

DEPARTMENT OF THE INTERIOR  
BUREAU OF EDUCATION

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INTELLIGENCE OF SENIORS  
IN THE  
HIGH SCHOOLS  
OF MASSACHUSETTS

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# CONTENTS.

Letter of transmittal.....	Page. v
Prefatory note.....	vi
Introduction.....	1

## TOPICS DISCUSSED.

1. What proportion of the present seniors in Massachusetts high schools are suitable college material?.....	4
2. What proportion of the present seniors in Massachusetts high schools plan to continue their education?.....	6
3. What specific plans for a career have seniors not intending to continue their education?.....	10
4. To what type of schools are high-school seniors in Massachusetts planning to go?.....	11
5. What proportion of high-school seniors are intending to go to Massachusetts institutions?.....	13
6. Do the Massachusetts high schools and the seniors in them differ pronouncedly among themselves in intelligence?.....	14
7. Are there substantial differences in the intelligence levels of the girls and boys in Massachusetts high schools?.....	17
8. What are the ages of seniors attending Massachusetts high schools?.....	19
9. What is the relation between intelligence scores and high-school standing?.....	20
10. What courses are being taken by high-school seniors, and how are psychological scores related to these various courses?.....	22
11. What high-school subjects are liked best, and how are psychological scores related to the choices made?.....	24
12. What high-school subjects are liked least, and how are psychological scores related to such designations?.....	27
13. What ultimate life occupations have been chosen by the seniors, and what are the comparative psychological rankings of the groups making each choice?.....	28
14. What occupations are pursued by parents of high-school seniors, and to what extent do seniors vary in intelligence accordingly?.....	30
15. What are the annual incomes of the parents of high-school seniors, and to what extent do seniors vary accordingly?.....	34
16. In what countries were the seniors and their parents born, and do the psychological scores vary accordingly to any extent?.....	37
Conclusions.....	38

## LETTER OF TRANSMITTAL.

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DEPARTMENT OF THE INTERIOR,  
BUREAU OF EDUCATION,  
Washington, March 12, 1924.

SIR: At the request of a special commission appointed by the Governor of Massachusetts for an investigation relative to technical and higher education in that Commonwealth, Dr. George F. Zook, specialist in higher education in the Bureau of Education, recently directed and completed a survey.

One of the chief problems involved was the possibility of establishing a State university or bringing about a cooperative arrangement between the State and the institutions of higher learning now existing in the State. The study broadened into a number of important educational investigations, among which was one which undertook to determine the number and proportion of high-school students who might be expected to enter the higher institutions of the State, and, as far as practicable, their intellectual capabilities to pursue studies in these institutions. This phase of the study was made by Stephen S. Colvin and Andrew H. MacPhail, of the School of Education of Brown University, who worked in collaboration with Doctor Zook and his staff.

The whole question of selection of students in our colleges and universities is very much alive throughout the country to-day. The results of this study are not only helpful and enlightening to those who are studying this question in Massachusetts, but should be generally helpful throughout the country and to students of education generally. I am, therefore, transmitting it for publication as a bulletin of the Bureau of Education.

Respectfully submitted.

JOHN J. TIGERT, *Commissioner.*

THE SECRETARY OF THE INTERIOR.

V

## PREFATORY NOTE.

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In 1922 a special commission was created in Massachusetts to survey the field of higher education in that State. Many experts were secured to investigate special problems in connection with the survey, under the general supervision of Dr. George F. Zook, specialist in higher education, United States Bureau of Education. Prof. Stephen S. Colvin, of Brown University, conducted a mental survey of the seniors in high schools of Massachusetts. It was then my privilege to be acting as research assistant in educational psychology at Brown University and when this survey was undertaken to act as one of the few trained examiners who gave the tests and to assist Doctor Colvin in the compilation of the data. A report bearing upon those questions that were of most vital interest to the commission was drawn up and rendered in February, 1923. The results appeared to be of sufficient value and general interest to pursue the investigation considerably beyond the scope of the original report. This was done, and Doctor Colvin and I were cooperating in preparing for publication a more extended account of the results of the mental survey when death suddenly overtook him on July 15, 1923, in New York City, where he had only a few months previously assumed a professorship at Teachers College. The work on this revised and extended account was unfinished, but I have sought to complete it as nearly as possible in the manner planned. The discussion of the first nine topics is substantially the same as the original report rendered to the commission.

ANDREW H. MACPHAIL.

# INTELLIGENCE OF SENIORS IN THE HIGH SCHOOLS OF MASSACHUSETTS.

## INTRODUCTION.

During December (1922) and January (1923) the Brown University psychological examinations were given to 3,333 pupils in the senior classes of Massachusetts high schools (1,262 boys and 2,071 girls). The schools selected enroll about one-fifth of the total high-school population of the State and were so chosen as to be representative of all the high schools of the State in respect to location, size, and economic, social, and industrial conditions. In other words, the group surveyed may be assumed to give a very accurate picture of what is true of the high schools of the State taken as a whole. The facts found and the conclusions arrived at by the present sampling are probably not essentially different from the facts and conclusions that would have been obtained if all the high schools had been surveyed. The following schools were surveyed:

### *Grouped by location.*

#### *Western group:*

Chicopee.  
Dalton.  
Holyoke.  
Lenox.  
Pittsfield (Central).  
Pittsfield (Commercial).  
South Hadley Falls.  
Springfield (Central).  
Springfield (Commercial).  
Springfield (Technical).

#### *Central group:*

Ayer.  
Fitchburg.  
Hopkinton.  
Leominster.  
Marlboro.  
Maynard.  
Northboro.  
Stow.  
Westboro.

#### *Eastern group:*

Amesbury.  
Belmont.  
Boston Girls' School.  
Dorchester.  
Fall River.  
Haverhill.  
Lynn (Classical).  
Lynn (English).  
Merrimac.  
Revere.  
Walpole.

#### *Cape group:*

Dennis.  
Harwich.  
Hyannis.  
Yarmouth.

**Cities:**

*Towns of 5,000 and over:*

Amesbury.  
Belmont.  
Maynard.  
South Hadley.  
Walpole.  
Westboro.

*Towns of less than 5,000:*

Ayer.  
Dalton.  
Dennis.  
Harwich.  
Hopkinton.  
Hyannis.  
Lenox.  
Merrimac.  
Northboro.  
Stow.  
Yarmouth.

*Special schools:*

Boston Boy's Trade School.  
Essex County Agricultural School.

In addition to the psychological examination, the survey included replies to the following questionnaire sent to the principals of all the high schools tested.

## MENTAL SURVEY OF HIGH-SCHOOL SENIORS.

QUESTIONNAIRE CARD.

**PART A** (To be filled out by each pupil).

Name of high school.....

1. PRINT your name \_\_\_\_\_ BOY or GIRL?  
(Last name.) (First name.) (Cross out one.)

2. What is your present age in years.....and months?.....
3. What course are you taking in high school?.....
4. What two subjects do you like best in high school?.....
5. What two subjects do you like least in high school?.....
6. In what month do you expect to graduate?.....
7. In what country were you born?.....
8. In what country was your father born?.....
9. In what country was your mother born?.....
10. What is your father's occupation?.....
11. What is your father's annual income?.....
12. Do you plan to go to some other school or college after you graduate?.....
13. If you do so plan, name the school or college.....
14. Do you plan to go to work immediately after you graduate?.....
15. If you do so plan, what kind of work do you plan to do?.....
16. What life occupation is most attractive to you, personally?.....
17. What do you plan to do for a life occupation, ultimately?.....
18. Does anything prevent you from doing what you wish most to do?.....
19. If so, what is it?.....

(Reverse side of card.)

## PART B (To be filled out by the principal).

1. In what academic fifth of the senior class is this pupil? .....
2. Does the course mentioned in answer to question 3 above fully prepare the pupil for college, normal school, or some higher institution? .....
3. Comments or explanations .....

The data secured from the psychological examinations has been carefully compiled and analyzed. An analysis has been made also of the replies to the questionnaire in so far as they have been received up to date and are in such shape as to be available for use. In all about 3,000 of these cards have been received, but not in all cases has each of the items been answered, while in some instances the replies have been in such a form as not to be available for use in the formulation of our data.

The Brown University psychological examination was employed as the instrument for the mental survey. This test was first used in the fall of 1918 with the Students' Army Training Corps men and the naval unit then at Brown University. It has since been given to all the men entering the University in succeeding years up to the present time. In all about 1,800 Brown students have been given this test. It also has been given in various other colleges and normal schools, as well as in a number of high schools. This test was selected in making the present survey for the following reasons:

1. It is a test of known reliability. This reliability is high.
2. It agrees closely with other important psychological tests that have been used to measure the intelligence of high-school seniors and college freshmen, notably with the Thorndike, the Thurstone, and the Otis test. There is substantial evidence that it is as valid as any mental test now in common use.
3. It is the only psychological test (with the exception of the Thorndike) that has been carefully checked up against facts relating to the success and failure of college students.<sup>1</sup> The scores in the Brown tests are known to indicate certain facts of major significance in regard to several important questions involved in the present

<sup>1</sup> For the most complete summary of investigations bearing upon this point and utilizing the Brown University tests, see "The Intelligence of College Students," A. H. MacPhail, Warwick and York, fall of 1923. Other titles are:

Psychological Tests at Brown University. S. S. Colvin. School and Society, 10: 27-30, July 5, 1919. The Purposes and Methods of Psychological Tests in Schools and Colleges. S. S. Colvin. Education, 40: 404-16, Mar., 1920. The Validity of Psychological Tests for College Entrance. S. S. Colvin. Educational Review, 40: 7-17, June, 1920. Educational Guidance and Tests in College. S. S. Colvin. Journal of Applied Psychology, 5: 32-38, Mar., 1921. The Use of Intelligence Tests. S. S. Colvin. Educational Review, 62: 134-48, Sept., 1921. The Value of Psychological Tests at Brown University. S. S. Colvin and A. H. MacPhail. School and Society, 16: 1-10, July 29, 1922. The Present Status of Mental Testing. S. S. Colvin. Educational Review, 64: 196-206; 320-37, Oct.-Nov., 1922. Educational Advice and Direction of College Students. S. S. Colvin. Christian Education, 5: 18-34, Mar., 1922. Methods and Results of Psychological Tests Given at Brown University. S. S. Colvin. A report to the President contained in the President's Report to the Corporation, University Bulletin, 19, Oct., 1922.

survey; hence the use of this examination in preference to several others of equal validity, but of less known significance in regard to the problems of college fitness.<sup>2</sup>

In examining the data obtained from the Brown tests and the questionnaire cards, the attempt has been made to give definite answers to the following questions, which are of both theoretical and practical importance. These are listed somewhat in the order of their significance in terms of the inquiry of the special commission:

**1. What proportion of the present seniors in Massachusetts high schools are suitable college material?**

The attempt to answer this question is made on the assumption that suitable college material is to be measured in terms of the standards of an academic college of which Brown University is representative. Other institutions, setting different standards, using different curricula and different methods of teaching, would doubtless find a greater or a less amount of available material in terms of standards, curricula, and methods. The present survey can answer this question, then, only in reference to those institutions of higher learning of which Brown is a type.

At Brown, achievements in the psychological examinations have been carefully checked against subsequent academic success. It has been clearly shown that those scoring in the lowest 10 per cent of these examinations (below a score of 46) have not more than two chances out of ten of making a satisfactory college record. Indeed, seven out of ten are total failures, while only a few succeed in graduating. They are bad college risks. It has also been found that those scoring in the lowest 20 per cent of the tests (below a score of 53) are very doubtful risks, since they have not more than one chance in three of making a fair college record. Those scoring in the upper 80 per cent of the psychological tests (above a score of 53) have a reasonably good chance of getting through college, the higher the psychological score the better the chance, though of course numbers of students of good intelligence fail in college for various reasons, such as unwillingness to work, wrong ideals and purposes, and excessive distraction or outside work. While all too many students of good ability fail, few of poor ability succeed. These are the questionable and bad risks.

When we compare the scores obtained by the Massachusetts seniors in the Brown tests with the above criteria we find the following facts: 40 per cent of the boys and nearly 60 per cent of the girls are

<sup>2</sup> The Thorndike examination, of all the other psychological tests suitable for this survey, alone satisfies the three general requirements discussed above. However, it requires three hours for administration, as against an hour and a quarter in the case of the Brown examination. Its cost per pupil is ten times as great, and its cost in scoring is three times as great as that of the Brown examination. Clearly for practical purposes the Thorndike test was not available in the present survey.

bad college risks, while less than 40 per cent of the boys and only 22 per cent of the girls are good risks. For the two sexes combined more than 50 per cent are bad risks and only about 25 per cent are good risks. It is to be noted in this connection (and this fact constantly appears throughout the survey) that the psychological ratings of the girls are lower than those of the boys. This may mean in part a somewhat lower average intelligence.<sup>3</sup> However, it is probable that as a rule more girls of a given mental ability will succeed in school and in college than will boys of the same ability, because the former show greater seriousness in their studies and a willingness to work at tasks they do not find agreeable. Hence it is quite likely that fewer girls are bad college risks than the facts presented above seem to indicate. However, it is a conservative estimate to say that not more than one-half (about 8,000) of the present seniors in the high schools of Massachusetts are likely to get much out of the ordinary academic courses of a typical arts college.

