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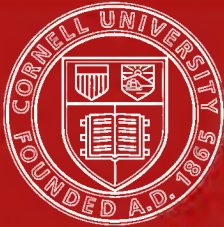
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PROGRESS THROUGH THE GRADES OF CITY SCHOOLS

A STUDY OF ACCELERATION AND ARREST

BY
CHARLES HENRY KEYES, PH. D.
"

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PROGRESS THROUGH THE GRADES OF CITY SCHOOLS

INTRODUCTION

The purpose of this study is to inquire into the quantity, place, and causes of Acceleration and Arrest in the passage through the grades, and to determine some of the factors that facilitate or hamper progress. It was undertaken under the stimulus received in a course of lectures given by Professor E. L. Thorndike, of Teachers College, Columbia University, in the summer session of 1910. It was prosecuted during the whole of the subsequent academic year, under the special guidance and criticism of Professor Thorndike, to whom the writer is indebted for many features of the plan of treatment and for constant aid in its execution. Grateful acknowledgments are also due to Professor Henry Suzzallo and Professor George Drayton Strayer, of Teachers College, Columbia University, both of whom contributed valuable constructive criticism during the progress of the work.

I

CONDITIONS

The field chosen was a single supervision district enrolling about 5,000 pupils annually. The course of study covered nine years above the kindergarten and involved about one-eighth more subject matter than appears in the ordinary eight-grade course, the grades being progressively more difficult to the end. Some light will be thrown upon the quantity and character of the work by the following time schedule:

TABLE 1

TIME SCHEDULE FOR RECITATION AND STUDY

GRADES:	I	II	III	IV	V	VI	VII	VIII	IX
Length of Period: No. of Periods:									
1. Mathematics	3 ¹⁰ 5 ²⁰ & 10 ¹⁵ 25 ⁰	4 ²⁰ 8 ⁰ 5 ²⁰ & 10 ¹⁵ 25 ⁰	4 ²⁵ 100 5 ³⁵ 175	5 ²⁵ 125 5 ²⁵ 125	5 ³⁰ 150 4 ³⁰ 120	5 ³⁰ 150 4 ³⁰ 120	4 ³⁰ 120 4 ³⁰ 120	6 ³⁰ 180 4 ³⁰ 120	6 ³⁰ 180 5 ³⁰ 150
2. Reading and Literature									
3. History and Civics									
4. Geography	4 ²⁰	4 ²⁵	3 ²⁵ 4 ³⁵	4 ²⁵ 100 4 ²⁵	4 ³⁰ 120 4 ³⁰	4 ³⁰ 120 4 ³⁰	4 ³⁰ 120 4 ³⁰	4 ³⁰ 120 4 ³⁰	3 ³⁰ 90 3 ³⁰
5. Language and Grammar	8 ⁰	100	100	100	125	125	120	120	150
6. Spelling	3 ²⁵	5 ¹⁰ 5 ²⁵	5 ¹⁵ 75	5 ¹⁵ 75	4 ¹⁵ 60	4 ¹⁵ 60	4 ¹⁵ 60	4 ¹⁵ 60	4 ¹⁵ 60
7. Nature Study	3 ²⁵	3 ²⁵ 75	5 ⁰ 75	5 ⁰ 75	6 ⁰ 60	6 ⁰ 60	6 ⁰ 60	6 ⁰ 60	6 ⁰ 60
8. Music	3 ²⁵ 75	3 ²⁵ 75	3 ²⁵ 75	3 ²⁵ 75	3 ²⁵ 75	3 ²⁵ 75	3 ²⁵ 75	3 ²⁵ 75	3 ²⁵ 75
9. Writing	5 ¹⁵ 75	5 ¹⁵ 75	4 ²⁰ 80	1 ³⁰ & 2 ²⁵ 80	1 ³⁰ & 2 ²⁵ 80	1 ³⁰ & 2 ²⁵ 80	1 ³⁰ & 2 ²⁵ 80	2 ²⁵ & 1 ³⁰ 80	2 ²⁵ & 1 ³⁰ 80
10. Drawing	75	75	75	75	75	75	75	45	45
11. Manual Training	80	60	60	60	60	60	90	90	90
12. Recesses	150	150	150	150	75	75	75	75	75
13. Opening Exercises	60	60	60	60	60	60	60	60	60
14. Dismissals	25 ²⁰ 50	20 ²⁰ 50	15 ²⁵ 50	15 ²⁵ 50	10 ³⁰ 50	10 ³⁰ 50	10 ³⁰ 25	10 ³⁰ 25	10 ³⁰ 25
15. Study in School	500	400	375	375	300	300	300	300	305
16. Study out of School	0	0	0	0	75	225	375	450	450
Each week									
17. Total Minutes in School	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
18. Total Minutes on School Work					1,575	1,725	1,875	1,950	1,950

The population was cosmopolitan. Its chief elements were American, Irish, German, Swedish, Norwegian, Italian, Russian, Canadian, English, French, Scotch, Polish, Armenian, and Lithuanian. Other races were represented, but the fourteen named comprised more than ninety-six per cent of the population. In religion they were Protestants, Catholics, and Jews. The chief industries maintaining the homes, were manufacturing of a widely varied character, banking, insurance, jobbing, merchandising, transportation, and those of the shops common to all American cities of 100,000 population. Schools were generously supported. In wealth, social status, and intelligence, the district represented every class from the highest to the lowest. Laws enforcing compulsory education and prohibiting child labor were rigidly enforced by both city and state authorities. These laws protected all children up to fourteen years of age and the more backward up to sixteen years.

Constant endeavor was made to provide one teacher for every forty pupils, only forty-two sittings being placed in each room. Formal promotions occurred in June of each year. Teachers were forbidden to detain pupils or permit them to remain in the school buildings at recess or after the regular hour for dismissal. All recesses were taken in the open air every day in the year save when rain or snow were falling at the recess time. All primary schools took such daily open air recesses for ten minutes at the end of every hour. School gardens were operated for children in primary grades on the school grounds.

Below the third grade, promotions were made by the principal on the recommendation of the grade teacher, after personally satisfying himself of the pupil's ability to begin the work of the next grade. In all other grades promotions were largely based on written and oral tests given three times each year. These tests were prepared in various ways, some by committees of grade teachers, some by committees of principals, some by the supervising office, some by joint committees representing all three of these interests. With the results of these tests there were combined the class teacher's judgments of the pupil's work in each subject. But in every case the endeavor was to determine whether the pupil had proved capacity to go ahead. Individual promotions were made at any time between September

and March that the conditions warranted. Special classes for gifted pupils and for slow pupils were maintained in every school.

Pupils were admitted to the first grade, at or after reaching the sixth birthday; but children who had spent two years in the kindergarten and were physically fit were admitted under this age. Children from first grades in other cities and systems were received by transfer without regard to this age limit. To be apparently physiologically six years old, was sufficient to secure admission. As a matter of fact nearly 2 per cent of the entrants to grade one were under five years of age; nearly 3 per cent were between five and five and one-half years of age; 25 per cent were between five and one-half and six years of age; 38 per cent were between six and six and one-half years old; 20 per cent between six and one-half and seven years; 6 per cent between seven and seven and one-half; 4 per cent were seven and one-half to eight; and 2 per cent, over eight years old.

To make clear another condition of the problem it is important to show the comparative enrollment by grades for the seven years covered by this study.

TABLE 2
TOTAL ENROLLMENT BY GRADES FOR EACH OF THE SEVEN YEARS
INVOLVED IN THIS STUDY

School Year	1903	1904	1905	1906	1907	1908	1909	Totals	
Kindergarten... (Double grade)	713	718	747	741	752	742	781	5,194	K'g
First grade . . .	659	655	627	638	584	679	716	4,558	I
Second grade . . .	555	557	550	557	545	528	516	3,808	II
Third grade . . .	519	522	536	549	520	526	514	3,686	III
Fourth grade . . .	498	510	520	531	526	510	509	3,604	IV
Fifth grade . . .	470	465	472	522	524	508	500	3,461	V
Sixth grade . . .	438	434	423	439	475	467	451	3,127	VI
Seventh grade . . .	360	365	407	421	430	434	445	2,862	VII
Eighth grade . . .	242	295	316	340	361	352	351	2,257	VIII
Ninth grade . . .	196	216	279	293	316	317	309	1,926	IX
Totals	4,650	4,737	4,877	5,031	5,033	5,063	5,092	34,483	

The point to be noticed in this table is, that the number of pupils beginning school is practically the same for each of the seven years as shown by the figures for the enrollment in the first, second, and third grades. Increasing persistence in school steadily advances the total enrollment, but the initial enrollment varies very little.

The fact that there is one teacher for every forty-two pupils, that there are a sufficient number of teachers and school rooms, that the pupil's fitness to proceed is tested, that the principal in every building is free to promote all proven pupils and required to promote no others, are conditions making the field of investigation especially important. Many studies are made of rapidly growing cities where there are neither teachers nor rooms enough to meet the admission pressure, and where the demand of new entrants for the seats, forces teachers and principals to move practically all the pupils along. They do what they must under pressure, until the grades are reached where elimination reduces the pressure. Then arrest seems large, simply because it has accumulated, and is made manifest by tests applied to determine fitness for entrance upon the work of the last grades of the course. Freedom from such necessity was one of the chief characteristics of the groups herein studied.

Further knowledge of the situation, that is necessary to understanding the results of the study, is disclosed by two specimen age-grade distribution tables. One is taken from the middle of the seven-year period, another at the close. In these tables, age 4 means 4.0 years to 4.99 years; age 5 means 5.0 years to 5.99 years, etc.

