

A Study of Some Facts Concerning the Senior High  
School of Springfield, Missouri

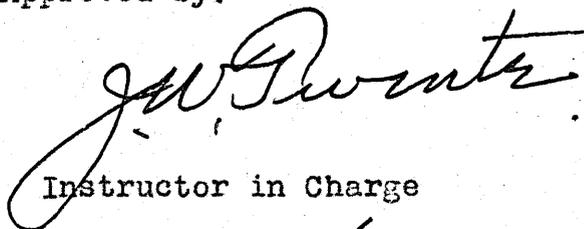
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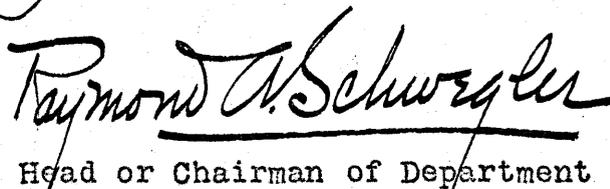
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School of Springfield, Missouri

Table of Contents

Introduction

Problem

Data

Method

- I. Related data from other Surveys and Findings.
- II. The Community and Plan of Survey.
  - Plan of Survey.
  - Population of Springfield.
  - Population of Greene County.
  - Location of City Schools.
- III. Enrollment
  - In School.
  - By Classes
  - Sources
- IV. Normal Progress Retardation, and Acceleration.
  - Age-grade table.
  - Recapitulations from Age-grade Table.
- V. Failures
  - By Chronological Age.
  - By Classes.
  - Compared with I. Q.
- VI. I. Q. Distribution
  - Distribution Graphs.
  - Percentile Graphs.
- VII. Percentage Grade Distribution.
- VIII. Comparing Springfield Senior High School with South  
West Missouri State Teachers College.
  - By Ages.
  - By Subject Failures
- IX. Questions and Suggestions.
- X. Summary.

## TABLES, CHARTS AND GRAPHS.

### Tables

- I Percentages of Failures (from Hackensack Survey).
- II School Elimination (from Hackensack Survey).
- III School Elimination (Springfield, Missouri).
- IV A Comparison Between Population and School Enrollment.
- V School Enrollment.
- VI Enrollment By Classes.
- VII Age-Grade Table.
- VIII Recapitulations from Age-Grade Table.
- IX Age-Grade Distribution of Pupils in 300 First Class Missouri High Schools.
- X Distribution of Pupils Entering 10th Grade as to Chronological Age and Percent Failing.
- XI Entrance Age and Percent Failing.
- XII Percentages of Failing and Non Failing Pupils.
- XIII Failures by Subjects.
- XIV Comparison of Table I with Failures in Springfield High School.
- XV Number of Failures and I. Q.
- XVI I. Q. Distribution for Juniors and Seniors (1924-'25) as Computed by Otis Intelligence Tests.
- XVII I. Q. Distribution for Senior High School (1925-'26) as Computed by Otis Intelligence Tests.
- XVIII I. Q. Distribution for 1924-'25, 1925-'26, as Computed by Otis Intelligence Tests.
- XIX Percentile Graph.
- XX Ages of High School Pupils of Springfield Senior High and S. W. T. C.
- XXI Ages and Percent Failing.
- XXII Number of Failures.

### Maps

- Map I Greene Co. Missouri.
- Map II Location of schools and colleges, Springfield, Missouri.

### Charts

- A A Comparison of the Percentages of Underage Pupils in Each School Year of Senior High School.
- B A Comparison of the Percentages of Normal Age Pupils in Each School Year of Senior High School.
- C A Comparison of the Percentages of Overage Pupils in Each School Year of Senior High School.

## Graphs

- Graph I Correlation Between I. Q's for Senior  
Boys (1925) and Grades
- Graph II Correlation Between I. Q's for Junior  
Boys (1925) and Grades
- Graph III Correlation Between I. Q's for Senior  
Girls (1925) and Grades
- Graph IV Correlation Between I. Q's for Junior  
Girls (1925) and Grades

## Introduction

### Problem.

With the help of the data given on the following pages, an attempt will be made to compare Springfield Missouri, Senior High School with other schools, as to normal progress, retardation and acceleration, and to find which year and which subjects have the greater number of failures, and to obtain the distribution for I. Q.'s and scholastic marks.

### Data.

The data regarding the Springfield Senior High School were secured from the official records and reports for 1923-1924 and 1924-1925, kept in the office of the Principal of Senior High School. These records contain the following information: Date of entrance, age, sex, failure by year/subject, and I. Q. for some.

Other data concerning the city of Springfield and Greene County were obtained from the records of the Chamber of Commerce, and the County Officers, as County Superintendent of Schools.

The complete bibliography on the last page gives the names of the article or book, and its author, for all material used for comparison.

### Method.

The method in general is statistical. Age-grade, grade progress, failures, I. Q. and percentage grade distribution will be shown by graphs and tabular arrays. Correlations are used for some comparisons.

## I. Related Data from other Surveys and Findings.

Previous training and preparation do not furnish as much of a problem for the teacher and administrator as the differences in mental ability and special aptitudes and abilities. Dr. W. O. Thompson, President of Ohio State University, in the 8th Year-book of the National Association of Secondary School Principals for 1924, says, "Public education is for the millions and not for the millionaires alone. Every child has a right to an education for the potentialities that lie within him. Mental endowment must be given opportunity to extend itself along the line appropriate to each individual's possessions and this when provided encompassing and solving most problems of lack of interest, school failures, and discipline."

In the same book mentioned above, W. M. Proctor states, "One-third to one-half of the pupils who enter high school the first year do not return for the third semester. The "drop outs" (that is, those who enter the first year and did not return for the first semester of the second year) number 46% of those who entered. This report is based on a study which covered a period of ten years. There will still be other drop outs before this first year class has completed its four-year course, and the final figures will show a worse picture."

In an article by J. H. Hinds, in the Journal of Educational Research for February 1922, he concludes that the country school children either do not have as high an I. Q. as the city children or else they have not learned the things which are being used to measure general intelligence. One item in which their score was particularly low was vocabulary.

In a study made by Harvey A. Smith(15) on high school failures one finds the following conclusions:

"More than one-half of the high school entrants fail in one or more subjects during their high school career.

In the group of pupils who graduate there is an increasing per cent of failures from the first to the fourth year, with a slight decline in the fourth year. This seems to indicate that the tendency to fail increases as the pupil remains in school. It may also indicate that the subjects in tenth and eleventh grades are more difficult for the average pupil.

Failure seems to be one of the causes of elimination from high school; particularly failure during the freshman year.

15. Harvey A. Smith--A study of High School Failures and Their Causes.

There is a greater per cent of failures in the Modern language courses than in either of the other courses, (commercial and classical). The difference occurs chiefly in the modern language, history, and mathematics.

Failures in English and mathematics predominate when classification is made as to subject. However when the per cent of failures in these subjects are compared with those of other subjects on the basis of number of hours required, they seem to be justified. The fact that a subject is elective does not materially effect a likelihood of failure.

Records show that if a pupil fails in either of the first two years in high school, he is extremely likely to do so in the following years.

The tendency to failure varies directly as the age of the pupil entering high school. The pupils who fail do not seem to be inferior in mental ability to those who do not, but the tendency to fail seems to vary inversely as the amount of application as revealed by the number of hours spent in home study."

Mr. Smith reached these conclusions after studying the school at Bloomington, Indiana.

The Fruita (Colorado) Survey reports that about one pupil in nine is repeating his grade, and estimates that \$6,500 is being spent annually for repeating instruction.

Studies(6) by Thorndike (1907) Ayres (1909) and Strayer (1911) show that the retention to graduation respectively of 29.6%, 25% and 32%. In Hackensack(16) the percentage retained to graduate from 1918-1921 had increased from 29% to 40%. Some of this increase in retention was attributed to the efforts of the teachers.

The largest per cent of the drop outs were from the commercial and clerical courses, undoubtedly due to the fact that children find greater possibilities of stepping directly from these distinctly vocational courses into positions in the business field.