The following tables and statements in regard to the results obtained from data secured from the 34 Massachusetts high schools compared with the results at Brown University, and similar comparisons utilizing the results obtained in the Providence high schools, show in detail the general facts previously discussed and are self-explanatory. See Graph I; and Graph II, Parts A and B.

Graph I is to be read by dropping a perpendicular line from the point at which the various curves cut the horizontal lines to the base line. For example, the curve representing Brown freshmen cuts across the bad-risk line at the 10 per cent division and across the questionable line at the 20 per cent division, meaning that the Brown students receiving scores in the lowest 10 per cent are bad risks, and those receiving scores in the second lowest 10 per cent are questionable risks, while the upper 80 per cent are good risks.

*Data from 34 Massachusetts high schools.*

Sex.	Number of cases.	Test score medians.
Boys.....	1,262	48.8
Girls.....	2,071	43.1
Both.....	3,333	45.5

A comparison of the scores made by boys and girls separately, with the combined scores for both sexes, shows that 62 per cent of the boys reached or exceeded the State median (45.5), 43 per cent of the girls reached or exceeded the same median, and 70 per cent of the boys reached or exceeded the girls' median (43.1).

<sup>3</sup> This apparent sex difference in intelligence will be discussed in detail under a separate topic. (See topic numbered 7.)

A comparison of the scores made by the Massachusetts seniors with those made by Brown freshmen shows that the median for Brown freshmen (63.0) was reached or exceeded by 12 per cent of the boys, by 6 per cent of the girls, and by 8 per cent of the sexes combined.

*Prognosis as college risks*

Sex.	Bad.	Questionable.	Good.	Total per cent.
Boys.....	40	24	36	100
Girls.....	58	20	22	100
Both.....	52	21	27	100
Brown freshmen <sup>1</sup> .....	10	10	80	100

<sup>1</sup> Over 1,200 cases.

*Data from four Providence high schools.*

Sex.	Number of cases.	Test score medians.
Boys.....	271	51.7
Girls.....	302	45.4
Both.....	573	48.2

A comparison of the scores received by the boys and girls separately, with those of the sexes combined, shows that 62 per cent of the boys reached or exceeded the Providence median (4 H. S.) (both sexes), 40 per cent of the girls reached or exceeded the same median, and 70 per cent of the boys reached or exceeded the Providence girls' median (45.4).

A comparison of the scores received by the Providence seniors, with those of the Brown freshmen, shows that the median for Brown freshmen (63.0) was reached or exceeded by 20 per cent of the boys, 9 per cent of the girls, and 14 per cent of the sexes combined.

*Prognosis as college risks.*

Sex.	Bad.	Questionable.	Good.	Total per cent.
Boys.....	32	24	44	100
Girls.....	52	22	26	100
Both.....	42	23	35	100
Brown freshmen <sup>1</sup> .....	10	10	80	100

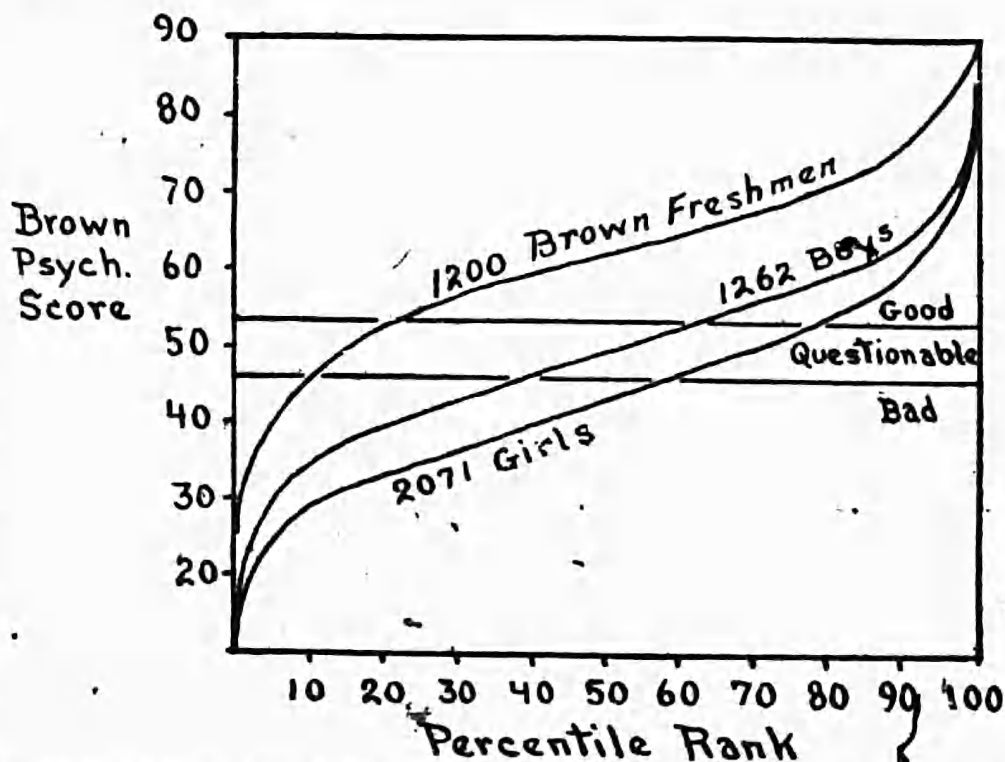
<sup>1</sup> Over 1,200 cases.

**2. What proportion of the present seniors in Massachusetts high schools plan to continue their education?**

Of the 34 high schools surveyed, 29 returned questionnaire cards giving the numbers of those students who intend to continue their

education after graduation. These schools had on January 1, 1923, an enrollment of about 2,800 pupils in their senior classes. Two-thirds of these indicated their intention to go to some higher school after finishing their high-school course. If this proportion is constant for the State, it means that in September, 1923, about 10,000 graduates of Massachusetts high schools will endeavor to begin work as first-year students in colleges, normal schools, and other advanced educational institutions. Of those expressing their purpose of continuing, 1,101 are girls and 749 are boys. The proportion of boys planning to continue is slightly higher than that of the girls, 71 per

### PERCENTILE CURVES

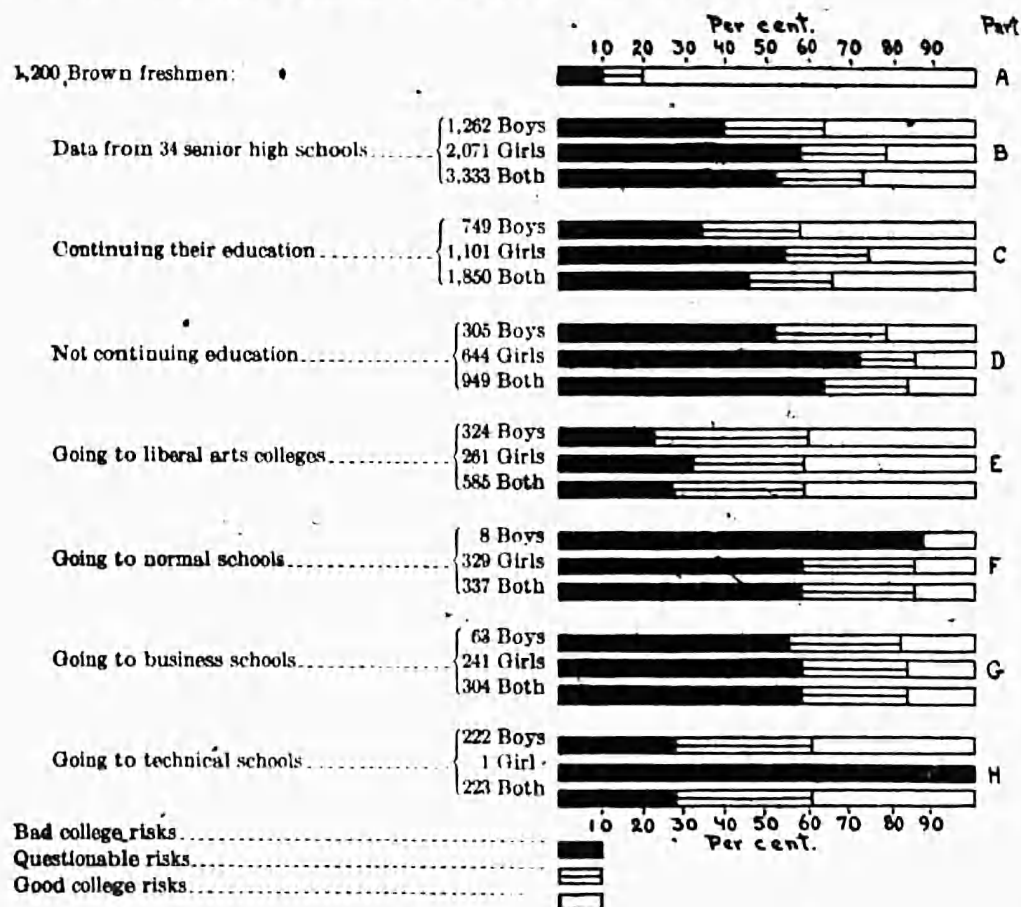


GRAPH I.—Psychological scores of Massachusetts high-school seniors and Brown freshmen interpreted as percentile ranks and indices of success in college.

cent as against 63 per cent of the total for each sex. It is interesting to note that in the case of each sex those planning to continue their education rank somewhat higher in intelligence on the average than do those who do not plan to go on. It seems reasonable to interpret this as meaning that ability to do school work is one of the factors that leads to a decision to continue education in some higher institution. Of those who decided to go on, 42 per cent of the boys and 26 per cent of the girls appear to be good college risks, while 34 per cent of the boys and 54 per cent of the girls seem to be bad college risks. Of those not signifying their intention to continue their education, only 22 per cent of the boys and only 14 per cent of the girls are classed as

good risks, while 52 per cent of the boys and 72 per cent of the girls are classed as bad risks. However, it is clear from these figures that there are a considerable number of pupils in the senior classes of the Massachusetts high schools who are not planning to continue their education and who are nevertheless good college material.

The following table indicates in some detail the facts discussed above. See also Graph II, parts A, C, and D.



GRAPH II.—Analysis of various groups of seniors as college risks.

Comparison as "college risks" of those intending to continue their education and those not so intending.

	Number of cases.	Per cent of cases.	Medians.	Prognosis as college risks (per cent).			
				Bad.	Questionable.	Good.	Total.
Continuing their education:							
Boys	749	71	50.6	34	24	42	100
Girls	1,101	63	44.6	54	20	26	100
Both	1,850	66	47.2	46	20	34	100
Not continuing their education:							
Boys	305	29	45.3	52	26	22	100
Girls	644	37	39.5	72	14	14	100
Both	949	34	41.4	64	20	16	100
Brown freshmen	1,200		63.0	10	10	80	100

<sup>1</sup> Something over 1,200.

An analysis of the reasons given by 961 pupils (323 boys and 638 girls) for not continuing their education reveals some important facts. The greatest number, 373 cases, prefer to work. However,

*Reasons for not continuing education.*

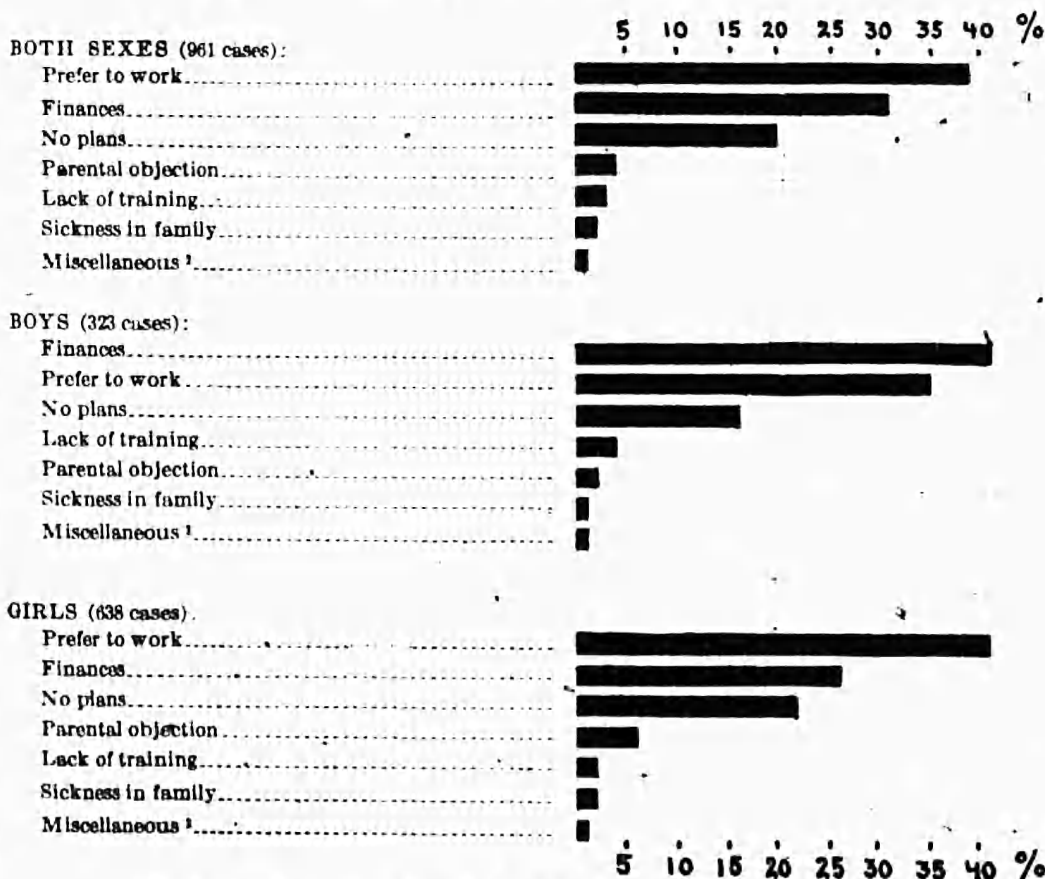
*Their relative frequency and relation to psychological scores.*

[Data from 29 high schools.]