TABLE 3
AGE-GRADE DISTRIBUTION FOR 1909-10

Age GRADE	4 yrs.	5 yrs.	6 yrs.	7 yrs.	8 yrs.	9 yrs.	10 yrs.
Kg.	410	358	13				
I		102	488	102	24		
II			92	320	89	15	
III				102	308	91	13
IV				10	73	295	110
V					5	63	288
VI						10	58
VII							13
VIII							
IX							
TOTALS	410	460	593	534	499	474	482
Per cents	8	9	11.6	10.4	9.8	9.3	9.4

AGE-GRADE DISTRIBUTION FOR 1906-07

Age GRADE	4 yrs.	5 yrs.	6 yrs.	7 yrs.	8 yrs.	9 yrs.	10 yrs.
Kg.	411	317	13				
I		162	349	101	27		
II			148	261	124	24	
III				131	214	122	74
IV				4	118	210	121
V					6	119	174
VI						8	103
VII							15
VIII							
IX							
TOTALS	411	479	510	497	489	483	487
Per cents	8.1	9.5	10.1	9.8	9.7	9.6	9.6

TABLE 3—(continued)

AGES FOR BEGINNING OF THE YEAR

11 yrs.	12 yrs.	13 yrs.	14 yrs.	15 yrs.	16 yrs.	17 yrs.	TOTALS
							781
							716
							516
							514
21		5					509
108	31	10					500
268	105	22					451
66	242	102	22				445
6	42	216	85	2			351
	15	33	152	88	14	7	309
469	435	366	259	90	14	7	5,092
9.2	8.5	7.1	5	1.9	.3	.14	

AGES FOR BEGINNING OF THE YEAR

11 yrs.	12 yrs.	13 yrs.	14 yrs.	15 yrs.	16 yrs.	17 yrs.	TOTALS
							741
							638
							557
							549
8							531
69	9						522
119	89	15					439
168	101	59					421
113	169	97	27				340
12	102	135	83	7	1		293
	10	104	158	19	1	1	
489	480	410	268	26	2	1	5,031
9.7	9.5	8.1	5.3	.5			

For every pupil in the system there was accessible a record made each year, of age, sex, grade, eye condition, deportment, scholarship, and time lost during the year. The continuous records of 3,279 pupils were studied. First, the school histories of all the pupils who during the years 1905, 1906, and 1907 gained one or more grades, were carefully examined. These were 1,239 in number. Second, call was made for the history of all the pupils for whom there were six or more annual records on the seven points named above, and who had at some time been compelled to repeat one or more grades. This brought 683 individual records. Third, all who had at some time gained one or more years, and whose detailed record on all points for six or more years was available, were studied. These were 613 in number. Fourth, study was made of the records of about an equal number of pupils who had been for six or more years in the same schools and who had in that time neither gained nor lost a grade. These proved to be 606 in number. Fifth, all the honor roll pupils in the graduating classes from six schools in one year, and from seven schools in the succeeding year, were made the subjects of study.

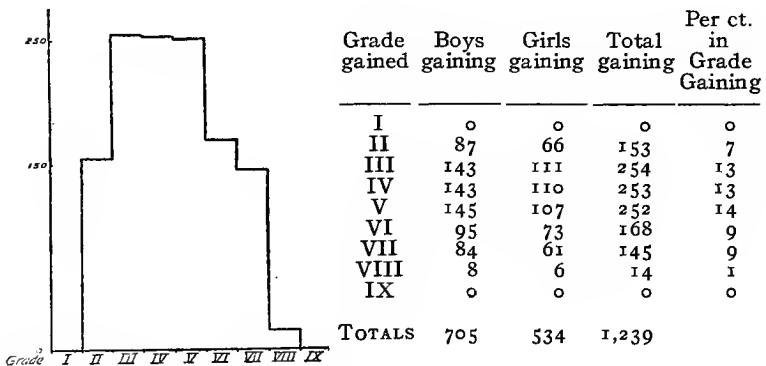
The progress of these 3,272 pupils through this long series of years was investigated with the initial purpose of learning how far age at entrance, time lost, condition of eyes, deportment, race, or sex, contributed to either *arrest* or *acceleration* in progress through the grades. Is there any evidence that some ages are especially fecund of arrest or acceleration? What grade or grades, if any, are particularly productive of arrest or acceleration? What study or studies, if any, tend to arrest or accelerate progress? How far are both arrest and acceleration phenomena of nature over which nurture has not complete control? The following section presents the results of the examination of the records of the accelerates. These accelerates or grade gainers are the pupils who at some time made up or gained a grade, that is one year's time, in their progress through the schools.

II

ACCELERATES FROM 1904-07

During these three years 1,239 pupils gained one or more years; of these, 705 were boys and 534 girls. That is, nearly 32 per cent more boys than girls gain grades. The distribution of these gains is shown in the plot and table following:

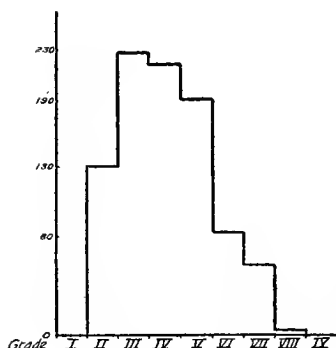
TABLE 4



Under the organization it was not possible to skip either the first or the ninth grade and only one pupil in a hundred succeeded in skipping the eighth grade. Grades three, four, and five are most productive of gains, furnishing 61 per cent of the whole number, and appear to be practically alike in the opportunity or condition of the pupils or both. Grade two, perhaps because it is reached before pupils get fairly under way, shows only half as much grade-gaining as appears in grade five. The large gains in the three middle grades would have a tendency to reduce relatively the gains in grades above.

Among the 1,239 accelerates or grade-gainers were 913 who went to work or moved away without graduating. Their gains were distributed as shown below:

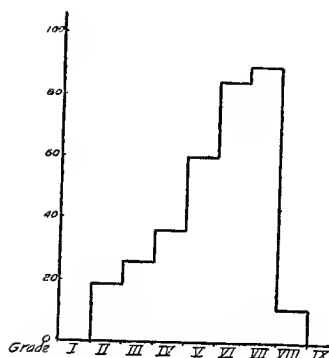
TABLE 5



Grade gained	Boys gaining	Girls gaining	Total Gaining
II	72	63	134
III	125	103	228
IV	113	104	217
V	102	90	192
VI	47	36	83
VII	32	24	56
VIII	2	1	3
TOTALS	493	420	913

The remaining 326 graduated from the grammar schools. Gains of this group as shown below present a totally different distribution.

TABLE 6



Grade gained	Boys gaining	Girls gaining	Total Gaining
II	12	7	19
III	16	10	26
IV	25	11	36
V	39	21	60
VI	54	31	85
VII	59	30	89
VIII	7	4	11
TOTALS	212	114	326

The divisions represented in the two foregoing tables may be characterized fairly as a separation from the others, of the top quarter in point of ability and capacity, so far as the processes and activities of the school may indicate these. It will be noted that for the 913 who do not graduate the ground-gaining mode is the third grade, while for the 326 completing

the grammar school course it is the seventh grade. There are 17.5 per cent more boys than girls in the former division and 86 per cent more boys than girls among the grade-gainers who go on to graduation.

Of the 913 non-graduates who gained one or more years during the course, 35 boys and 32 girls also lost a grade. Forty-four of these, 24 boys and 20 girls, lost the grade immediately after the one they gained. Of the 326 graduates who completed the course in one or more years less than schedule time, 15 boys and 15 girls also lost a grade, 8 boys and 9 girls losing the grade immediately following that which they gained. These losses seem in no way related to the skipping or making up of any particular grade. That is, the arrest after acceleration does not point to any particular grade as being an especially unfortunate one to be passed or made up by bright pupils, as will appear from the following showing of the grade gained by all those who subsequently lost:

TABLE 7
GAINS AND LOSSES

Grade gained	Boys		Girls		Both Groups		
	Graduate	Non-Graduate	Graduate	Non-Graduate	Boys	Girls	Total
II	1	8	2	4	9	6	15
III	3	8	1	9	11	10	21
VI	2	6	2	6	8	8	16
V	5	6	1	4	11	5	16
VI	1	5	2	6	6	8	14
VII	3	1	5	2	4	7	11
VIII	0	1	2	1	1	3	4
Totals	15	35	15	32	50	47	97

It will be noticed in this connection that of all those who skip a grade only one in fourteen fails to maintain the gained rank. Of those who complete the full nine years and thus have the maximum exposure to arrest only one in every eleven loses the ground gained.

But the total ground gained is more than 1,239 years. A gain of 3 years is made by two boys and no girls among the non-graduates, and by two boys and one girl among the graduates. A gain of 2 years is made by fourteen boys and twelve girls from the non-graduate group, and by sixteen boys and eleven girls of the graduate group. Thus the boys gain 743 years time and the girls 559 years. The total enrollment of boys and girls during this time was practically the same.

The larger number of boys among the ground-gainers is in part due to a hesitancy on the part of teachers and parents to let the girls undertake the extra work necessary to gain a grade, in part to the more ready acceptance of the conventional schedule by girls, and for girls by their parents. On the other hand, the larger number of boys looking ahead to business careers, or to college and professional life, were stimulated to save time. Not a few capable boys, whose home conditions demanded that they should go to work as early as possible, and who were yet ambitious to finish the grammar school course, were prompted to make the extra endeavor. These factors all contributed to enable these pupils to reduce the time for completing the course from 9 years to 7.9 years. No skipping was possible in either grade one or grade nine. There were enrolled in the seven remaining ground-gaining grades 4,186 different pupils during the three years under consideration. This number includes, once only, every pupil who was enrolled in all these seven grades, no matter how brief the period of his attendance. Thus 29.6 per cent of all pupils enrolled in these seven grades gained one or more years.

During the same three years, 932 pupils, or 22 per cent of the total number of different pupils enrolled, failed of promotion in the same seven grades. If those arrested in the ninth grade are added the number becomes 1,038. If to these we add all pupils held over in grade one, many of whom did not enter school before the end of March of each year, the total number of arrests becomes 1,254. The term arrests is used to designate all pupils denied promotion and required to repeat a grade and lose a year in their progress through the schools. The total number of different pupils appearing in these nine grades during the three years was 5,824. Thus the total number of arrests was less than 24 per cent of all enrolled.

Turning next to examine the age at which the 326 graduating accelerates entered the first grade, and the age at which they graduated from the ninth grade, we find the facts to be as shown in the following table:

TABLE 8
AGE AT ENTRANCE AND AT GRADUATION OF 326 ACCELERATES

ENTERED GRADE I AT AGE OF	Boys	Girls	Total	GRADUATED AT AGE OF	Boys	Girls	Total
4 yrs.	3	2	5	12 yrs.	8	7	15
5 "	33	32	65	13 "	60	61	121
6 "	107	102	209	14 "	43	40	83
7 "	23	20	43	15 "	46	43	89
8 "	2	1	3	16 "	7	4	11
Over 8 yrs.	1	0	1	Over 16 yrs.	5	2	7
Totals	169	157	326	Totals	169	157	326

From this it appears that more than 85 per cent of these accelerates enter school at six years old or under, the average entrance age being 5.9 years. More than 67 per cent of them graduate when fourteen years old or younger, the average graduating age being 13.9 years. Late entry does not contribute to acceleration. Of course, it must be borne in mind that late entry, while it is not necessarily evidence of sub-normal capacity or low mentality, points in that direction. In fact, practically all late entries in communities like the one studied are due to four causes. These are: (a) low or slow mentality; (b) remoteness from school facilities, such as is the lot of many emigrant children prior to their arrival in America; (c) illness; and (d) parental conviction that primary schools and their activities do not constitute the best physiological environment for young children, and that in the long run no time will be lost by late entry. In the community studied, these causes are influential in the order named; and the accelerates who entered later than six years of age, are all explained by either the second or the fourth of these causes.

This division of the study was undertaken to discover the truth on a few specific points only. The evidence warrants the following conclusions for communities thoroughly enforcing the compulsory school attendance law, furnishing a teacher for every

forty pupils, and making provision for special opportunity for slow and for gifted pupils:

1. The number of accelerations is larger than the number of arrests; and if we exclude from the reckoning all pupils who do not enter the first grade until two-thirds of the school year has elapsed, the accelerations are much more numerous than the arrests.