The study of failures reveals a rather high mortality in the modern languages and mathematics.

6. Van Denburg--Elimination of Students in Public Secondary Schools.
16. Strayer & Engelhardt--The Hackensack Schools.

The following table is taken from the Hackensack Survey.

Table No. I.  
Percentages of Failures

Promoted in all subjects	68%
Failing in one subject	18%
Failing in two subjects	8%
Failing in three subjects	4%
Failing in four subjects	1%
All others	1%

These percentages were computed January, 1921. The percentage who have been promoted in all subjects was found to remain rather constant at approximately 68%.

The following data and comment are copied from the Lawrence School Survey.

"English appears to have an excessive number of failures. Subjects which offer such a hazard for the pupils pursuing them are not likely to prove most attractive or serve to hold the student in school, by giving them the feeling of assurance that they are getting work that is well presented and adapted to their needs. It is difficult to believe that the kind of English instruction that produces such a crop of failures in the subject of the mother tongue is the kind that develops a love for and appreciation of Literature, or attracts the pupils to the English classes, and to the library, yet certainly this is not expecting too much for effective English instruction to accomplish. Whatever the cause or causes of this situation, its correction, whether by modification of content of courses, method of teaching, or of uniformity of requirement, would result not only in fewer failures, but in better education."

In School and Society for May 1921, the statement is made that the two main causes for elimination from school, are: first, economic; second, interaction of factors; mental capacity, and minimum standards of requirements. If those in the lower ten or fifteen per cent of the class are carefully guided into courses other than the academic, in which they can hardly hope to succeed, there will be fewer failures. The enriched curriculum, especially one which considers the interests and capabilities of the students, will have increased holding power.

The following table is taken from the Hackensack Survey. It gives the elimination from high school on the basis of every hundred enrolled in the first year.

Table No. II.  
School Elimination

	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.
North Atlantic	100	66	47	39
North Central		69	51	43
South Atlantic		65	44	28
South Central		64	43	28
Western		62	45	37
United States		66	48	38
Hackensack		78	56	40
Pennsylvania		63	48	33
New Jersey		57	45	39
New York		62	37	30
Connecticut		68	49	45
Rhode Island		62	42	36
Massachusetts		67	51	47
Vermont		71	49	47
New Hampshire		72	57	51
Maine		72	58	50

Van Denburg in his study of the elimination of students in public secondary schools comes to the conclusion that what a pupil intends to do correlates high with the length of time a pupil remains in school. The economic conditions of pupils is a relatively minor factor. The pupil ranked in the top tenth by the teacher will stay four and one fourth times as long as the one who is rated in the bottom tenth. A rating in the top third compared with one of the bottom third nearly trebles (2.7 times) the probable high school career. An average mark of eighty or more for the first few months means a stay of five times as long as an average mark below fifty.

In the Lawrence School Survey by F. P. O'Brien, the "Elimination of Students in Public Secondary Schools," by Van Denburg, and Harvey A. Smith's Study of High School Failures, some of the reasons given for failures and elimination are:

1. Inadequate curriculum
2. Lack of concern for individual differences and interests.
3. Economic.
4. LOW I. Q.

5. Low A. Q.
6. A combination of causes.

The three main causes for failure seem to be:

1. Low ability of the student.
2. Poor teaching methods, or material.
3. Absence.

There is a rather general agreement that English, mathematics, and modern languages have the larger per cent of failures, and the first two are required subjects.

## II. The Community and the Plan of the Survey.

### Plan of Survey.

The following study was undertaken for the purpose of inquiring into the number of high school students enrolled, their normal progress, retardation, and acceleration, the trend of failures, and I. Q.'s and percentage grade distribution.

### Greene County.

Greene County located in southwest Missouri, has an area of 667 square miles, and a population of 68,698, according to the census taken in 1920. The state has an average of 49.5 persons to the square mile, the county average is 103 persons per square mile.

The total assessed valuation of the county in 1922 was \$67,412,136. The tax levy was: State 1.3¢; county 37¢; road and bridge, 15¢; average school tax, 49.7¢.

The county contains 103 school districts, with 137 public schools that employ 421 teachers, and have a total enrollment of 17,173.

The high schools are located on Map I, (Page 12 by means of asterisks).

### Springfield, Missouri.

Springfield, Missouri is the county seat of Greene County. In 1920 the census report for the population was 39,621. The city corporate limits have not been extended for 12 years. The city's suburban population, outside the city limits, exceeds 11,000. The population is really over 50,000, an increase since 1910 of over 40%. The population estimate for 1925 is 56,200, an increase of 73% since 1900.

This makes Springfield the fourth city of Missouri in size.

The census estimate was given after two inspectors had spent two weeks in this city checking the deliveries of all carriers. This applies to the city proper, covering only the part that is served by the post office carriers.

Springfield has 22 public schools. These include three junior high schools, which were completed recently and a senior high school building. \$750,000 were spent on the three new junior high schools within the last four years, 1921 to 1925.

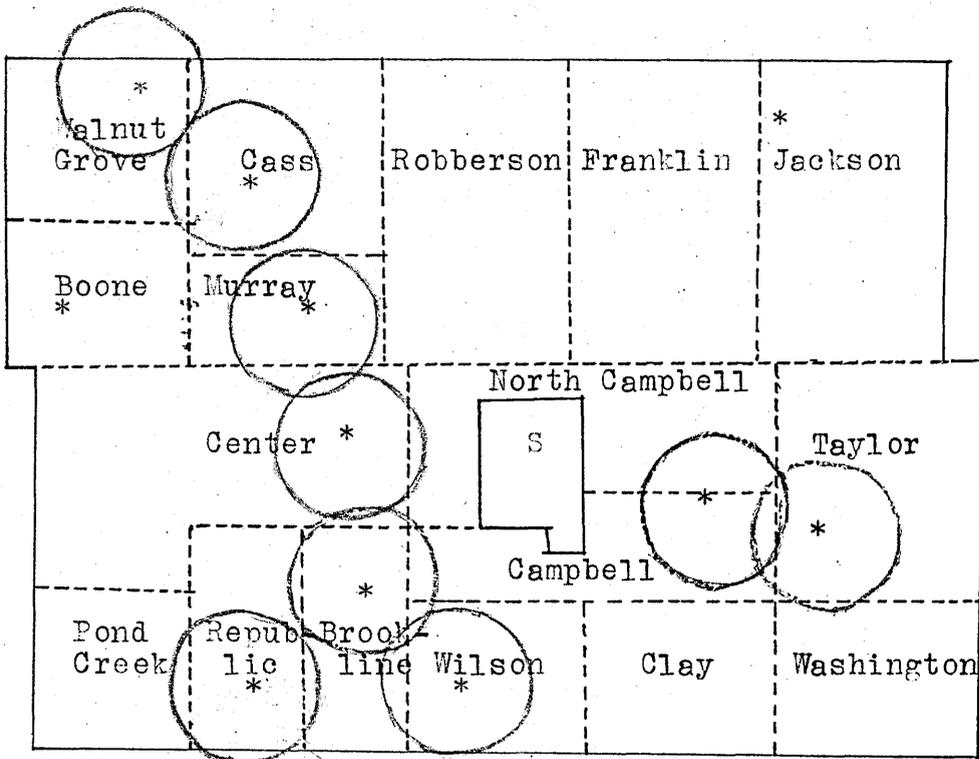
In 1922, 250 teachers were employed, and in 1925 there was a faculty of 272 members. The standard of preparation of teachers in service has been raised, and helpful expert supervision introduced, by employing special supervisors.

The other educational institutions are: Three parochial schools, and five colleges. Southwest Missouri State Teachers College has an enrollment which exceeds 2,000. The enrollment at Drury College is about 350. Since 1914, Drury College has been doing only regular college work. Previously it had an academy. St. de Chantel Academy is a Catholic school. There are two first class business colleges, Draughn and Springfield Business College.

The grade schools are located on Map II, by numbers. (See page 13).

Map I.

Map of Greene County, Missouri, showing location of high schools.



