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# Determination of critical scores for the United States Armed Forces Institute tests of general educational development at Dartmouth High School.

Charles Frank Oliver  
*University of Massachusetts Amherst*

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DETERMINATION OF CRITICAL SCORES  
FOR THE UNITED STATES ARMED FORCES INSTITUTE TESTS  
OF GENERAL EDUCATIONAL DEVELOPMENT AT  
DARTMOUTH HIGH SCHOOL

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DETERMINATION OF CRITICAL SCORES FOR THE UNITED  
STATES ARMED FORCES INSTITUTE TESTS OF  
GENERAL EDUCATIONAL DEVELOPMENT

AT

DARTMOUTH HIGH SCHOOL

By

Charles Frank Oliver Jr.

A problem submitted in partial fulfillment of  
the requirements for the Master of  
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1946

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CHAPTER I  
INTRODUCTION

## CHAPTER I

### INTRODUCTION

Beginning of a Problem -- When Hitler's horde swarmed over the plains of Poland to begin a second World War, secondary education people in the United States little realized the effect it was to have on the entire structure of secondary education in this country. They did not envision that within three short years the high school and college faculties would be reduced to a mere skeleton force and that the student body itself would be stripped of virtually all males over eighteen years of age.

With Selective Service going into effect October 16, 1940 there began a gradual exodus of males from the colleges with some older boys in the high school going along realizing that they would eventually be called. Early in December, 1940 other young men were called out of the schools when the National Guard was called for active duty. Following the sneak attack of the Japanese at Pearl Harbor on December 7, 1941, a wave of patriotic zeal swept the land at which time thousands of young men from the high schools flocked to the service of their country. July 1, 1942 when the order became effective to draft eighteen year old boys the schools were reduced to very meager numbers. This was particularly true in Dartmouth since most of the boys preferred the Navy and in order to be sure of getting into that branch of the

service they had to enlist before they were called by the local Selective Service Board.

V-E Day, May 8, 1945, saw the first break in the pressure that had been on the military forces for three and a half years. Some boys were coming home on extended leave, others were waiting in camps for assignment to other theaters of operations, all had more opportunity for consideration of things that lay ahead. Inquiries started coming in as to what they could do to qualify for a high school diploma. These requests kept gradually increasing until after Japan collapsed late in August, 1945 when they increased tremendously.

United States Armed Forces Institute<sup>1</sup>-- Early in World War II military authorities realized that there were hundreds of thousands of men in the service whose education had been interrupted. They also were aware of the fact that a great deal of the training being given to the military personnel had some direct as well as indirect educational value. These men in service had considerable time on their hands which could be used to advantage in educational activities. To take care of this situation, the United States Armed Forces Institute was organized, charged among other things with (1) organizing an educational program both on a correspondence

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1. United States Armed Forces Institute, Madison 3, Wisconsin.



and group instruction basis (2) testing the educational results of this program and the training programs that were being given by the military units (3) certifying to the schools and colleges the extent and value of any training program that any individual in the armed service may have followed. As a part of their program they developed the Tests of General Educational Development. These tests are described fully in Chapter III of this study.

G. I. Bill -- Under terms of Public Law 346, commonly known as the G. I. Bill of Rights, there has been provided some very liberal educational benefits. Those who had their education interrupted and those who needed further training to enter civilian occupations of their choice could get their tuition and other fees to the extent of \$500 per calendar year with a subsistence allowance of \$65 per month, if they were single, or \$90 per month if they were married. The length of the educational training period to which they are entitled depends on the length of military service as follows: one year of training for the first ninety days of service plus one month training for each additional month of service. The offering of this practically free educational program combined with the rather uncertain employment situation has been the means of turning many individuals toward further education who under ordinary circumstances would not think of completing their education once it had been interrupted or who would not go on beyond high school.

The Problem -- Many young veterans are returning to Dartmouth High School who had not completed the requirements for a high school diploma before entering the armed forces. Some of these people want to qualify for graduation only while others want to complete their high school work with the idea of going on to some higher institution. The United States Armed Forces Institute has done a remarkable piece of work in constructing the battery of Tests of General Educational Development and establishing norms for the same. What the scores of these tests mean in terms of the pupils of Dartmouth High School has not been established. It is the purpose of this study to give these tests to the senior class at the school and after a careful study of the scores made by the various groups make recommendations as to what will constitute a satisfactory score in each test for high school credit and also for recommendation to college.