2. More boys than girls are found in the ranks of accelerates.

3. Late entry into the first grades does not contribute to acceleration of progress. The average accelerate enters school first under six years of age. The school which would be of most service to the community and not unmindful of its duty to gifted pupils should receive all pupils who are physiologically six years of age, no matter what the chronological age, provided it does not thereby cripple its facilities for receiving and training in the most effective way, those who are older or within the compulsory attendance limits. The whole regimen of the primary school should be such as to furnish the desirable hygienic environment needed by the young child.

5. The average accelerate has no difficulty in gaining more than one full year in the first seven years of progress through the grades of the public schools.

6. Such possible accelerates are present in our schools in large number, constituting from one-fourth to one-third of our whole body of pupils above the first grade.

III

STUDY OF 683 CASES OF ARREST

The age at which each of these 683 pupils who became arrests or "repeaters," entered the first grade is important; and since the same data will be needed in the study of the 613 accelerates or "gainers," and of the 606 "regulars," or pupils who neither gain nor lose grades, these facts for all three groups are shown in the following table:

TABLE 9
ENTRANCE AGES OF 1,902 PUPILS STUDIED IN SECTIONS III,
IV, AND V

Entrance Age	Repeaters		Gainers		Regulars		All Classes	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Under 5	$\frac{11}{7}$	$\frac{7}{18}$	$\frac{3}{4}$	$\frac{1}{11}$	$\frac{7}{14}$	$\frac{7}{27}$	$\frac{21}{61}$	$\frac{15}{36}$
5 - 5½	$\frac{7}{23}$	$\frac{16}{23}$	$\frac{5}{11}$	$\frac{6}{11}$	$\frac{12}{27}$	$\frac{15}{27}$	$\frac{24}{61}$	$\frac{37}{61}$
5½-6	$\frac{77}{144}$	$\frac{67}{144}$	$\frac{58}{114}$	$\frac{56}{114}$	$\frac{78}{183}$	$\frac{103}{183}$	$\frac{213}{439}$	$\frac{226}{439}$
6 - 6½	$\frac{124}{215}$	$\frac{91}{215}$	$\frac{110}{230}$	$\frac{120}{230}$	$\frac{108}{219}$	$\frac{111}{219}$	$\frac{342}{664}$	$\frac{322}{664}$
6½-7	$\frac{80}{135}$	$\frac{55}{135}$	$\frac{79}{143}$	$\frac{64}{143}$	$\frac{68}{115}$	$\frac{47}{115}$	$\frac{227}{393}$	$\frac{166}{393}$
7 - 7½	$\frac{34}{70}$	$\frac{36}{70}$	$\frac{28}{52}$	$\frac{24}{52}$	$\frac{18}{30}$	$\frac{12}{30}$	$\frac{80}{152}$	$\frac{72}{152}$
7½-8	$\frac{24}{41}$	$\frac{17}{41}$	$\frac{18}{31}$	$\frac{13}{31}$	$\frac{5}{10}$	$\frac{5}{10}$	$\frac{47}{82}$	$\frac{35}{82}$
8 or over	$\frac{16}{37}$	$\frac{21}{37}$	$\frac{13}{28}$	$\frac{15}{28}$	$\frac{6}{10}$	$\frac{4}{10}$	$\frac{35}{75}$	$\frac{40}{75}$
Totals	$\frac{373}{683}$	$\frac{310}{683}$	$\frac{314}{613}$	$\frac{299}{613}$	$\frac{302}{606}$	$\frac{304}{606}$	$\frac{989}{1,902}$	$\frac{913}{1,902}$

The same data may be more useful for comparative purposes if cast in per cent forms. This is done in the subjoined table, using as the basis of the percentage for each item of each of the twelve columns of Table 9, the total of the column in which the item occurs:

TABLE 10
ENTRANCE AGES OF 1,902 PUPILS STUDIED IN SECTIONS III,
IV AND V
In Per Cents

Entrance Age	Repeaters			Gainers			Regulars			All Classes		
	Boys	Girls	Totals	Boys	Girls	Totals	Boys	Girls	Totals	Boys	Girls	Totals
	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
Under 5	3	2	2.6	1.0	.3	.6	2.3	2.3	2.3	2.1	1.7	1.9
5-5½	2	5	3.4	1.6	2.0	1.8	4.0	5.0	4.5	2.2	4.0	3.3
5½-6	21	21	21.0	18.4	18.6	18.5	25.9	33.6	30.0	21.5	24.7	23.0
6-6½	33	30	31.5	35.0	40.3	37.6	35.9	36.7	36.2	34.6	35.3	35.0
6½-7	22	18	20.0	25.0	21.5	23.4	22.4	15.4	19.0	23.0	18.3	20.6
7-7½	9	12	10.0	9.0	8.0	8.5	6.0	4.0	5.0	8.4	7.8	8.0
7½-8	6	5	6.0	6.0	4.0	5.5	1.5	1.5	1.5	4.6	3.9	4.3
8 or over	4	7	5.5	4.0	5.0	5.0	2.0	1.5	1.5	3.6	4.3	3.9
Total	100	100	100	100	100	100	100	100	100	100	100	100

Of all those who began the first grade before the fifth birthday, 50 per cent are compelled to repeat a grade. The same thing is true of all who enter over eight or over seven and one-half. Almost the same proportion (46 per cent) fail somewhere among those who enter between seven and seven and one-half. Practically one-half of all children who begin the first grade after reaching their seventh birthday, or before reaching their fifth, may be expected to lose a year at some time during the grammar school course.

It is necessary to know how these losses are distributed through the grades and this is shown in the following table:

TABLE 11

REPEATERS SHOWN BY GRADE AND SEX FOR EIGHT AGE-GROUPS OF ENTRANTS

The upper number in each line is for boys; the lower is for girls

Beginning Grade I at Age of	Grades									Totals		
	I	II	III	IV	V	VI	VII	VIII	IX	Boys	Girls	
Under 5 yrs.	0 4	4 1	1 0	4 1	1 1	1 0	0 0	0 0	0 0	11	7	18
5-5½ yrs.	4 8	1 3	0 0	0 1	0 2	0 2	1 0	0 0	1 0	7	16	23
5½-6 yrs.	14 17	13 6	9 7	18 13	11 9	2 4	4 3	4 4	2 4	77	67	144
6-6½ yrs.	17 8	14 10	15 10	19 20	16 16	17 10	14 5	10 10	2 2	124	91	215
6½-7 yrs.	7 3	6 2	16 10	16 10	11 8	5 9	11 7	3 4	5 2	80	55	135
7-7½ yrs.	1 4	2 1	6 5	3 2	6 10	4 7	3 0	6 6	3 1	34	36	70
7½-8 yrs.	0 1	1 0	5 3	4 1	5 4	3 4	4 1	2 2	0 1	24	17	41
8 yrs. or over	2 2	1 0	2 4	1 4	2 3	3 6	1 0	1 1	3 1	16	21	37
Boys	45	42	54	65	52	35	38	26	16	373		
Girls	47	23	39	52	53	42	16	27	11		310	683
Totals	92	65	93	117	105	77	54	53	27			683

Two things should be observed in this table. First, the grades most prolific of arrest are the fourth, fifth, and third; and all exceed the first, so commonly held to be the most productive of repeaters. Second, the boys in this group are more numerous than the girls, just as they were in the large group of accelerates considered in Section I, as would be expected from the known greater variability of the male.

At what age these arrests occur is equally important. The following are the facts:

TABLE 12

	BOYS	GIRLS	TOTAL
Under 6	0	4	4
6-7	28	20	48
7-8	32	27	59
8-9	33	26	59
9-10	51	42	93
10-11	56	52	108
11-12	41	34	75
12-13	42	37	79
13-14	36	32	68
14-15	27	24	51
15-16	17	11	28
16-17	6	1	7
Over 17	4	0	4
Total	373	310	683

But before the two foregoing tables can be intelligently interpreted we must know what percentage of the total enrollment each age and each grade represents. Then by noting the per cent of arrests at each age and at each grade we can answer the questions: What percentage of its equitable proportion does each *age* produce? What percentage of its equitable proportion of arrests does each *grade* produce? That is, if we know that grade five comprises 10 per cent of the total enrollment and produces 20 per cent of the cases of arrest, we know that grade five is responsible for 200 per cent of its equitable proportion of the repeaters. If we knew that the ten-year-olds were 8 per cent of the enrollment, and that ten-year-old repeaters were 12 per cent of the total arrests, we could at once say, age ten produces 150 per cent of its equitable share of the repeaters.

Table 13 shows in the first column all ages represented above five years in the grades from one to nine inclusive. The second

column shows what per cent the enrollment of each age is of the total enrollment over five. The third column shows what percentage of all the repeaters, the repeaters of any given age constitute. The fourth column shows the ratio of the number of repeaters of any given age to the percentage of the enrollment of that age. In other words the right-hand column of Table 13 answers the question: What percentage of its due share of arrests does each age from six to seventeen produce?

TABLE 13

THE RIGHT-HAND COLUMN ANSWERS THE QUESTION, WHAT PERCENTAGE OF ITS DUE SHARE OF REPEATERS DOES EACH AGE PRODUCE

Age	A Percentage of Enrollment of Each Age	B Percentage of Repeaters of Each Age	$\frac{A}{B}$ Ratio of Frequency of Repeaters to Frequency of Age Distribution
6	12.1	7.0	.57
7	10.9	8.6	.79
8	10.1	8.6	.80
9	11.4	13.6	1.19
10	11.3	15.8	1.40
11	11.6	10.9	.94
12	10.7	11.5	1.08
13	10.9	10.0	.91
14	7.3	7.4	1.01
15	2.1	4.1	1.95
16	.3	1.0	3.33
17 and over	.16	.6	3.75

The fifteen-year-olds furnish nearly double their fair share of the repeaters, the sixteen-year-olds three and one-third times their share and the seventeen-year-olds claim three and three-quarters times as many arrests as they are entitled to by their numbers. These pupils were nearly all late entries, some of low or slow mentality, many of them emigrants from lands of illiteracy, but all possessed of an ambition to go on and graduate from the grammar schools. The three ages at the beginning of the school course are least fecund of arrest. In this regard the six-year-olds lead all the others. That is, if a child is such a one as could enter the schools at six years of age, he is rarely likely to be held back during his first year. Ages ten, nine, and twelve cover the period that produces most repeaters.