Reasons for not continuing education.	Number of cases.			Per cent of cases.			Psychological median.		
	Boys.	Girls.	Both.	Boys.	Girls.	Both.	Boys.	Girls.	Both.
Prefer to work.....	112	261	373	35	41	39	46.3	38.6	40.7
Finances.....	131	170	301	41	26	31	46.0	39.7	44.2
No plans.....	54	140	194	16	22	20	43.0	38.2	39.5
Parental objection.....	6	37	43	2	6	4	32.5	40.0	39.3
Lack of training.....	13	13	26	4	2	3	44.4	45.2	45.0
Sickness in family.....	4	12	16	1	2	2	50.0	40.0	42.0
Miscellaneous <sup>a</sup> .....	3	5	8	1	1	1	47.5	43.7	45.0
Total.....	323	638	961	100	100	100			

<sup>a</sup> Health, age, lack of talent.

301 are held back for financial reasons. The median psychological score of these pupils is 44.2, and 17 per cent of these are good college risks, while nearly half of them have a fair chance of success in an academic college. Those who prefer to work rank somewhat lower,



GRAPH III.—Reasons for not continuing education. Their relative frequency.<sup>1</sup>

62 per cent being bad college risks. Those who have no plans after leaving high school make on the whole the poorest showing of all. The next two tables show these facts in detail. See also Graph III.

<sup>1</sup> Data from 29 high schools.

<sup>1</sup> Health, age, lack of talent

*Those who are not continuing their education for specific reasons analyzed as "college risks:"<sup>1</sup>*

Reason for not continuing education.	Sex.	Number.	As "college risks" (per cents).			
			Bad.	Questionable.	Good.	Total.
Prefer to work.....	Boys.....	112	45	40	15	100
	Girls.....	261	69	24	7	100
	Both.....	373	62	28	10	100
Finances.....	Boys.....	131	46	35	19	100
	Girls.....	170	57	26	17	100
	Both.....	301	53	30	17	100
No plans.....	Boys.....	54	58	22	20	100
	Girls.....	140	78	19	5	100
	Both.....	194	70	20	10	100
Parental objection.....	Boys.....	6	100	0	0	100
	Girls.....	37	60	24	16	100
	Both.....	43	65	21	14	100

<sup>1</sup> Only the most frequently occurring reasons are here treated. See previous table.

### 3. What specific plans for a career have seniors not intending to continue their education?

Pupils stating their plans for work after leaving high school numbered 934, while 130 were undecided. Nearly nine-tenths of the girls are seeking clerical positions. Over one-fourth of the boys are hoping to enter similar occupations. However, nearly a quarter of the boys are undecided as to what they wish to do. The accompanying table shows these and additional facts.

*Occupations of those going to work immediately after graduating.*

[Data from 29 high schools.]

Occupations.	Number of cases.			Per cent of cases.		
	Boys.	Girls.	Both.	Boys.	Girls.	Both.
Clerical worker <sup>1</sup> .....	127	553	680	30.0	87.0	64.0
Undecided.....	104	26	130	24.0	4.0	12.0
Skilled artisan <sup>2</sup> .....	60	8	68	14.0	1.0	6.0
Engineer <sup>3</sup> .....	59	.....	59	14.0	.....	5.0
Business <sup>4</sup> .....	26	.....	26	6.0	.....	2.5
Farmer <sup>5</sup> .....	21	.....	21	5.0	.....	2.0
Musician.....	6	12	18	2.0	2.0	2.0
Teacher <sup>6</sup> .....	1	15	16	.2	2.6	2.0
Home maker.....	.....	13	13	.....	2.0	1.0
Journalist.....	12	.....	12	2.8	.....	1.0
Scientist <sup>7</sup> .....	7	1	8	1.0	.2	1.0
Nurse.....	.....	8	8	.....	1.0	1.0
Miscellaneous <sup>8</sup> .....	4	1	5	1.0	.2	.5
	427	637	1,064	100.0	100.0	100.0

<sup>1</sup> Accountant, clerk, lawyer, stenographer, bookkeeper, and civil service.

<sup>2</sup> Machinist, mechanic, contractor, sign painter, telephone worker, decorator, sheet-metal worker, auto upholsterer, tanner, draftsman, and carpenter.

<sup>3</sup> Electrician and mechanical draftsman.

<sup>4</sup> Salesman, banker, business manager, and manufacturer.

<sup>5</sup> Farmer, gardener, poultryman, landscape gardener, greenhouse man, herdsman, and dairyman.

<sup>6</sup> Also assistant golf professional.

<sup>7</sup> Forester, pharmacist.

<sup>8</sup> Mill hand, naval service, expressman, and social worker.

It is also of interest to compare the intelligence ratings of the groups planning to engage in these various occupations immediately after graduation. This is made possible in the following table. It is noteworthy that in both sexes those entering upon clerical work are as a group inferior to most of the other groups.

*Psychological scores related to occupations to be engaged in immediately after graduating from high school.*

[Data from 29 schools, 427 boys and 637 girls.]

Boys			Girls		
Occupation	Percent	Psychological median	Occupation	Percent	Psychological median
Miscellaneous	2.0	46.2	Miscellaneous	0.2	62.5
Engineering	14.0	51.0	Teachers	2.6	56.2
Journalism	2.8	50.0	Scientific pursuits	.2	47.5
Miscellaneous	1.0	50.0	Musicians	2.0	46.7
Business pursuits	6.0	48.3	Skilled artisans	1.0	45.0
Scientific pursuits	1.0	47.5	Home making	2.0	42.5
Undecided	24.0	46.7	Clerical	87.0	39.6
Clerical	30.0	46.0	Undecided	4.0	38.5
Skilled artisans	11.0	44.1	Nursing	1.0	37.5
Farmers	5.0	43.5			
Teachers	.2	37.5			

#### 4. To what type of schools are high-school seniors in Massachusetts planning to go?

The question concerning what type of institution they expected to attend after graduating from high school was answered by 1,621 pupils (641 boys and 980 girls), about half of those examined. Of these, over a third planned to go to colleges of liberal arts and about 14 per cent (practically all boys) to higher technical schools. Twenty-one per cent, practically all girls, planned to take a normal-school course; almost an equal number (largely girls) intended to go to some business school. On the basis of these figures it can be estimated with fair certainty that about 3,600 seniors throughout the State plan to go to some liberal arts college and about 1,400 to a higher technical school (such as Massachusetts Institute of Technology). Nearly 2,000 girls are seeking a normal school education. Those who enter liberal arts colleges should have made a minimum intelligence score of 46 on the Brown tests to give a reasonable promise of success; those who go to higher technical schools should have made a minimum score probably somewhat higher (around 50) while those going to normal schools can probably succeed with a somewhat lower intelligence rating, possibly a score of 40 being sufficient to indicate a fair possibility of success. The facts as collected show that those planning to go to liberal arts colleges have a median psychological score of 52.1 and that over 40 per cent are good college risks, with

only 27 per cent bad risks. The medians and "good risk" percentages are almost identical for both girls and boys. Evidently those who intend to go to a liberal arts college are a somewhat superior group, and further, the girls who plan to continue have a mental capacity on a par with that of the boys. Those intending to enter higher technical schools have an equally high rating, but those planning to enter normal schools are considerably inferior.<sup>4</sup> The median psychological score for the normal school groups is nine points lower than that obtained by the liberal arts group. Moreover, only 20 per cent of the normal group scored as high as the median for the liberal arts group. Those intending to enter business schools seem to have practically the same ability as those planning to continue their education in a teacher-training school. These facts are shown in the following table:

<sup>4</sup> This conclusion is in substantial agreement with the results of a recent survey of normal students in Massachusetts, and with other investigations made elsewhere. In Jan., 1922, E. A. Kirkpatrick reported that the students in 10 Massachusetts normal schools made a median score (75.3) on the Thurstone intelligence test which was 11.3 points lower than the median score (86.6) made by freshmen in 30 colleges on the same test. Kirkpatrick gives the following comparative figures:

	Median scores.
Five high schools—seniors .....	69.5
Ten Massachusetts normal schools—all students .....	75.3
Ten other normal schools .....	74.8
Thirty colleges—freshmen .....	86.6

(Intelligence Tests in Mass. Nor. Schs., E. A. Kirkpatrick, Fitchburg, Mass., School and Society, vol. 15, Jan. 14, 1922.) A classification of 445 Ohio high-school seniors in terms of intelligence (Terman test) and occupational choice showed those going into high-school teaching to be inferior to those taking up law, engineering, and medicine, while those intending to teach in elementary schools were inferior to even a greater extent. (The Intelligence of County Normal School Students, W. B. Bliss, Educ. Research Bul., vol. 2, Feb. 7, 1923, O. St. Univ.) Students, all women, in the Rhode Island College of Education recently (1923) scored 6.4 points lower than Brown University freshmen on the test used in the Mass. Survey (median scores). Only 28 per cent reached or exceeded the median for Brown freshmen and only 34 per cent reached or exceeded the median score on the same test made by the freshmen (1923) at the Women's College of Brown University. On the other hand, the freshmen at the women's college (Brown University) made a median score on the Brown test one point higher than the median score made by the freshmen at the men's college. B. L. Gambrill, using the Thorndike test, compared the scores of three successive entering classes at the Trenton Normal School (1919-1921) with the scores attained by two groups of women college students: (1) freshmen in an eastern liberal arts college, and (2) home economics freshmen in a western State. The comparison showed that only 15 per cent of the normal-school students reached or exceeded the median for the liberal arts students. However, when compared with the home economics group the normal students suffered little, if any. (Twenty-First Yearbook of the Nat. Soc. for the Study of Educ., 1922, p. 230.) Another important investigation substantiates the Mass. finding. In his mental survey of nearly 6,000 seniors in the high schools of Indiana (1919), Book found that after arranging the occupational choices of the seniors from high to low in terms of the intelligence of each group, those selecting teaching as a life work occupied a middle position, in the case of each sex. This mediocre ranking remained the same whether the occupational groups were compared on the basis of central tendency or percentage of the total group possessing the higher grades of intelligence. (The Intelligence of High School Seniors, W. F. Book, p. 141.)

*Those going to certain higher schools analyzed as "college risks."*

Type of higher education.	Sex.	Number.	As college risks (per cents).				Psychological median.
			Bad.	Questionable.	Good.	Total.	
Liberal arts.....	Boys.....	324	23	37	40	100	52.3
	Girls.....	261	32	27	41	100	51.9
	Both.....	585	27	32	41	100	52.1
Normal.....	Boys.....	8	88	0	12	100	35.0
	Girls.....	329	58	28	14	100	43.1
	Both.....	337	58	28	14	100	42.9
Business.....	Boys.....	63	55	27	18	100	43.6
	Girls.....	241	58	26	16	100	42.4
	Both.....	304	58	26	16	100	42.7
Technical.....	Boys.....	222	28	33	39	100	51.6
	Girls.....	1	100	0	0	100	37.5
	Both.....	223	28	33	39	100	51.5

Only those institutions drawing the largest number are here treated. The complete table follows. See also Graph II. Parts E, F, G, and H.

*Types of higher education to be pursued.*

[Data from 29 high schools.]

Type of continued education.	Number of cases.			Per cent of cases.		
	Boys.	Girls.	Both.	Boys.	Girls.	Both.
Liberal arts.....	324	261	585	50.5	26.6	36.0
Normal.....	8	329	337	1.2	33.5	20.7
Business.....	63	241	304	9.8	24.5	18.7
Technical.....	222	1	223	34.6	0.1	13.7
Conservatory of music.....	4	39	43	.6	4.0	2.6
Physical education.....	1	36	37	.1	3.7	2.2
Art.....	6	29	35	.9	3.0	2.1
College of pharmacy.....	6	6	12	.9	0.7	.7
Law.....	7	4	11	1.0	0.5	.6
Hospital training.....		34	34		3.5	2.0
Total.....	641	980	1,621	99.6	100.1	99.3

### 5. What proportion of high-school seniors are intending to go to Massachusetts institutions?

Of 1,641 pupils replying to question 13 on the questionnaire card, 86 per cent plan to go to institutions situated in Massachusetts. About two-thirds of the boys planning to go to liberal arts colleges intend to remain in the State, while about 80 per cent of the girls intend to do the same. About 82 per cent of those entering a technical school will probably go to an institution in Massachusetts. Nearly all who are going to "business colleges" will remain in their home State. Thus in only one instance is any considerable proportion of pupils planning to go outside of the State for their education. This exception is found in the case of liberal arts colleges as chosen by boys, about a third of whom are seeking institutions away from home. It might be interesting to know why this is the case. Is it because the liberal arts college is largely a social as well

as an educational institution, and thus tends to offer a charm somewhat in terms of its remoteness from the home environment? Students who seek social distinction and advantages are quite frequently persuaded that a college away from home is the thing distinctly worth while. Those who are going to higher schools for practical and professional reasons do not, however, have this motive. They are more apt to select schools near at hand. The following table gives in more detail the facts above discussed.

