, and which will prepare him for a life of altruistic service to mankind. The writer hopes this study may be of some value in this type of guidance and counseling program.

#### Purpose of Study

1. To determine the distribution of academic aptitude among students in the various major fields.
2. To find the grade achievements relative to academic abilities among those groups of students that have indicated their choices from among the major fields.
3. To produce an instrument that will be useful in guiding and counseling the students in the School of Arts and Sciences.

### Procedure and Method

1. All available A.C.E. percentile scores were gathered from advisors' records, qualification cards and personal files for approximately 1,600 students in the School of Arts and Sciences.

✓ 2. The grade point averages for the first semester were computed and recorded for each of the students to whom grade slips were issued.

3. All records were checked and double checked to insure the greatest number of subjects in the study.

4. The first compilation included as much of the following information regarding each student as was possible to obtain: Name, A.C.E. percentile score, classification, hours credit received, and grade point average.

5. A number of charts were compiled regarding the distribution of A.C.E. percentile scores\* of students who had indicated their choice of the various major fields.

6. A frequency chart was constructed from which the quintile points of the grade distribution were calculated.

7. Quintile charts in two variables were constructed for freshman, sophomore, junior and senior students of each indicated major field.

8. Tables were constructed for each major subject having a sufficient number of students to make such treatment worthwhile, showing the percent of the class from each quin-

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\*A.C.E. quintile score as defined on p.



tile of the A.C.E. scores, and also showing the percent located in each grade quintile.

9. All major fields for which twenty or more cases were included were ranked: first, according to difficulty as indicated by the degree of underachievement or overachievement as indicated on the two-variable charts; second, according to the academic ability of the students attracted to each major field as indicated by their A.C.E. percentile scores.

#### The School of Arts and Sciences

The School of Arts and Sciences\* has four distinctive functions:

First, it provides basic training for students enrolled in vocational schools.

Second, it provides vocational training in the social, physical, and biological sciences and in the humanities.

Third, it provides an orientation for students whose inexperience or immaturity justifies a broad survey of the chief fields of knowledge preliminary to choosing a vocation.

#### Fields of Study

The fields of study in the School of Arts and Sciences are organized in the following five groups:

1. The Biological Sciences group includes the Department of Bacteriology, Physiology, and Veterinary Science; the Department of Botany and Plant Pathology; and the Department of Zoology.

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\*Bulletin, Oklahoma Agricultural and Mechanical College. General Catalog Issue 1945-46, Announcements 1946-47 Sessions, p. 103.

2. The departments included in the Physical Sciences and Mathematics group are Chemistry, including Geology; Mathematics, including Astronomy; and Physics.

3. The Social Sciences group, by cooperation among the Schools of Arts and Sciences, Agriculture, Commerce, and Education, includes the disciplines of Agricultural Economics, Economics, Geography, Journalism, Political Science, History, Statistics, including the mathematics fundamental thereto, Sociology and Rural Life, Philosophy, Psychology, and Public Affairs. A student may elect a general major in Social Sciences under prescribed conditions.<sup>1</sup>

4. The Departments of the Humanities offer a divisional degree to students who choose their major work in a field of related subjects rather than in one department. The studies must meet the common requirements in the Lower Division of the School of Arts and Sciences and the student must take forty hours of junior and senior courses, including at least six hours of each of three departments. The Departments of Humanities are Art, English, Foreign Languages, Health and Physical Education, Music and Speech. Upper Division courses may be counted toward a Humanities degree.

5. In the preprofessional group are offered curricula leading to teachers' certificates, to certificates in technical journalism, to admission to schools of nursing and dentistry, and to entrance to Class A schools of medicine and law.

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<sup>1</sup>Ibid., p. 111.

The author feels that some mention should be made regarding references to percentile scores:<sup>2</sup>

A student who makes a percentile rank between 30 and 70 on his entrance tests, which is equivalent to a grade of C, shall enroll in no more than 15 credit hours of work, not including Physical Education or Military Science. The higher ranking student, who demonstrates his ability, may petition the Administrative Committee of the School of Arts and Sciences for permission to enroll in not more than 21 hours. He may eliminate some of the required courses by satisfactory performance in achievement tests or may obtain college credit by examination. At present, approvals will be limited to applications of students scoring above the fiftieth percentile on the college aptitude test required for admission. To obtain these privileges, the student shall consult the head of the department or the Dean. Students whose entrance percentile rank is below 30 are required to carry proportionally lighter loads.

A second reference is found under the heading of the Pre-professional Program:

Students ranking below the fiftieth percentile on the college aptitude test required for admission are not ordinarily eligible to enroll in a preprofessional curriculum.

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<sup>2</sup>Ibid., p. 114.

## CHAPTER II

### REPORT OF STUDY

This study of the major fields in the School of Arts and Sciences at the Oklahoma Agricultural and Mechanical College is made with the purpose of determining the degree of academic aptitudes among the various groups of students indicating these major fields as their choice of study, and, in addition, to gain some insight regarding the relative difficulty of the major fields.

The only criterion common to a majority\* of all the students in the School of Arts and Sciences upon which scholastic aptitude might be assessed were their scores on the American Council of Education Psychological Examination which each student\*\* is required to take upon his matriculation into the college. All records pertaining to the students were made available to the author, and his first efforts were directed toward a compilation of data on each student in the school, which were to include: Name, major field, class, and raw scores on the A.C.E. test. It was soon discovered that a large majority of the scores of upper division students were recorded only as percentile scores based on the national

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\*From 90 to 95 percent of the students.

\*\*Exceptions are graduate students, special students and those students excused by the Dean of the Arts and Sciences School.

norms, and the large numbers that had only a single percentile score to represent both the linguistic and quantitative fields<sup>1</sup> made it expedient to use this as a basis of determining scholastic aptitude among the major fields.

The above data were recorded for approximately 1,700 students, and completion of the work was accomplished a few days prior to the issuance of grade slips for the first semester. The author needed data regarding the achievement of the individual students and debated the choice of using the cumulative grade point averages which would soon be available from each student's qualification card, or of computing grade averages for each of the students for whom grade slips were to be issued. A first impression favored using the cumulative grade point average due to its greater dependability as an indicator of achievement and to its accessibility from the qualification cards. There were two factors that swung the pendulum to the more laborious procedure: first, since a goodly number of students have transferred to the School of Arts and Sciences from other schools on the campus and from other institutions, their cumulative grade point averages obviously would not be a true picture of work accomplished in this school; second, it was felt that the study would be more statistically significant if the sampling of achievement were taken from one given semester rather than using the cumulative averages

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<sup>1</sup>Quantitative Tests (the Q-Score): Arithmetic, Number Series, Figure Analogies  
 Linguistic Tests (the L-Score): Same-Opposite, Completion, Verbal Analogies

which would compare one semester's work of the freshman with the senior's seven semesters of work.

The final entry for the grade point averages found the author with a number of problems. There were many items of missing data that had to be pursued in order to have the greatest number of subjects for the study. The records were checked and double checked so that every available percentile score was included as well as correct data regarding major, class, and grade point average. The decision was made to compare academic aptitude and achievement of those students indicating their preference of the major studies by running two-variable frequency charts on the quintile distribution of their A.C.E. scores against the quintile distribution of their grades.

The percentile scores which the author had at hand did not lend themselves gracefully to statistical manipulation. A mental image of the phrases "a quintile distribution of percentile scores" or "the standard deviation of percentile scores" was enough to convince him that discretion in their treatment must need be observed. For that reason, it was decided to call the first or lowest quintile those scores including zero and 19.99, the second quintile those scores including 20 and 39.99, the third quintile those scores including 40 and 59.99, the fourth quintile those scores including 60 and 79.99, and the fifth and highest quintile those scores including 80 and 99.99.

The author must beg the reader's indulgence when reference is made to the quintile distribution of the A.C.E. scores. A true quintile includes one-fifth of the cases in a given distribution, and this might have been accomplished for the A.C.E. scores in a manner similar to that used in determining the grade quintiles as shown in Table IV; however, the author felt that a direct comparison to the national norms would be more significant. By defining the quintiles as indicated above, this study should be of greater value to those interested in guidance and counseling due to its direct comparability with the results of A.C.E. examinations.