0 5 10  
Scale:-Miles

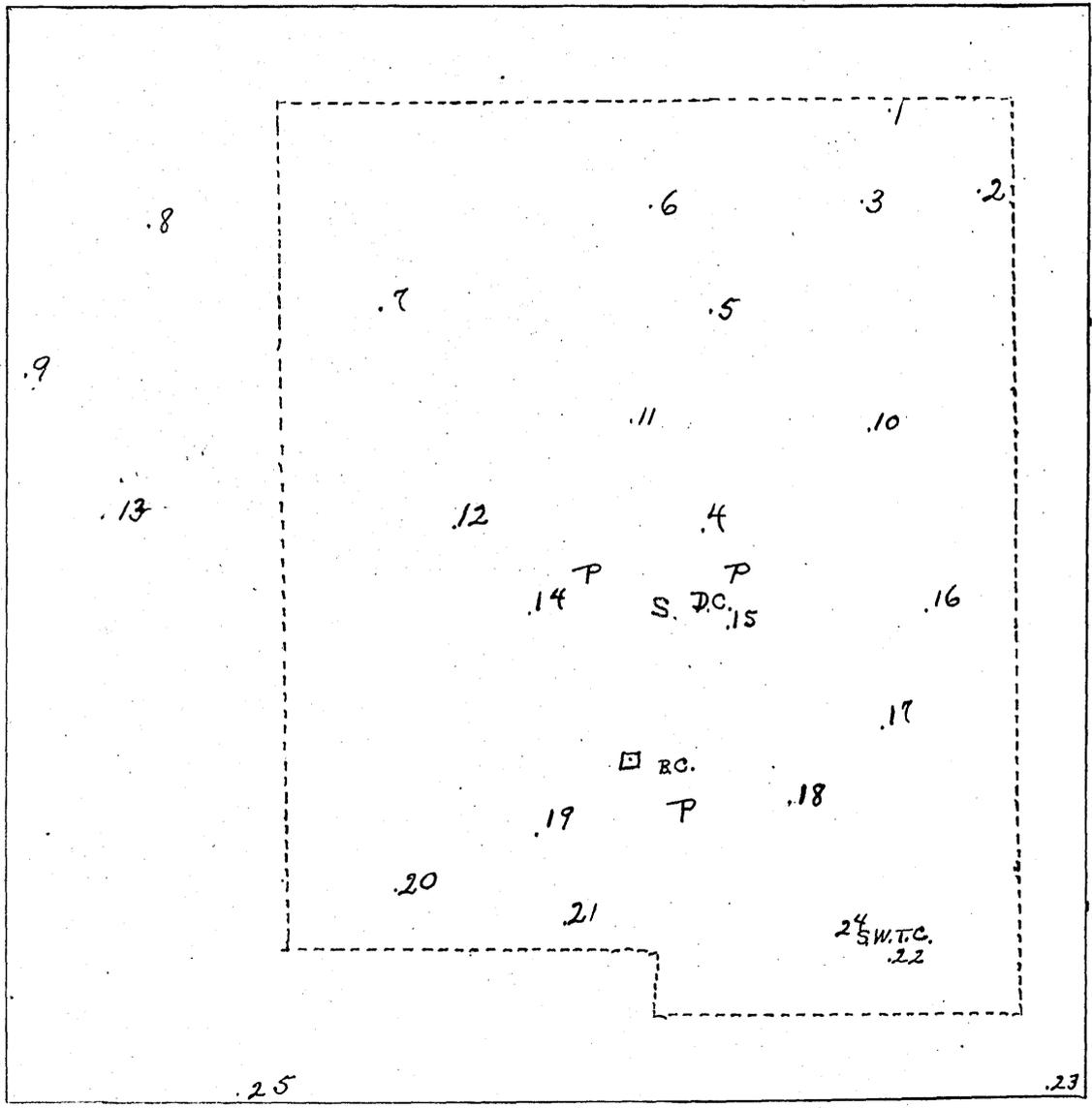
\*-High Schools

S-Springfield

Radius of circles which show overlapping of school districts, is 2.5 miles.

Map II

Map of Springfield, Mo. showing location of schools and colleges.--City Limits



Scale: Miles

## Key to Map II.

Numbers 1 to 23, Grade Schools.

1. Robberson
  2. Pepperdine
  3. Waddell
  4. Boyd
  5. Rogers
  6. Bowerman
  7. Doling
  8. New Home
  9. Bissette
  10. Berry
  11. Weaver
  12. Fairbanks
  13. York
  14. Baily
  15. Lincoln
  16. Teet
  17. Mc Daniel
  18. Phelps
  19. Campbell
  20. Mc Gregor
  21. Douglas
  22. Roundtree
  23. Oak Grove
24. Greenwood, Grades & High School connected with State Teachers College.
  25. Elfindale, Catholic School.

- P.- Parochial Schools.  
 S.- Senior High School.  
 D.C.- Drury College.  
 B.C.- Business College.  
 S.W.T.C.-Southwest Missouri State Teachers College.  
 E- Main Business Section

### III. Enrollment.

#### a In Schools.

Taking the population of the county and comparing with Springfield, it is found that Springfield has 55% of the population within the city limits, and a greater per cent of the population in the city school district, for the district is extended beyond the city limits.

It has almost 59% of the assessed valuation of the county in its school district, and it is paying 2.3 times as much school tax.

The following items regarding school taxes were obtained from the Chamber of Commerce and County Superintendent.

The school tax levy plus the state apportionment yields a total working fund of \$515,536.00.

The school tax averages \$1.10 per \$100.00 valuation, the total tax for the city is \$2.73 on \$100.00.

The minimum tax levy for schools in Missouri is 40% per \$100.00.

The average tax levy for the schools of Greene County is 49 7/10¢ on the \$100.00.

The tax levy for the Springfield schools is \$1.05 to \$1.15.

Springfield has 59% of the pupils of the county and 60% of the public school teachers of the county, are employed in the city schools.

The school enrollment in 1921-1922 was 10,248, in 1923-1924, 11,237, and the enrollment for the year 1924-1925 was 14,000.

The enrollment in Central High School for 1924-1925 was 1320 and including the 9th grades from the three junior high schools the total is 1998.

By comparing the ratios this bears to the total population of the city, and the total school enrollment, it is found that Springfield high school enrolls 4% of the city population, and about 16% of the total school enrollment. This places Springfield in maximum group according to the ratio given by Lee Byrne (page 16) for total population and above median for total school enrollment.

Table III.

## The elimination by years

First year	Second year	Third year	Fourth year
100	104	96	68

The elimination from the high school is unusual when compared with the table on page 8.

Table IV.

## A Comparison Between Population and School Enrollment

Median	Maximum	Minimum	
1.87%	3.06%	.71%	Total Population
28.3%	65.6%	9.70%	Estimate Population (Ages 15-18)
13.6%	20.0%	6.40%	Total School Enrollment

This table which shows the actual high school enrollment to total population in large cities is given by Lee Byrne, in the American School Board Journal, March, 1921.

From data collected by the School of Education of the University of Missouri, and State Superintendent Charles A. Lee, it was found that the high school enrollment for 1924 to 1925 in communities having a population from 30,001 to 100,000 was:

Table V.

## School Enrollment

Enrollment	Number of Schools
201-300	1
301-500	1
501-1,000	1
1001-2,000	2
Total	5
Median	750

St. Joseph and Springfield are the two cities in this group which have more than 1,000 enrolled in high school. Before the close of the year Springfield had 1,998 enrolled.

The estimated total high school enrollment for cities of this size is 5,400. Springfield's enrollment is 37% of the estimated total.