*Per cent of high-school seniors continuing their education in Massachusetts.*

Based on 1,641 answers to question No. 13; 641 boys and 1,000 girls.

[Data from 29 schools.]

Type of higher education selected.	Per cent.		
	Boys.	Girls.	Both
Liberals arts	66	81	73
Normal	100	96	97
Business	98	98	98
Technical	82	100	82
Music	100	100	100
Physical education	100	94	95
Art	83	92	90
Pharmacy	100	100	100
Law	100	100	100
Hospital		94	94
Total	76	93	86

**6. Do the Massachusetts high schools and the seniors in them differ pronouncedly among themselves in intelligence?**

If we examine the distribution of intelligence scores of all the 3,333 pupils tested, we find, as we would naturally expect, wide differences among the pupils in terms of their attainments in the test. This is shown in the following tables, which indicate the distribution of scores for boys and girls alone and for both sexes combined. The range is great, a very few receiving scores in the eighties and a very few receiving scores between 10 and 15, the great majority, however, falling between 25 and 65 in their intelligence ratings.

*Distribution of total psychological scores made by 3,333 seniors in 34 high schools.*

Brown scores.	Boys.	Girls.	Both
80	4	1	5
75	5	2	7
70	31	18	49
65	70	47	117
60	114	99	213
55	148	195	343
50	207	239	446
45	228	315	543
40	172	316	488
35	139	345	484
30	82	261	343
25	40	166	206
20	16	51	67
15	6	14	20
10		2	2
Number of cases	1,262	2,071	3,333

<sup>1</sup> To be read as 10-14.9, and so on.

*Distribution of psychological scores, in percentages, made by 3,333 seniors in 34 high schools.<sup>1</sup>*

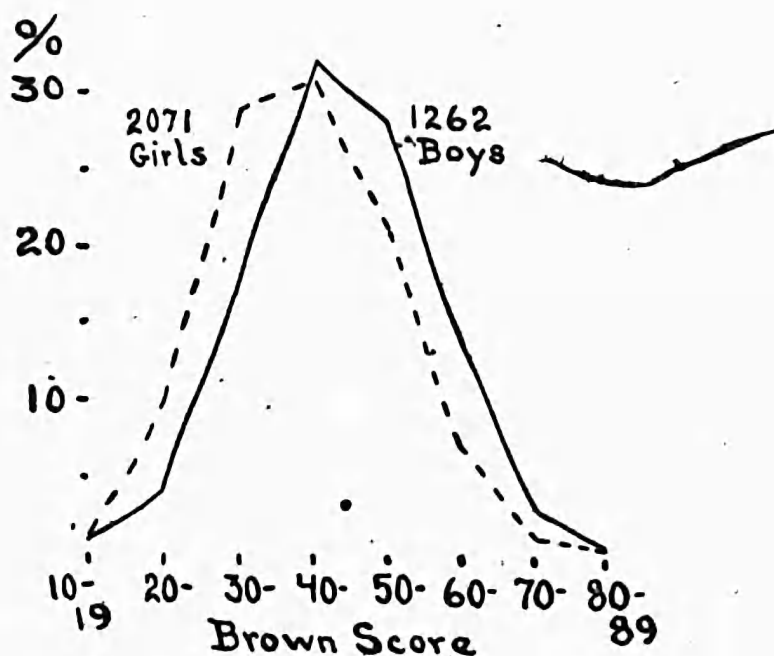
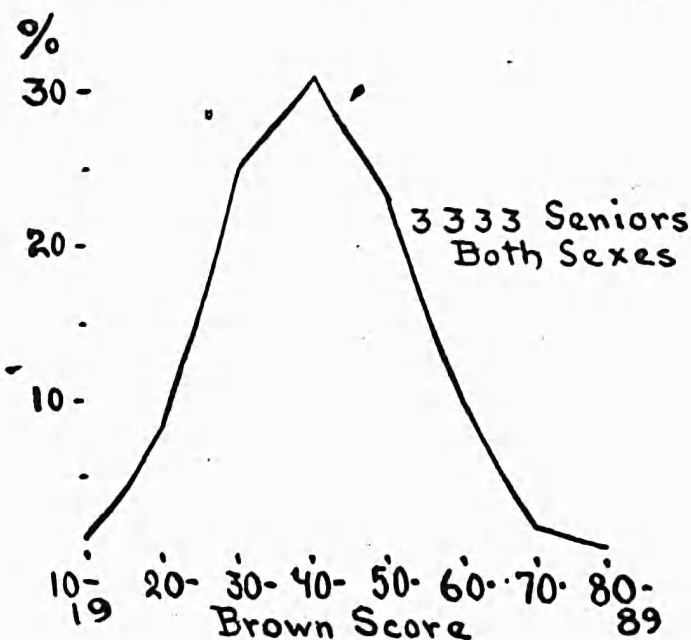
Brown score	Boys.	Girls.	Both.
80-89	0.5	0.1	0.2
70-79	3.0	1.0	2.0
60-69	11.0	7.0	10.0
50-59	28.0	21.0	23.0
40-49	52.0	31.0	31.0
30-39	18.0	29.0	25.0
20-29	4.0	10.0	8.0
10-19	1.5	9	.8
Total	100.0	100.0	100.0
Number of cases	1,262	2,071	3,333

<sup>1</sup> See Graph IV, which shows these facts in the form of distributions curves. Graph I illustrates the same facts by use of percentile curves.

In this distribution some schools occupy higher positions than do others. For example, a school with 107 seniors has a median score for both sexes of 54.8, with one pupil scoring 27.5 at the lower end and one scoring 77.5 at the upper end. Another school with 124 seniors has a median score of 56.2, no pupils scoring below 35 and one scoring above 75. On the other hand, a school of 26 pupils has a median score of 35, two pupils receiving a score of 17.5 and one of 57.5. Among other schools having relatively low median scores was the following: A large school with 362 seniors has a median score of 40.9 and another with 387 seniors has a median score of 42.1. As a rule, however, the lower intelligence ratings are found in the small rural high schools. These have a median score of 41.9. In towns above 5,000 the median is 45.6; in cities, 45.7. As in most surveys of this sort, the rural schools show up at a disadvantage. The question may be asked, Are these lower ratings due entirely to lower intelligence on the part of the pupils, or in part to a difference in educational advantages that work unfavorably for the pupils in rural communities? In either case it seems probable that the seniors in the small rural high schools of Massachusetts are on the whole less promising as college material than are the seniors in the high schools situated in towns and in cities.

Schools in different parts of the State differ considerably in the median intelligence ratings of their seniors. The western group leads with a median score of 48.2; next comes the eastern with a median score three points lower; the central group has a median of 42.6; and the Cape group of 42. A partial explanation of these differences is found in the fact that the Cape and central groups are composed of relatively small schools. The western group has most of its schools situated in towns and cities. This is also true of the eastern group, which, however, has a number of schools in large industrial centers.

In the survey two industrial schools are included. The Boston Boys' Trade School, with a class of 25 seniors, has a median intelligence rating of 42.5, not decidedly inferior to the median rating of the boys in the Cape schools (44). The other industrial school is



GRAPH IV.—Distribution of psychological scores made by high-school seniors.

[Data from 34 Massachusetts high schools.]

the Essex County Agricultural School with 18 boys who have a median score of 40 and with 16 girls who have a median score of 32, as compared with the median rating of the girls in the Cape high schools of 40.8. Thus it can be seen that the intelligence ratings of these two special schools are below that of the other groups. The

question may be raised as to whether the Brown tests are as well suited to pupils taking this type of education as to those pursuing the more academic studies. The facts discussed in the above section are set forth in detailed form in the following tables:

*Table of medians.*

Based on 3,333 scores made in 34 high schools.

[1,262 boys and 2,071 girls.]

Arrangement of schools.	Medians.			Number of cases.			Number of schools
	Boys.	Girls.	Both.	Boys.	Girls.	Both.	
<i>Geographical groups.</i>							
Western.....	50.8	45.7	48.2	328	418	746	10
Central.....	44.8	40.8	42.6	170	262	432	9
Eastern.....	49.2	42.7	45.3	736	1,362	2,098	11
Cape.....	44.0	40.8	42.0	28	29	57	4
<i>Size of community.</i>							
Cities.....	49.2	43.2	45.7	1,080	1,800	2,880	17
Towns of 5,000 and up.....	49.4	43.0	45.6	113	175	288	6
Towns under 5,000.....	42.0	41.7	41.9	69	96	165	11
All groups <sup>1</sup> .....	48.8	43.1	45.5	1,262	2,071	3,333	34
<i>Special schools.</i>							
Boston Boys' Trade.....	42.5	-----	42.5	25	-----	25	1
Essex County Agricultural School.....	40.0	32.0	34.0	18	16	34	1

<sup>1</sup> See next table for a distribution of the 34 separate medians.

*Distribution of median scores made by 34 high schools, Massachusetts mental survey of seniors.<sup>1</sup>*

Sex.	Brown test score.						All schools.	Number of cases.
	30-34	35-39	40-44	45-49	50-54	55-59		
Boys <sup>1</sup> .....	3	1	6	14	5	4	48.8	1,262
Girls.....	1	8	14	6	4	1	43.1	2,071
Both.....	-----	4	14	10	5	1	45.5	3,333

<sup>1</sup> Table to be read as: In three schools the medians for boys fell between 30 and 34. In four schools the medians for the combined sexes fell between 35 and 39. Make other readings accordingly.

<sup>2</sup> Note that only 35 medians for boys appear here. This is because in one of the 34 high schools there were no boys. (Boston Girls' High School.)

## 7. Are there substantial differences in the intelligence levels of the girls and boys in Massachusetts high schools?

From time to time throughout this survey reference has been made to the fact that the median scores of the girls are somewhat lower than those of the boys. Graphs I and IV indicate these differences clearly as well as do the tables embodying the facts in another form. It is clearly shown that while there is a large amount of overlapping between the scores made by the two sexes, the median score of the boys is higher, and further, the girls receive relatively more low

scores than do the boys; also that they receive relatively fewer high scores. A similar investigation made by Book a few years ago<sup>4</sup> of seniors in the high schools of Indiana revealed the same consistent sex differences. He explains the superiority of the boys over the girls as follows: "It is \* \* \* evident that more girls than boys are graduating from the high schools of the State, and that the difference in mental ability found can not be taken as typical of actual differences in the mental capacity of the sexes."<sup>5</sup> He assumes that the boys who have not gone to high school or who, having entered, have not continued, are on the whole of lower intelligence than those who have remained. Hence the boys in the senior classes on the whole are a more selected group than are the girls in these same classes and therefore have a higher median intelligence. However, it should follow, even if this is the case, that the number of girls receiving high intelligence ratings would at least equal the number of boys. An examination of the first table presented under the discussion of Question 6 giving the scores made by the girls and boys shows, however, that this is not a fact. Only 1 girl received a score of 80, while 4 boys attained this figure; for the score of 75, there were 5 boys to 2 girls; for the score of 70, there were 31 boys to 18 girls; for the score of 60, there were 114 boys to 99 girls. For the median and low scores, however, the girls markedly exceed the boys both as to the actual number of scores and the percentage of scores. This evidence seems to point to a difference in intelligence between the two sexes, which, if small, is still real.<sup>6</sup>

It has been frequently said when girls and women on the whole receive lower median intelligence ratings than do boys and men, when both are subjected to the same test, that these tests are fairer for the latter than for the former. There is little to justify this

<sup>4</sup> The Intelligence of High School Seniors, W. F. Book, Macmillan, 1922, p. 270.

<sup>5</sup> A summary of the scores made by 3,333 high school seniors shows the following:

	Means.*	S. D.*	No.
Boys.....	48.9	11.9	1,262
Girls.....	43.6	11.6	2,071
Difference.....	5.3	----	-----

\* Worked from data distributed in steps of 10.