The freshman class in the School of Arts and Sciences closely approximates true quintile divisions in its distribution of A.C.E. scores as will be noted in Table I. A true quintile division of the cases would have twenty percent of the cases in each of the five divisions. It will be noted that 17.8% of the freshmen have scores in a range from zero to 19.99. This means that 17.8% of the freshmen entering the School of Arts and Sciences the first semester of the school year 1946-47 had scores within the same range as the lowest twenty percent of freshmen entering four-year colleges and universities in the school years 1942 and 1943 on whom the norms were based. Each of the remaining quintile divisions for the freshman class are very near twenty percent.

The sophomore, junior and senior classes lose all resemblance to a true quintile division due to selective factors

in institutions of higher learning which act to eliminate those students in the lower brackets of academic aptitude. If it may be assumed that each of these classes approximated as true a quintile division as the freshman class at the time of their matriculation into college, it will be seen that an increasingly large percent of the students in the lower quintiles have dropped out of school.

The results of the selective factors which eliminate those in the lower brackets are noted in the successively decreasing percentage of students in the lowest quintile from the freshman to the senior class. Decreases from 17.8% in the freshman year to 9.9% in the sophomore year, to 6.8% in the junior year and 3.9% in the senior year, show very graphically the result of these factors at work.

An overall view of the academic aptitude within the School of Arts and Sciences may be had by studying the information in Table I. The author has computed the percent which the raw number of each quintile represents in order to facilitate the reader's ready understanding.



## TABLES FROM RESEARCH DATA

TABLE I

DISTRIBUTION OF ARTS AND SCIENCE STUDENTS  
BY QUINTILE RANKINGS OF THEIR A.C.E. PERCENTILE SCORES,  
RAW NUMBER AND EQUIVALENT PERCENT GIVEN FOR EACH QUINTILE

<u>Percentile</u>	<u>Freshmen</u>		<u>Sophomores</u>	
80th to 99th	154	20.6%	163	29.7%
60th to 79th	143	19.1%	131	23.9%
40th to 59th	149	20.0%	112	20.4%
20th to 39th	168	22.5%	88	16.1%
0 to 19th	133	17.8%	54	9.85%
<b>Total</b>	<b>747</b>		<b>548</b>	

<u>Percentile</u>	<u>Juniors</u>		<u>Seniors</u>	
80th to 99th	51	31.7%	49	38.6%
60th to 79th	43	26.7%	32	25.2%
40th to 59th	31	19.3%	21	16.5%
20th to 39th	25	15.5%	20	15.8%
9 to 19th	11	6.8%	5	3.9%
<b>Total</b>	<b>161</b>		<b>127</b>	

<u>Percentile</u>	<u>Total Distribution</u>
80th to 99th	417 26.3%
60th to 79th	350 22.1%
40th to 59th	313 19.8%
20th to 39th	301 19.0%
0 to 19th	202 12.8%
<u>Total</u>	<u>1,583</u>

Insight into the distribution of academic ability among the major fields in the School of Arts and Sciences may be had by studying the frequency charts in Table II. Each chart includes the number of students whose percentile scores on the A.C.E. test fall within each of the designated quintiles. The vertical column under Numbers 1, 2, 3, and 4 give the number of scores in each quintile for the freshman, sophomore, junior and senior classes respectively. The total for each class is found at the bottom of each column and under the column headed "Total" will be found the sums of the five quintiles for the four classes, and the sum of these totals represents all the students\* in the School of Arts and Sciences who have indicated that particular subject as their major interest. The sum of the total number in the five quintiles is equal to the sum of the students in the four classes; i.e., the bottom figure under the total column is the sum of both

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\*Those students for whom percentile scores were available and for whom grade slips were issued for the first semester's work. This represents approximately 95 percent of the students in the School of Arts and Sciences.

the vertical and horizontal columns of which it is a part.

Table III is a repetition of Table II with the percent computed and shown to the right of each quintile number.

This was accomplished for those major fields with a sufficient number of students to deem the effort worthwhile.

TABLE II

GENERAL					ART				
#1	#2	#3	#4	Total	#1	#2	#3	#4	Total
36	37	3	0	76	4	8	1	2	15
42	25	2	0	69	7	8	2	6	23
48	19	3	0	70	10	10	2	0	22
54	19	1	0	74	14	8	5	3	30
50	12	0	0	62	8	2	2	0	12
230	112	9	0	351	43	36	12	11	102

BACTERIOLOGY					BIOLOGICAL SCIENCE				
#1	#2	#3	#4	Total	#1	#2	#3	#4	Total
3	1	4	4	12	1	1	1	0	3
1	2	1	3	7	0	0	0	0	0
1	1	1	2	5	0	0	0	0	0
0	3	0	0	3	0	0	0	0	0
1	0	0	0	1	0	0	0	0	0
6	7	6	9	28	1	1	1	0	3

TABLE II - Continued

BOTANY					CHEMISTRY				
<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>	<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>
0	1	1	0	2	6	12	5	6	29
0	1	0	0	1	14	11	2	2	29
0	1	0	0	1	4	4	0	2	10
0	0	0	0	0	4	0	1	5	10
0	0	1	0	1	1	1	0	0	2
0	3	2	0	5	29	28	8	15	80

ECONOMICS					ENGLISH				
<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>	<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>
0	2	1	1	4	8	4	5	3	20
1	2	0	1	4	2	10	7	3	22
1	0	0	0	1	5	6	3	2	16
0	0	0	1	1	2	4	1	2	9
1	0	0	0	1	3	2	0	0	5
3	4	1	3	11	20	26	16	10	72

FOREIGN LANGUAGE					GEOLOGY				
<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>	<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>
3	8	1	2	14	5	1	0	0	6
2	4	2	1	9	5	2	1	0	8
2	3	4	0	9	5	5	1	0	11
1	0	1	0	2	2	3	0	0	5
1	1	0	0	2	5	3	0	0	8
9	16	8	3	36	22	14	2	0	38

TABLE II - Continued

## HISTORY

<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>
0	2	1	2	5
3	0	1	1	5
0	0	1	2	3
0	1	0	0	1
<u>1</u>	<u>3</u>	<u>2</u>	<u>0</u>	<u>6</u>
<u>4</u>	<u>6</u>	<u>5</u>	<u>5</u>	<u>20</u>

## JOURNALISM

<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>
16	17	8	5	46
17	11	5	0	33
9	11	3	3	26
18	4	2	1	25
<u>10</u>	<u>4</u>	<u>2</u>	<u>0</u>	<u>16</u>
<u>70</u>	<u>47</u>	<u>20</u>	<u>9</u>	<u>146</u>

## LAB-TECHNICIAN

<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>
2	4	1	0	7
2	2	0	2	6
1	2	0	0	3
0	3	0	0	3
<u>0</u>	<u>2</u>	<u>0</u>	<u>1</u>	<u>3</u>
<u>5</u>	<u>13</u>	<u>1</u>	<u>3</u>	<u>22</u>

## MATHEMATICS

<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>
2	3	4	4	13
2	2	1	1	6
6	0	0	0	6
4	2	0	0	6
<u>2</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>3</u>
<u>16</u>	<u>7</u>	<u>5</u>	<u>6</u>	<u>34</u>

## MUSIC

<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>
10	9	6	4	29
8	5	2	2	17
14	5	2	5	26
13	3	3	2	21
<u>5</u>	<u>3</u>	<u>2</u>	<u>0</u>	<u>10</u>
<u>50</u>	<u>25</u>	<u>15</u>	<u>13</u>	<u>103</u>

## PHYSICAL EDUCATION

<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>
4	2	0	2	8
1	3	3	1	8
3	2	2	1	8
7	8	4	1	20
<u>9</u>	<u>5</u>	<u>1</u>	<u>2</u>	<u>17</u>
<u>24</u>	<u>20</u>	<u>10</u>	<u>7</u>	<u>61</u>

TABLE II - Continued

PHYSICS				
<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>
5	8	0	2	15
3	3	0	0	6
5	1	0	0	6
2	0	0	0	2
0	0	0	0	0
<u>15</u>	<u>12</u>	<u>0</u>	<u>2</u>	<u>29</u>

POLITICAL SCIENCE				
<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>
0	1	1	2	4
0	3	1	0	4
0	0	0	1	1
1	1	0	1	3
0	0	0	0	0
<u>1</u>	<u>5</u>	<u>2</u>	<u>4</u>	<u>12</u>

PRE-DENTAL				
<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>
4	3	0	0	7
2	6	0	0	8
3	5	0	0	8
10	5	0	0	15
<u>7</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>9</u>
<u>26</u>	<u>21</u>	<u>0</u>	<u>0</u>	<u>47</u>