TABLE 14

THE RIGHT-HAND COLUMN ANSWERS THE QUESTION, WHAT PERCENTAGE OF ITS DUE SHARE OF REPEATERS DOES EACH GRADE PRODUCE

Grade	Percentage of Enrollment	Percentage of Repeaters	Ratio of Frequency of Repeaters to Frequency of Grade Distribution
I	13.6	13.4	.98
II	12.7	9.5	.75
III	12.1	13.4	1.10
IV	12.2	17.1	1.40
V	12.2	15.3	1.25
VI	11.0	11.2	1.01
VII	10.0	7.9	.79
VIII	8.4	7.9	.94
IX	7.3	4.0	.54

The fact that grade nine has only half its proper share of repeaters is to be accounted for in part by the frequency with which pupils of this grade, who see failure impending, leave school and go to work. They are fourteen years of age or over. They have reached a grade where the sixteen-year-old clause of the compulsory law is inoperative, they are physically fit in most instances to go to work; so they drop out and reduce unduly the number of repeaters charged against this grade. Grades three, four, and five are the places of high exposure to arrest. Grades two and seven produce proportionally fewer repeaters than any other grades excluding the ninth, which may for reasons stated above fairly be dismissed from comparison. The first and sixth grades produce practically only their equitable proportion of repeaters.

How far is loss of time coincident with arrest or immediately precedent thereto? The average loss of time in the first grade for all the pupils who repeated grade one was 15.6 days. In grade two repeaters lost on an average 13.7 days. In grade three repeaters lost on an average 14.5 days. In grade four repeaters lost on an average 12.2 days. The record in grade five was identical with that of grade four, 12.2 days. In grade six the average loss of time by repeaters was 10.5 days. In grade seven this average loss was 10.2 days. In grade eight it dropped to 9.5 days. In grade nine it was only 9.2 days. Thus

the loss in grade one is on an average only 8.2 per cent of the total time; in grades two and three about 7.5 per cent; in grades four and five, less than 6.5 per cent; in grades six and seven, 5.5 per cent; while in grades eight and nine the loss is less than 5 per cent.

This loss of time, under the general acceptance and rigid enforcement in the community of the laws requiring constant attendance and prohibiting child labor, is practically a measure of the amount of illness in all the grades from two to eight inclusive, as the law requiring the children to be in attendance every day on which school was in session had the heartiest public sentiment behind it and was rigidly enforced. The losses noted are not so great when one remembers that the large majority of all the cases of chicken-pox, measles, mumps, scarlet fever, whooping-cough, diphtheria, to say nothing of scabies and pediculosis, occur within the age limits covered by this study.

As nearly as can be determined from the health records for the last five years of the period studied, there occurred each year among the pupils represented in the schools an average of 92 cases of diphtheria, 46 cases of typhoid fever, 56 cases of scarlet fever, and 119 cases of measles. These diseases alone make large inroads on attendance. Pupils are often incapacitated for school work for periods much longer than is indicated by the exclusion time of health regulations. Twelve weeks loss on account of typhoid and ten weeks on account of scarlet fever are neither uncommon nor unwise. In the case of diseases like scarlet fever or diphtheria, it must not be forgotten that the exclusion operates not only against all other children in the family, but, in the case of those resident in tenement or apartment houses, against all children using the same entrance to the house. Thus it will be seen that the number of long-time absences is necessarily large, even in the presence of an advanced and vigorous policy of school and municipal sanitation.

The prevalence of children's diseases during the years from five to ten (practically covering the first five grades) is remarkable as the following will show:

The records of the famous Measles epidemic of Kiel in 1860, as reported by Nathnagel, show that 90 per cent of all the cases between 5 and 15 years were found to be between the ages

of 5 and 10 years. The records of the New York City Board of Health according to Dr. Wm. H. Gilfoy show that of every hundred deaths from measles between the ages of 5 and 15 years, 97 of them are those of children between 5 and 10 years.

The Willard Parker Hospital records of 1,785 cases of Diphtheria treated in that institution in persons between the ages of 5 and 60 years, show that 62 per cent were between the ages of 5 and 15 years. Of these latter, 75 per cent were children between 5 and 10 years of age. The records of the New York City Board of Health show that of every hundred deaths from diphtheria between the ages of 5 and 15 years, 89 of them are those of children between 5 years old and 10 years.

The Willard Parker Hospital records of 3,181 Scarlet Fever patients between 5 and 60 years of age treated in that institution show that 72 per cent were those of children aged 5 to 15 years. Of these 72.6 per cent were aged from 5 to 10 years. The Board of Health records of New York City show that of every hundred deaths from scarlet fever between 5 and 15 years of age, 77 are those of the children aged 5 to 10 years.

Similar records show Whooping-Cough to be six times as prevalent in the first of these five year periods as in the second. Of all the mortality from this disease between 5 and 15 years in New York City, 86 per cent of it is among children aged 5 to 10 years.

So, too, children during the first five years of school life have about four times as much Broncho-Pneumonia as in the years from 10 to 15. Of the deaths from this disease during the ten years under discussion 79 per cent of them occur between the fifth and tenth year. Mumps and Chicken-pox likewise occur most frequently during this same period.

The records of the Princeton, Indiana, schools for 1910, as given in the annual report of Superintendent Harold Barnes (pp. 78 and 79), indicate that 85 per cent of the cases of the six contagious diseases for which pupils were excluded from these schools occurred in the first five grades. They also show that one pupil in four was so excluded during the year.

The evidence could be multiplied indefinitely to show the inevitable interference with attendance, to which the first five grades are exposed. The point to keep in mind is not only

that these children's contagious diseases are heavily massed in the elementary school period and especially in the first five years of school life, but that the loss of time which they compel is very large. Every case of measles involves from two to four weeks' absence for each child affected and not less than two weeks absence for every other non-immune pupil coming from the same household. Chicken-pox demands for each case a loss of at least two weeks and mumps a loss of from two to three weeks. Diphtheria enforces at least four weeks of absence, and scarlet fever not less than six. Whooping-cough involves from ten to twelve weeks of absence.

Now if it is remembered that it is no uncommon experience to have one pupil out of every six enrolled in elementary schools, excluded during the year on account of contagious disease or exposure to the same, how futile it is to expect to eliminate exposure to it, how futile it is to expect to eliminate arrest from any system of schools having a uniform course of study.

The location of the large absences indicates the situation of the major portion of all arrests. The figures given in Table 15 are the number of absences of four weeks or more which occur in grade one two, three, four, etc. The second column registers those made by accelerates, pupils who at any time gain one full grade. The third column records those made by arrests, pupils who repeated any grade. The fourth column is the large absence record of the normals:

TABLE 15
LOCATION OF 1,649 ABSENCES OF 4 WEEKS OR MORE

Grade	Number by Accelerates	Number by Arrests	Number by Normals	Totals	Per cent
I	114	146	112	372	23
II	77	122	109	308	19
III	53	115	82	250	15
IV	67	90	90	247	15
V	39	71	44	154	9
VI	56	53	55	164	10
VII	35	29	24	88	5
VIII	16	14	18	48	3
IX	2	7	9	18	1
Total	459	647	543	1,649	100

Note that 1,331 cases or 80 per cent of all these over four weeks' absences are in the five grades in which we find the children who are from five to ten years old and who are most susceptible to the common contagious diseases. The total amount of such absence seems large. But it must be remembered that one case of scarlet fever, for example, in a family with four children of school age, means four such protracted absences. Exposure to contagion often produces the same interference with attendance as does contracting the contagious disease or any other disabling illness.

Of the arrests only 24 in every hundred get through seven years without a record of absence amounting to four weeks or more in some year. In every hundred of the normals 32 escape without a record of four or more weeks' absence in any one year; of the accelerates 33 in every hundred are fortunate enough to escape such absence.

It is apparent, however, that neither the average nor the total loss per pupil is so significant for our problem, as protracted absence at one time, or within one year. About one-third of all the cases of arrest in the first three grades follow four or more weeks of absence in the same year. Practically one-fifth of all cases in grades four, five, eight, and nine are so marked.

The change of residence involving change of school is astonishingly frequent and without doubt is a marked factor in causing arrest of progress through the grades. The effect of massed absence and change of school will be the more manifest from the following showing (Table 16) and from others appearing as we come to examine the same facts for the accelerates.

TABLE 16

FREQUENCY OF LOSSES OF FOUR WEEKS OR MORE AND FREQUENCY OF CHANGE OF RESIDENCE BY REPEATERS

Of every 100 pupils who repeated—

Grade	lost 30 days or more	lost 20 days or more	and 10 days or more	and 29 changed school
I.....	30	"	"	50
II.....	33	"	"	42
III.....	36	"	"	49
IV.....	20	"	"	41
V.....	19	"	"	27
VI.....	16	"	"	43
VII.....	10	"	"	28
VIII.....	23	"	"	28
IX.....	20	"	"	"

What proportion of the repeaters have defective eyesight? What proportion of them are the children of non-English speaking races? The answers to both these questions appear in Table 17.

TABLE 17

GRADE	HAVING DEFECTIVE EYES	OF NON-ENGLISH SPEAKING RACES
	<i>Per cent</i>	<i>Per cent</i>
I	36	52
II	30	50
III	39	42
IV	40	49
V	37	41
VI	40	27
VII	24	43
VIII	19	28
IX	18	24

The difficulty of securing scientifically accurate results in the examination of the eyes of first grade children with the Snellen type test for illiterates probably makes the figures for first grade children too high.

How far the sympathy and understanding between pupils and teacher contributes to acceleration or the lack of these to arrest is difficult to determine. The conduct or deportment rankings given each year may be fairly taken as an index of the closeness with which a pupil fits into the spirit and methods of the school. In the schools under consideration the pupils are ranked six times each year in deportment. From the annual summaries of these each year, I gather the following:

39	per cent of repeaters	rank	90-100
34	"	"	80- 90
21	"	"	70- 80
6	"	"	60- 70

This is a record that does not seem to account appreciably for arrest. We shall see in Section IV how it compares with the record of the accelerates.

Pupils are ordinarily required to repeat grades because they are not able to pass examinations for entrance to the grade above—or are not able to do the work of the next higher grade—or because they are generally weak in the work of the grade

in which they are arrested. What effect has repetition of any grade upon the scholarship of the repeater in subsequent grades? To test this, the rankings obtained in each grade after the repetition, were compared with those of the two previous years. For example, a repeater of grade three made the following record in scholarship:

GRADE	1	2	3	3	4	5	6	7	8	9
	D	E	F	C	D	D	E	E	F	F

The subsequent record was accordingly:

	4	5	6	7	8	9
	+ $\frac{1}{2}$	+ $\frac{1}{2}$	- $\frac{1}{2}$	- $\frac{1}{2}$	- $1\frac{1}{2}$	- $1\frac{1}{2}$

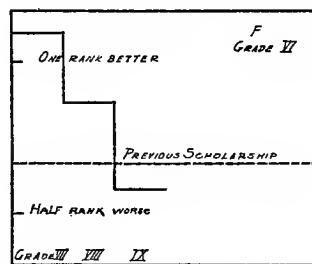
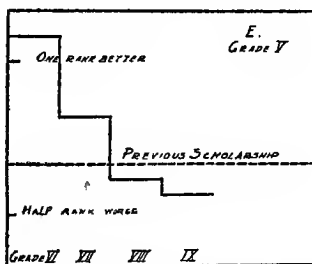
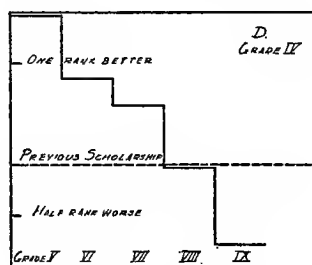
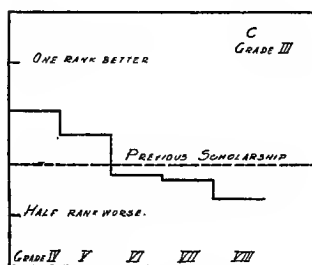
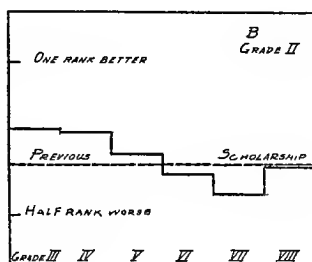
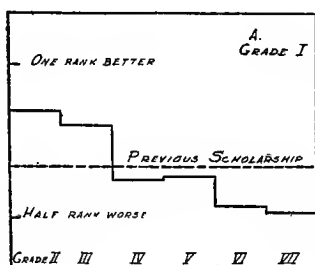
This is, his standing in grade four was one-half rank better (+ $\frac{1}{2}$); his standing in grade six was one-half rank worse (- $\frac{1}{2}$); his standing in grade eight was one and one-half ranks worse (- $1\frac{1}{2}$) than before repeating.