Formula for the P. E. (probable error) of the difference is:

$$.6745 \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$$

This formula gives P. E. = .283

Difference of the means then equals  $5.3 \pm .283$

Significance test  $\frac{5.3}{.283} = 18.7$

That is, the difference of the means for the sexes equals eighteen times its own P. E. Since the difference between the means for the sexes (5.3) is eighteen times as large as its own P. E. (.283), the difference between the means for the sexes is to be considered as significant, for the usual rule is to consider as significant a difference which is even three or four times its own P. E., because in such a case the odds are, roughly, 100 to 1 against the difference being due to sampling. The odds against such a difference being due to sampling rise to 19,200 to 1 when the difference is six times its own P. E. In the present case we have a difference between the means for the sexes which is as much as eighteen times its P. E. It is therefore highly significant, and an effort should be made to account for it, if possible.

statement in the Brown tests. With the possible exception of that part of the test that presents fundamental operations in arithmetic and simple arithmetical problems, the test is fully as well adapted to girls as to boys. Granting the possibility that girls on the whole have less mental capacity than boys, they probably make up for this slight handicap in zeal for work and in persistence and may be expected to do college work as well as, or even better than, boys. In any event, as has been previously indicated, the girls planning to enter academic colleges are the equal of boys in their intelligence ratings, and their promise of success is on the whole good.

#### 8. What are the ages of seniors attending Massachusetts high schools?

On the questionnaire cards 2,716 pupils gave their ages, indicated to the nearest six months. The oldest reporting (245) gave their age as 19 years. The youngest, 1 pupil, a boy, gave his age as 14½ years. The largest group of pupils (581) gave their age as 17½ years, the next largest group as 17 years. This indicates that the most frequent age of Massachusetts high school seniors at graduation is approximately 18 years.

An interesting relation is shown between the age of the seniors and their intelligence ratings. The younger pupils have the higher intelligence ratings. This is true for both boys and girls, and is what would naturally be expected. The brightest pupils do their work better and more rapidly. The following tables show the facts.

*Distribution of ages of seniors.*

Age in years. <sup>1</sup>	Number of cases.		
	Boys.	Girls.	Both.
19.....	135	110	245
18-6.....	125	158	283
18.....	180	275	454
17-6.....	202	379	581
17.....	175	374	549
16-6.....	129	299	428
16.....	43	76	119
15-6.....	18	24	42
15.....	2	2	4
14-6.....	1		1
Total.....	1,019	1,697	2,716

<sup>1</sup> 19 years means 18-9 to 19-2, inclusive, etc

*Age in relation to psychological scores.*

Age in years. <sup>1</sup>	Median scores.		
	Boys.	Girls.	Both.
19.....	44.4	38.6	41.7
18-6.....	46.0	39.1	41.7
18.....	47.2	41.5	43.9
17-6.....	50.4	42.1	45.1
17.....	51.3	43.9	46.3
16-6.....	52.1	44.7	47.0
16.....	52.7	46.6 <sup>2</sup>	49.0
15-6.....	56.2	55.0	55.6
15.....	55.0	47.5	55.0
14-6.....	77.5		77.5

<sup>1</sup> 19 years means 18-9 to 19-2, inclusive, etc.

### 9. What is the relation between intelligence scores and high-school standing?

Are the Brown tests reliable indications of school achievements as well as of college success? Only about one-half of the high-school principals replied to question 1, part B, in such a way as to make it possible to use the data for correlation purposes. However, the data available points to the conclusion that the tests are a slightly more accurate indication of what pupils have done in high school than what they will do in college. In neither case is the relation between tests and grades perfect, nor is this to be expected, but it is sufficient to show that there is a pronounced tendency for those who score low in the tests to do poor work in school and college, and for those who score high to do good work. Results from High School B show that, out of the pupils scoring in the highest fifth on the tests, three-quarters did work in school of a good and superior grade, while only about one-tenth did work of a poor and inferior grade. On the other hand, of those scoring low in the psychological tests nearly two-thirds did work of a poor and inferior grade, and only one-fifth did work of a good or superior grade. These facts are expressed in the following table:

#### *Correlation between intelligence scores and standing in class.*

High School B, 329 cases.  $r=0.441$ .

Psychological quintiles. <sup>1</sup>	Academic quintiles.					Total per cent.
	Low 5	4	3	2	High 1	
High 1.....	3	8	14	23	52	100
2.....	13	13	32	20	22	100
3.....	18	23	18	24	17	100
4.....	27	26	21	18	8	100
Low 5.....	34	30	15	18	3	100

<sup>1</sup> Read table from left to right for academic distribution of any one psychological quintile. At the top is indicated the academic fifth (quintile) in which the pupils were placed by their principals. On the left are the psychological scores divided into quintiles from high to low. The table is to be read as follows: Of the pupils in the highest fifth on the psychological tests, 3 per cent were in the lowest fifth in their school standing, 8 per cent in the second lowest fifth, 14 per cent in the middle fifth, 23 per cent in the second highest fifth, and 52 per cent in the highest fifth. In the same manner it is seen that of those scoring in the second highest fifth of the psychological test, 13 per cent were in the lowest fifth in school standing, etc.

The facts indicated in the table are expressed mathematically by a so-called correlation coefficient ( $r = 0.441$ ). The next table shows a number of coefficients obtained from various other high schools. High School A has a coefficient considerably higher than High School B, while the nine combined high schools and the remaining three fall somewhat lower. The average of these six is 0.428. This coefficient is almost identical with the average coefficients secured over four years between the tests and the academic standings of students in Brown. On the whole the data from the High School A are the most satisfactory, and the coefficient of 0.546 between high-school standing and the intelligence tests (indicating a pronounced agreement) seems to be what should be expected. The next table shows in more detail these facts:

*Correlations between intelligence scores and standing in class.*

School	Pearson coefficient	Number of cases
A	0.546	100
B	0.441	329
C (nine combined) <sup>1</sup>	.431	302
D	.409	155
E	.390	268
F	.350	359
Average coefficient	.428	

<sup>1</sup> Between academic and psychological quintiles. Others between academic quintiles and psychological scores, i. e., without conversion into quintiles.

<sup>2</sup> The number of cases in the nine schools combined were: Ayer 25, Amesbury 69, Boston Trade School 23, Chicopee 55, Dennis 5, Harwich 13, Hyannis 31, Maynard 30, Walpole 51, total 302.

The results based on replies to the questionnaire cards that have so far been presented were obtained from 29 high schools. This constituted the total data available at the time. However, after the work of compiling the data for the report to the commission had been started, the questionnaire cards from 3 additional high schools became available. Hence, wherever possible, the results to be presented in the remainder of the survey are based upon data obtained from 32 high schools.

Comparisons of some of the remaining groups will be made on the basis of the relative percentage of the various given groups that scored in the highest 20 per cent of the psychological scores made by the total 3,333 seniors throughout the State; i. e., in the highest State quintile, or fifth. Similar comparisons will be made concerning the lowest State quintile. In connection with such comparisons the Massachusetts results will at times be paralleled with those obtained by Book in his survey of Indiana high-school seniors. It should be noted in passing, however, that Book used the highest 22 per cent of the total scores for the State and the lowest 26 per cent, whereas the Massachusetts figures are the highest and lowest 20 per

cent. Book refers to these two groups as those rated (1) A or B and (2) D, E, or F, on the Indiana University Intelligence Scale, Schedule D.<sup>7</sup> However, in most instances the Massachusetts and Indiana results will only be compared with reference to the order of comparative intelligence of certain groups.

**10. What courses are being taken by high-school seniors and how are psychological scores related to these various courses?**

From 32 high schools there were obtained 3,016 answers to the question, "What course are you taking in high school?" To be sure, not all of the courses reported are offered by each and every high school and doubtless courses that are substantially the same may be known under different names in different schools. Over two-fifths of the seniors are taking the commercial or business course, out of a total of eight courses reported. The next most popular course is the college preparatory which is being taken by nearly one-fourth of all the seniors. Nearly two-thirds of all the seniors, then, are found in two out of the eight courses, namely, the commercial and the college preparatory. About one-seventh of the seniors are taking a general course. The remaining fifth are divided among five courses. It is to be noted that only 2 per cent are reported as taking the classical course and 1 per cent the academic. With regard to the courses being pursued by the boys, the figures might be taken to indicate a greater diversity of interest among them than among the girls, since 13 per cent or more of the boys are found in each of five different courses, while the greatest percentage found in any one course, the college preparatory, is 33. Among the girls, on the other hand, 14 per cent or more are found in each of only three different courses and nearly three-fifths of the girls are found in one course, the commercial.

When the seniors taking the various courses are compared in terms of the psychological scores made by each group, unmistakable and striking differences are revealed. If the standard of comparison be the median score for each subject group, the classical and academic groups, which are quite comparable one to the other, are distinctly in the lead; the scientific and college preparatory groups are only very slightly inferior to these; the general, vocational, and normal preparatory groups are practically identical and have a mediocre ranking, while the commercial group ranks lowest. Slight sex differences are found which are favorable to the girls in the classical and academic groups, but favorable to the boys in the vocational, general, and commercial groups. It is to be noted that the median scores for the two sexes in the college preparatory group are almost identical.

<sup>7</sup> The Intelligence of High School Seniors, W. F. Book, p. 23.

This is in rather striking agreement with a fact already reported under question 4, namely, that the senior girls who plan to go to liberal-arts colleges have a mental capacity on a par with that of boys.

When the basis of comparison is changed from median scores to the percentages of each subject group that scored in the highest State quintile, the relative order of the groups remains substantially the same, but the actual differences between the various groups become more apparent. The academic, classical, college preparatory, and scientific groups remain in the lead and maintain the same order, respectively. The general, vocational, and normal preparatory groups remain very much alike, as before, and merely shift places within themselves. As before, too, the commercial group ranks lowest. Whether the basis of comparison is median scores or percentages scoring in the highest State quintile, the classical, academic, college preparatory, and scientific groups rank highest and in the order here indicated; on these same two bases the commercial group ranks lowest and the general, vocational, and normal preparatory courses have mediocre rankings. Book (*op. cit.*, pp. 145-147) also found the classical and academic groups to lead and the vocational and commercial groups to rank lowest. Book reported no facts for a normal preparatory group. The facts for the Massachusetts seniors are shown in more detail in the following tables. See also Graph V.

*Intelligence scores related to courses taken in high school.*

1,131 boys and 1,885 girls; total, 3,016 cases.

[Data from 32 high schools.]

High-school course.	Per cent of cases.			Psychological median.		
	Boys.	Girls.	Both.	Boys.	Girls.	Both.
Commercial or business	17	57	42	42.9	40.5	40.9
College preparatory	33	16	23	53.7	53.4	53.6
General	15	13	14	46.4	41.1	43.5
Scientific	19	1	7	52.1	47.5	52.9
Vocational	13	2	6	44.4	36.1	43.3
Normal preparatory		8	5		43.9	43.9
Classical	2	2	2	54.2	57.7	56.5
Academic	1	1	1	52.5	50.4	55.0
Total	100	100	100			

*Seniors scoring in highest and lowest State quintiles.*

Arranged by courses taken in high school.

[Data from 32 schools: 3,016 cases.]

Course taken in high school.	Total number cases, both sexes.	Per cent scoring in—	
		Lowest State quintile.	Highest State quintile.
Classical.....	54	4	56
Academic.....	35		51
College preparatory.....	682	7	45
Scientific.....	225	8	33
General.....	421	24	18
Vocational.....	188	24	16
Normal preparatory.....	150	22	16
Commercial or business.....	1,261	30	12
Total.....	3,016		

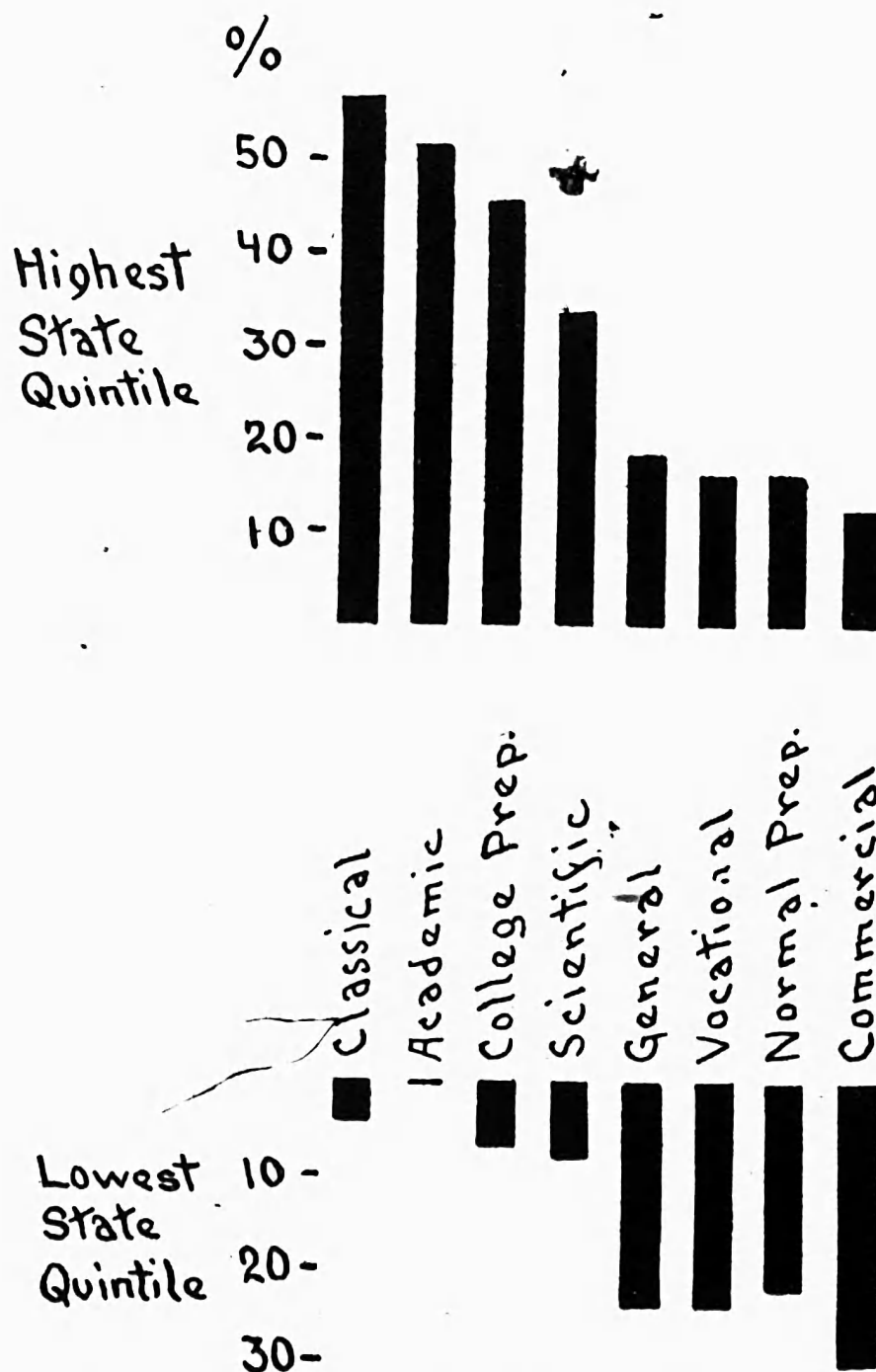
*Subject-groups arranged according to psychological data.*