PRE-LAW				
<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>
8	5	2	1	16
8	4	0	0	12
7	4	1	0	12
9	4	0	0	13
<u>7</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>7</u>
<u>39</u>	<u>17</u>	<u>3</u>	<u>1</u>	<u>60</u>

PRE-MEDICAL				
<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>
13	16	0	1	30
11	9	1	2	23
6	16	1	0	23
12	3	1	0	16
<u>6</u>	<u>3</u>	<u>0</u>	<u>0</u>	<u>9</u>
<u>48</u>	<u>47</u>	<u>3</u>	<u>3</u>	<u>101</u>

PRE-VETERINARY				
<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>Total</u>
6	2	0	0	8
3	4	0	0	7
5	0	0	0	5
6	1	0	0	7
<u>5</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>6</u>
<u>25</u>	<u>8</u>	<u>0</u>	<u>0</u>	<u>33</u>

TABLE II - Continued

## PSYCHOLOGY

<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#+</u>	<u>Total</u>
6	7	3	3	19
4	8	2	4	18
5	7	0	0	12
4	6	1	2	13
<u>1</u>	<u>3</u>	<u>0</u>	<u>1</u>	<u>5</u>
<u>20</u>	<u>31</u>	<u>6</u>	<u>10</u>	<u>67</u>

## SOCIAL SCIENCE

<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#+</u>	<u>Total</u>
0	2	1	2	5
0	2	4	0	6
1	0	1	0	2
0	1	0	0	1
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<u>1</u>	<u>5</u>	<u>6</u>	<u>2</u>	<u>14</u>

## SOCIOLOGY

<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#+</u>	<u>Total</u>
1	3	1	2	7
0	1	2	2	5
1	6	3	2	12
0	3	3	0	6
<u>1</u>	<u>3</u>	<u>1</u>	<u>0</u>	<u>5</u>
<u>3</u>	<u>16</u>	<u>10</u>	<u>6</u>	<u>35</u>

## SPEECH

<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#+</u>	<u>Total</u>
2	2	1	1	6
5	1	1	0	7
5	3	2	0	10
4	5	1	0	10
<u>6</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>6</u>
<u>22</u>	<u>11</u>	<u>5</u>	<u>1</u>	<u>39</u>

## WILD-LIFE CONSERVATION

<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#+</u>	<u>Total</u>
4	1	0	0	5
1	1	1	1	4
2	1	1	0	4
1	1	0	0	2
<u>2</u>	<u>3</u>	<u>0</u>	<u>0</u>	<u>5</u>
<u>10</u>	<u>7</u>	<u>2</u>	<u>1</u>	<u>20</u>

## ZOOLOGY

<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#+</u>	<u>Total</u>
5	1	0	0	6
0	1	2	0	3
0	0	0	1	1
0	0	1	2	3
<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>1</u>
<u>5</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>14</u>

TABLE III

PRINCIPAL CHARTS FROM TABLE II  
WITH PERCENTAGES COMPUTED FOR FACILITY  
IN COMPREHENSION AND COMPARISON

## GENERAL

Freshman		Sophomore		Junior		Senior		Total	
36	15.7%	37	33.0%	3	33.3%	0	0.0%	76	21.7%
42	18.3%	25	22.3%	2	22.2%	0	0.0%	69	19.7%
48	20.9%	19	17.0%	3	33.3%	0	0.0%	70	19.9%
54	23.5%	19	17.0%	1	11.1%	0	0.0%	74	21.1%
50	21.7%	12	10.7%	0	0.0%	0	0.0%	62	17.7%
230		112		9		0		351	

## ART

Freshman		Sophomore		Junior		Senior		Total	
4	9.3%	8	22.2%	1	8.3%	2	18.2%	15	14.7%
7	16.3%	8	22.2%	2	16.7%	6	54.5%	23	22.6%
10	23.3%	10	27.8%	2	16.7%	0	0.0%	22	21.6%
14	32.6%	8	22.2%	5	41.7%	3	27.3%	30	29.4%
8	18.6%	2	5.6%	2	16.7%	0	0.0%	12	11.8%
43		36		12		11		102	



TABLE III - Continued

## BACTERIOLOGY

Freshman		Sophomore		Junior		Senior		Total	
3	50.0%	1	14.3%	4	66.7%	4	44.4%	12	42.9%
1	16.7%	2	28.6%	1	16.7%	3	33.3%	7	25.0%
1	16.7%	1	14.3%	1	16.7%	2	22.2%	5	17.9%
0	0.0%	3	42.9%	0	0.0%	0	0.0%	3	10.7%
1	16.7%	0	0.0%	0	0.0%	0	0.0%	1	3.6%
6		7		6		9		28	

## CHEMISTRY

Freshman		Sophomore		Junior		Senior		Total	
6	20.7%	12	42.9%	5	62.5%	6	40.0%	29	36.3%
14	48.3%	11	39.3%	2	25.0%	2	13.3%	29	36.3%
4	13.8%	4	14.3%	0	0.0%	2	13.3%	10	12.5%
4	13.8%	0	0.0%	1	12.5%	5	33.3%	10	12.5%
1	3.5%	1	3.6%	0	0.0%	0	0.0%	2	2.5%
29		28		8		15		80	

## ENGLISH

Freshman		Sophomore		Junior		Senior		Total	
8	40.0%	4	15.4%	5	31.3%	3	30.0%	20	27.8%
2	10.0%	10	38.5%	7	43.8%	3	30.0%	22	30.6%
5	25.0%	6	23.1%	3	18.8%	2	20.0%	16	22.2%
2	10.0%	4	15.4%	1	6.3%	2	20.0%	9	12.5%
3	15.0%	2	7.7%	0	0.0%	0	0.0%	5	6.9%
20		26		16		10		72	

TABLE III - Continued

## JOURNALISM

Freshman		Sophomore		Junior		Senior		Total	
16	22.9%	17	36.2%	8	40.0%	5	55.6%	46	31.5%
17	24.3%	11	23.4%	5	25.0%	0	0.0%	33	22.6%
9	12.9%	11	23.4%	3	15.0%	3	33.3%	26	17.8%
18	25.7%	4	8.5%	2	10.0%	1	11.1%	25	17.1%
10	14.3%	4	8.5%	2	10.0%	0	0.0%	16	11.0%
70		47		20		9		146	

## MUSIC

Freshman		Sophomore		Junior		Senior		Total	
10	20.0%	9	36.0%	6	40.0%	4	30.8%	29	28.2%
8	16.0%	5	20.0%	2	13.3%	2	15.4%	17	16.5%
14	28.0%	5	20.0%	2	13.3%	5	38.5%	26	25.2%
13	26.0%	3	12.0%	3	20.0%	2	15.4%	21	20.4%
5	10.0%	3	12.0%	2	13.3%	0	0.0%	10	9.7%
50		25		15		13		103	

## PRE-MEDICAL

Freshman		Sophomore		Junior		Senior		Total	
13	27.1%	16	34.0%	0	0.0%	1	33.3%	30	29.7%
11	22.9%	9	19.2%	1	33.3%	2	66.6%	23	22.8%
6	12.5%	16	34.0%	1	33.3%	0	0.0%	23	22.8%
12	25.0%	3	6.4%	1	33.3%	0	0.0%	16	15.8%
6	12.5%	3	6.4%	0	0.0%	0	0.0%	9	8.9%
48		47		3		3		101	

TABLE III - Continued \*

Biological Science		Botany		Economics		Foreign Language	
3	100.0%	2	40.0%	4	36.4%	14	38.9%
0	0.0%	1	20.0%	4	36.4%	9	25.0%
0	0.0%	1	20.0%	1	9.1%	9	25.0%
0	0.0%	0	0.0%	1	9.1%	2	5.6%
0	0.0%	1	20.0%	1	9.1%	2	5.6%
3		5		11		36	

Geology		History		Laboratory Technician		Mathematics	
6	15.8%	5	25.0%	7	31.8%	13	38.2%
8	21.1%	5	25.0%	6	27.3%	6	17.6%
11	29.0%	3	15.0%	3	13.6%	6	17.6%
5	13.2%	1	5.0%	3	13.6%	6	17.6%
8	21.1%	6	30.0%	3	13.6%	3	8.8%
38		20		22		34	

Physical Education		Physics		Political Science		Pre-Dental	
8	13.1%	15	51.7%	4	33.3%	7	14.9%
8	13.1%	6	20.7%	4	33.3%	8	17.0%
8	13.1%	6	20.7%	1	8.3%	8	17.0%
20	32.8%	2	6.9%	3	25.0%	15	31.9%
17	27.9%	0	0.0%	0	0.0%	9	19.2%
61		29		12		47	

\*Total columns only are shown for those major fields with insufficient cases to warrant a complete table.