That is, in comparison with his record in grades one and two, his records in grades four and five were each one-half rank higher (+ $\frac{1}{2}$); in grades six and seven, one-half rank lower (- $\frac{1}{2}$); in grades eight and nine, one and one-half ranks lower (- $1\frac{1}{2}$). Every repeater's standings were so tested and recorded when the arrest took place below the seventh grade. In the case of the first grade repeater the comparison was made with his higher first grade standing. In the case of the second grade repeater the comparison was made with his first and higher second grade standing. Assembling all these comparisons gave the following results:

TABLE 18
CHANGES IN SCHOLARSHIP FOR BETTER OR FOR WORSE AFTER REPEATING

Grade	After Repeating					
	First year	Second year	Third year	Fourth year	Fifth year	Sixth year
I	+ .54	+ .42	- .13	+ .10	- .39	- .45
II	+ .35	+ .33	+ .13	- .12	- .30	.00
III	+ .52	+ .30	- .13	- .14	- .33	
IV	+ 1.50	+ .85	+ .58	- .09	- .78	
V	+ 1.25	+ .46	- .15	- .30		
VI	+ 1.27	+ .58	- .25			

The six graphs (A-F) bring out these changes more clearly and indicate that the tendency is: (1) to do better work the first year after repeating; (2) to lose half this superiority the second year; (3) to fall after two years to the level of his performances prior to the repetition. Thereafter he apparently does worse, but this appearance is probably at least in part the result of the relative meanings of the marks A, B, C, D, etc., the same symbol possibly standing for a higher degree of performance in the late grades after the less gifted pupils have been arrested or eliminated.



CHANGES IN SCHOLARSHIP AFTER REPEATING GRADES

The records of all repeaters from grades one to nine were next checked off and classified as doing *better* work, the *same grade* of work, or *worse* work after the repeating than before the arrest, without regard to how much better or how much worse in each individual case. For example, it was found that out of every hundred pupils required to repeat grade five, 21 did better work *afterwards*; that is, in grades six, seven, eight, and nine, than they had done *before*, that is in grades one, two, three, and four. No change appeared in the character of the work of 39, while 40 did poorer work after repeating than they had before. The figures for all the grades constitute Table 19.

TABLE 19
REPEATERS OF ALL GRADES WHO AFTER REPEATING:

GRADE	DID BETTER WORK	DID SAME GRADE OF WORK	DID WORSE WORK
	Per cent	Per cent	Per cent
I	46	27	27
II	15	30	54
III	19	31	51
IV	18.8	31.7	49.5
V	21	39	40
VI	22	43	35
VII	28	52	20
VIII	48	48	4
IX	70	30	0
All grades	28	36	36

There remains to be examined the question of how far arrest is caused by special subjects in the curriculum as a whole, or in any particular year of the course. Examination was made of the causes of 977 arrests; 561 were taken without regard to whether there were available six or more years' records; 416 were in the list of repeaters furnishing the basis of this portion of study. No first grade repeaters were included because all of these were due to the one cause, weakness in reading. The facts for the other grades are shown in the following table:

TABLE 20
 SUBJECTS REPORTED AS THE STRONG CONTRIBUTING CAUSE OF
 977 ARRESTS
 The upper number in each line is for boys; the lower is for girls

SUBJECT	Grade								Totals	
	2	3	4	5	6	7	8	9	Boys	Girls
Reading and spelling	20 17	13 14	11 12						44	43
Mathematics		7	12 16	8 13	14 17	7 4	10 12	5 5	63	67
Mathematics and grammar			4 0	4 6	6 0	8 7	12 12	8 7	42	32
Mathematics and geography				10 9	18 16	10 6	5 3		43	34
Mathematics and history						6 4	6 6	5 5	17	15
Mathematics, grammar and history						10 6	2 5	0 5	12	16
Mathematics, language and spelling	15 21	12 12	8 12	10 9					45	54
History and geography				7 7		0 4			7	11
All subjects	23 19	15 12	12 11	15 14	24 20	15 20	12 15	25 21	141	132
All but spelling	0 7	12 10	6 7	8 10	6 10	11 16	15 16	11 14	69	90
Totals	58 64	59 54	53 58	62 68	68 63	67 67	62 69	54 67	483	494

The most striking feature of this table is the showing that 28 per cent of all the arrests are failures in all subjects; and that 16 per cent more fail in everything but spelling.

Mathematics alone causes 13 per cent of the failures to pass; and mathematics together with one other subject (sometimes history, sometimes geography, and sometimes grammar) causes 18 per cent of the failures. In combination with two other subjects it adds 14 per cent more to the list of failures.

Probably no rearrangement of curriculum could save from arrest, the 44 per cent who fail in everything or everything but spelling. They are children of low or slow mentality who need

more time. To keep such children up to grade would be a crime. Fortunately it is not possible. This does not necessarily mean that there is much wisdom in the present policy of worrying them through one year of dispiriting failure, and then compelling repetition only to secure mediocre success.

Mathematics furnishes much hindrance. This is due in part to the nature of the subject. To do the work in mathematics of any grade requires some reasonable mastering of the work of the previous grade. This is not true in so marked a way of any other subject. In fact it would be entirely possible to do good work in seventh grade history or geography for example, without even having spent a day on sixth grade history or geography. But in arithmetic, the shortcomings of one grade must be added to the burden of every subsequent grade. The spiral mode of attack, or the constant review of topics, aims to minimize this hindrance, but there is still needed relief that has not yet been found. Is there any, short of an arrangement providing for minimum and maximum courses in mathematics in every grade in question?

The constant appearance of evidence that pointed toward the conclusion that acceleration and arrest are indexes of nature rather than consequence of nurture, prompted examination of the questions. "How frequently does one family produce two or more accelerates? How frequently, two or more arrests? How frequently are both classes represented in one family?" It was found that nearly one-fourth of the 613 accelerates were furnished by one-fifteenth of the families represented in this class, and similarly that almost one-fourth of the arrests came from one-fourteenth of the families represented. The detailed results are shown in Table 21:

TABLE 21
SIBLINGS AMONG ACCELERATES AND ARRESTS

<i>Accelerates</i>			<i>Arrests</i>	
34	17 pairs	2 Brothers	28 pairs	56
42	21 pairs	2 Sisters	11 pairs	22
42	21 pairs	Brother and Sister	28 pairs	56
15	5 trios	2 Brothers, 1 Sister	3 trios	9
3	1 trio	3 Brothers	1 trio	3
3	1 trio	3 Sisters	1 trio	3

139² Accelerates, 66 Families

72 Families, 149 Arrests

Thus 7.7 per cent of the families occasion 24.5 per cent of the arrests and 6.8 per cent of the families secure 24 per cent of the double promotions. On the other hand only thirty mixed contributions appear. The cases are as follows:

Brother who gains and sister who repeats.....	3 cases
Sister who gains and brother who repeats.....	15 "
Brother who gains and brother who repeats.....	3 "
Sister who gains and sister who repeats.....	9 "

Will any uniform course of study meet these conditions? Must not the programs of study in every grade present a minimum and a maximum schedule of work to be done? The same school nurture can never produce even approximately similar results for groups varying as widely in nature and home nurture as those represented by the accelerates and arrests involved in this study.

IV

THE ACCELERATES

The gainers or accelerates were 613 in number; 314 of them were boys, 299 girls. The greater variability of boys is here shown again. The age at entrance as with the "arrests" ranged from 4½ to 9 years. The distribution of these gains among the grades and between the sexes is shown for each of the eight age groups of entrants in Table 22:

TABLE 22
GRADE GAINERS SHOWN BY GRADE AND SEX FOR EIGHT AGE-GROUPS OF ENTRANTS

The upper number in each line is for boys; the lower is for girls

Beginning Grade I at Age of	Grades									Totals		
	I	II	III	IV	V	VI	VII	VIII	IX	Boys	Girls	Total
Under 5 yrs.	0	0	0	1	1	0	0	1	0	3		
	0	0	0	1	0	0	0	0	0		1	4
5-5½ yrs.	0	2	1	1	0	1	0	0	0	5		
	0	2	1	3	0	0	0	0	0		6	11
5½-6 yrs.	0	6	16	17	12	3	4	0	0	58		
	0	6	16	18	9	2	3	2	0		56	114
6-6½ yrs.	0	13	33	22	32	6	4	0	0	110		
	0	14	44	21	24	10	5	2	0		120	230
6½-7 yrs.	0	9	21	18	15	5	10	1	0	79		
	0	7	19	15	12	5	4	2	0		64	143
7-7½ yrs.	0	5	8	5	7	2	1	0	0	28		
	0	4	7	4	6	2	1	0	0		24	52
7½-8 yrs.	0	1	6	1	6	4	0	0	0	18		
	0	2	2	3	6	0	0	0	0		13	31
8 yrs. or over	0	0	3	5	0	3	1	1	0	13		
	0	0	2	1	4	7	1	0	0		15	28
Boys	0	36	88	70	73	24	20	3	0	314		
Girls	0	35	91	66	61	26	14	6	0		299	613
Totals	0	71	179	136	134	50	34	9	0			613

Taking into account the total number of entrants at each age, we find that of all who enter the first grade, under five years of age, only one in nine gains a grade during the course. Of those who enter during their fifth year, one in four makes such gain; while more than one in every three, who enter after reaching the sixth birthday, gains a year at some time during the course. The exact figures for each of the age groups is as follows:

Under 5 years.....	11.1	per cent
Between 5 and 5½ yrs.....	18	"
" 5½ " 6 " 	26	"
" 6 " 6½ " 	34	"
" 6½ " 7 " 	36	"
" 7 " 7½ " 	34	"
" 7½ " 8 " 	37	"
Over 8 years.....	37	"

While it thus appears that children who enter school before the fifth birthday, win double promotions not quite one-third as frequently as those who enter at six or thereafter, this does not mean that there is no gain in starting children to school at an early age if they are physiologically fit, as clearly appears from observation of the following facts:

1. Of these very early entrants, 50 per cent lose a year in seven.
2. Of all other entrants, 34 per cent thus lose a year.
3. Of the former, 39 per cent suffer neither gain nor loss in the course.
4. Of the later entrants, 34 per cent neither gain nor lose.
5. The early entrants get 11 per cent of their number into accelerate class.
6. The late entrants get 34 per cent of their number into this class.