By median scores.		By per cent scoring in highest State quintile.	
Classical.....	56.5	Classical.....	56
Academic.....	55.0	Academic.....	51
College preparatory.....	53.6	College preparatory.....	45
Scientific.....	52.9	Scientific.....	33
Normal preparatory.....	43.9	General.....	18
General.....	43.5	Vocational.....	16
Vocational.....	43.3	Normal preparatory.....	16
Commercial.....	40.9	Commercial.....	12

**11. What high-school subjects are liked best and how are psychological scores related to the choices made?**

Item 4 on the questionnaire card was, "What *two* subjects do you like best in high school?" In answer to this question 6,145 choices were made. The commercial subjects were most frequently named as favorite studies and were chosen by over a fourth of the seniors. Nearly a fifth selected English and literature. History and civics, modern language, and mathematics were each selected by about one-tenth of the seniors. No one of the remaining high-school subjects was selected by more than 5 per cent of the seniors. Agriculture and gymnastics were each selected by less than 1 per cent. The three most popular studies among the boys are evidently (1) mathematics, (2) history and civics, and (3) English and literature, in the order named. Only one of these subjects appears among the favorite three chosen by the girls, which were (1) the commercial subjects, (2) English and literature, and (3) modern languages.

When the seniors who selected the various studies are compared, as groups, in terms of median psychological scores, the results are again found to be in general agreement with Book's findings (op. cit., 161), namely, that the seniors who selected languages (both ancient and modern) and science lead the other groups, and that the vocational groups rank lowest.



GRAPH V.—Percentage of seniors scoring in highest and lowest State quintiles.

Arranged by courses taken in high school.

[Data from 32 high schools: 3,016 cases.]

*Senior groups selecting various subjects.*

Arranged according to psychological medians.

Subjects liked best.	Median psych. score.	Subjects liked best.	Median psych. score.
Latin.....	52.8	English and literature.....	46.4
Physics.....	51.9	Manual training <sup>1</sup> .....	45.4
Modern languages.....	51.9	Economics.....	43.4
Mathematics.....	51.3	General science.....	40.4
Chemistry.....	49.3	Commercial subjects.....	39.6
Music and art.....	47.3	Agriculture <sup>1</sup> .....	39.5
Gymnastics.....	47.1	Domestic science.....	36.4
History and civics.....	46.6		

<sup>1</sup> Boys only.

Girls only.

A comparison of the psychological medians for the sexes within each subject group again points out a sex difference favorable to the boys but with one interesting exception. Out of 12 subjects selected as favorites by both boys and girls, in only 1 instance are the boys exceeded by the girls, namely, in the case of those selecting modern languages, where the medians were 50.4 and 52.3, respectively. Book also found this especially true in respect to modern languages, but he also found the girls exceeding the boys in several other subjects (op. cit., 169). In further agreement with Book the brightest girls appear to have selected modern languages and Latin; but, in disagreement, the boys selecting Latin surpass all the others, with those selecting physics, mathematics, and chemistry only very slightly inferior (op. cit., 167 and 169). The following table contains these same facts in greater detail:

*Intelligence scores related to subjects liked best in high school.*Based on 6,145 choices,<sup>1</sup> 2,253 made by boys; 3,892 made by girls.

[Data from 32 high schools.]

Subject liked best in high school.	Per cent of cases.			Psychological median.		
	Boys.	Girls.	Both.	Boys.	Girls.	Both.
Commercial subjects.....	9.9	36.0	27.0	42.3	39.2	39.6
English and literature.....	14.0	20.0	19.0	50.1	45.1	46.4
History and civics.....	17.0	10.0	12.0	49.4	43.9	46.6
Modern language.....	6.0	13.0	10.0	50.4	52.3	51.9
Mathematics.....	19.0	5.0	10.0	51.8	50.4	51.3
Chemistry.....	9.0	3.0	5.0	51.0	46.8	49.3
General science.....	5.0	3.0	3.0	44.5	40.7	40.4
Latin.....	3.0	3.0	3.0	53.9	51.7	52.8
Physics.....	6.0	.5	3.0	52.8	40.0	51.9
Music and art.....	2.0	2.0	2.0	49.1	43.3	47.3
Manual training.....	7.0		2.0	45.4		
Domestic science.....		3.0	2.0		36.4	
Economics.....	1.0	1.0	1.0	45.5	41.9	43.4
Agriculture.....	1.0		.5	39.5		
Gymnastics.....	.1	.5	.5	50.0	46.5	47.1
Total.....	100.0	100.0	100.0			

<sup>1</sup> Each senior was asked to name the *two* subjects best liked. Hence each senior so reporting is counted twice.

## 12. What high-school subjects are liked least and how are psychological scores related to such designations?

Item 5 on the questionnaire card was, "What *two* subjects do you like least in high school?" Some seniors appear to have been a little hesitant about naming subjects they liked least, nevertheless 5,396 choices were made. The five subjects that were most frequently named as the best liked also constitutes the five most disliked subjects; the order of frequency, however, does not remain the same. Nearly one-fifth of all the seniors attach their greatest dislike to history and civics. The commercial subjects and mathematics are each named by about one-sixth of the seniors. The subjects most frequently named by the girls are (1) history and civics and (2) the commercial subjects. Each is named by slightly over one-fifth of the girls. The subjects most frequently named by the boys are (1) mathematics, (2) modern languages, and (3) English and literature. Each subject is named by 15 or 16 per cent of the boys.

Comparisons based on median psychological scores show the boys to excel the girls in each of the 12 subjects that were named by both sexes. Interesting results are also obtained by comparing the median score made by each group (both sexes) naming a subject as liked best, with the median score of those who liked the same subject least. For example, those liking history and civics best made a higher median score than those who liked history and civics least. Fifteen subjects were named in the "liked best" list. The "liked least" list is identical. In 9 cases out of the 15, those liking a subject best appear to be superior to those liking the same subject least. The remaining 6 cases, wherein those liking a subject least are superior to those liking it best, involve the following subjects (note the dominance of vocational subjects):

Commercial subjects.

General science. •

Music and art.

Domestic science (girls only).

Manual training (boys only).

Agriculture (boys only).

It is also worthy of note that the boys who most dislike modern language are superior to the boys liking it best. Among the girls those most disliking physics and economics are superior to the girls liking those subjects best. These and other facts are shown in the following table.

*Intelligence scores related to subjects liked least.*Based on 5,396 choices; <sup>1</sup> 2,022 made by boys; 3,374 made by girls.

[Data from 32 high schools.]

Subject liked least.	Per cent of cases.			Psychological median.		
	Boys.	Girls.	Both.	Boys.	Girls.	Both.
History and civics.....	13.0	22	18.0	48.9	42.0	43.7
Commercial subjects.....	8.0	21	16.5	44.4	41.5	42.1
Mathematics.....	16.0	14	15.0	49.8	47.5	48.5
Modern languages.....	15.5	9	12.0	51.8	42.5	47.4
English and literature.....	15.0	8	11.0	48.8	39.7	45.0
Latin.....	13.0	7	9.0	53.1	50.8	52.0
General science.....	4.0	7	6.0	46.2	41.3	42.3
Physics.....	4.0	3	3.0	50.0	44.6	47.2
Chemistry.....	4.0	3	3.0	47.6	42.5	44.7
Economics.....	2.0	2	2.0	43.0	42.3	42.6
Music and art.....	2.0	1	1.0	53.8	47.0	50.8
Domestic science.....		2	1.0		39.0	
Gymnastics.....	.5	1	1.0	55.0	42.7	44.4
Manual training.....	2.0		1.0	46.1		
Agriculture.....	1.0		.5	42.5		
Total.....	100.0	100.0	100.0			

<sup>1</sup> Each senior was asked to name two subjects liked least. Hence each senior so reporting is counted twice.

### 13. What ultimate life occupations have been chosen by the seniors and what are the comparative psychological rankings of the groups making each choice?

The question, "What do you plan to do for a life occupation, ultimately?" was answered by 2,589 seniors, approximately five-sixths of the total number whose questionnaire cards have been analyzed. This exceeds even the unexpectedly high results obtained by Book, who found that approximately two-thirds of the seniors surveyed in Indiana had chosen their vocation in life (op. cit., p. 116). The specific occupations mentioned were classified under a smaller number of headings according to substantially the same scheme as that employed by Book (pp. 186, 187). When this was done it was found that nearly one-half of all the seniors intend to enter some profession, and nearly one-third intend to follow clerical occupations. Of the girls 90 per cent are evenly divided between professional and clerical occupations. One-half of the boys intend to enter professions, and the next largest group is made up of the one-sixth who intend to become skilled artisans. (1) Clerical occupations, (2) salesmen and clerks, and (3) foremen and business executives each claim roughly one-tenth of the boys.

When the groups selecting various life occupations are compared in terms of psychological median scores it is rather surprising to find that 36 boys who intend to take up farming head the list. On this basis the groups are arranged as follows. Note that among the careers selected by both sexes the professional group leads in intelligence.

Median scores.

Life career.	Median psychological score.
Farmers <sup>1</sup> .....	48.2
Salesmen and clerks <sup>1</sup> .....	47.7
Profession.....	47.0
Foremen and business executives.....	46.1
Skilled artisans.....	45.4
Homemaking <sup>1</sup> .....	43.1
Clerical workers.....	42.0

<sup>1</sup> Boys only.

1

<sup>1</sup> Girls only.

Boys entering the professions are distinctly superior to all other groups of boys, with foremen and business executives at the bottom of the list; yet this latter group is the very one that leads among the girls, with clerical workers at the bottom. Among the girls, those entering professions have only a mediocre ranking.

Psychological scores as related to careers chosen.

Careers chosen by boys.	Median psychological scores.	Careers chosen by girls.	Median psychological scores.
Professional.....	55.7	Foremen and business executives.....	50.0
Farmers.....	48.2	Skilled artisans.....	44.4
Salesmen and clerks.....	47.7	Professional.....	44.1
Clerical workers.....	46.7	Homemaking.....	43.1
Skilled artisans.....	45.9	Clerical workers.....	41.4
Foremen and business executives.....	45.5		

When the seniors selecting various careers are compared on the basis of the percentage of each group scoring in the highest State quintile, the foremen and business executive group takes the lead, while the professional group is on a par with the salesmen and clerks group. Clerical workers remain at the bottom of those careers chosen by both sexes. The detailed data bearing upon ultimate careers are contained in the following two tables. See also Graph VI.

Intelligence scores related to ultimate life occupations.

923 boys and 1,666 girls; total, 2,589.

[Data from 32 high schools.]

Ultimate occupation.	Per cent of cases.			Psychological median.		
	Boys.	Girls.	Both.	Boys.	Girls.	Both.
Professional.....	50	45.0	47	55.7	44.1	47.0
Clerical workers.....	11	45.0	32	46.7	41.4	42.0
Skilled artisans.....	16	5.2	8	45.9	44.4	45.4
Foremen and business executives.....	9	.8	4	45.5	50.0	46.1
Salesmen and clerks.....	10		4	47.7		47.7
Homemaking.....		4.0	3		43.1	43.1
Farmers.....	4		2	48.2		48.2
Total.....	100	100	100			

*Intelligence scores related to ultimate life occupations.*

923 boys and 1,666 girls; total, 2,589.

[Data from 32 high schools.]