TABLE III - Continued

<u>Pre-Law</u>		<u>Pre-Veterinary</u>		<u>Psychology</u>		<u>Social Science</u>	
16	26.7%	8	20.0%	19	28.4%	5	35.7%
12	20.0%	7	14.3%	18	26.9%	6	42.9%
12	20.0%	5	34.3%	12	17.9%	2	14.3%
13	21.7%	7	17.1%	13	19.4%	1	7.1%
7	11.7%	6	14.3%	5	7.5%	0	0.0%
60		33		67		14	

<u>Sociology</u>		<u>Speech</u>		<u>Wild-Life Conservation</u>		<u>Zoology</u>	
7	20.0%	6	15.4%	5	25.0%	6	42.9%
5	14.3%	7	18.0%	4	20.0%	3	21.4%
12	34.3%	10	25.6%	4	20.0%	1	7.1%
6	17.1%	10	25.6%	2	10.0%	3	21.4%
5	14.3%	6	15.4%	5	25.0%	1	7.1%
35		39		20		14	

In order to facilitate determination of the comparable difficulty of the various groups of studies which constitute the majors in the School of Arts and Sciences, a frequency chart was made on all grade point averages, and quintile points in the distribution were calculated as shown in Table V. The frequency chart was calibrated from zero to 4.00, zero meaning that no grade points are given for those hours in which the student fails, one point for each hour of D, and progressing to four points for each hour of credit with a grade of A. The interval used in calibrating the chart was 0.25, which provided a total of seventeen intervals. The formula used in determining the quintile points on the distribution is taken from a text on educational problems by Monroe and Engelhart.<sup>2</sup>

Table V consists of a series of two variable charts for each year of each major field. From the bottom to the top the horizontal lines represent the succeeding quintiles from lowest to highest on the A.C.E. test, and from left to right the vertical columns represent the succeeding quintiles from lowest to highest on grade achievement. On page 24 will be noted a sample two-variable frequency chart upon which the data for Table V were computed.

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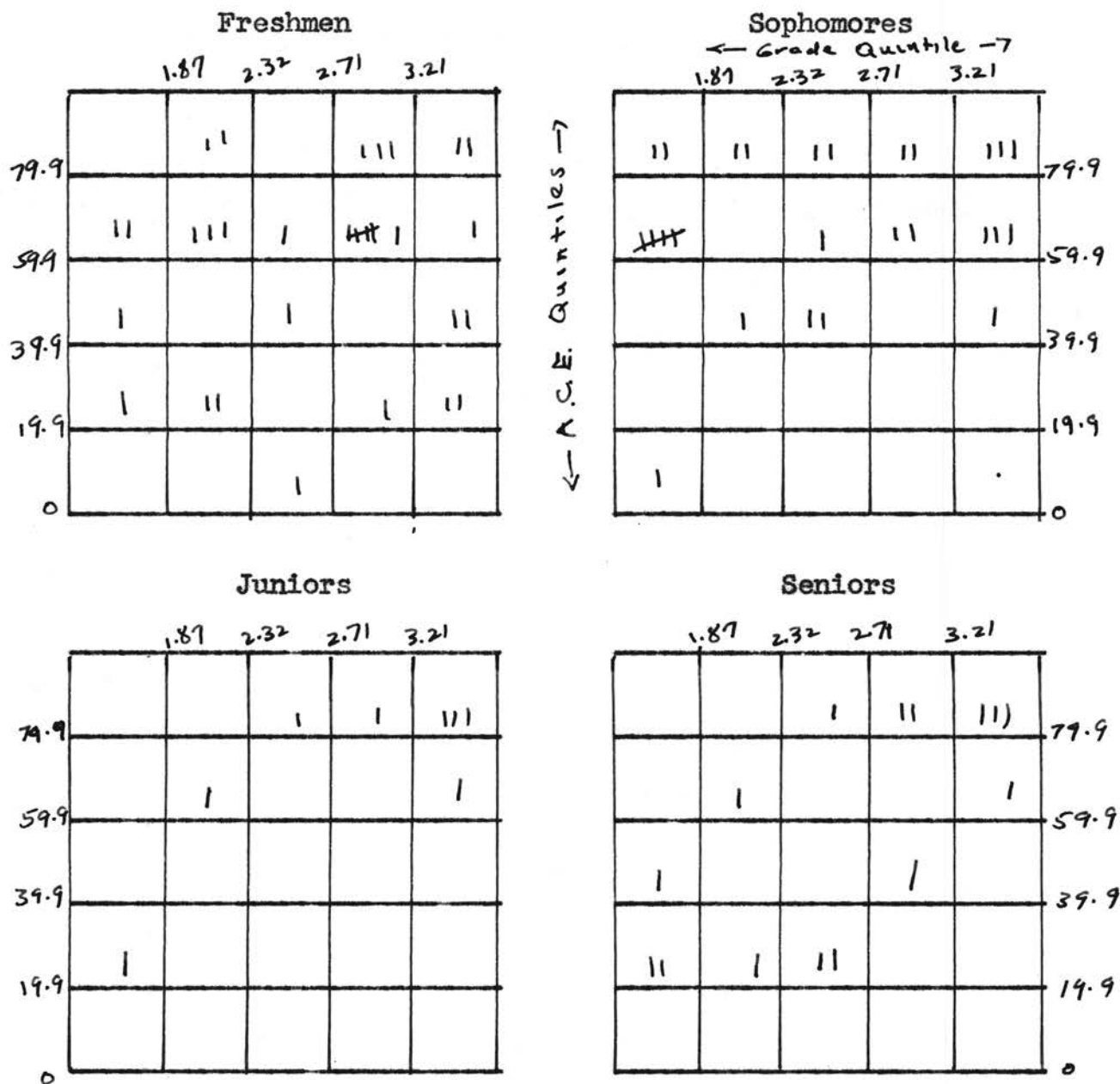
<sup>2</sup>Monroe and Engelhart. The Scientific Study of Educational Problems. New York: The Macmillan Company, 1936, p. 73.

TABLE IV

QUINTILE DISTRIBUTION OF GRADE POINT AVERAGES  
FOR 1,583 STUDENTS IN ARTS AND SCIENCES  
FIRST SEMESTER, 1946-47

Grade Points	f	Formula
4.00	31	Formula $Q = 1 + \left[ \frac{4N/5 - SL}{f} \right] i$
3.75	54	$Q_{80} = 300 + \left[ \frac{1266.4 - 1141}{152} \right] i$
3.50	88	$= 300 + \left[ \frac{125.4}{152} \right] 25$
3.25	117	$= 300 + 20.625$
3.00	152	$= 3.20625$ or <u>3.21</u>
2.75	157	$Q_{60} = 250 + \left[ \frac{949.8 - 786}{198} \right] i$
2.50	198	$= 250 + \left[ \frac{163.8}{198} \right] 25$
2.25	211	$= 250 + 20.68175$
2.00	203	$= 1.7068$ or <u>2.71</u>
1.75	110	$Q_{40} = 2.25 + \left[ \frac{633.2 - 575}{211} \right] i$
1.50	79	$= 2.25 + \left[ \frac{58.2}{211} \right] 25$
1.25	56	$= 2.25 + 6.8955$
1.00	48	$= 2.318955$ or <u>2.32</u>
.75	26	$Q_{20} = 175 + \left[ \frac{316.6 - 262}{110} \right] i$
.50	12	$= 175 + \left[ \frac{54.6}{110} \right] 25$
.25	7	$= 175 + 12.409$
0.00	34	$= 1.87409$ or <u>1.87</u>
N = 1,583		

## CHEMISTRY



Two-Variable Chart upon Which Original Frequencies  
Were Computed for Table V

TABLE V

TWO-VARIABLE CHARTS INVOLVING GRADE AND A.C.E.  
 QUINTILE RANKINGS FOR EACH OF THE MAJOR FIELDS  
 IN THE SCHOOL OF ARTS AND SCIENCES