## b In Classes.

Table No. VII. which reports the facts of age and school grades separately for boys and girls in the high school for the graduates of 1924, and the tenth, eleventh, and twelfth grades of 1924-1925, shows a decrease of 211 from junior to senior years. The number of graduates for the two successive years varies but little, there being only 10 more graduates this year, than last, but the number of boys decreases from 135 to 120, while the number of girls increases from 185 to 210. In 1924 the class was divided as follows:

Table VI.  
Distribution by Classes

Girls	185	58%
Boys	135	42%
Total	320	100%

In 1925 the senior class was divided:

Girls	210	64%
Boys	120	36%
Total	330	100%

In 1925 the junior class was divided:

Girls	275	51%
Boys	266	49%
Total	541	100%

In 1925 the sophomore class was divided:

Girls	247	55%
Boys	202	45%
Total	449	100%

In 1925-1926 the senior class was divided:

Girls	185	58%
Boys	133	42%
Total	318	100%

In 1925-1926 the junior class was divided:

Girls	173	52%
Boys	159	48%
Total	332	100%

In 1925-1926 the sophomore class was divided:

Girls	287	53%
Boys	254	47%
Total	541	100%

### c. Sources of Enrollment

The place where the pupil's grade work was completed is not on permanent report cards filed in the Principal's office, but a note is made if the pupil is transferred from another high school.

Of the 185 girls who were graduated in May, 1924, 37 did part of their work in other schools, and 24 of the 135 boys were transferred from other high schools. 81% of the class made all of their credits in Springfield high school.

57 of the 210 girls of the graduating class of 1925 were from other places, and 34 of the 120 boys had high school credits from various sources. This makes the total for this class almost 28%.

46 of the junior girls of 1925 were from other high schools, and 37 of the junior boys. The per cent for this class is 15, a decrease from the senior class.

The enrollment for the girls in the sophomore class is divided as follows:

Pipkin Junior High School	106	43%
Jarrett Junior High School	60	24%
Reed Junior High School	48	20%
Other Sources	33	13%
Total	<u>247</u>	100%

### III. Normal Progress, Retardation, and Acceleration.

Age-grade Table, No. VII. shows that the majority of pupils are of normal age. More students are under age than over age.

The junior class of 1924-1925 shows a slight variation. The number over age exceeds the number under age. This junior class seems to have an excessive number of boys doing poor work. Their attendance is very irregular.

There are too many of the boys who are not completing the four year high school course in regular time, or too many enter who do not remain to graduate. In this list, those that are classified as juniors are juniors in years of attendance, but many do not have credits sufficient to entitle them to junior classification.

Table No. VIII. A. which gives the recapitulations from the Age-grade Table, should be read in this manner: The sophomore class, which has 247 pupils, or 17% of the pupils listed on Age-grade table, had 65 pupils under age, or 26% of the sophomore class was under age. 136 pupils were at normal age. This was 55% of the class. 38 were above normal age, and the ages of eight were not recorded. These pupils are girls only, for the records concerning the sophomore boys were not available at the time this survey was started. Both boys and girls are listed for the other three classes.

Table No. VIII. B. should be read: The sophomore class has 247 of the 1438 pupils listed, or 17%. 65 girls are below age, or 4% of the entire number. 136 are at normal age, or 9% of the entire number, 2% of all the pupils listed are above age and are in the sophomore class. Not quite 1% did not give their ages.

This table shows that 5% more of the pupils are under age than over age, and 57.3% of the entire student body are of normal age.

Comparison of Tables No. VII. and IX. shows that Springfield has a greater percent of students at normal age than the 300 first class high schools.

Table No. IX. shows the girls consistently make a better showing than boys. Larger percentages of girls than boys are underage and smaller percentages are over age. In going from lower to higher school years the situation becomes more and more favorable to the girls.

The percentage of normal remains almost constant, and the percentage of overageness decreases.

The junior class (1924-1925) of Springfield has the greatest number of over age pupils, and the senior class of the same year has the smallest number.

The percentage of boys and girls in the tenth, eleventh, and twelfth grades, of communities the size of Springfield, who are under age, normal age, and overage, are shown graphically in Charts A, B, and C respectively.

The percentages of underage pupils in the sophomore, junior and senior classes in communities the size of Springfield are 11.1%, 10.9% and 17.8% respectively.

In Springfield 19% of the junior class is under age, and 29% of the senior class of 1924-1925, and 23% of the senior class of 1923-1924.

Table No. VII

Age-Grade  
Springfield, Mo. Senior High School Compiled July 1,  
1925. Ages computed as of Sept. 1, 1924, except Seniors  
(Sept. 1, 1923).

Grade	10		11		12			12(1924)			TOTAL			
	Age	G	B	G	T	B	G	T	B	G	T	B	G	T
12½		2											2	2
13		6		1	1				1	1			8	8
13½		5											5	5
14		19	1	2	3				1	1		1	22	23
14½		35	2	8	10		1	1	1	1		2	43	45
15		57	15	21	36	2	1	3				17	79	96
15½		47	15	38	53	2	5	7	2	1	3	19	91	110
16		32	43	63	106	11	20	31	11	10	21	65	125	190
16½		22	41	49	90	19	36	55	17	27	44	77	134	211
17		4	59	44	103	25	48	73	32	51	83	116	147	263
17½		4	37	23	60	23	47	70	21	39	60	81	113	194
18		5	21	11	32	20	31	51	25	27	52	66	74	140
18½		2	11	7	18	5	5	10	12	13	25	28	27	55
19		1	7	2	9	4	4	8	9	7	16	20	14	34
19½			2		2	2	5	7	2	3	5	6	8	14
20			2	2	4	4	3	7	1	1	2	7	6	13
20½			2	2	4	3	1	4	1		1	6	3	9
21							1	1					1	1
Over														
21			4	1	5		1	1	1	2	3	5	4	9
No														
Rec-														
ord		8	4	1	5		1	1	1	1	2	5	11	16
Total		247		275		120		330		185		531		1438
			266		541		210		135		321			

Age period 12½ includes 12 years 3 months to 12 years 8 months. 13 years includes 12 years 9 months to 13 years 2 months, etc.

Table VIII  
Recapitulations from the Age-Grade Table

Ages computed as of September 1, 1924, except for the Senior Class of 1924, their ages computed as of September 1, 1923.

Table A.

Year 1924-'25 Grade	10		11		12		Total		1923-24 12	
	No.	%	No.	%	No.	%	No.	%	No.	%
Pupils in age-grade table	247	17	541	38	330	23	1118	78	320	22
Pupils below normal age.	65	26	103	19	97	29	265	24	71	23
Pupils at normal age	136	55	299	55	194	59	629	56	195	60+
Pupils above normal age	38	16	134	25	38	11+	210	19	52	16
Pupils age unknown	8	03	5	1	1	1	14	1	2	1
Total	247	100	541	100	330	100	1118	100	320	100

Table B.

Grade	10		11		12		Srs. '24		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Pupils in table	247	17	541	38	330	23	320	22	1438	100
Pupils below normal	65	4+	103	7+	97	6.7	71	4.9	336	23.3
Pupils at normal age	136	9+	299	20+	194	13.5	195	13.5	824	57.3
Pupils above normal age	38	2+	134	9+	38	2.6	52	3.6	262	18.2
age unknown	8	1-	5	.3	1	.01	2	1	16	1.

Table IX \*

## Age-Grade Distribution of Pupils in 300 First Class Missouri High Schools.

Age	Sophomores			Juniors		
	Boys	Girls	Total	Boys	Girls	Total
12	1	2	3			
12½	3	5	8	1		1
13	30	34	64		1	1
13½	59	84	143	9	3	12
14	277	457	734	15	21	36
14½	378	518	896	32	51	83
15	916	1277	2193	141	254	395
15½	720	818	1538	239	362	601
16	778	954	1732	618	927	1545
16½	472	503	975	516	727	1243
17	455	391	846	571	635	1206
17½	265	183	448	342	341	683
18	190	120	310	279	256	535
18½	86	59	145	157	125	282
19	70	30	100	120	83	203
19½	23	7	30	57	30	87
20	23	7	30	31	37	68
20½	9	2	11	18	9	27
21	18	13	31	26	20	46
Totals	4773	5405	10178	3172	3882	7054
Under age	748	1100	1848	437	692	1129
Per cent	15.6	20.8	18.4	13.8	17.9	16
Normal age	24.14	3049	5463	1705	2289	3994
percent	50.5	56.2	53.8	53.8	59	56.2
Over age	1611	1256	2867	2867	901	1931
Percent	33.9	23	27.8	27.8	23.1	27.8

\* Arranged from data received from School of Education of University of Missouri.