Ultimate occupation.	Total number cases (both sexes). <sup>1</sup>	Per cent scoring in—	
		Lowest State quintile.	Highest State quintile.
Foremen and business executives.....	104	13	36
Farmers <sup>2</sup> .....	36	19	36
Salesmen and clerks <sup>3</sup> .....	96	20	28
Professional.....	1,205	18	28
Skilled artisans.....	232	19	22
Clerical workers.....	838	28	16
Home making <sup>3</sup> .....	78	27	15
Total.....	2,589		

<sup>1</sup> Except as noted.<sup>2</sup> Boys only.<sup>3</sup> Girls only.

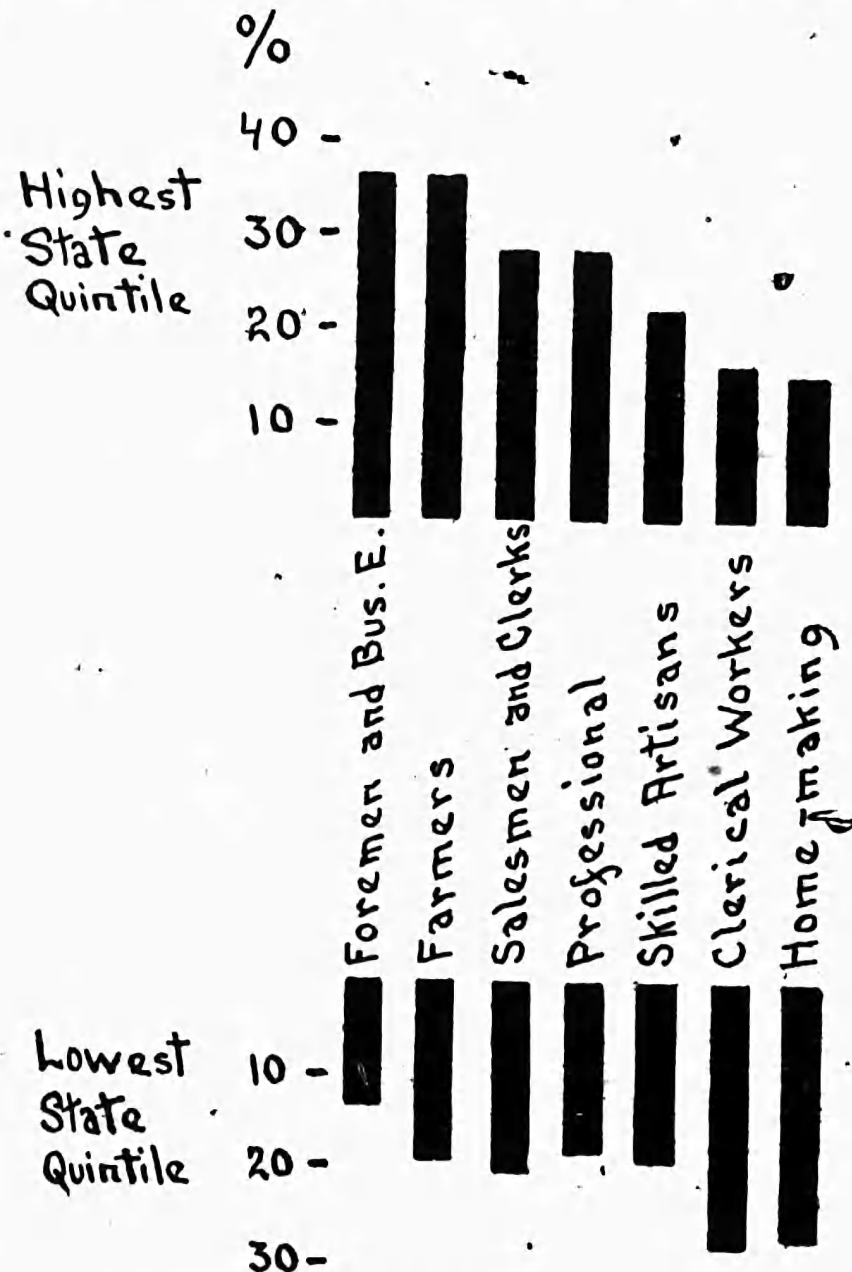
**14. What occupations are pursued by parents of high school seniors and to what extent do seniors vary in intelligence accordingly?**

Occupations in which their fathers engaged were described by 2,532 seniors sufficiently well to classify those occupations under the same seven heads as were used in the question just discussed. The same results show that nearly a third of the seniors come from the homes of skilled artisans, slightly over one-fifth come from the homes of salesmen and clerks, and another fifth from the homes of business executives and foremen. Nearly twice as many come from the homes of day laborers as come from professional homes. As would be expected, the Massachusetts results differ greatly from Book's Indiana findings in certain respects because of an obvious difference in the prevailing occupations in the two States. In certain other respects there is quite a striking similarity in the results; for example, the percentage coming from the homes of clerical workers and professional men. (Book, op. cit., p. 188.)

*Percentage of seniors representing various parental occupations.*

Parents' occupation.	Massachusetts.	Indiana.
Skilled artisans.....	30	18.02
Salesmen and clerks.....	22	6.19
Foremen and business executives.....	21	19.01
Day laborers.....	12	9.32
Professional.....	7	6.04
Clerical workers.....	4	4.82
Farmers.....	4	37.40
Total.....	100	100.80

The psychological scores made by the seniors were tabulated according to the seven classes of occupations pursued by their parents, and the seven groups of seniors thus obtained were compared on the basis of psychological rankings. The first comparisons were made accord-



GRAPH VI.—Percentage of seniors scoring in highest and lowest State quintiles.

Arranged by ultimate life occupations.

[Data from 32 high schools: 2,589 cases.]

ing to median scores. As has been found in other investigations involving the relative intelligence of occupational groups, distinct variations were revealed. The following table shows that seniors whose parents belong to the professional class rank highest, with those from the homes of clerical workers ranking second. Seniors whose

parents are day laborers or farmers rank lowest. To this extent the Massachusetts findings are in exact agreement with what Book found. The only difference is a reversal of the order of the three middle groups.

*Occupations of parents in order of intelligence of children.*

Arranged from high to low according to median psychological scores.

Book <sup>1</sup> in Indiana.	Massachusetts.		
	Sexes combined.	Boys only.	Girls only.
1. Professional.....(high)	1	1	1.0
2. Clerical workers.....	2	2	3.0
3. Skilled artisans.....	5	5	5.0
4. Salesmen and clerks.....	4	4	4.0
5. Business executives, etc.....	3	3	2.0
6. Day laborers.....	6	7	6.5
7. Farmers.....(low)	7	6	6.5

<sup>1</sup> This same order true for each sex and both combined (op. cit., p. 192).

When these same senior groups are compared on the basis of the percentage of each group scoring in the highest State quintile, the order from high to low remains the same except in the case of the two lowest which reverse places. On this basis, seniors from the homes of day laborers rank lowest. Whether the basis of comparison is median scores or the percentage scoring in the highest State quintile, seniors from the professional class of homes rank first and the children of clerical workers second; the two lowest groups are those whose parents are farmers and day laborers. These same facts appear in greater detail in the following two tables. See also Graph VII.

*Occupational status of parents related to intelligence of seniors.*

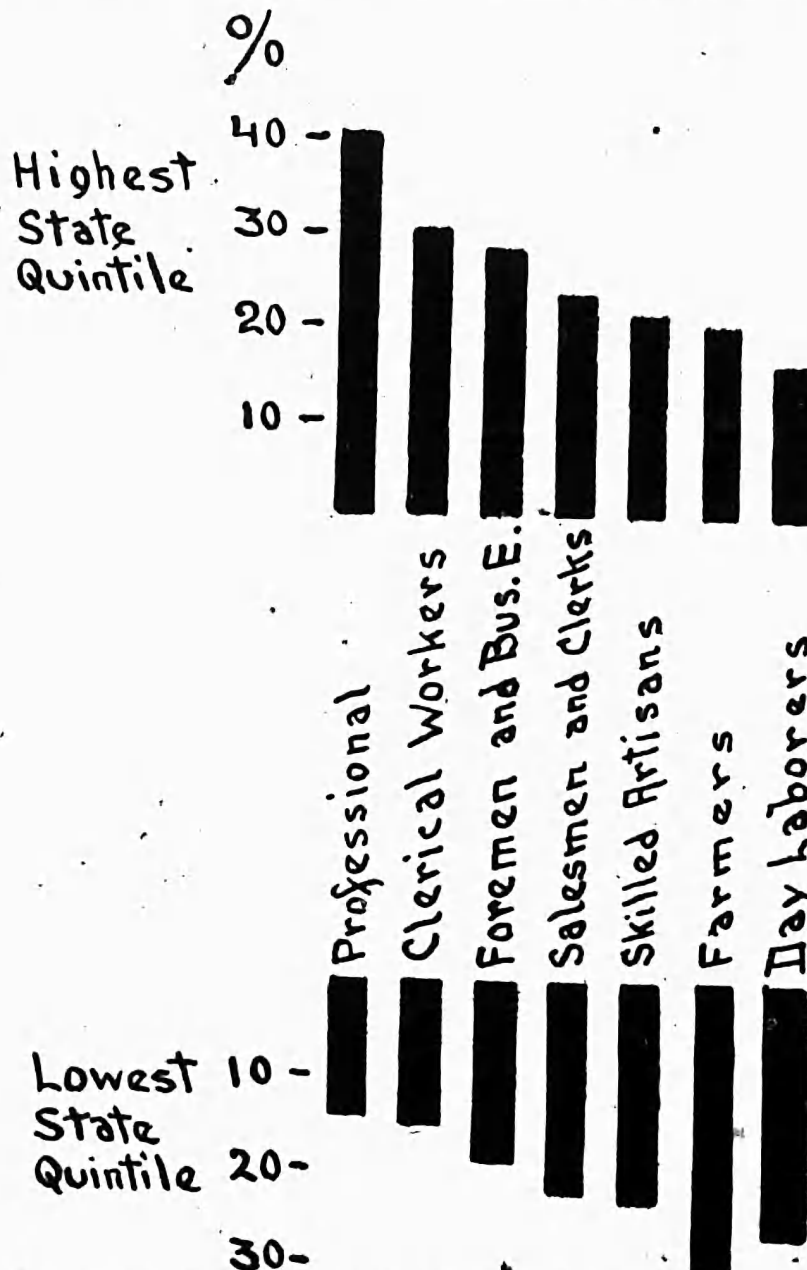
[Data from 29 schools, 960 boys and 1,572 girls.]

Occupation of parent.	Per cent of cases.			Psychological median.		
	Boys.	Girls.	Both.	Boys.	Girls.	Both.
Professional.....	7	7	7	52.6	50.0	50.9
Clerical workers.....	5	3	4	52.5	43.2	47.7
Business executives and foremen.....	22	21	21	51.2	44.2	46.8
Salesmen and clerks.....	19	24	22	50.6	42.6	45.0
Skilled artisans.....	32	28	30	47.8	41.9	44.5
Day laborers.....	12	13	12	46.6	39.5	42.4
Farmers.....	3	4	4	48.0	39.5	42.0
Total.....	100	100	100			

*Occupational status of parents related to intelligence of seniors.*

[Data from 29 high schools: 2,532 cases.]

Occupation of parent.	Total number cases (both sexes).	Per cent scoring in—	
		Lowest State quintile.	Highest State quintile.
Professional.....	174	14	40
Clerical workers.....	99	15	30
Business executives and foremen.....	535	19	28
Salesmen and clerks.....	562	22	23
Skilled artisans.....	759	23	21
Farmers.....	93	31	20
Day laborers.....	310	27	16
Total.....	2,532		



GRAPH VII.—Percentage of seniors scoring in highest and lowest State quintiles.

Arranged by occupations of parents.

[Data from 29 high schools: 2,532 cases.]

**15. What are the annual incomes of the parents of high-school seniors and to what extent do seniors vary accordingly?**

Question 11 on the questionnaire card was "What is your father's annual income?" Very many either did not know, even in approximate terms, or did not care to give the information. Where there was any hesitancy whatever about giving this information no pressure was brought to bear in an effort to secure an answer. Their father's annual incomes were stated by 1,170 seniors with sufficient accuracy to warrant tabulating them under five heads. The following table shows the frequency with which each income was represented among the seniors in Massachusetts and in Indiana:

*Percentage of seniors representing various incomes.*

Income.	Massachusetts.	Indiana. <sup>1</sup>
\$1,000-\$2,000.....	49	45.19
\$2,000-\$3,000.....	28	16.67
Over \$4,500.....	10	8.51
\$3,000-\$4,500.....	9	4.58
Below \$1,000.....	4	25.04
	100	100.49

<sup>1</sup> Book, op. cit., p. 210; Book uses \$500-\$1,000; all other income groups are the same.

The Massachusetts and the Indiana investigations agree very closely in showing that very nearly half of the seniors have fathers whose annual incomes are between \$1,000 and \$2,000. The results are also roughly alike in respect to the percentage representing incomes of over \$4,500, namely, 8 to 10 per cent. The greatest disagreement pertains to those whose fathers have incomes of less than \$1,000; in Massachusetts this is the least frequently represented group, with only 4 per cent, while in Indiana one-fourth of all the seniors come from such homes. In Massachusetts fully three-fourths of the seniors have fathers whose incomes range from \$1,000 to \$3,000. In Indiana, on the other hand, nearly three-fourths represent incomes of less than \$2,000. Such differences are of course related to the fact that the various occupations do not occur with equal frequency in these two States. This was pointed out under question 14.