## GENERAL

Freshman					Sophomore				
1	5	9	7	14	3	5	13	10	6
9	12	11	2	8	2	5	8	6	4
14	11	15	3	5	8	5	5	1	0
18	13	9	9	5	6	4	7	2	0
29	12	4	4	1	3	3	4	2	0

Junior					Senior				
0	0	1	2	0	0	0	0	0	0
0	1	0	1	0	0	0	0	0	0
1	2	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

## ART

Freshman					Sophomore				
0	1	0	2	1	0	2	1	2	3
1	1	3	1	1	3	2	0	2	1
0	3	3	2	2	2	0	4	1	3
3	5	3	2	1	2	2	2	0	2
5	1	2	0	0	1	0	0	0	1



TABLE V - ContinuedART - Continued

<u>Junior</u>					<u>Senior</u>				
0	0	0	0	1	0	0	1	0	1
0	0	0	1	1	0	0	1	2	3
0	1	1	0	0	0	0	0	0	0
0	2	1	2	0	0	0	1	1	1
0	0	2	0	0	0	0	0	0	0

## BACTERIOLOGY

<u>Freshman</u>					<u>Sophomore</u>				
0	0	1	0	2	0	0	0	1	0
1	0	0	0	0	0	0	2	0	0
0	0	1	0	0	0	0	1	0	0
0	0	0	0	0	2	0	1	0	0
0	1	0	0	0	0	0	0	0	0

<u>Junior</u>					<u>Senior</u>				
1	0	0	1	2	1	0	0	2	1
0	0	0	0	1	0	0	1	0	2
0	0	1	0	0	0	0	1	0	1
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

TABLE V - Continued

## BIOLOGICAL SCIENCE

<u>Freshman</u>					<u>Sophomore</u>				
0	0	0	1	0	0	1	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
<u>Junior</u>					<u>Senior</u>				
0	1	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
BOTANY									
<u>Freshman</u>					<u>Sophomore</u>				
0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	1	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

TABLE V - ContinuedBOTANY - Continued

<u>Junior</u>					<u>Senior</u>				
0	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0

## CHEMISTRY

<u>Freshman</u>					<u>Sophomore</u>				
0	1	0	3	2	2	2	2	2	4
2	4	1	6	1	5	0	1	2	3
1	0	1	0	2	0	1	2	0	1
1	2	0	1	0	0	0	0	0	0
0	0	1	0	0	1	0	0	0	0

<u>Junior</u>					<u>Senior</u>				
0	0	1	1	3	0	0	1	2	3
0	1	0	0	1	0	1	0	0	1
0	0	0	0	0	1	0	0	1	0
1	0	0	0	0	2	1	2	0	0
0	0	0	0	0	0	0	0	0	0

TABLE V - Continued

## ECONOMICS

<u>Freshman</u>					<u>Sophomore</u>				
0	0	0	0	0	0	0	0	1	1
0	0	0	0	1	0	0	0	1	1
0	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<u>Junior</u>					<u>Senior</u>				
0	1	0	0	0	0	0	1	0	0
0	0	0	0	0	0	0	0	1	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	0	0
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

## ENGLISH

<u>Freshman</u>					<u>Sophomore</u>				
0	1	2	2	3	1	0	0	0	3
0	1	0	0	1	2	1	4	2	1
0	1	0	2	2	1	1	2	1	1
1	0	1	0	0	0	1	2	0	1
<u>3</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>0</u>

TABLE V - ContinuedENGLISH - Continued

<u>Junior</u>					<u>Senior</u>				
0	0	1	2	2	1	0	0	1	1
0	0	0	4	3	0	2	0	1	0
1	1	0	0	1	1	0	0	1	0
0	1	0	0	0	0	0	2	0	0
0	0	0	0	0	0	0	0	0	0

## FOREIGN LANGUAGE

<u>Freshman</u>					<u>Sophomore</u>				
0	0	0	2	1	0	2	0	3	3
1	1	0	0	0	0	0	1	0	3
2	0	0	0	0	0	2	1	0	0
0	1	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	1	0	0

<u>Junior</u>					<u>Senior</u>				
0	0	1	0	0	0	0	0	1	1
0	1	0	1	0	0	0	0	1	0
1	0	1	2	0	0	0	0	0	0
0	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

TABLE V - Continued

## GEOLOGY

<u>Freshman</u>					<u>Sophomore</u>				
1	1	1	2	0	0	0	0	1	0
1	1	0	2	1	0	1	0	0	1
1	3	1	0	0	0	0	3	1	1
1	0	0	1	0	1	0	0	2	0
4	0	1	0	0	1	1	1	0	0

<u>Junior</u>					<u>Senior</u>				
0	0	0	0	0	0	0	0	0	0
0	0	0	0	1	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

## HISTORY

<u>Freshman</u>					<u>Sophomore</u>				
0	0	0	0	0	0	0	0	0	2
0	0	1	1	1	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	1	0	1	0
1	0	0	0	0	1	1	0	1	0

TABLE V - ContinuedHISTORY - Continued

<u>Junior</u>					<u>Senior</u>				
0	0	0	0	1	0	0	0	0	2
0	0	1	0	0	0	0	0	1	0
1	0	0	0	0	0	0	0	0	2
0	0	0	0	0	0	0	0	0	0
<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

## JOURNALISM

<u>Freshman</u>					<u>Sophomore</u>				
3	0	2	5	6	2	5	2	4	4
3	3	4	5	2	2	3	4	2	0
1	1	2	5	0	2	3	2	1	3
8	2	3	4	1	2	0	0	1	1
<u>3</u>	<u>3</u>	<u>2</u>	<u>2</u>	<u>0</u>	<u>4</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

<u>Junior</u>					<u>Senior</u>				
1	1	1	4	1	0	0	1	2	2
1	1	1	2	0	0	0	0	0	0
0	0	0	2	1	0	0	1	1	1
1	1	0	0	0	0	0	0	1	0
<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

TABLE V - Continued

## LAB-TECHNICIAN

<u>Freshman</u>					<u>Sophomore</u>				
0	0	0	0	2	2	1	1	0	0
1	0	0	1	0	0	0	1	0	1
1	0	0	0	0	0	0	2	0	0
0	0	0	0	0	2	1	0	0	0
0	0	0	0	0	0	1	1	0	0

<u>Junior</u>					<u>Senior</u>				
0	0	0	1	0	0	0	0	0	0
0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	0	0	0	0

## MATHEMATICS

<u>Freshman</u>					<u>Sophomore</u>				
0	0	0	1	1	0	0	1	1	1
1	0	0	0	1	0	1	0	0	1
1	0	3	1	1	0	0	0	0	0
1	2	0	1	0	1	0	1	0	0
2	0	0	0	0	0	0	0	0	0



TABLE V - ContinuedMATHEMATICS - Continued

<u>Junior</u>					<u>Senior</u>				
0	0	0	2	2	0	0	0	1	3
0	0	0	1	0	0	0	1	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	1	0

## MUSIC

<u>Freshman</u>					<u>Sophomore</u>				
0	0	0	3	7	3	1	0	1	4
1	0	2	3	2	0	1	2	1	1
2	0	3	6	3	0	1	2	2	0
5	0	5	2	1	1	1	1	0	0
2	3	0	0	0	0	1	1	1	0

0	1	1	1	3	0	0	0	1	3
0	0	0	1	1	0	1	0	0	1
0	1	0	0	1	0	1	1	2	1
0	1	1	0	1	0	0	1	0	1
1	0	1	0	0	0	0	0	0	0

TABLE V - Continued

## PHYSICAL EDUCATION

<u>Freshman</u>					<u>Sophomore</u>				
0	0	2	1	1	0	1	0	0	1
0	0	0	1	0	1	1	1	0	0
1	1	1	0	0	1	1	0	0	0
1	3	2	1	0	2	1	4	0	1
8	1	0	0	0	3	2	0	0	0

<u>Junior</u>					<u>Senior</u>				
0	0	0	0	0	0	0	0	1	1
0	0	1	0	2	0	0	0	0	1
0	0	1	1	0	0	1	0	0	0
0	0	3	1	0	0	0	0	0	1
0	0	0	1	0	0	0	1	1	0

## PHYSICS

<u>Freshman</u>					<u>Sophomore</u>				
0	1	1	0	3	0	0	1	4	3
0	0	1	0	2	2	1	0	0	0
0	3	1	0	1	1	0	0	0	0
2	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