CHAPTER II

CHARACTERISTICS OF THE GROUP STUDIED



## CHAPTER II

### CHARACTERISTICS OF THE GROUP STUDIED

Grade Placement -- All members of the group were regularly enrolled seniors at Dartmouth High School and expected to be graduated in June 1945. With one exception, they had progressed at a normal rate through high school. The one exception was a young lady who, because of failures in her first two years, found it necessary to take five years to accumulate the sixteen credits necessary for graduation.

Place of Education -- Thirty-four of the group had received all their formal schooling in the town of Dartmouth. Of the seven remaining, five had completed all their secondary education in Dartmouth High School while the other two had been in the system for only one and a half and two years respectively. As one can see, the group is largely the product of the local school system and any educational development that they showed would have been the result of the program carried on in this system.

Mental Ability -- A study of Table I reveals that the group as a whole was considerably above the average for most high school seniors even in New England. This condition may have resulted from the fact that the program at Dartmouth High School may be of a more highly selective nature than some other schools. Another factor that may have had a

bearing on this situation is that with the advent of war those pupils with lower intelligence quotients were more easily influenced to leave school to take the high paying jobs that were then available.

TABLE I  
Intelligence Quotient Distribution

Intelligence Quotient	Boys	Girls	Total
135-140		1	1
130-134		1	1
125-129		3	3
120-124	3	1	4
115-119	3	2	5
110-114	2	3	5
105-109	1	7	8
100-104		5	5
95-99		7	7
90-94	1	1	2
High	121	138	138
Low	92	92	92
Median	117	106	108

Chronological Ages -- The chronological age of the group as shown in Table II is about normal as compared with other twelfth grade groups.

TABLE II

Chronological Ages of the Group

Age in Years and Months	Boys	Girls	Total
17 - 17:3		2	2
17:4 - 17:8	5	9	14
17:9 - 18	4	6	10
18:1 - 18:3	1	7	8
18:4 - 18:8		4	4
18:9 - 19		1	1
19:1 - 19:3			
19:4 - 19:8		2	2
Oldest	18:3	19:5	19:5
Youngest	17:6	17	17
Median	17:8	18	17:11

The boys averaged slightly younger than the girls probably because of the fact that the boys, who were previously members of the class, and approaching their eighteenth birthday, enlisted in the branch of the armed forces of their choice rather than wait and be drafted.



The oldest boy in the group was eighteen years and three months. He had previously enlisted in the U. S. Navy but his actual induction was deferred until the end of the school year. The youngest boy was seventeen years and six months, while the median age of the boys was seventeen years and eight months.

The average of the girls was raised considerably by the presence of one young lady who was taking five years to complete high school and by another who had had to remain out of school for a year because of illness in the family. The oldest girl in the group was nineteen years and five months and the youngest, seventeen years with a median age of seventeen years and eleven months for all the girls.

Enrollment by Curriculum -- Table III shows how the members of the group studied were divided among the various curriculums offered by the school. The numbers enrolled in the college and commercial courses remained in about the same ratio as they had been in previous years when the senior classes were much larger. The numbers enrolled in the other three curriculums showed a decided decline as compared with other years when there was no war influence. This condition may be attributed probably to two chief causes, (1) that those ordinarily enrolled in these courses had the skills and willingness to work which made them in greater demand for the carrying out of the war effort (2) that this group usually

TABLE III

## Enrollment by Curriculum

Curriculum	Boys	Girls	Total
College	5	11	16
Commercial	0	16	16
Civic	4	3	7
Household Arts	0	1	1
Agriculture	1	0	1
Totals	10	31	41

included those who had more difficulty with the academic offerings of the school and were therefore quick to leave when the fabulous war time wages were offered in industry.

Occupation of Parents -- A study of Table IV indicates the occupations followed by the parents of this senior class at Dartmouth High School. The miscellaneous group contains an insurance underwriter, a contractor, two carpenters, a bank clerk, a high school janitor, a fisherman, a postman, a salesman, a mechanical engineer, and a domestic servant. This rather odd distribution of occupations is brought about by the fact that while the town itself is rural in nature it is situated adjacent to a large textile manufacturing center and many workers in the mills make their homes in that part of the town bordering the city.