Table IX (Continued)

Age	Seniors			Totals		
	Boys	Girls	Total	Boys	Girls	Total
12				1	2	3
12½				4	5	9
13				30	35	65
13½	1		1	69	87	156
14				292	478	770
14½	1	3	4	411	572	983
15	19	37	56	1076	1568	2644
15½	54	70	124	1013	1250	2263
16	203	306	509	1599	2187	3786
16½	283	428	711	1371	1658	2929
17	604	950	1554	1630	1976	3606
17½	564	730	1294	1171	1254	2435
18	352	687	1039	821	1063	1884
18½	329	332	661	572	516	1088
19	300	252	552	490	365	855
19½	137	113	250	217	150	367
20	120	78	198	174	122	296
20½	45	41	86	72	52	124
21	64	70	134	103	103	211
Totals	3074	4097	7171	11019	13384	24403
Under age	559	844	1403	1744	2636	4380
Percent	13.1	21.1	19.6	15.8	19.7	17.95
Normal age	1520	2367	3887	5639	7705	13344
percent	49.5	58	54.1	51.2	57.57	54.68
Over age	995	886	1881	3636	3043	6679
Percent	37.4	20.9	26.3	33	22.73	27.37

Chart A

A Comparison of the Percentages of Underage Pupils in each school year of Senior High School

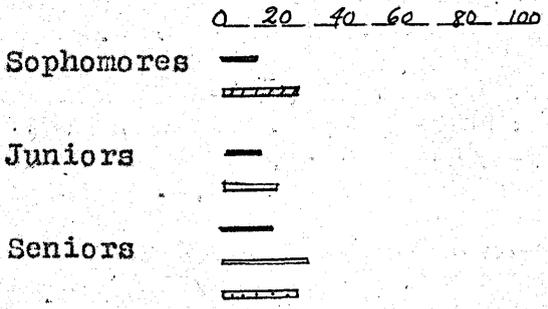


Chart B

A Comparison of the Percentages of Normal Age Pupils in Each School Year of Senior High School.

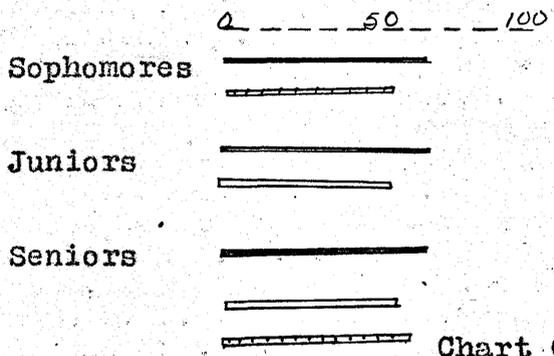
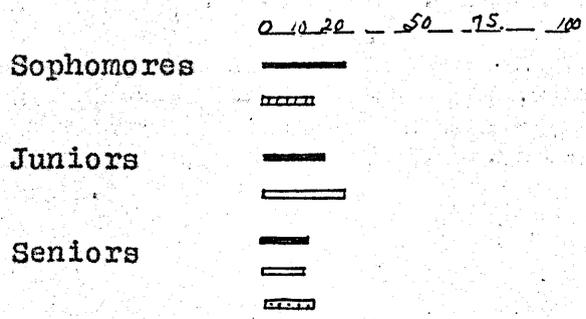


Chart C

A Comparison of the Percentages of Overage Pupils in each School Year of Senior High School.



For all three charts

- Communities the size of Springfield
- ▨ Sophomore Girls of Springfield Sr. High. 1924-'15
- ▭ Both boys and Girls of Springfield Senior High 1924-'25
- ▤ Both boys and Girls of Springfield Senior High 1923-'24.

## V. Failures

Table X.  
Distribution of Pupils Entering 10th  
Grade as to Chronological Age.

Age	12	12½	13	13½	14	14½	15	15½	16	16½
Boys	0	0	3	6	37	51	100	87	102	55
Failed	0	0	1	1	7	8	35	36	59	27
Per cent	0	0	33	17	19	16	35	41	58	50
Girls	2	4	9	19	70	134	219	182	134	63
Failed	0	0	1	1	8	14	30	44	41	19
Per cent			11	5	11	10	14	24	31	30
Total	2	4	12	25	107	185	319	269	236	118
Failed			2	2	15	22	65	80	100	46
Per cent			17	8	14	12	20	30	42	39

Age	17	17½	18	18½	19	19½	21	22	23
Boys	33	16	12	5	2	3	1	2	1
Failed	16	9	10	1	1	0	1	1	1
Per cent	48	56	83	20	50	0	100	50	100
Girls	26	19	11	3	4	4	1		
Failed	12	5	5	1	2	2	0		
Per cent	46	26	45	33	50	50	0		
Total	59	35	23	8	6	7	2	2	1
Failed	28	14	15	2	3	2	1	1	1
Per cent	41	40	65	25	50	14	50	50	100

Table X shows the chronological ages of the students when entering the tenth grade as of September the year they entered. The number entrants at each chronological age, the number who failed in one or more subjects and the percentage of those enrolled at that age who fail are given.

Sixty per cent of those who enter the sophomore class at normal age fail, and only ten per cent of those below normal age fail in one or more subjects, while 2.8 times as many, or 28 per cent of those above normal age fail. The ages of seven pupils were not given. This accounts for the remaining two per cent.

The records for the girls show that 61 % of those at normal age fail, 13 % of those below normal age fail, and 24 % of those above normal age fail. The ages for two per cent of the failures are not given.

The failure for the boys shows that 8% below normal age fail 60% of those of normal age fail, and 31% of those above normal age fail in one or more subjects.

Table X shows that the liability to failure has a tendency to increase as age increases at which students enters.

In Harvey A. Smith's study he gives the following table.

Table XI.

Age on entering	12	13	14	15	16	17	18
All pupils	9	84	163	151	37	15	3
Graduates	7	51	71	51	1	3	1
Per cent	77.7	60.7	43.6	33.7	2.7	20	33.3
Pupils failing	3	35	86	87	25	7	0
Per cent	33.3	41.6	52.8	57.6	67.6	46.6	

He gives this comment: "The age of the pupils in this table is that of their nearest birthday. Thus in the 13 year group are included pupils whose age varied from 12 years 6 months, to 13 years 6 months. A study of this table will convince the students of high school failures that the per cent of pupils who fail varies directly as the age at which the pupils enters. An apparent contradiction to this occurs in the case of the 17 and 18 year old pupils, but this is readily accounted for because the pupils in this group are a selected group since only the pupils of a higher intellectual type will enter school and continue his education at an age so far advanced beyond the average age of the high school pupil. On the other hand there is a possibility that this greater experience in the world at large may be a factor in his comparative success. However experience with these pupils of advanced age seems to indicate that the former conclusion is true."

Perhaps the large percentage of those above normal age failing can partly be accounted for by the fact that the majority of these miss a full quarter to a year at a time, thus losing credit for work partly done. The records give no reason for these students dropping out for such a long time, neither do they state the source from which these pupils come.

This irregular attendance was not true for the girls.

#### Failures by Years.

Grade	IX	X	XI	XII	Total
No. of failures	380	420	313	13	1126

Because there are no data for the ninth grade of this year, the forty-one failures for this year's sophomore class should be subtracted to get the real average.

Grade	IX	X	XI	XII	Total
No. of failures	380	379	313	13	1085
Per cent	35	35	29	1	100

Table XII.  
Percentages of Failing and Non-failing Students.

	Enrol- led	No. Failing	Per cent	Non- Failing	Per Cent
Senior Girls 1924	185	41	22.16	144	77.84
Senior Boys 1924	135	36	26.67	99	73.33
Senior Girls 1925	210	40	19.05	170	80.95
Senior Boys 1925	120	33	27.5	87	72.5
Junior Girls 1925	275	82	29	193	71
Junior Boys 1925	266	148	56	118	44
Total	1191	380	32	811	68
Sophomore Girls 1925	247	26	10.5	221	89.5
Grand Total	1438	406	28	1032	72

The high school records show that of the 380 who failed in the senior classes, 1923-1924 and 1924-1925, and the junior class of 1924-1925, 73 failed only in the ninth grade, 62 failed only in the tenth grade, 45 failed only in

the eleventh grade, 115 failed in two grades, 84 failed in three grades, and one failed in each of the four grades.