TABLE V - ContinuedPHYSICS - Continued

<u>Junior</u>					<u>Senior</u>				
0	0	0	0	0	0	1	0	0	1
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

## POLITICAL SCIENCE

<u>Freshman</u>					<u>Sophomore</u>				
0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	1	1	1	0	0
0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0

<u>Junior</u>					<u>Senior</u>				
0	0	0	1	0	0	0	0	0	2
0	0	0	1	0	0	0	0	0	0
0	0	0	0	0	0	0	1	0	0
0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0

TABLE V - Continued

## PRE-DENTAL

Freshman					Sophomore				
1	0	1	1	1	0	2	0	0	1
0	1	0	0	1	0	2	2	1	1
2	0	1	0	0	2	2	1	0	0
4	1	3	0	2	2	0	1	2	0
3	1	2	1	0	1	0	0	0	1

Junior					Senior				
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

## PRE-LAW

Freshman					Sophomore				
0	1	3	3	1	1	1	0	0	3
1	2	0	2	3	0	1	1	0	2
1	1	1	3	1	1	1	1	1	0
4	3	1	1	0	0	1	1	1	1
5	1	1	0	0	0	0	0	0	0

TABLE V - ContinuedPRE-LAW - Continued

<u>Junior</u>					<u>Senior</u>				
0	0	0	2	0	0	0	0	1	0
0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

PRE-MEDICAL

<u>Freshman</u>					<u>Sophomore</u>				
0	1	1	5	6	0	1	6	3	6
1	4	2	4	0	0	3	1	1	4
1	1	1	2	1	4	5	3	1	3
5	4	1	1	1	0	1	0	2	0
5	1	0	0	0	1	1	1	0	0

<u>Junior</u>					<u>Senior</u>				
0	0	0	0	0	0	0	0	1	0
0	0	1	0	0	0	0	2	0	0
0	1	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

TABLE V - Continued

## PRE-VETERINARY

Freshman					Sophomore				
0	2	2	0	2	0	0	1	0	1
0	1	1	1	0	0	2	1	0	1
1	4	0	0	0	0	0	0	0	0
3	1	1	1	0	0	0	0	1	0
1	2	2	0	0	0	1	0	0	0

Junior					Senior				
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

## PSYCHOLOGY

Freshman					Sophomore				
1	1	1	1	2	0	0	0	3	4
0	1	0	1	2	1	2	2	1	2
2	0	3	0	0	1	1	4	1	0
2	0	2	0	0	4	0	1	0	1
1	0	0	0	0	2	1	0	0	0

TABLE V - ContinuedPSYCHOLOGY - Continued

<u>Junior</u>					<u>Senior</u>				
0	0	2	0	1	0	0	1	0	2
1	0	1	0	0	0	1	2	1	0
0	0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	1	0	0	1
0	0	0	0	0	0	0	0	0	1

## SOCIAL SCIENCE

<u>Freshman</u>					<u>Sophomore</u>				
0	0	0	0	0	0	0	0	0	2
0	0	0	0	0	0	0	1	1	0
0	0	0	1	0	0	0	0	0	0
0	0	0	0	0	0	0	1	0	0
0	0	0	0	0	0	0	0	0	0

<u>Junior</u>					<u>Senior</u>				
0	0	0	0	1	0	0	1	1	0
0	1	0	2	1	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

TABLE V - Continued

## SOCIOLOGY

<u>Freshman</u>					<u>Sophomore</u>				
0	0	0	0	1	1	1	0	0	1
0	0	0	0	0	1	0	0	0	0
0	0	1	0	0	1	1	1	1	2
0	0	0	0	0	1	1	0	0	1
1	0	0	0	0	3	0	0	0	0

<u>Junior</u>					<u>Senior</u>				
0	0	0	0	1	0	2	0	0	0
0	1	0	1	0	0	0	0	1	1
0	0	2	0	1	1	0	1	0	0
1	0	1	1	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0

## SPEECH

<u>Freshman</u>					<u>Sophomore</u>				
0	0	0	0	2	0	0	1	1	0
1	2	1	1	0	0	0	0	0	1
1	1	2	1	0	1	0	0	1	1
2	1	1	0	0	1	0	1	3	0
3	1	0	0	2	0	0	0	0	0



TABLE V - ContinuedSPEECH - Continued

<u>Junior</u>					<u>Senior</u>				
0	0	0	0	1	0	0	0	0	1
0	0	0	0	1	0	0	0	0	0
0	0	1	1	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

## WILD-LIFE CONSERVATION

<u>Freshman</u>					<u>Sophomore</u>				
1	1	0	0	2	0	0	0	1	0
0	0	1	0	0	0	0	1	0	0
0	1	1	0	0	0	0	0	1	0
0	0	1	0	0	0	0	0	1	0
2	0	0	0	0	1	1	1	0	0

<u>Junior</u>					<u>Senior</u>				
0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	1
0	0	1	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

TABLE V - Continued

## ZOOLOGY

<u>Freshman</u>					<u>Sophomore</u>				
0	1	1	1	2	0	0	0	0	1
0	0	0	0	0	0	1	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	0	0

<u>Junior</u>					<u>Senior</u>				
0	0	0	0	0	0	0	0	0	0
1	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	1	0	0
0	0	0	1	0	0	0	1	1	0
0	0	0	0	0	0	0	0	0	0

Table VI was prepared in order to make quick comparisons between A.C.E. and grade quintiles for each major field with forty-five or more students. From Table V, the percentages were computed from the totals in each grade quintile. These percentages together with the A.C.E. percentages comprise Table VI. The general major\* in this table was deemed sufficiently large to merit special treatment. The percentage for each number in the chart was computed by dividing the number by the total number in the class, thus showing the amount of overachievement and underachievement among the five quintiles representing academic ability.

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\*The general major field is followed by those entering students who have not yet made up their minds as to the major field they wish to pursue.

TABLE VI

PERCENT OF EACH CLASS OF THE LARGER MAJOR FIELDS  
THAT FALL IN THE FIVE A.C.E. AND GRADE QUINTILES

## GENERAL MAJOR

Freshman (230)					
0.4%	2.2%	3.9%	3.0%	6.1%	15.6%
3.9%	5.2%	4.8%	0.9%	3.5%	18.3%
6.1%	4.8%	6.5%	1.3%	2.2%	20.9%
7.8%	5.7%	3.9%	3.9%	2.2%	23.5%
12.6%	5.2%	1.7%	1.7%	0.4%	21.6%
30.8%	23.1%	30.8%	10.8%	14.4%	99.9%
Sophomore (112)					
2.7%	4.5%	11.6%	8.9%	5.4%	33.1%
1.8%	4.5%	7.1%	5.4%	3.6%	22.4%
7.1%	4.5%	4.5%	0.9%	0.9%	17.0%
5.4%	3.6%	6.3%	1.8%	0.0%	17.1%
2.7%	2.7%	3.6%	1.8%	0.0%	10.8%
19.7%	19.8%	33.1%	18.8%	9.0%	100.4%

TABLE VI - Continued

## ART

Freshman (43)		Sophomore (36)	
A.C.E.	Grades	A.C.E.	Grades
9.3%	11.6%	22.2%	27.8%
16.3%	16.3%	22.2%	13.9%
23.3%	25.6%	27.8%	19.4%
32.6%	25.6%	22.2%	16.7%
18.6%	20.9%	5.6%	22.2%

Junior (12)		Senior (11)	
A.C.E.	Grades	A.C.E.	Grades
8.3%	16.7%	18.2%	45.5%
16.7%	25.0%	54.5%	27.3%
16.7%	33.3%	00.0%	27.3%
41.7%	25.0%	27.3%	0.0%
16.7%	0.0%	0.0%	0.0%

## CHEMISTRY

Freshman (29)		Sophomore (28)	
A.C.E.	Grades	A.C.E.	Grades
20.7%	17.2%	42.9%	28.6%
48.3%	34.5%	39.3%	14.3%
13.8%	10.3%	14.3%	17.9%
13.8%	24.1%	0.0%	10.7%
3.5%	13.8%	3.6%	28.6%

TABLE VI - ContinuedCHEMISTRY - Continued

Junior (8)		Senior (15)	
A.C.E.	Grades	A.C.E.	Grades
62.5%	50.0%	40.0%	26.7%
25.0%	12.5%	13.3%	20.0%
0.0%	12.5%	13.3%	20.0%
12.5%	12.5%	33.3%	13.3%
0.0%	12.5%	0.0%	20.0%