TABLE IVOccupations of the Parents  
of the Group Studied

Occupation	Number
Mill Workers	14
Farmers	10
Mill Executives	3
Professional Men	3
Miscellaneous	11

General Conclusions -- The preceding paragraphs give a fairly general overall picture of this class of 1945 at Dartmouth High School. This class although small in number is fairly representative of all the recent graduating classes from this four year high school of three hundred students.

They are a fair cross section of this rural town of 9,900 inhabitants scattered over seventy-two square miles. With the industrial development in the neighboring city, the occupations of the residents have changed gradually from strictly agricultural pursuits to the point where now nearly fifty percent of the working population finds employment in the city.



CHAPTER III

THE UNITED STATES ARMED FORCES INSTITUTE  
TESTS OF GENERAL EDUCATIONAL DEVELOPMENT

### CHAPTER III

#### THE UNITED STATES ARMED FORCES INSTITUTE TESTS OF GENERAL EDUCATIONAL DEVELOPMENT

Major Purposes of the Tests -- The three major purposes of these tests may be stated as follows:

1. To provide a more adequate basis for the educational and vocational guidance of those who are returning to our schools after having served in the armed forces.

2. To help the schools in the proper placement in the school program of general academic education of those students returning from military service.

3. To assist the schools in determining the amount of academic credit which they could allow such students for their educational experience in the armed forces.

These tests are designed to measure the general educational development of the individual to which all his experiences, including military service, have contributed. Such a measure will also indicate his ability to carry on the program of general education usually found in the academic courses of a high school.

Many of those returning from military service are looking to their former high schools for assistance in furthering their education either in high school or in some other institution. Others are seeking advice in the choice of a vocation with its attendant problem of securing the necessary

training to enter that vocation of their choice. Public Law 346, commonly known as the G. I. Bill of Rights, with its clauses providing for education and training has influenced many, who would not otherwise have done so, to seek additional educational advantages beyond that which they ordinarily would have chosen. Results of these tests properly interpreted can be of inestimable aid in guiding these people along lines which will be to their advantage.

Among the many veterans returning to the high school will be those who have had anywhere from a few months of high school work to those who had nearly completed their secondary school program when they entered service. For those who wish to complete the work of the high school by enrollment in formal classes, these tests offer a means of placing them in the school program at the level to which they have educationally developed while in the armed forces regardless of previous school attendance.

The third purpose of these tests grows naturally out of the first two, because of the credit counting and time serving features that are so common in our secondary schools today. It is impossible to determine the academic equivalent (in terms of course credits) of any individual's in-service experience as such, since his pre-service and in-service experience are inextricably intermingled. Therefore, all the tests can do is to help the schools determine the maximum



amount of academic credit which they can allow for his educational experience in the service.

Minor Purpose of the Tests -- Many of those returning from military service will have no plans for formal educational training. For this group, these tests could be used to indicate to their prospective employers the extent to which they have attained the equivalent of a high school education. In consideration of the increasing frequency with which employers set definite educational standards for specific positions, as well as the tendency to make use of test results in selecting employees, this latter use of these tests may well prove of major importance to a large proportion of veterans tested.

Organization of the Tests -- Two separate batteries of tests were prepared, one for use at the high school level and the other at the level of the first two years in college. The high school level tests are intended to be used primarily to determine whether or not the individual has had the equivalent of a general high school education, or should be granted a high school diploma. The high school level battery consists of five comprehensive examinations concerned respectively with English composition, the social studies, the natural sciences, literature, and mathematics. The college level battery is similarly organized, except the comprehensive examination in mathematics is omitted and special examinations corresponding to various college courses

in mathematics are substituted.

Military and Civilian Forms -- Two equivalent forms of the general battery were constructed at each level. Form A is retained exclusively by the United States Armed Forces Institute for use with personnel in the armed forces. Form B is generally available to high schools and colleges through the American Council on Education and the Science Research Associates. These civilian forms will enable the schools to establish their own local norms for the interpretation of the scores reported to them by the United States Armed Forces Institute and will also enable them to secure for themselves comparable measures on students who have had no military experience.