Thus it appears that almost 60 per cent of the early entrants preserve the advantage of the year over the average child.

To be sure that the child is mentally and physically able to begin doing work manifestly planned for children from 5½ to 6½ years old, is an important duty of those charged with the responsibility of either sending or admitting children to school. When satisfied as to this, the chronological age may safely be ignored if the school is of the right sort.

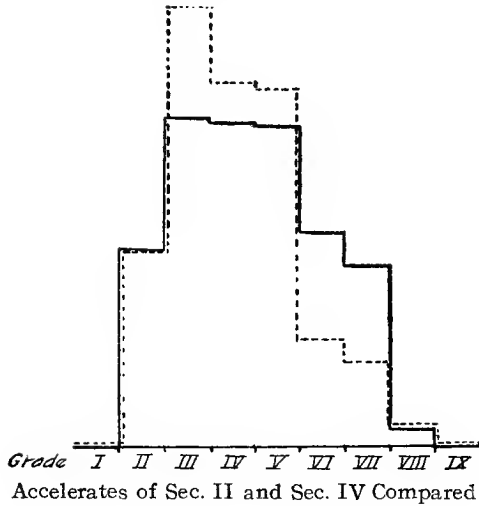
The figures showing the large number of gains among those who enter at seven or later, should be interpreted along with those heretofore presented showing that one-half of all children who enter the first grade before they are five years old are foreordained to lose a year in their progress through the grades. On the other hand it must be remembered that children are educated by other agencies than the school. Such influences are operative with many for whom bodily disablement, remoteness from school, or parental conviction have delayed the day of entrance. On the other hand the accumulating evidence that nature may play as great a part as nurture in determining the rate of progress through school, must be kept in mind.

The similarity of the distribution of accelerations through the grades, between the group of 1,239 accelerates studied in Section II and the 613 accelerates under consideration in this section, will be seen on comparing Table 4 with Table 21. If the figures given in the last line of Table 21 are doubled and thus practically converted to the same numerical basis as those of the fourth column of Table 4, the comparison gives us the following:

GRADE LOCUS OF GAIN	I	II	III	IV	V	VI	VII	VIII	IX
Accelerates of Sec. II.	0	153	254	253	252	168	145	14	0
Accelerates of Sec. IV.	0	142	358	272	268	100	68	18	0

The general tendency is alike in both groups, as witness their distribution curves. The dotted line gives the distribution for the 613 accelerates for whom there are six or more annual records, the continuous line for the accelerates of Section II.

The fourth, fifth, and third are the grades most frequently made up, just as they are the grades most frequently repeated, thus showing that arrest in these particular grades is not due to any extra difficulty attaching to the work of these grades. These three grades furnish the greatest exposure to loss and the largest opportunity for gain. Should we not conclude that they need the services of the most skilled members of the teaching force? Many supervising officers are constantly on the alert to find artist teachers for the two lower and two upper grades, and are disposed to tolerate so much mediocrity as they must, in the third, fourth, and fifth grades. The results shown here certainly point the special folly of this policy.



The ages at which acceleration takes place, indicate the same necessity of providing the most skilled teachers for the period of high variability extending from the eighth to the eleventh year. The following are the facts:

TABLE 23
AGES AT WHICH ACCELERATION OCCURS

Age	Boys	Girls	Total
Under 6	0	0	0
6-7	9	8	17
7-8	40	38	78
8-9	81	78	159
9-10	69	66	135
10-11	55	53	108
11-12	32	31	63
12-13	22	21	43
13-14	5	4	9
14-15	1	0	1
Over 15	0	0	0
Totals	314	299	613

While the gross number of gains made indicates the ages and grades of largest opportunity for acceleration, the facts will be more clearly seen from a statement of the proportion of gainers at any particular grade or age to the whole number enrolled at each grade and age. These are shown in the two tables following. The right-hand column in Table 24 answers the question "What percentage of its due share of accelerates does each *grade* furnish?"

TABLE 24
PERCENTAGE OF ACCELERATES TO GRADE ENROLLMENT

Grade	A Percentage of Enrollment of Each Grade	B Percentage of Accelerates of Each Grade	$\frac{A}{B}$ Ratio of Frequency of Accelerates to Frequency of Enrollment in Each Grade
I	13.6	.0	.0
II	12.7	12.4	.97
III	12.1	27.9	2.30
IV	12.2	23.3	1.91
V	12.3	23.3	1.91
VI	11.0	6.8	.62
VII	10.0	5.3	.53
VIII	8.4	1.3	.15
IX	7.3	.0	.0

Grade three produces practically two and one-third times its due share of accelerates; grades four and five nearly double their respective shares; while grade two falls only slightly below its due proportion.

The right-hand column of Table 25 answers the question "What percentage of its due share of accelerates does each *age* furnish?"

TABLE 25
PERCENTAGE OF ACCELERATES TO AGE ENROLLMENT

Age	A Percentage of Enrollment of Each Age	B Percentage of Accelerates of Each Age	$\frac{A}{B}$ Ratio of Frequency of Accelerates to Frequency of Enrollment at Each Age
6	12.1	2.7	.22
7	10.9	12.7	1.16
8	10.7	26.0	2.43
9	11.4	22.0	1.93
10	11.3	16.6	1.46
11	11.6	10.2	.88
12	10.7	7.0	.65
13	10.9	1.4	.13
14	7.3	.16	.02
15	2.1	.0	.00

Children eight years of age furnish nearly two and one-half times their due share of gainers. Children nine years of age have nearly double their due share; at ten years they have nearly one and one-half times their share. The seven-year-olds too have more than their share.

Turning next to examine the amount of interference with regular attendance on the part of accelerates, it was found at every grade to be less than that of the repeaters. (See p. 20 ff and Table 15.) The average amount of time lost each year for six years by these accelerates varies in the different grades from 8.5 days to 10.75 days. The pupils who skipped the fifth grade for example had an average absence of 8.5 days each year for six years, while those who skipped the second grade lost on an average 10.75 days per year for six years. The figures for all are as follows:

GAINERS OF GRADE

II
III
IV
V
VI
VII
VIII

LOST ANNUALLY

10.75 days
" "
9.35 "
9.50 "
8.50 "
10.70 "
10.15 "
9.20 "

Two other items of interference with steady attendance of accelerates appear in Table 26. In every 100 pupils who gained a grade, the number absent 20 days (i.e., 4 weeks) or more in the year of acceleration, and the number changing schools in the year just before the acceleration are the facts shown.

TABLE 26

OF ONE HUNDRED GAINERS OF GRADE	NUMBER LOSING 20 DAYS OR MORE	NUMBER CHANGING SCHOOLS
II	12	24
III	15	25
IV	10	14
V	9	20
VI	7	23
VII	6	9
VIII	0	0

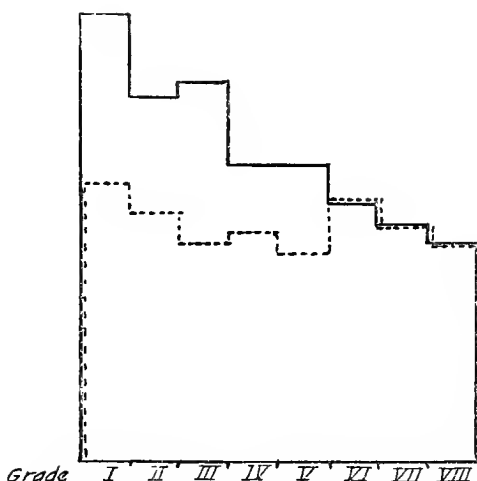
The total loss of time for accelerates is almost 21 per cent less than for repeaters. But the interference is greater than this indicates; for while an average of only 8 per cent of the accelerates in all grades lose four weeks or more in the year prior to their gain, the records of the arrests show that on an average 22 per cent of their number sustain this loss of time. That is, the large loss in a single year is nearly three times as frequent among the repeaters as among the accelerates.

In the matter of change of schools too, the showing is equally favorable to the accelerates. On an average only 14 per cent of them change residence in the year prior to their gain; but on an average more than 40 per cent of the repeaters make such change in the year prior to arrest.

The marked difference in regularity of attendance is more clearly brought out in the curve on following page. The continuous line shows the average number of days' absence of the repeaters, the broken line that of the accelerates.

Repeaters, as a whole, lose 26 per cent more time than accelerates; but in the first five grades, in which nearly three-fourths of all the losses occur, they lose nearly 40 per cent more time than the accelerates.

To throw further light on the question of the maximum loss of time consistent with satisfactory progress through the grades the records of 3,623 other candidacies for promotion were



Comparison of Regularity of Attendance Between Accelerates and Repeaters

examined. These were the records for the whole period of the study of all *accelerates* who had in any one year lost twenty days or more. They were only 353 in number, or less than ten per cent of all the cases. The following is their showing:

No. of Days Lost.....	20	25	30	35	40	45	50	or more	
No. of Cases of Each Loss...	116	71	58	31	27	13	37	Total	353

In all these 353 cases the pupils were able to earn promotion despite the large losses of time. In fact 296 of them were with candidates for a double promotion in the year of the large loss. They failed in this design but *were* able to earn the regular promotion.

For 126 different pupils who earned two *double promotions*, there were records of 637 annual candidacies for promotion. Only 16 of these, or less than three per cent, were marked by losses of twenty days or more.