## ENGLISH

Freshman (20)		Sophomore (26)	
A.C.E.	Grades	A.C.E.	Grades
40.0%	30.0%	15.4%	23.1%
10.0%	20.0%	38.5%	15.4%
25.0%	15.0%	23.1%	30.8%
10.0%	15.0%	15.4%	15.4%
15.0%	20.0%	7.7%	15.4%

Junior (16)		Senior (10)	
A.C.E.	Grades	A.C.E.	Grades
31.3%	37.5%	30.0%	10.0%
43.8%	37.5%	30.0%	30.0%
18.8%	6.3%	20.0%	20.0%
6.3%	12.5%	20.0%	20.0%
0.0%	6.3%	0.0%	20.0%

TABLE VI - Continued

## JOURNALISM

Freshman (70)		Sophomore (47)	
A.C.E.	Grades	A.C.E.	Grades
22.9%	12.9%	36.2%	17.0%
24.3%	30.0%	23.4%	17.0%
12.9%	18.6%	23.4%	17.0%
25.7%	12.9%	8.5%	23.4%
14.3%	25.7%	8.5%	25.5%

Junior (20)		Senior (9)	
A.C.E.	Grades	A.C.E.	Grades
40.0%	15.0%	55.6%	33.3%
25.0%	40.0%	0.0%	44.4%
15.0%	10.0%	33.3%	22.2%
10.0%	20.0%	11.1%	0.0%
10.0%	15.0%	0.0%	0.0%

## MUSIC

Freshman (50)		Sophomore (25)	
A.C.E.	Grades	A.C.E.	Grades
20.0%	26.0%	36.0%	20.0%
16.0%	28.0%	20.0%	20.0%
28.0%	20.0%	20.0%	24.0%
26.0%	6.0%	12.0%	20.0%
10.0%	20.0%	12.0%	16.0%

TABLE VI - ContinuedMUSIC - Continued

Junior (15)		Senior (13)	
A.C.E.	Grades	A.C.E.	Grades
40.0%	40.0%	30.8%	46.2%
13.3%	13.3%	15.4%	23.1%
13.3%	20.0%	38.5%	15.4%
20.0%	20.0%	15.4%	15.4%
13.3%	6.7%	0.0%	0.0%

## PHYSICAL EDUCATION

Freshman (24)		Sophomore (20)	
A.C.E.	Grades	A.C.E.	Grades
16.7%	4.2%	10.0%	10.0%
4.2%	12.5%	15.0%	0.0%
12.5%	20.8%	10.0%	25.0%
29.2%	20.8%	40.0%	30.0%
37.5%	41.7%	25.0%	35.0%

Junior (10)		Senior (7)	
A.C.E.	Grades	A.C.E.	Grades
0.0%	20.0%	28.6%	42.9%
30.0%	30.0%	14.3%	28.6%
20.0%	50.0%	14.3%	14.3%
40.0%	0.0%	14.3%	14.3%
10.0%	0.0%	28.6%	0.0%



TABLE VI - Continued

## PRE-DENTAL

Freshman (26)		Sophomore (21)	
A.C.E.	Grades	A.C.E.	Grades
15.4%	15.4%	14.3%	14.3%
7.7%	7.7%	28.6%	14.3%
11.5%	26.9%	23.8%	19.0%
38.5%	11.5%	23.8%	28.6%
26.9%	38.5%	9.5%	23.8%

## PRE-LAW

Freshman (39)		Sophomore (17)	
A.C.E.	Grades	A.C.E.	Grades
20.5%	12.8%	29.4%	35.3%
20.5%	23.1%	23.5%	11.8%
18.0%	15.4%	23.5%	17.6%
23.1%	20.5%	23.5%	23.5%
18.0%	28.2%	0.0%	11.8%

## PRE-MEDICAL

Freshman (48)		Sophomore (47)	
A.C.E.	Grades	A.C.E.	Grades
27.1%	16.7%	34.0%	27.7%
22.9%	25.0%	19.2%	14.9%
12.5%	10.4%	34.0%	23.4%
25.0%	22.9%	6.4%	23.4%
12.5%	25.0%	6.4%	10.6%

TABLE VI - Continued

## PSYCHOLOGY

Freshman (20)		Sophomore (31)	
A.C.E.	Grades	A.C.E.	Grades
30.0%	20.0%	22.6%	22.6%
20.0%	10.0%	25.8%	16.1%
25.0%	30.0%	22.6%	22.6%
20.0%	10.0%	19.4%	12.9%
5.0%	30.0%	9.7%	25.8%

On page 55 is shown the mathematical computation which would be used in determining the grade deviation and academic aptitude for the freshmen in the general major. The computations on the left side of the page are used to determine the grade deviation.

If the A.C.E. score were a perfect measure of academic aptitude and each student's achievement was exactly normal with all other factors being equal, it can be readily seen that all cases would lie on a diagonal from the lower left to the upper right of each chart; i.e., those in the lowest quintile of ability would lie in the lowest quintile of achievement, second in ability would be second in achievement, and so on until the highest quintile in ability would be shown in the highest quintile in achievement. Thus, the cases which lie on this diagonal are achieving as might be expected and therefore are not included in computing the deviation which is indicated by the series of zeros. Those cases which lie one place to the right of the zero diagonal are one quintile better in achievement than their A.C.E. scores would indicate ( $D_1$ ). The cases in the second diagonal to the right ( $D_2$ ) are two quintiles ahead in achievement, ( $D_3$ ) three quintiles ahead, and ( $D_4$ ) is four quintiles better in achievement than would be indicated by the A.C.E. percentile score.

The same would be true of underachievement, which would be found to the left of the zero diagonal. The average deviation is computed by multiplying the sum of each diagonal

times its distance from the zero diagonal, keeping in mind that those numbers to the right of the zero diagonal will be positive and those to the left will be negative. Then all the sums, together as determined in the four classes which comprise each major and divide the sum of these positive and negative factors by the total number of students pursuing the major. The quotient obtained represents the average deviation from the zero diagonal for that particular major field.

The quintile point which represents the average for each major field is determined in the same manner as the grade deviation. The "Total" columns from Table II are used, and the quintiles from lowest to highest are given weighted multipliers of from one to five. The cases in each quintile are multiplied times its weighted number and the sum of these products is divided by the total number of cases in the major field. The quotient thus obtained is the quintile point which represents the average for those in that particular major field.

An average A.C.E. percentile score may be obtained for each major field through interpolation; i.e., multiplying 20 times the decimal part of the quintile point and adding the product to the midpoint of the quintile indicated by the whole number.

Freshmen (General Major)  
from Table V

-D <sub>4</sub>	-D <sub>3</sub>	-D <sub>2</sub>	-D <sub>1</sub>	0	
-D <sub>3</sub>	-D <sub>2</sub>	-D <sub>1</sub>	0	D <sub>1</sub>	
-D <sub>2</sub>	-D <sub>1</sub>	0	D <sub>1</sub>	D <sub>2</sub>	
-D <sub>1</sub>	0	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	
0	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	
1	5	9	7	14	
9	12	11	2	8	
14	11	15	3	5	
18	13	9	9	5	
29	12	4	4	1	
					N = 230

$$\begin{array}{r}
 12 \neq 9 \neq 3 \neq 8 = 32 \\
 4 \neq 9 \neq 5 \times 2 = 36 \\
 4 \neq 5 \times 3 = 27 \\
 1 \times 4 = \underline{4} \\
 \hline
 99
 \end{array}$$

$$\begin{array}{r}
 -18 -11 -11 -7 = -47 \\
 -14 -12 - 9 \times 2 = -70 \\
 -9 -5 \times 3 = -42 \\
 -1 \times 4 = \underline{-4} \\
 \hline
 -163
 \end{array}$$

$$99 - 163 = -64$$

$$-64/230 = -.278 \text{ (average deviation from middle diagonal)}$$

Freshman Quintile Distribution  
from Table II (General Major)

5th Quintile	36 X 5 = 180
4th Quintile	42 X 4 = 168
3d Quintile	48 X 3 = 144
2d Quintile	54 X 2 = 108
1st Quintile	<u>50</u> X 1 = <u>50</u>
	230                  650

$$230/650 = 2.826$$

2.826 is quintile point representing average for freshmen in General Major.

By means of interpolation the average A.C.E. percentile score for the freshmen is found to be 46.5.