General Characteristics of the Tests -- In consideration of the purposes of the tests and the nature of the experience of the persons tested, it is apparent that these tests should differ markedly from those used in the past to measure school progress. The persons tested will, in most instances, have developed educationally in a very different manner than they would have if they had remained in school. Their in-service educational growth will be in a much larger part due to their own deliberations, first hand observation, direct experience, self-directed reading and study, conversation, and a process of maturation intensified and accelerated by the circumstances of war. It is important then that these tests were constructed so that they would not penalize those



being tested because of lack of recent academic experience or formal classroom instruction.

The tests are constructed as far as possible to measure the ultimate objectives of the whole program of general education rather than the more immediate and temporary content objectives of special school subjects. The emphasis is placed on intellectual power rather than detailed content, upon acquisition of broad but definite generalizations, concepts and ideas, to evaluate critically, and to think clearly in terms of those concepts and ideas, rather than upon detailed facts from which the ideas and generalizations were originally derived.

This does not mean that the informational background in knowledge is unimportant or is ignored in these tests. On the contrary, these tests have been so planned that the person is held responsible for a very extensive and substantial body of knowledge but they consist only of those elements of widest applicability and greatest functional value. In fairness to the veterans tested, some preference has been given to those items of knowledge which may have been readily acquired informally by intelligent observation, discriminating general reading and other methods of self-education.



CHAPTER IV

STUDY OF THE TESTS AND TEST SCORES

## CHAPTER IV

### STUDY OF THE TESTS AND TEST SCORES

Introduction -- The U.S.A.F.I. Tests of General Educational Development, Form B, were constructed at the high school level for the use of civilians. The three major ways in which the results of these tests could be utilized by the high schools would be (1) to provide a more adequate basis for the educational and vocational guidance of those returning from service in the armed forces (2) to assist in the placement at the proper level those returning veterans (3) to help the local high school determine the amount of credit which should be allowed their former students for the educational experience in the armed forces. A large share of those entering military service before they had completed their secondary education came from general academic high schools. Therefore the tests were organized to cover the four areas of work usually found in such a high school, namely English, social studies, natural sciences, and mathematics. Because of the basic importance of English to all phases of education, in the expression and communication of ideas, this field was covered by two tests, one dealing with the correctness and effectiveness of expression, the other with the interpretation of literary materials. Each of the other three areas are treated in single tests which include a large body of the material usually covered in

the respective fields in a general academic high school.

Arrangement of Tables -- In this chapter the test scores will be studied by considering a separate table for each test. These five tables were all constructed on the same pattern. In column one are shown the standard scores arranged from the highest possible score of 75 down to 35 which was the lowest score made by any Dartmouth High School senior on any of the five tests. Column six shows the New England percentile norms corresponding to the various standard scores. These norms were worked out by the U.S.A.F.I. using the scores of thousands of public high school seniors tested at the time of graduation from general academic high schools. In column two are shown the distribution of the scores of the entire class on this test. Columns three, four, and five show these scores as they were made by pupils in the college, commercial, and other courses.

Test of Correctness and Effectiveness of Expression -- The first part of this test consisted of eighty words, some of which were spelled incorrectly. The testee was asked to pick out those misspelled. The main body of the test was a series of passages of connected prose which were originally well written but which for test purposes have been systematically corrupted by including many of the most common and serious faults and infelicities found in the writing of high school students. Certain words, phrases, sentences, and marks of punctuation are underlined and numbered. Several



ways of writing each numbered portion are given and the student is asked to decide which way is best.

This method permits the inclusion of errors in choice of words, order of sentences, connectives, irrelevant and unnecessary details, parallel structure, sequence of tenses, inconsistency, style, good taste, and literary tact which could not be based upon isolated sentences. The usual errors of punctuation, capitalization, agreement of pronoun and of antecedent, use of adverb for adjective, and agreement of noun with subject are also included.

In Table V are shown the scores made on the Test of Correctness and Effectiveness of Expression. On this test the score representing the 50 percentile point for New England is 52. In the group which was used to determine these norms, over half of those tested made better scores than this. The senior class studied, however, had 78% of their scores above this point. This figure broken down by courses shows the commercial group with 86%, the college with 80% and the other courses with 66% of their scores above the New England 50 percentile mark.