These figures agree quite closely with other studies, which concluded that if a pupil failed in the first year, he would perhaps fail the second, but the liability would decrease the third year.

Either the senior class is distinctly "the survival of the fittest," or else the classes are small and the teacher can give more individual help or encouragement, or it takes the pupils some time to overcome some of the handicaps, as low mentality could not be overcome.

### Failures.

The sophomore class of 1924-1925 is composed of those who came from the junior high schools with the exception of a few transfers, and the percentage of failures is very low. Two reasons might be given for this, one is that the pupils have a start on high school subjects, and those who could not do creditable work were not promoted to the senior high school, and the other might be due to the fact that there was a change in the grading policy. Principal Hull requested the teachers to keep their list of failures as near as advisable on the normal frequency curve.

When it is considered that an average of seventy is a passing grade, providing the last quarter has a passing grade, it seems that the citizens of Springfield are paying quite a sum to re-teach many of the pupils.

Table XIII  
Failures by Subjects

Subject	Number	Per cent
Modern History	150	13
Algebra	116	10
English (3 years)	230	20
Modern Language	60	5
Latin	55	5
Ancient History	40	4
Com'l Arithmetic	56	5
Plane Geometry	40	4
All Others	379	34
<b>Total</b>	<b>1126</b>	<b>100</b>

Modern History has 13 per cent of the failures, and it is a required subject. The three classes in Mathematics, one of which is required, have a total of 212 failures, but this does not equal the three classes in English. All of these subjects which have such a high number of failures are freshman and sophomore subjects.

Table XIV.  
Comparing Failures

Table given on page

Promoted in all subjects	68%	Springfield	72%	4 above.
Failing in one subject	18%	Springfield	11%	7 below.
Failing in two subjects	8%	Springfield	5%	3 below.
Failing in three subjects	4%	Springfield	4%	
Failing in four subjects	1%	Springfield	2%	1 above
All others	1%	Springfield	5%	4 above

Springfield compares quite favorably with this report, having fewer pupils who fail, by a small margin. But the failures are so common in the first two years, ninth and tenth. There seems to be something wrong with the required subjects, or in the attitude the pupils have towards them, or previous preparation is not adequate.

Springfield is making a change in the system of counting credits, which gives the student a decided advantage in the total number of credits.

The school year is divided into quarters, and for any quarter that a student receives a passing grade in a subject, he will receive one credit. Thus if only one quarter of English I, which is a full year subject is completed satisfactorily, one credit will be given, and the usual method, unless the entire year's work was satisfactory, no unit would be received. A full semester or a full year of work in the subject, whichever the subject is taught, must be completed before it counts for graduation. Since music, physical training, and all other subjects are counted, as well as the solids, 36 credits will be required for graduation.

The subjects required for graduation by the State Board of Education are:

English	3 units	6 credits
History and Social Science	3 units	6 credits
Mathematics	1 unit	2 credits
Science	1 unit	2 credits
Hygiene and Physical Training	2 units	4 credits
Total	10 units	20 credits

Table XV.  
Number of Failures and I. Q.

I. Q.	Number	No. of Failures	
130-134	2	0	
125-139	5	0	
124-120	21	2	
115-119	48	8	
110-114	78	13	
105-109	107	24	
104-100	126	39	
95-99	128	52	
94-90	110	60	
85-89	63	35	Median-100.85
80-84	26	15	
75-79	12	9	$Q_1$ -108.66
70-74	1	1	
65-69	0	0	$Q_2$ -92.44
60-64	4	2	
Unknown	140	43	

There are 91 pupils whose I. Q.'s range from 95-104 inclusive, who made failing grades. 47 of the 261, or 18% of those who have I. Q.'s above 104 failed in one or more subjects. Those in the upper quartile have 23 failures in their groups. This is 15% of their number, 154.

56% of those whose I. Q. is 94 or below make failing grades. 58% of those in the lower quartile made failing grades.

Low I. Q. seems to be one of the reasons for failures. It appears that it would be profitable from an economic standpoint to give Intelligence tests every year, and encourage the pupils to take work within their ability, and then put forth an extra effort to get all to work to the best of their ability.

## VI I. Q. Distribution

Previous to September 1925 only 731 students had been given Intelligence tests. The median for these is 100.85,  $Q_1$  is 108.66 and  $Q_3$  92.49.

In 1925-'26, 1181 were tested. The median is 97.5,  $Q_1$  is 105.52 and  $Q_3$  95.55. The median for the latter group is 2.35 points lower.

The tables which show the correlation of brightness and scholarship as indicated by the teachers' marks, of the four different classes vary. There is not so much difference between the girls and boys of the senior class as there is between the girls and boys of the junior class. The boys of the junior class are crowded toward the lower end of the scale, so far as grades are concerned, while the junior girls seem to be working up to ability. The junior boys have the greatest per cent of failures for any class, 56% of the class failing in one or more subjects.

Twenty-two of the 217 boys of the junior class (1924-1925) listed on Graph 2, are not making enough passing grades to bring their total average to seventy. Judging by the I. Q. there are 21 more failures than need to be, for by comparing with the other students, a pupil whose I. Q. is 80 or above can make passing grades in high school.

Of the 266 boys enrolled in this class, 49 have been in high school  $2\frac{1}{2}$  years, 125 have attended 3 years, 40 entered  $3\frac{1}{2}$  years ago, 35 should be senior, and 17 have been in high school more than 4 years. Almost 20% are one year or more, not by age, but by actual school time spent in high school on the 4 year course. Only 18 or  $6\frac{1}{2}$  % of the junior girls have attended more than 3 or  $3\frac{1}{2}$  years.

## Graph I

Correlation Between I. Q's for Senior Boys (1925) and Grades.

I.Q.

134-			1	
130				1
129-				
125				
124-				
120			2	1
119-				
115		5	1	4
114-				
110		4	6	3
109-				
105		9	8	5
104-				
100	1	6	7	4
99-				1
95		1	15	6
94-				1
90			4	4
89-				
85			1	
84-				
80		1	1	
	70-74	75-79	80-84	85-89
				90-94

Correlation  $\approx$  .6

P.E.  $\pm$  .04

## Graph II

## Correlation Between I. Q's for Junior Boys (1925) and Grades.

I. Q.

129-					1	1
125						
124-						
120			1	1	4	3
119-						
115		1	3	3	5	1
114-						
110	1	3	3	3	8	5
109-						
105	1	3	4	7	7	2
104-						
100	3	3	10	8	7	3
99-						
95	5	6	10	8	7	
94-						
90	4	15	12	11		
89-						
85	5	8	7	1		
84-						
80	2	6	1	1		
79-						
75	1	1				
74-						
70		1				
69-						
65						
64-						
60		1				
	70-	70-74	75-79	80-84	85-89	90-94

Correlation-.3

P. E.-- $\pm$ .04

## Graph III

Correlation Between I. Q's for Senior Girls (1925) and Grades.

I. Q.	70-74	75-79	80-84	85-89	90-94	95-99
129-					1	
125						
124-				1	2	1
120						
119-						
115			3	5	3	
114-						
110			3	6	5	1
109-						
105		4	8	16	7	
104-						
100		1	14	15	5	1
99-						
95		3	16	16	2	
94-						
90	1	2	6	10	2	
89-						
85		2	8	2	1	
84-						
80		1	2	2		
79-						
75						
74-						
70						
69-						
65						
64-						
60			1			

Correlation  $\checkmark$ .4

P. E.  $\pm$ .04

Graph IV

Correlation Between I. Q's for Junior Girls (1925) and Grades.