They were distributed as follows:

Losing 20 days.....	9 cases
“ 25 “.....	3 “
“ 30 “.....	2 “
“ 35 “.....	2 “
“ 40 “.....	1 “

Desiring to know more definitely how far the loss of 20 or more days in any one year operated to *insure* arrest, the records of 3,952 annual promotions of pupils who were at any time included among the *arrests* were studied. It was found that there were among these 608 cases of loss of 20 or more days. That is, almost *fifteen and one-half* per cent of all candidacies for promotion in this group, were marked by a record of loss not smaller than 20 days in the year of arrest. How often does each length of absence result in arrest? The facts are as follows:

TABLE 27

NO. OF DAYS LOST	NO. OF CASES OF EACH LOSS	NO. OF THESE CASES ARRESTED	PER CENT ARRESTED	NO. OF THOSE EARNING PROMOTION	PER CENT PROMOTED
20-24	148	59	40	89	60
25-29	83	33	40	50	60
30-34	67	28	42	39	58
35-39	47	17	36	30	64
40-44	31	14	45	17	55
45-49	23	6	27	17	73
50 or more	209	152	73	57	27

Examination of the records of 3,000 candidacies for promotion among the *normals* revealed 445 cases of loss of twenty days or more. That is, one pupil in seven sustained such loss and yet maintained the normal rate of progress. The distribution of these losses was as follows:

No Days Lost.....	20	25	30	35	40	45	50 or more	
No Cases of Each Loss.....	151	79	59	41	34	21	60	Total 445

These results prompted the examination of the records of all arrests who had lost less time than twenty days in any year of the course with a view to discovering just what happened after each of the smaller losses. This involved going through 2,448 candidacies for promotion of which 407 were unsuccessful; that is one pupil in six among those with creditable attendance records failed of promotion. The distribution of these losses and parallel failures was as follows:

No. Days Lost.....	0	5	10	15
No. Cases of Each Loss.....	803	794	529	322
No. Losers Arrested.....	117	120	94	76

Assembling the figures for the whole 8,400 cases involved in these three groups, we may answer the inquiry "What is the chance of failure each year with perfect attendance? 5 days absence? 10 days absence? 15 days absence? 20 days absence? And so on."

TABLE 28

NO. DAYS LOST	NO. OF CASES	NO. OF ARRESTS IN THE YEAR OF LOSS	PER CENT OF ARRESTS FOR YEAR OF LOSS
0	803	117	14
5	794	120	15
10	529	94	17
15	322	76	23
20	524	210	40
25	236	112	48
30	186	87	47
35	121	58	48
40	93	48	51
45	57	27	48
50 or more	296	212	72

More than three-fourths of all pupils are not hindered by absence of less than one month; when the absence reaches 20 days, only 60 per cent can triumph over it. Losses varying from one to two months stay the progress of only 50 per cent. But when the loss amounts to fifty days or more, nearly three-fourths of all pupils sustaining such loss fail of promotion.

In point of vision the accelerates far outrank the repeaters. The ground-gaining pupils show the following percentages in each grade with defective eyes:

GRADE	II	III	IV	V	VI	VII	VIII
Per Cent Defective Eyes . .	14	15	20	14	11	9	2

There is an average of about 14 per cent with this defect among accelerates, while we have already seen that among the arrests the average is 32 per cent; that is, nearly two and one-half times as many bad eyes are found among repeaters as among gainers.

In the matter of possible advantage from having the English language as mother tongue, the study discloses that on an average fewer than *seventeen* per cent of the accelerates are children of non-English speaking races, while we have heretofore seen that practically forty per cent of the arrests are such. The figures for the ground gainers are as follows:

GRADE.....	II	III	IV	V	VI	VII	VIII
Percentage of non-English Speaking Races.....	24	25	14	20	23	9	2

The department records of the accelerates are better than those of the repeaters. Of all the ground-gaining pupils 66 per cent get a ranking of 90 to 100 as against 39 per cent of the repeaters. But on the other hand only 1 per cent get the D ranking of 60 to 70 as against 6 per cent of the arrests. The full distribution of department ranking is as follows:

RANKING	PERCENTAGE RECEIVING	
	ACCELERATES	ARRESTS
90-100	66	39
80-90	28	34
70-80	5	21
60-70	1	6

In testing the question: "How far does good conduct, acceptable behavior, what the school marks under the heading department, bear upon the freeing of progress through the grades?" the 3,279 pupils were examined in further subdivisions. The arrests were divided into two groups, those who had been compelled to repeat two grades and those who had lost but a single year. The first appear in the subjoined table as Double Arrests and Single Arrests. Similar division of the Gainers give us the Double Accelerates and Single Accelerates. These with the Normals and Honor Pupils are the six classes represented in the table which shows the percentage of each group receiving each of the four department rankings, A, B, C, D. The A group are those whose department ranking is from 90 to 100; the B group those ranking 80 to 90; the C group, 70 to 80;

the D group, 60 to 70. The number receiving E or F was so very small as to be practically negligible and was omitted from the comparison. The following are the records:

TABLE 29
COMPARISON OF DEPARTMENT RANKINGS
Percentages of Each Receiving the Different Standings

Ranking	Double Arrests	Single Arrests	Normals	Single Accelerates	Double Accelerates	Honor Pupils
90-100	37	39	36	66	70	53.4
80-90	35	34	46	28	16	39.6
70-80	22	21	16	5	11	9
60-70	6	6	2	1	3	0
Average	85.3	85.6	86.5	90.9	90.3	91.8

The absence of the two lower gradings does not mean that they were not frequently given; but pupils receiving these very low rankings, which indicate that the pupil is completely out of harmony with the purposes and activities of the school, are not found in the groups that stay in school for six or more years. While Normals stand higher than Arrests, Accelerates higher than Normals, and Honor pupils, the highest of all, the difference is not great. Whether high department rankings mark the condition in which success in study is achieved, or whether high rank in study achieves the condition in which good grades in department are received, is not here disclosed. Probably both things are true. But in any event it is doubtless true, other things being equal, that improving department tends to free progress and improve scholarship. The significance of the grades for department is investigated further in the Appendix, p. 70 ff.

Advocates of hard and fast uniformity in progress through the grades, often urge that it is unwise to provide for acceleration as it results in lowering the standard of performance in subsequent grades. We have already seen that 92 per cent of all who make a double promotion succeed in holding the year gain. The exact effect on subsequent scholarship of passing or skipping any particular grade was determined by comparing the rankings obtained in each year after skipping, with those of the two years before the double promotion. In the case of those pupils who passed from grade one to grade three the comparison was made with the standing in grade one, the only available basis. The records of pupils skipping grades two, three, four, five, and six were thus studied. It will be borne in mind that as a rule all these accelerates earn an A standing in the year preceding a double promotion. Accordingly few, if any, can do better afterwards. The question is, How many fall one or more full grades lower in ranking in subsequent years? For all those who skip grade two the following are the average results:

They rank .9 of one point lower in grade three, more than one-third of all doing just as well as before. In grade four they are .7 of a point lower, and nearly one-half show no loss. In grade five they are .5 of a point lower, fully one-half showing no loss. In grade six the average loss is .3 of a point, more than one-half showing no loss. In grade seven the average loss is only .23 of one point and sixty per cent show no loss. In grade eight, the average loss is only .11 of one point and sixty per cent of all maintain the same high standard as before. The following table and graph show these results.

TABLE 30
EFFECT ON SUBSEQUENT SCHOLARSHIP OF SKIPPING GRADE TWO

Average Number of Points Lower	In Grade	Percentage Showing No Loss
.9	3	34
.7	4	49
.5	5	50
.3	6	52
.23	7	60
.11	8	60

Tables 31 to 34 and accompanying graphs are the exhibits for the remaining grades.

TABLE 31
EFFECT ON SUBSEQUENT SCHOLARSHIP OF SKIPPING GRADE THREE

Average Number of Points Lower	In Grade	Percentage Showing No Loss	Percentage Showing Gain
1.1	4	26	8
.9	5	32	10
.6	6	39	11
.4	7	40	20
.3	8	41	20

TABLE 32
EFFECT ON SUBSEQUENT SCHOLARSHIP OF SKIPPING GRADE FOUR

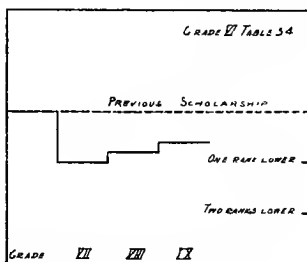
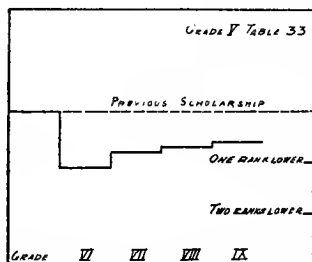
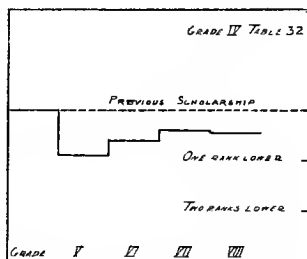
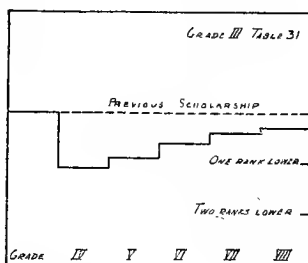
Average Number of Points Lower	In Grade	Percentage Showing No Loss	Percentage Showing Gain
.9	5	26	8
.66	6	40	10
.4	7	39	16
.43	8	50	13

TABLE 33
EFFECT ON SUBSEQUENT SCHOLARSHIP OF SKIPPING GRADE FIVE

Average Number of Points Lower	In Grade	Percentage Showing No Loss	Percentage Showing Gain
1.1	6	34	0
.8	7	46	2
.7	8	47	3
.6	9	59	1

TABLE 34
EFFECT ON SUBSEQUENT SCHOLARSHIP OF SKIPPING GRADE SIX

Average Number of Points Lower	In Grade	Percentage Showing No Loss	Percentage Showing Gain
1.0	7	45	0
.8	8	51	0
.6	9	53	0



CHANGES IN SCHOLARSHIP AFTER SKIPPING A GRADE

V

COMPARISON OF 606 NORMAL PACE PUPILS WITH ACCELERATES AND ARRESTS

The records of the pupils who neither gain nor lose time during the grammar school course furnish a means for verifying the conclusions reached from our study of the two extreme cases.

TABLE 35
ENTRANCE AGES—PERCENTAGE OF EACH GROUP IN EACH AGE

Age	Arrests	Normals	Accelerates	131 Honor Pupils
Under 5 yrs.	2.5	2.3	.6	.6
5-5½ yrs.	3.4	3.4	1.7	.8
5½-6 "	21.0	30.0	18.0	31.6
6-6½ "	31.4	37.1	37.5	38.0
6½-7 "	20.0	19.0	23.8	20.0
7-7½ "	10.0	4.0	8.4	7.0
7½-8 "	6.0	2.6	5.0	1.0
8 yrs. or over	5.4	1.6	4.5	1.0

It will be noticed that the entrants under 5½ years of age furnish 5.9 per cent of the arrests, 5.7 per cent of the normal paced, 2.3 per cent of the accelerates, and only 1.4 per cent of the honor pupils. We have seen heretofore that 15 per cent of all entrants began grade one between 7 and 8 years of age; but they get only 8 per cent or little more than half their share of the honors. Of all entrants nearly 5 per cent were over 8 years of age at entrance to grade one, and they win only 1 per cent or one-fifth of their share of the honors.