TABLE V

Test of Correctness and Effectiveness  
of Expression

Score	Entire Class	College Course	Commercial Course	Other Courses	N.E. Percentile Norms
1	2	3	4	5	6
75	1	1			
74					99
73					98
72	1	1			98
71					97
70					96
69	2	2			95
68	1		1		93
67	2	1	1		92
66	3	1	1	1	91
65	3		2	1	89
64	1		1		87
63	1	1			84
62					82
61					80
60	1	1			78
59	1	1			74
58	3	2		1	70
57	2		2		67
56	3	1	2		63
55	5	1	2	2	59
54	1			1	56
53	1		1		52
52	2	1		1	47
51					43
50	2	1		1	40
49	2	1	1		36
48	2		2		32
47	1			1	28
46					25
45					20
44					16
43					14
42					13
35					3
High	75	75	68	66	
Low	47	49	48	47	
Median	57	60	56	55	

The median score of each group studied in this test with the corresponding percentile norm is as follows:

	Median Score	Percentile
Entire Class	57	67%
College	60	78%
Commercial	56	63%
Other Courses	55	59%

No score as low as 43 which would place them in the lower quartile of the New England norms was made by any member of the class.

Test of Interpretation of Literary Materials -- This test consisted of fifteen isolated pieces of literary writing, some of which are from the older standard works while others are from contemporary writings. Four of the selections are bits of poetry. Sixty-five questions are asked concerning these pieces varying from four to eight questions on each item. The questions are of such a nature that they require more careful and analytical reading than is commonly done on such type materials. The student is required to interpret and evaluate the selections presented. This type of test is particularly appropriate in this field in light of the considerations discussed in Chapter III of this paper. It was selected for use in this battery because of its effectiveness in measuring certain generalized intellectual skills and abilities. These include such abilities as those needed to note implicit assumptions and to dig out meanings



not explicitly stated, to recognize an appeal to the emotions rather than to intellect, to recognize and resist the tricks of propaganda.

In Table VI are presented the scores of the Test of Interpretation of Literary Materials. In this test the 50 percentile point for New England is represented by a score of 53. The subjects of this study placed 54% of their scores above this point represented by 75% of the college course, 25% of the commercial course, and 55% of those in other courses.

The median score of each group studied in this test with the corresponding percentile norm is as follows:

	Median Score	Percentile
Entire Class	55	69%
College	60	84%
Commercial	51	54%
Other Courses	55	69%

The class as a whole scored the lowest on this test of any of the five with 12.5% of the scores falling in the fourth quartile of the New England norms. On the other hand, the college group showed a marked superiority in this literary test.

TABLE VI

Test of Interpretation of  
Literary Materials

Score	Entire Class	College Course	Commercial Course	Other Courses	N.E. Percentile Norms
1	2	3	4	5	6
75					
74					
73	1	1			
72					99
71	1	1			98
70					97
69					97
68					96
67					94
66	1			1	93
65	2	2			91
64					89
63					86
62	4	3		1	84
61					81
60	2	1	1		78
59					75
58					72
57	3	2	1		68
56	3	1	1	1	64
55	4	1	1	2	59
54					55
53	1		1		50
52	2	1	1		45
51	6	2	4		42
50					38
49	3		2	1	34
48	1	1			30
47	2		1	1	26
46	1			1	23
45	2		2		21
44	1			1	18
43					15
42	1		1		13
35					3
High	73	73	60	66	
Low	42	48	42	44	
Median	55	60	51	55	

Test of Interpretation of Reading Materials in the Social Studies -- This test consists of nine short passages of reading material taken from textbooks and other writings covering the fields of history, sociology, politics, economics, law, and education. Each passage is followed by five to twelve multiple choice questions. These require considerable deliberation and frequent rereading of the passage. In part, this test tests the background of the subject in the social studies but more important it tests his ability to ferret out important meanings in what he has read. The tests do not seriously penalize the student for having forgotten detailed facts if he has retained important generalizations and uses them intelligently to interpret what he has read. In this type of test the student is held both directly and indirectly responsible for a wide background of fundamental knowledge. His ability to interpret the passages depends primarily upon how much he already knows and has thought about the subject. The more background the student possesses the greater the likelihood that he will answer correctly the questions calling for an interpretation of the passage read. Thus a test of this type can bring an integrated body of knowledge to bear on particular problems without placing any undue premium upon the peculiar form or organization in which the student has acquired his ideas.