I. Q.					
134-					
130					1
129					
125					1
124-					
120			1	1	1
119-					
115					
114-			2	6	7
110			9	10	8
109-					
105		2	1	7	14
104-					
100		2	5	15	10
99-					
95		3	3	15	8
94-					
90	1	7	9	12	9
89-					
85		5	6	13	3
84-					
80	1	3	3	1	1
79-					
75	2	4	3	1	
74-					
70					
69-					
65					
64-					
60	1		1		
	70-	70-74	75-79	80-84	85-89
					90-94

Correlation .9

P. E.  $\pm$ .008

## VI.I.Q.Distribution

Table XVI.

I. Q. Distribution for Juniors and Seniors 1924-'25  
As Computed by Otis Intelligence Test

I. Q.	Seniors			Juniors			G	B	T
	G	B	T	G	B	T			
130-134		1	1	1		1	1	2	
125-129	1	1	2	1	2	3	2	3	5
120-124	5	3	8	5	8	13	10	11	21
115-119	10	10	20	15	13	28	25	23	48
110-114	15	13	28	27	23	50	42	36	78
105-109	35	22	57	26	24	50	61	46	107
100-104	36	19	55	37	34	71	73	53	126
95-99	37	23	60	32	36	68	69	59	128
90-94	21	8	29	39	42	81	60	50	110
85-89	13	1	14	28	21	49	41	22	63
80-84	5	2	7	9	10	19	14	12	26
75-79				10	2	12	10	2	12
70-74					1	1		1	1
65-69					0	0		0	0
60-64	1		1	2	1	3	3	1	4
Total	179		282	232		449	411		731
		103			217			320	

Median- Senior Girls	101.59
Senior Boys	103.6
Junior Girls	98.375
Junior Boys	98.74
All Girls	100.59
All Boys	101.23
All	100.85

Arithmetical-Mean- Senior Girls	98.28
Senior Boys	104.45
Junior Girls	98.76
Junior Boys	99.83
All Girls	98.55
All Boys	101.325
All	99.9

Table XVII

I. Q. Distribution for Senior High School 1925-'26  
As Computed by Otis Intelligence Test

	Seniors		Juniors		Sophomores		Total		T
	G	B	G	B	G	B	G	B	
130-134			1		1		1	1	2
125-129	3	1	2	2	1	2	6	5	11
120-124	6	7	3	1	0	6	9	14	23
115-119	15	11	5	9	9	9	29	29	58
110-114	14	15	8	11	19	16	41	42	83
105-109	25	25	21	15	26	20	72	60	132
100-104	20	25	17	20	49	31	86	76	162
95-99	33	17	36	39	50	39	119	95	214
90-94	36	14	42	16	51	44	129	74	203
85-89	19	10	22	21	46	46	87	77	164
80-84	11	8	12	10	21	22	44	40	84
75-79	3		4	5	11	12	18	17	35
70-75					4	2	4	2	6
65-69						2		2	2
60-65						2		2	2
	185	133	173	149	287	254	645	536	1181

Median- Senior Girls	98.56
Senior Boys	102.5
Junior Girls	95.9
Junior Boys	97.5
Soph. Girls	95.05
Soph. Boys	94.5
All Girls	96.7
All Boys	97.84
All	97.21

Table XVIII.

Complete I. Q. Distribution, According to Otis Intelligence Test Comparing Scores of 1924-'25 and 1925-'26

	Girls		Boys		Total	
	1925-1926		1925-1926		Girls	Boys
130-134	1	1	1	1	2	2
125-129	2	6	3	5	5	11
120-124	10	9	11	14	21	23
115-119	25	29	23	29	48	58
110-114	42	41	36	42	78	83
105-109	61	72	46	60	107	132
100-104	73	86	53	76	126	162
95-99	69	119	59	95	128	214
90-94	60	129	50	74	110	203
85-89	41	87	22	77	63	164
80-84	14	44	12	40	26	84
75-79	10	18	2	17	12	35
70-74		4	1	2	1	6
65-69			0	2	0	2
60-64	3		1	2	4	2
	411	645	320	536	731	1181

Median-	All Girls	1925	100.58
	All Girls	1926	96.70
	All Boys	1925	101.23
	All Boys	1926	97.84
	All	1925	100.85
	All	1926	97.21

All Girls	1925	Q <sub>1</sub>	108.16	Q <sub>3</sub>	92.90
All Girls	1926	Q <sub>1</sub>	104.81	Q <sub>3</sub>	93.20
All Boys	1925	Q <sub>1</sub>	109.36	Q <sub>3</sub>	94.20
All Boys	1926	Q <sub>1</sub>	106.32	Q <sub>3</sub>	88.61
All	1925	Q <sub>1</sub>	108.66	Q <sub>3</sub>	92.49
All	1926	Q <sub>1</sub>	105.52	Q <sub>3</sub>	92.55

### Percentile Graph

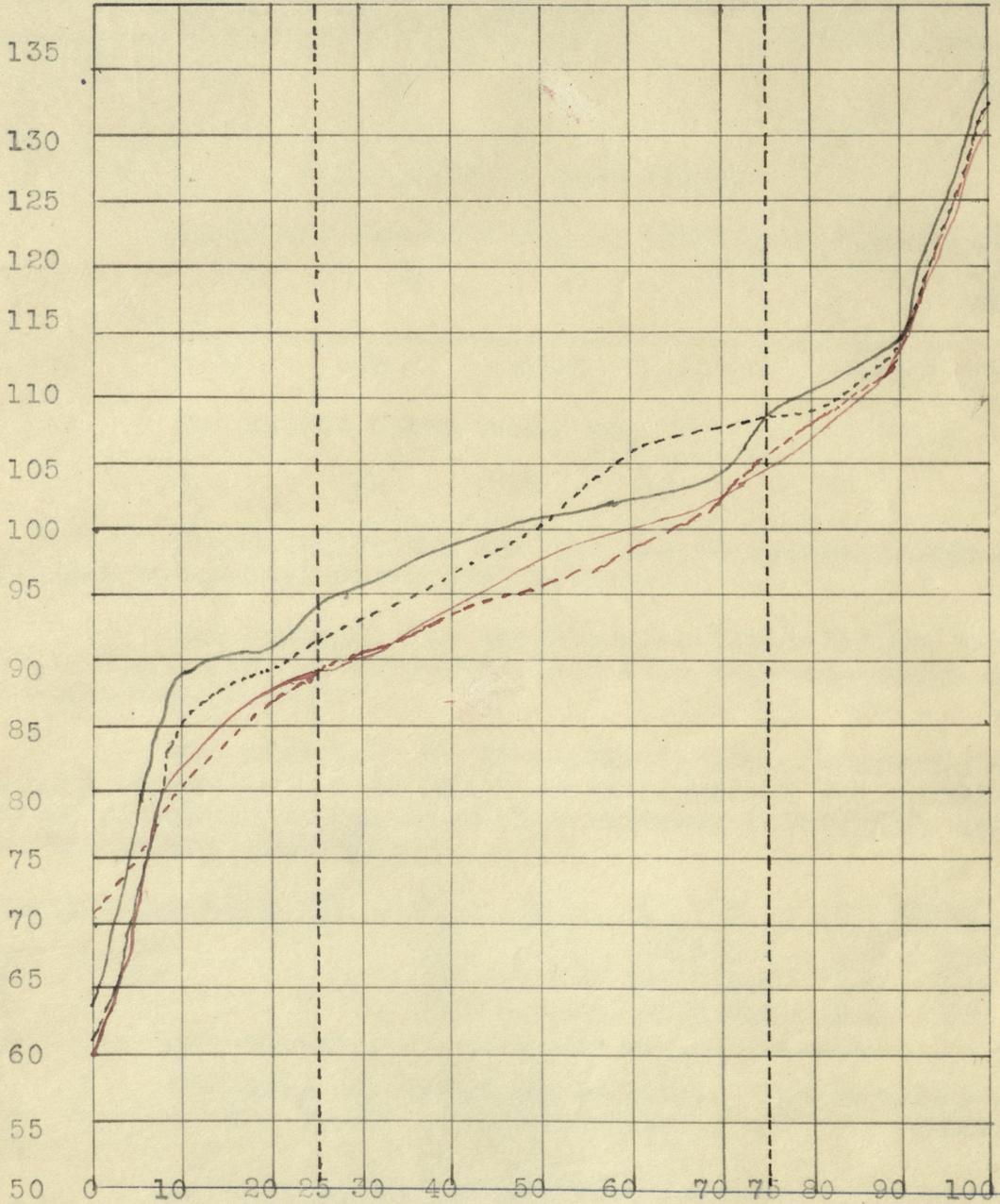
Table XIX, which is a percentile graph comparing the I. Q. distribution for girls (1924) Boys (1924) girls (1925) and Boys, (1925) should be read as follows:

No boy (1924) has an I. Q. below 62, 10% have an I. Q. below 89, 20% fall below 91, 30% below 95.5, 40% below 97.9, and 50% do not have an I. Q. exceeding 96.7.