The psychological scores of the seniors were tabulated in such a way that the seniors representing the various income groups could be compared with reference to median scores and the percentage of each group that scored in the highest State quintile. The seniors from homes with the largest incomes made the highest median psychological score and the other median scores drop gradually but continuously according to the size of income. Seniors representing the highest and the lowest incomes ranked highest and lowest, re-

spectively, on the psychological test, whether the sexes are combined or each taken separately. As one passes from the highest income group down to the lowest there are no pronounced differences in median scores between any two successive groups, since the greatest difference is only 2.3 points. Book, using the percentage scoring above the State median, also found a slight but continuous decline in passing from the highest to the lowest salaried group, but he also found a marked decline for the lowest salaried group (op. cit., p. 211).

When the different groups were compared according to the percentage scoring in the highest State quintile, the two highest salaried groups were still found to rank highest, respectively, just as in terms of median scores. In general, when the rankings of the different salary groups obtained by these two psychological standards are compared, the Massachusetts figures appear more consistent than do the Indiana ones.

INDIANA. <sup>1</sup>			MASSACHUSETTS.		
Salary group.	Ranked according to—		Salary group.	Ranked according to—	
	Per cent above State median.	Per cent scoring in highest 22 per cent in State.		Median scores	Per cent scoring in highest State quintile.
Over \$4,500.....	(High) 1	4	Over \$4,500.....	(High) 1	1
\$2,000-\$3,000.....	2	1	\$3,000-\$4,500.....	2	2
\$3,000-\$4,500.....	3	2	\$2,000-\$3,000.....	3	3.5
\$1,000-\$2,000.....	4	3	\$1,000-\$2,000.....	4	5
Under \$1,000.....	(Low) 5	5	Under \$1,000.....	(Low) 5	3.5

<sup>1</sup> Book, op. cit., pp. 213 and 215.

The data upon which the discussion of question 15 has been based appears in greater detail in the following tables. See also Graph VIII

*Economic status of parents related to intelligence of seniors.*

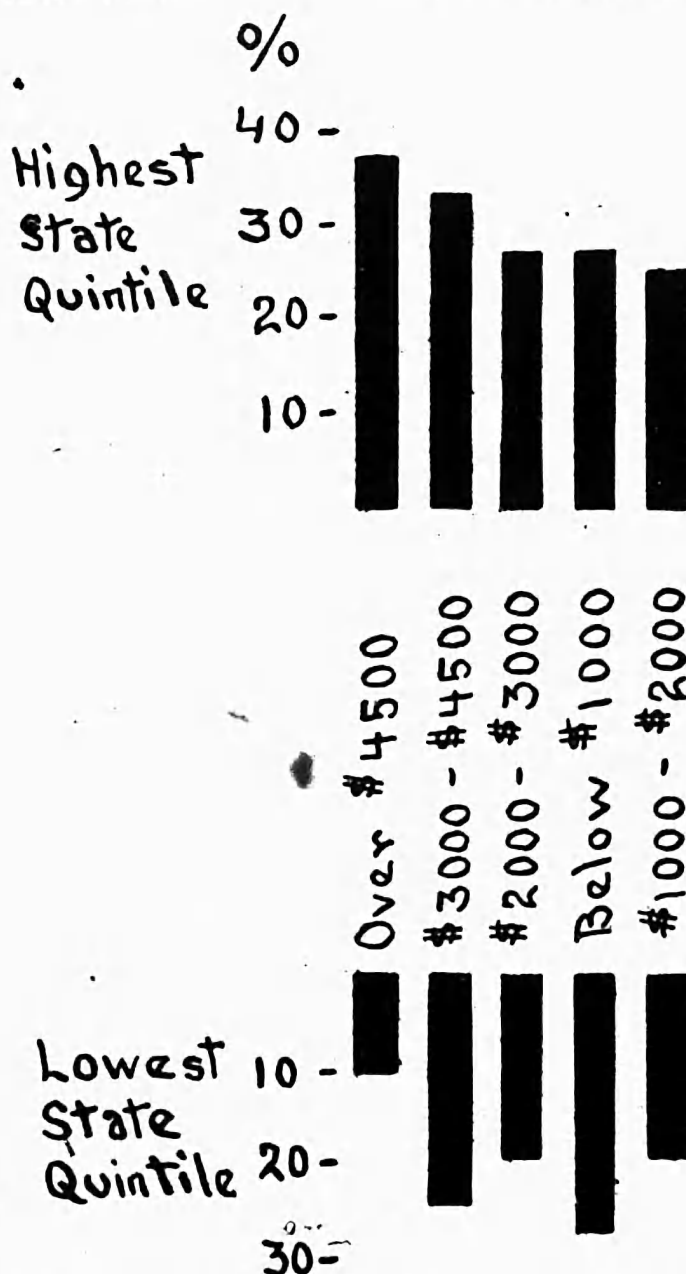
[Data from 29 schools: 551 boys and 619 girls; total, 1,170 cases.]

Salary.	Per cent of cases.			Median psychological score.		
	Boys.	Girls.	Both.	Boys.	Girls.	Both.
Over \$4,500.....	12	9	10	52.9	48.3	50.8
\$3,000-\$4,500.....	10	7	9	51.0	42.3	49.0
\$2,000-\$3,000.....	26	30	28	51.7	43.0	46.7
\$1,000-\$2,000.....	47	50	49	49.5	43.2	45.9
Below \$1,000.....	5	4	4	48.3	38.5	45.4
Total.....	100	100	100			

*Economic status of parents related to intelligence of seniors.*

[Data from 29 high schools: 1,170 cases.]

Salary.	Total number cases (both sexes).	Per cent scoring in—	
		Lowest State quintile.	Highest State quintile.
Over \$4,500.....	120	10	37
\$3,000-\$4,500.....	102	24	33
\$2,000-\$3,000.....	327	19	27
\$1,000-\$2,000.....	569	19	25
Below \$1,000.....	52	27	27
Total.....	1,170		



GRAPH VIII.—Percentage of seniors scoring in highest and lowest State quintiles. Arranged by salaries of parents. Data from 29 high schools: 1,170 cases.

**16. In what countries were the seniors and their parents born, and do the psychological scores vary accordingly to any extent?**

To the question, "In what country were you born?" 3,047 replies were received. Nearly 19 seniors out of 20 were born in the United States. Of these, 3 per cent were born in Russia, 2 per cent in Great Britain,  $1\frac{1}{2}$  per cent in continental Europe, and less than 1 per cent in Asiatic and other countries. In terms of median psychological scores those born in the United States lead all the other groups, those born in Great Britain come second, those born in Russia follow and are quite similar to those from continental Europe. The Asiatic-miscellaneous group ranks lowest. These same facts appear in tabular form below.

*Intelligence scores related to native country.*

[Data from 32 high schools.]

Native country.	Number cases (both sexes).	Per cent cases (both sexes).	Psychological median (both sexes).
United States.....	2,845	93.0	45.6
Russia.....	91	3.0	40.5
Great Britain <sup>1</sup> .....	59	2.0	43.5
Continental Europe <sup>2</sup> .....	37	1.5	40.0
Asiatic and miscellaneous <sup>3</sup> .....	15	.5	38.0
Total.....	3,047	100.0	

<sup>1</sup> Canada, England, Scotland.

<sup>2</sup> Italy, Poland, Austria-Hungary, Finland, Sweden, France, Denmark, Germany, in order of psychological medians, as follows: Sweden, 50.0 (4 cases); France, 45.0 (2 cases); Austria-Hungary, 45.0 (6 cases); Germany, 45.0 (2 cases); Poland 40.0 (8 cases); Italy, 37.5 (8 cases); Finland, 36.2 (5 cases); Denmark, 35.0 (2 cases).

<sup>3</sup> Asia, Greece, West Indies, Turkey, Armenia, Africa.

Practically 3,000 seniors answered the questions: "Where was your father born?" and "Where was your mother born?" A study of these replies shows that nearly half of the seniors (44 per cent) have parents both of whom were born in the United States and in about one-sixth of the cases at least one parent was born in the United States. About one-seventh of the seniors have parents both of whom were born in Russia. Outside of the United States and Russia no country was found to be the birthplace of both parents of more than 6 per cent of the seniors. When the median psychological scores of the seniors are compared according to the native countries of their parents, it is found that the small group whose parents were born in England lead all others. Also ranking among the highest are the seniors whose parents were born in the United States, Scotland, and Austria-Hungary. Seniors born of Asiatic parents rank lowest. The following table presents these facts in more detail.

*Intelligence scores related to parental nativity.*

1,152 boys and 1,847 girls; total, 2,999 cases.

[Data from 32 high schools.]

Native country of parents. <sup>1</sup>	Per cent of cases (both sexes).	Median psychological score (both sexes).	Native country of parents. <sup>1</sup>	Per cent of cases (both sexes).	Median psychological score (both sexes).
United States (both parents)...	44.0	46.9	England.....	2.0	47.7
United States (one parent).....	16.0	46.1	Scotland.....	1.0	46.0
Russia.....	14.0	43.3	Germany.....	1.0	44.2
Ireland.....	6.0	44.3	Poland.....	1.0	43.8
Mixed foreign parentage.....	6.0	41.8	Asia.....	.5	36.5
Canada.....	3.0	45.0	Austria-Hungary.....	.5	46.2
Italy.....	3.0	39.9	Denmark.....	.5	41.2
Sweden.....	2.0	41.5	Miscellaneous <sup>2</sup> .....	.5	37.5

<sup>1</sup> United States (both parents) means that both parents were born in the United States of America. United States (one parent) means that one or the other parent was born in the United States of America. No note is made of where the remaining parent was born. Mixed foreign parentage means that both parents were born outside of the United States of America, but not in the same country. Any group designated by the name of a country other than the United States of America (as Sweden) means that both parents were born in that country.

<sup>2</sup> France, Portugal, Armenia, Belgium, Roumania.

**CONCLUSIONS.**

The outstanding facts of the survey are as follows:

1. In all, about 10,000 seniors in Massachusetts high schools plan to go to some institution of learning after graduation in June. Not more than half of this total have reasonable prospects of success in an ordinary liberal arts college.

2. More than a third of the pupils who intend to continue their education after graduation plan next year to enter a liberal arts college or a higher technical school. Of these, 40 per cent are likely to succeed, and about one-fourth seem doomed to failure.

3. A considerable number of girls, about an eighth of all the seniors, both sexes, now in Massachusetts high schools, plan to go to normal schools. Of these the majority are below the intelligence levels of those pupils planning to go to liberal arts colleges and higher technical schools.

4. Those seniors planning to enter business schools have about the same capacity as those intending to enter normal schools.

5. About 6,000 of the seniors now in Massachusetts high schools are planning no further education after graduation. Of these, the majority would have little chance of success in a liberal arts college. However, there are some of promise, possibly 2,000 in all. Of these, a considerable number will not go on with their studies because they prefer to work, but an almost equal number are prevented by lack of funds from going to a higher school.

6. The seniors are found to be divided very unequally among eight different high-school courses. Over two-fifths are taking the commercial (business) course alone, and only 3 per cent are taking

the classical and academic courses (combined). The boys are less homogeneous than the girls in their choice of courses. On the basis of psychological scores the classical, academic, college preparatory, and scientific groups are distinctly in the lead, while the commercial group ranks lowest.

7. The three studies most frequently named as "favorites" by the boys are (1) mathematics, (2) history and civics, and (3) English and literature; by the girls, (1) commercial subjects, (2) English and literature, and (3) modern language. Seniors selecting languages and science lead the others in psychological scores, while the vocational groups rank lowest.

8. Nearly a fifth of the seniors like history and civics least of all the high-school subjects. It is rather striking to note that particularly in the case of vocational subjects, the seniors liking these subjects *least* are psychologically superior to those liking them *best*.

9. Roughly, five-sixths of the seniors have chosen ultimate life occupations. About one-half of them intend to enter professions, and about one-third clerical work. Among careers chosen by both sexes, those selecting professions and positions as business executives and foremen rank highest psychologically, and those going into clerical work lowest.

10. About a third of the seniors come from the homes of skilled artisans, and about twice as many come from the homes of day laborers as come from professional homes. Those coming from professional homes lead the others psychologically, and those whose parents are farmers and day laborers rank lowest.

11. About half of the seniors have fathers whose annual incomes are between \$1,000 and \$2,000. Fully three-fourths of the fathers' incomes fall between \$1,000 and \$3,000. The psychological scores of seniors tend to vary with the fathers' income; those whose fathers' incomes are largest rank highest, and so on.

12. About 19 seniors out of 20 were born in the United States, and these same seniors head all other groups in psychological scores.

13. Nearly half the seniors have parents both of whom were born in the United States, and about one-third mention some one of 17 different countries other than the United States as the birth-place of both parents. The seniors making the highest median psychological scores were those whose parents were both born in English-speaking countries.