The scores of the Dartmouth High School seniors on the Test of Interpretation of Reading Materials in the Social Studies are presented in Table VII. In this test the 50 percentile score for New England is 52. Of the group studied eighty percent scored higher than this point with the median for the entire class being 55. Three members of the college group made standard scores greater than the highest score of 75 given in the original standard score table of this test. The commercial group and those taking other courses placed 75% and 66% of their scores above the 50 percentile norm for New England with the medians for each group being 53 and 55 respectively.

The median for each group with the corresponding percentile position in the New England norms is summarized as follows:

	Median Score	Percentile
Entire Class	55	65%
College	58	75%
Commercial	53	57%
Other Courses	55	65%

Of the three groups studied the commercial people made the poorest record on this test. Their highest score was a 68 and they made the lowest score, 45, of any of the three groups. This low score was the only one which falls in the lower quarter of the New England norms.



TABLE VII

Test of Interpretation of Reading Materials  
in the Social Studies

Score	Entire Class	College Course	Commercial Course	Other Courses	N.E. Percentile Norms
1	2	3	4	5	6
75.....	3.....	3.....	.....	.....	.....
74					
73					
72					99
71.....	1.....	.....	.....	1.....	98
70					98
69					97
68	1		1		96
67					94
66					92
65					90
64.....	1.....	1.....	.....	.....	89
63	1	1			88
62					85
61					83
60.....	1.....	1.....	.....	.....	80
59	2	1	1		78
58	4	1	2	1	75
57	4	1	1	2	72
56.....	2.....	2.....	.....	.....	69
55	3	1	1	1	65
54	3	2	1		61
53	4		3	1	57
52.....	3.....	1.....	2.....	.....	52
51	5	1	1	3	49
50	1		1		44
49					39
48.....	1.....	.....	1.....	.....	34
47					31
46					26
45	1		1		22
44					18
43					15
42					12
35					4
High.....	75.....	75.....	68.....	71.....	.....
Low	45	51	45	51	
Median	55	58	53	55	

Test of Interpretation of Reading Materials in the Natural Sciences -- This test consists of seven passages taken from textbooks and other writings in the general field of science. While separate passages can not be specifically labelled physics, chemistry, biology, there are a number of fundamental principles of these sciences and many others included in the articles presented for consideration. Here again the student is held directly and indirectly responsible for a wide background of fundamental knowledge. The ability of the student to interpret the material presented depends primarily on how familiar the student is with the many basic terms and phrases unique to science and an understanding of broad scientific principles. While this test is well suited to determining the background in science of the student, it also is effective in measuring his ability to detect errors and inconsistencies in the statements presented, to develop and apply generalizations, to draw inferences from the data and many other abilities involved in critical thinking in general.

In Table VIII are presented the scores of the group studied in the Test of Interpretation of Reading Materials in the Natural Sciences.

On this test all scores above 49 are in the upper 50 percentile in terms of the New England norm. The class as a whole made 82% of their scores above this point. The college group was outstanding with 93% of them above the 50 percentile

TABLE VIII

Test of Interpretation of Reading Materials  
in the Natural Sciences

Score	Entire Class	College Course	Commercial Course	Other Courses	N.E. Percentile Norms
1	2	3	4	5	6
75					
74	1			1	
73					
72					99
71					98
70	3	3			98
69					98
68					98
67					97
66					95
65					93
64					92
63	1			1	90
62					88
61	1	1			86
60	3	2	1		85
59	1		1		83
58	6	2	2	2	80
57	2	1		1	77
56					74
55	3	1	1	1	71
54					66
53	1	1			63
52	3	2	1		60
51	4	1	2	1	57
50	5	1	3	1	53
49	2	1	1		47
48	1			1	43
47	1		1		39
46					35
45					32
44	2		2		29
43					27
42	1		1		24
35					7
High	74	70	60	74	
Low	42	49	42	48	
Median	55	58	50	57	



mark. In fact, 56% of their scores were above the 75 percentile mark for New England. Those in the other courses did nearly as well as the college group placing 88% of their scores in the upper 50 percentile while the commercial group placed only 62% of their scores in this bracket.