Each line is marked designating the group for which the scores are ranked.

The lines for the girls and boys of 1925 show little variation, except at the starting points.

Table XIX  
Percentile Graph



## VII. PERCENTAGE GRADE DISTRIBUTION.

## Third Quarter (1924-25)

Teachers	Excellent (90-100)	Good (80-90)	Passing (70-80)	Incomplete	Failure (Below 70)	Total
56	24	38	28	5	5	100

## First Quarter (1925-1926)

Excellent A	Superior B	Medium C	Incomplete D	Failure F	Delayed or in- complete
5.67	20.9	40.8	21.09	6.51	5.02

The Normal Curve would be:

7	18	50	18	7	0
---	----	----	----	---	---

The distribution for the second quarter (1925-26) follows the normal curve much better.

The extremes for the E grades (1924-25) are 8--57.5, for G grades (1924-25), 14.5--61, Passing, 6--46.3, and failing, 0--20%.

The Principal of Excelsior Springs, Missouri High School furnished the following data regarding the percentage grade distribution for the first semester (1924-'25), and third quarter (1924-25).

Quarter	Teachers	E	S	M	I	D	F	Total
1.	18	3.3	21.7	48.9	20.7	3.4	2.0	100
2	18	6.	24.3	49.4	17.8	3.6	0.9	100
3.	18	5.8	21.3	49.3	19.2	2.5	2.0	100

The total distribution is good. The majority of the faculty had a grade distribution that was very commendable.

The improvement in the grading in both Excelsior Springs and Springfield is probably due to the efforts on the part of the Principals to encourage a uniform grading system.

The next distribution is from Nevada Senior High School. The year is (1924-'25), but quarter is not mentioned.

E	S	M	I	D	F
10.1	26.8	39.9	15.8	1.9	5.5

The grades of the individual teachers show no uniformity, and grades are crowded in the E, and S groups.

VIII. COMPARING SPRINGFIELD SENIOR HIGH SCHOOL WITH SOUTHWEST MISSOURI STATE TEACHERS COLLEGE AS TO AGE AND SUBJECT FAILURES

Since the records of the regular college students and those doing only high school work are kept together, it would be a rather tedious task to collect complete data regarding the high school students.

Registrar, F. B. O'Rear kindly furnished data giving age, address, and subject failures of high school students for the four terms of 1924-25. No classification of the students is given.

Table XX.

Comparison of Ages of High School Pupils of Springfield and Southwest Missouri State Teachers College

Age	Springfield Senior High		Southwest Missouri State Teachers College	
12	2	1 %	5	2 %
13	13		35	
14	68		30	
15	206		46	
16	401		84	83 %
17	457	92 %	42	
18	195		38	
19	48		23	
20	22		12	14 %
21	4		33	
22	1	6 %	3	
23	3			
24	0			
25	1			
33	1			
no Rec- ord	16	1 %	2	1 %
Total	1438		288	

The Springfield Senior high school has the majority of students who are of normal age, but it has more students who are unusually young or over age for high school

students. The median for the high school students is 17 years, and for the college students 16 years.

Of the 288 students enrolled for the year 1924-25, fifty failed in one or more subjects for one or more terms. This makes 17 % of the students failing, a percentage which seems rather high, but part of this may be due to the fact that some of the poorer students who fail during the school year at the senior high school try to make some of their work during the summer term at the Teachers College.

Table XXI.  
Age and Percent Failing.

Age	13	14	15	16	17	18	19	20	21	22
All Pupils	5	30	46	84	42	38	23	12	3	3
Pupils Failing	1	3	3	20	8	6	6	2	1	0
Percent	20	10	6.5	24	19	16	25	16.6	33.3	

The above table does not show such a steady increase in failures as age increases, but it agrees with the conclusion that there is a tendency for the number of failures to vary directly as age of pupil increases.

Table XXII.  
Failures by Subjects, for Fall, Winter and Spring terms (1924-1925) at Southwest Missouri State Teachers College.

Subject	Number	Per cent
American History	16	26
Ancient History	9	15
Modern History	7	11
English (all 3 years)	12	19
Algebra	6	10
Methods	3	5
School Management	1	1.6
General Science	2	3
Typewriting	1	1.6
Solid Geometry	1	1.6
Spanish	2	3
Physical Education	1	1.6
Physiology	1	1.6

62

Total Subject failures

Summer

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English	6	75
Caesar	2	25
	<hr/>	
	8	

American History has 26 % of the failures. All history courses combined have 52 % of the failures.

In the Senior High School 18 % of all the subject failures are in the three history classes.

There is a very close correlation in the failures in the three years of English. The Senior High School has 20 % of the failures in this group, and Southwest Missouri State Teachers College high school has 19 %.

Taking the failures by terms, they are divided:

17 Fall  
24 Winter  
15 Spring  
8 Summer

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64 Total

There are 86 students of high school rank attending during the summer term, and 9 % of them failed. Six failed in English and 2 in Caesar.

## IX Questions and Suggestions.

These are some of the questions that the tables showing chronological age and failure suggest:-

1. Do the over-age or older pupils have lower mentality?
2. How many have work outside of school--
  - a. Which interferes with school duties?
  - b. To earn own living?
3. Do younger pupils receive home help?
4. Have older pupils been out of school and lost interest?
5. Would a study of the ways the older and younger pupils spend their leisure hours and the amount of time spent, reveal any information useful to the instructor?
6. Do the older pupils have mind-sets or stronger dislikes for a subject?
7. What are the teachers' attitudes toward the over-age pupils?
8. What part does irregular attendance have to do with poor grades, especially among the over-age students?

The percentage of boys who fail is higher than that of the girls. A comparison of the I. Q.'s for both sexes shows that the difference as shown by the Otis Intelligence test is slight. The difference is in favor of the boys. Evidently general intelligence can not be used to account for the greater number of failures.

The majority of the teachers, forty-two out of 59 are women. It would seem that they can not teach boys so successfully as girls, or are prejudiced against them. Perhaps the boys have some prejudices, either against the teachers or some of the subjects.

In Gates' "Psychology for students of Education" pages 472 to 477, he does not find such a marked difference in the elementary school subjects, when standard tests were given.

The efforts or work of the girls as shown by their scholastic marks is quite commendable.

Judging from the number of years enrolled, some of the boys exhibit great persistence.

If it is for financial reasons that boys drop out so frequently, it seems that there should be some way by which they could get at least a high school education without the school paying so much for reteaching.

It would undoubtedly be an economic advantage for Springfield to ascertain the causes which makes re-teaching necessary, and either eliminate them to a great extent or remedy them.

### Summary

1. Over 50 per cent of the students of Springfield Senior High School are of normal age, and there are about 5 per cent more under-age than over-age.
2. The enrollment does not show very much of a drop until senior year. This may be due to the fact that the sophomore and junior classes have so many repeaters, and the population and school enrollment are increasing.
3. The boys have a greater number of failures than the girls.
4. An over-age student is more apt to fail than an under-age student.
5. In both the Senior High School and Southwest Missouri State Teachers' College history has more failures than any other subject.
6. There are fewer failures in the senior high school since the 6-3-3 plan has been used, than there were when Springfield had the 8-4 plan.
7. The percentile graph shows little difference in I. Q. of boys and girls, but more boys are overage than girls, and boys make a greater number of poor and failing grades.

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