Mathematical procedure used in determining the grade deviation and academic aptitude among the twenty-two largest major fields in Table VII

TABLE VII

TWENTY-TWO MAJOR FIELDS OF THE SCHOOL OF ARTS AND SCIENCES  
LISTED ACCORDING TO THE DEVIATION IN GRADE ACHIEVEMENT  
AND A SECOND TIME IN ORDER OF THE AVERAGE QUINTILE  
POINT OF THOSE STUDENTS PURSUING THAT MAJOR

Arts and Science Majors Listed  
According to Underachievement  
Indicated in Table V

1. Physics	(29)	-0.897
2. Lab-Technician	(22)	-0.773
3. Chemistry	(80)	-0.725
4. Bacteriology	(28)	-0.536
5. Foreign Language	(36)	-0.500
6. Journalism	(146)	-0.486
7. Pre-Veterinary	(33)	-0.485
8. Psychology	(67)	-0.478
9. General	(351)	-0.439
10. Pre-Medical	(101)	-0.436
11. Sociology	(35)	-0.314
12. English	(72)	-0.292
13. Geology	(38)	-0.289
14. Pre-Law	(60)	-0.267
15. Wild-Life Conservation	(20)	-0.200
16. Pre-Dental	(47)	-0.191
17. Mathematics	(34)	-0.177
18. Art	(102)	-0.088
19. Music	(102)	-0.078
20. Speech	(39)	∕0.103
21. History	(20)	∕0.286
22. Physical Education	(61)	∕0.308

TABLE VII - Continued

Arts and Science Majors listed  
according to academic aptitude  
of students attracted, judged  
by A.C.E. percentile scores

	Quintile Point	Interpolated A.C.E. Average
1. Physics	4.172	73.4
2. Bacteriology	3.929	68.6
3. Chemistry	3.913	68.3
4. Foreign Language	3.861	67.2
5. English	3.597	61.9
6. Mathematics	3.588	61.8
7. Lab-Technician	3.500	60.0
8. Psychology	3.493	59.9
9. Pre-Medical	3.485	59.7
10. Journalism	3.466	59.3
11. Music	3.330	56.6
12. Pre-Law	3.283	55.7
13. Pre-Veterinary	3.121	52.6
14. History	3.100	52.0
15. Wild Life Conservation	3.100	52.0
16. Sociology	3.086	51.7
17. General	3.066	51.3
18. Art	2.990	49.8
19. Geology	2.974	49.5
20. Speech	2.923	48.5
21. Pre-Dental	2.766	45.3
22. Physical Education	2.508	40.2

CHAPTER III  
SUMMARY AND CONCLUSIONS

Using the American Council on Education Psychological Examination as a criterion, an overall view of the distribution of academic aptitude in the School of Arts and Sciences may be had by studying Table I. The percentile scores awarded for this examination at the Oklahoma Agricultural and Mechanical College compare the students receiving them with entering freshmen students in four-year colleges from all parts of the nation.

The average percentile score for each of the four college classes and for all the students in the School of Arts and Sciences was found from the data in Table I and were computed as shown on page . By finding the average quintile point for each group and interpolating, the following average percentile scores were obtained:

<u>Class</u>	<u>Average Percentile Score</u>
Freshman	50.4
Sophomore	59.9
Junior	62.2
Senior	65.7
Total Arts and Sciences	56.1

The norms on which our present A.C.E. percentile scores are derived are from tests administered in the years 1942



and 1943. Thus it can be said that the freshman class which entered the School of Arts and Sciences the first semester of the school year 1946-47 was a small fraction above the national average for the entering freshmen students in the school years 1942 and 1943. It will be interesting to note how the larger post-war freshmen classes compare with those of 1942 and 1943. These comparisons must await later norms than are now available.

Assuming that the sophomore, junior and senior classes also equaled the national norms at the time of their matriculation into college, a survey of Table I will show the large numbers of students with low percentile scores who drop out of school before the senior year. Comparison of the lowest quintile (scores below 20) with the highest quintile (scores above 80) for the freshman class shows the ratio as approximately 9 to 10; for sophomores 1 to 3; for juniors 1 to 5; and for seniors 1 to 10.

Tables II, III, IV, V and VI are included in this study for those who might wish to give particular attention to the studies of academic aptitude and achievement within the many major fields in the School of Arts and Sciences. The tables also furnish the data upon which Table VII was derived.

Table VII lists the twenty-two largest major fields under two headings: first, according to underachievement among those indicating the fields as their major; second,

according to the academic aptitudes of the students attracted to them, judged by their A.C.E. percentile scores. The significance of this study regarding any major field will become more meaningful by comparing its relative position under each of the two headings. If there were the same degree of overachievement and underachievement among those in each major field represented on the right side of the page then the majors on the left would correlate perfectly with those on the right.

If all the students in one major field were in the highest quintile, then the highest deviation in achievement they could possibly show would be zero, and in order to do that, each would have to be in the highest quintile in grade achievement. Thus the only deviation this group could show would be negative. The students in the fourth quintile could overachieve as much as one quintile and underachieve as much as three quintiles; the third quintile group would have the same number of quintiles to the right and to the left; the second quintile would have three to the right and one to the left; and finally in the lowest quintile, the lowest deviation this group could show would be zero and any deviation would necessarily be positive.

The twenty-nine students who indicated physics as their major had an average percentile score of 73.4. A deviation of  $-0.897$  means that the average in achievement for the twenty-nine students was .9 of one quintile to the left of the zero diagonal. Those major fields that hold the same

relative position under both headings may be considered to be achieving normally. Those majors higher on the left side are showing greater underachievement and those lower on the left side show greater overachievement. Mathematics, with an average percentile score of 61.8, has an average grade deviation of .17 quintiles to the left; whereas, the thirty-three people indicating the Laboratory-Technician Major had an average percentile score of 60, and their grade deviation was .77 quintiles to the left. The twenty students in the major field of History had the same percentile average as the twenty students in the Wild-Life Conservation Major, which was 52. The History Majors had a grade deviation of .29 quintiles to the right (positive); whereas, the Wild-Life Conservation Majors had a grade deviation of .49 quintiles to the left. This would indicate the twenty students with a percentile score of 52 in the field of History made better grades on the average than did twenty students with the same percentile score average in the major field of Wild-Life Conservation. The author concludes from this observation that the subjects taken by the students in the field of Wild-Life Conservation are relatively more difficult than those taken by students pursuing the major field of History.

In conclusion, the author wishes to bring attention to several unusual cases in the study and to the testing program at the Oklahoma Agricultural and Mechanical College.

Three seniors are noted in the lowest quintile in academic ability and in the highest grade quintile, with majors

in Mathematics, Physical Education and Psychology. One senior in the major field of English was found to be in the highest quintile in academic ability and in the lowest quintile in grade achievement. These cases which show unusual amounts of underachievement or overachievement merit special attention, more especially if the college is called upon to furnish such information to prospective employers.

It is possible that very good grades might be made by people in the lowest quintile of aptitude due to factors of motivation, good study habits, social adjustments, etc.; however, this writer is inclined to feel that a better interpretation would be that some factors were at work at the time the students took the A.C.E. examination which prevented them from giving a true accounting of their own abilities. It is suggested that in all fairness to the students they be given an opportunity to take another psychological examination in order to determine whether the grades are a result of true academic ability or the result of overachievement. The school should make every effort to obtain the most accurate data possible on each individual student. The counselor or prospective employer would be interested in finding the reasons for the one senior's apparent great degree of underachievement in the field of English. A lack of motivation, social or environmental conditions might have been contributing factors which prevented the student from achieving at a rate commensurate with his abilities, or again there is a possibility

that the score might not be a fair indicator of the student's academic aptitudes. A retest for this student would surely not be out of order.

The Oklahoma Agricultural and Mechanical College has instituted a testing service during this school year which this writer feels will develop into a very vital factor in the guidance and counseling of college students. This department needs facilities for administering tests of aptitude and achievement under those conditions which will cause the test results to be directly comparable to the groups upon whom the tests were standardized, and it is felt that within the space of a few short years, college students will seek these instruments of self-appraisal in order to approach the decisions on immediate and future goals with a greater degree of insight.

The author hopes this study may be found of some benefit to administrators and to those who share the responsibility for guidance and counseling in the School of Arts and Sciences. He feels that the tables included in this study are of sufficient scope and contain significant data to be of value to those who advise students regarding choices of major fields in college.

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