The highest score for this test, 74, was made by a boy in the civic curriculum. This individual has the ability to do college course work but because of his dislike for foreign languages he chose this curriculum and elected subjects largely in the field of science and mathematics. Previous to taking this battery of tests he passed the Eddy Test which qualified him for advanced training by the United States Navy in electronics.

The median score for each of the various groups with the corresponding percentile norms for New England is as follows:

	Median Score	Percentile
Entire Class	55	71%
College	58	80%
Commercial	53	47%
Other Courses	57	77%

Only one score of the entire group was low enough to come within the lowest 25 percentile group of the New England norms.



Test of General Mathematical Ability -- This test contains fifty problems which involve the ability to solve mathematical problems in a very practical sort of way. The fields from which these problems are drawn vary very widely. They include the estimating of home repairs, simple business transactions, mathematics of insurance, taxation, installment buying, and investment. This test measures the students' ability and understanding of basic arithmetic, conception of algebra and geometry, employment and familiarity with various units of measure, the use of tables, scale drawings and graphs. While this general test does not attempt to cover in detail all the algebra and geometry usually found in such courses in a general academic high school, the application of the principles involved gives a fair measure of the ability of the student to carry on a mathematical program at the high school level.

The scores made by this group being studied on this test of general mathematical ability appear in Table IX.

A score of 49 represents the 50 percentile point for New England. The class as a whole did the poorest on this test of any of the battery yet they made 53% of their scores above this point. The college group placed 75% above the 50 percentile point, the commercial group fell exactly at the norm with 50% above that point and the others made 55% of their scores above that of 49.

TABLE IX

## Test of General Mathematical Ability

Score	Entire Class	College Course	Commercial Course	Other Courses	N.E. Percentile Norms
1	2	3	4	5	6
75	1			1	
74					
73					99
72.....	2.....	2.....			98
71					97
70					96
69					95
68					95
67					94
66.....	1.....			1.....	92
65					91
64	2	2			89
63	1	1			87
62					85
61.....	1.....			1.....	83
60	1		1		81
59					79
58	3	2	1		75
57.....	4.....	1.....	2.....	1.....	73
56	1	1			71
55	2	1		1	68
54					65
53					63
52.....	1.....	1.....			59
51	2		2		56
50	2	1	1		53
49	3	2	1		50
48.....	1.....			1.....	46
47					43
46	8	2	5	1	39
45	1		1		36
44.....	2.....		2.....		31
43	1			1	27
42					25
35	1			1	8
High.....	75.....	72.....	60.....	75.....	
Low	35	46	44	35	
Median	51	57	46	55	

The highest score in this test, 75, is above any score given on the standard table for determining the percentile norms. This score was made by the same boy who did such an outstanding piece of work in the science test as explained earlier in this chapter.

Quite in contrast to the low median scores only one score, 35, was low enough to come within the lower quarter of the New England norms. Incidentally this was the lowest score made by anyone within the group studied on any test in this battery.

The median scores for this test were the lowest of any test in the battery. These scores with the corresponding percentile norms are as follows:

	Median Score	Percentile
Entire Class	51	56%
College	57	73%
Commercial	46	39%
Other Courses	55	68%

Summary -- In three of the five tests at least one pupil made the highest possible score. The median for all the test scores was 55 which is the exact median of the entire class on Tests 2, 3, and 4. The median for Test 1 was 57 and that of Test 5, 51. These medians are well above the medians for New England.

The median score of any group would ordinarily fall at the 50 percentile point in the New England norms but in the



group being studied the median score for each of the five tests fell at the 69, 59, 65, 71, and 56 percentile points respectively. A better picture of these scores made by the group studied is given by considering the percentage of each group that made scores which were above the 50 percentile point of the New England norms. The following data shows what percentage of this senior class scored above this point:

Test 1	78%
Test 2	54%
Test 3	80%
Test 4	83%
Test 5	66%

The group studied made very few scores which would place them in the lower quartile of all persons tested in New England. Only eight out of two hundred and five scores were in this bracket. The Test of Interpretation of Literary Materials had 12% of the scores in this classification while the other tests had 2% and one did not have any scores in the lower quartile.

In three of the five tests, the highest score was made by a student in the college course. The high score in each of the other two tests was made by a boy in the civic course as previously explained. In each of these tests, the next highest score was made by pupils in the college course so technically the college course pupils led in every test.



The median score of the college group was in every instance much higher than that of the other pupils in the class. Just how much higher in terms of standard score points and percentages is given as follows:

	Points Higher	% Higher
Test 1	4	15
Test 2	9	36
Test 3	5	18
Test 4	7	26
Test 5	8	23

Consistent with the high and median scores, the lowest score made on each of the tests was by a pupil other than in the college course.

CHAPTER V

RECOMMENDATIONS AND CONCLUSIONS

## CHAPTER V

### RECOMMENDATIONS AND CONCLUSIONS

Use of the Tests -- Many of our young men are now returning from the service and looking toward securing a high school diploma. Some of them are looking forward to higher education after meeting the necessary qualifications for college entrance. The amount of high school training they had before entering the service and their educational experience while in the armed forces varies widely. In order that the school may measure this accumulated experience it is recommended that these students be given the United States Armed Forces Institute Tests of General Educational Development.

Recommendation for High School Credit -- If the pupil being tested is looking only to complete the work for a high school diploma, he should be given credit for one unit of work in each of the fields of English, social studies, science, and mathematics provided his scores in each field are above the following:

Test of Correctness and Effectiveness of Expression	49
Test of Interpretation of Literary Materials	48
Test of Interpretation of Reading Materials in the Social Studies	51
Test of Interpretation of Reading Materials in the Natural Sciences	47
Test of General Mathematical Ability	44

These scores are relatively high being placed in every case above the 30 percentile point on the scale of New England norms. In view of the fact that this class at Dartmouth High School is typical of most classes that have graduated from there and their scores were exceptionally high, it would not seem out of place to require the above scores in order to receive credit at Dartmouth High School.

Recommendation for Certification to College -- If the student being tested wished not only to complete his high school requirements for a diploma but is intending to go on to some higher institution of learning, he should be given credit for one unit of work in each of the fields of English, social studies, science and mathematics provided his scores in each field are above the following:

Test of Correctness and Effectiveness of Expression	62
Test of Interpretation of Literary Materials	62
Test of Interpretation of Reading Materials in the Social Studies	60
Test of Interpretation of Reading Materials in the Natural Sciences	60
Test of General Mathematical Ability	61

The median score on each test of the college course group was well above all other groups. These college course students are expected to be a very highly selected group and should make scores considerably better than the general average of all members of a class. These scores are very



high, in fact they are all above the 80 percentile point on the scale of New England norms. Since these students are expected to be able to carry on work at the college level these high scores are necessary for proper qualification.

General Recommendations -- If a returning veteran were to take the complete battery of tests and fails to make qualifying scores in some of them, he should be given credit for those fields in which he made satisfactory scores. Ways and means should be provided for these veterans to take further work in those fields in which they need further background.

Veterans needing only two or three units of credit for a high school diploma may be given only part of the battery of tests preferably in those fields in which their records indicate that they may have some weakness. If the student passes the test satisfactorily it is quite evident that he is qualified to receive a high school diploma.

A veteran returning with sufficient service-earned credits to meet high school graduation requirements should be given the battery of tests and make satisfactory scores in order to justify the granting of the high school diploma.

Conclusions -- After a careful study of the scores made by the senior class at Dartmouth High School as presented in Chapter IV of this study, the following conclusions may be drawn:

1. This senior class at Dartmouth High School as a whole is considerably above the average of the group used by the United States Armed Forces Institute in establishing norms for New England.
2. The group studied showed the best scores in the Test of Correctness and Effectiveness of Expression.
3. The program of English at this high school is very effective in giving the pupils a well rounded background in this field.
4. The commercial course pupils are the most poorly equipped group in all fields tested with the exception of the field of Correctness and Effectiveness of Expression.
5. The college course pupils showed marked superiority in all fields tested.
6. The group as a whole demonstrated that their greatest weakness was in mathematics but in this field the college course pupils maintained the same high standards that they did in all other fields.
7. The Tests of General Educational Development as developed by The United States Armed Forces Institute have a definite place in the high school as a means of measuring the general educational development of an individual regardless of where or how his experience was gained.

Approved by:

Albert W. Purvis

Problem Committee

Date May, 1946