The average number of weeks lost by each pupil of these same four groups for six years still further forces the con-

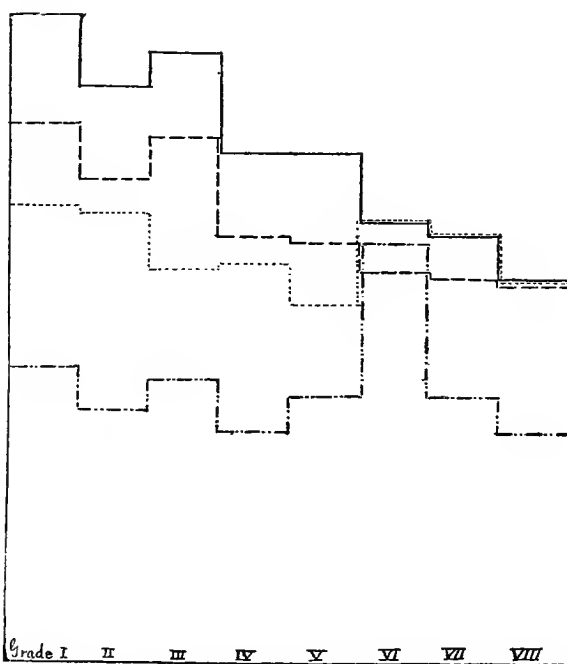
clusion that less acceleration is due to good teaching, and less arrest to poor teaching than is commonly supposed. Pupils who repeat two grades lose on an average 15.70 days per year for six years; repeaters of one grade, 12.25 days per year; normals, 10.20 days; accelerates, 9.75 days; honor pupils, 6.80 days. From grade two to eight inclusive the comparative record of average loss is shown in Table 36. These facts, together with similar facts for grade I, are shown graphically in the curves on page 49.

TABLE 36
AVERAGE ANNUAL LOSS IN DAYS FOR SIX YEARS

Grade	Arrests	Normals	Accelerates	Honor Pupils
II	13.70	11.50	10.75	6.05
III	14.50	12.55	9.35	6.80
IV	12.20	10.20	9.50	5.00
V	12.20	10.05	8.50	6.40
VI	10.50	9.40	10.45	10.25
VII	10.20	9.20	10.15	6.35
VIII	9.25	8.95	9.20	6.40

Repeaters as a whole lose 26 per cent more time than the accelerates. In the first five grades (1 to 5) in which nearly three-fourths of all the arrests occur, the repeaters lose 43 per cent more time than the gainers. The difference in weeks if spread evenly through all six years would mean an average difference between the extreme classes of less than two weeks per year; but this is not the way the absence is distributed. It is massed in a few years for nearly all individuals. This will be better appreciated by looking at the comparison of the proportions from each losing four or more weeks in a single year. The facts are given in Table 37.

The double arrests, or pupils losing two different years during their course, show in general about one and one-half times as many of the large time losses as the single arrests. The double accelerates show only about five-ninths as many as the single accelerates.



COMPARISON OF TOTAL AVERAGE TIME LOST BY ARRESTS, NORMALS, ACCELERATES, AND HONOR PUPILS

Arrests —————
 Normals - - - - -
 Accelerates - . - . - .
 Honor

TABLE 37

PERCENTAGE OF STUDENTS OF EACH CLASS (ARRESTS, NORMALS, ETC.) IN EACH GRADE WHO WERE, DURING THE YEAR IN QUESTION, ABSENT 20 DAYS OR MORE

Grade	Arrests	Normals	Accelerates	Honor Pupils
II	34	24	12	8
III	36	31	15	9
VI	20	17	10	6
V	19	16	9	5
VI	16	14	7	5
VII	10	9	6	4
VIII	23	18	3	0

The first line of the table reads "Of every hundred pupils arrested in grade two, 34 lose four weeks or more in the year of arrest; of every hundred normals in the second grade 24 sustain such loss; while among the accelerates of this grade only 12 per cent lose as much as 20 days in the year of acceleration; of each hundred honor pupils, 8 lose 20 days or more in the second grade."

Comparison of eyesight of Normals, Arrests, and Accelerates is made in Table 38. The figures in each column show the percentage of each class having defective eyes:

TABLE 38

COMPARATIVE DEFECTS OF VISION

Grade	Arrests	Normals	Accelerates	Honor Pupils
I	36	26		
II	30	28	14	
III	39	30	15	
IV	40	31	20	
V	37	27	14	
VI	40	26	11	
VII	24	18	9	
VIII	19	16	2	
IX	16	12		16

The honor roll pupils are the ten with highest scholarship standings in each of thirteen graduating classes coming from seven ninth grades one year and from six the other. They include 63 boys and 68 girls. Of these 12 boys and 10 girls have defective eyes.

42 per cent of the double arrests have defective eyes
 32 " " " arrests " " "
 25 " " " normals " " "
 14 " " " accelerates " " "

Two other contrasts between acceleration and arrest should be noticed. They are the comparative productiveness of either of these conditions by each age and grade. What percentage of its due share of acceleration and arrest does each grade produce? Assembling the data given heretofore on pages 20 and 36, we have the following answer:

TABLE 39
 COMPARATIVE FECUNDITY OF ACCELERATION AND ARREST FOR EACH GRADE

GRADE.....	I	II	III	IV	V	VI	VII	VIII	IX
Percentage of Due Share of Acceleration.....		.97	<u>2.30</u>	<u>1.91</u>	<u>1.91</u>	.62	.53	.15	
Percentage of Due Share of Arrest.....	.98	.75	<u>1.10</u>	<u>1.40</u>	<u>1.25</u>	1.01	.79	.94	.54

Similarly we have (from pages 19 and 37) the answer to the question: What percentage of its due share of acceleration and arrest does each age disclose?

TABLE 40
 COMPARATIVE FECUNDITY OF ACCELERATION AND ARREST FOR EACH AGE

AGE...	6	7	8	9	10	11	12	13	14	15	16	17
Percentage Due Share of Acceleration.....	.22	<u>1.16</u>	<u>2.43</u>	<u>1.93</u>	<u>1.46</u>	.88	.65	1.28	.21			
Percentage of Due Share of Arrest...	.57	.79	.80	<u>1.19</u>	<u>1.40</u>	.94	1.08	.91	1.01	<u>1.95</u>	<u>3.33</u>	<u>3.75</u>

Table 40 discloses a marked element of agreement with Table 39. It emphasizes the variability of the period at or just before the middle of the common school course. The third, fourth, and fifth grades present the exceptionally large share of both accelerates and arrests. So too the ninth and tenth years of age produce an undue share of both. Three grades just before and at the middle of the course and two ages just before the middle of the course mark the period of extreme variability.

But Table 40 shows an undue proportion of accelerates as young as seven years and eight years of age. As the other end of the age line, in the year 15, 16, and 17, is found a very high proportion of arrests. The former, the six-year-old and seven-year-old accelerates, are the ready able pupils who enter young and disclose their nature and capacity just as soon as they master the first processes of the school. The latter are the pupils of low or slow mentality who enter late and are kept in school because they are not the kind for whom there is any special call in the business and industrial world.

As a test of the representative character of these results a similar comparison was made of the production or disclosure of acceleration between the 613 accelerates represented in Tables 23 and 24, and the 1,239 accelerates of Section II. The following are the results:

TABLE 41
COMPARISON OF DUE SHARE OF ACCELERATION IN EACH GRADE
FOR THE 1,239 ACCELERATES OF SECTION II AND THE
613 OF SECTION III

GRADES.....	I	II	III	IV	V	VI	VII	VIII	IX
Percentage of Due Share for the 1,239.....	0	97	170	168	168	74	64	13	0
Percentage of Due Share for the 613.....	0	97.6	230	191	191	62	53	15	0

The showings for grades one, two, eight, and nine are practically identical. The results for grades three, four, and five in both groups agree in disclosing these three grades as especially prolific of acceleration. The fact that the proportion of gainers in grades six and seven is larger among the 1,239 comprising all the accelerates for three years without regard to the number

of years they have been in the system, than for the 613 who had been more than six years in the system, is readily explained. Many of the first group came to these schools from cities or countries where no especial provision was made for the ready or gifted group. They were often over-age for the grades they were able to enter. They made gains in grades six and seven, which with earlier provision for free progress they *would have made* in the earlier grades.

The possible influence of the *non-English speaking home* on the make-up of the four groups is shown in

TABLE 42
 PERCENTAGE OF ARRESTS, ACCELERATES, NORMALS, AND HONOR PUPILS WHO ARE CHILDREN OF NON-ENGLISH SPEAKING RACES

GRADE.....	I	II	III	VI	V	VI	VII	VIII	IX	Aver.
Arrests.....	52	50	42	49	41	27	43	28	21	41.5
Normals.....	24	29	30	32	32	24	28	29	19	27.5
Accelerates.....		24	25	14	20	23	9	2		17.5
Honor pupils.....										27.0

To test mathematically the correlation of deportment and scholarship, a random drawing of the records of twenty double arrests, two hundred single arrests, two hundred normals, two hundred single accelerates, and twenty double accelerates was made, to secure a group representative in number and distribution of the whole group. A complete set of correlation tables was prepared and the coefficients of correlation calculated on the basis of the formula, $R = \text{Cos. } \pi U$. For the use of readers interested in mental measurements and familiar with the mathematics of correlation all these tables and the diagrams illustrative of the source are printed in the Appendix to this study.

In examining the tables and graphs illustrating the variation in scholarship after skipping a grade, several things should be kept in mind. First, almost all accelerates have A and B rankings in the two years preceding the double promotion. This is the evidence that warrants candidacy for acceleration. Second, A, B, or C rankings are all creditable standings. Third, A is an undistributed maximum. Fourth, for double promotion a

grade of A is usually required. This being the case, a pupil may almost never be able to surpass after acceleration his standing in the last grade before acceleration. Fifth, to finish the course in seven years with a C standing may be a better performance than to do it in eight years with a B standing or to do it in nine years with an A ranking. Therefore the tendency of accelerates as a class rarely to drop more than one full rank lower and after two years to very nearly or quite regain the maximum standing, is noteworthy. It is almost the exact reverse of the history made by the arrests. The influence on standing of either skipping or repeating a grade is temporary.

In summarizing this section then, it may be pointed out that the normals are not only the middle class in point of the success with which they meet the duties, tasks, and difficulties of the conventional program of city schools; but they are, as a class, in the middle position so far as physical and economic condition is concerned. This will be more clearly seen from the following assembly of the chief points of comparison.

TABLE 43
COMPARISON OF THE NORMALS WITH THE OTHER CLASSES
In Per Cents

	Arrests	Normals	Accelerates	Honors
Median age at entrance to Grade 1	6.2	6.2	6.4	6.2
Per cent entering under 5½ yrs. old	5.9	5.7	2.3	1.4
Per cent entering over 7½ yrs. old	11.4	4.2	9.5	2.0
Average annual loss in days.....	12.3	10.2	9.7	6.8
Per cent losing 4 wks. or more in some one year.....	76.6	68.4	66.6	45.3
Per cent with defective eyes.....	32.	25.	14.	16.
Per cent changing schools in the year in question.....	40.	26.	14.	0.
Per cent from non-English speaking homes.....	40.	27.5	17.	27.
Average department ranking for 6 years.....	86.	86.6	92.	93.
Per cent of each class in the system	24.	46.	30.	

VI

STUDY OF 131 HONOR PUPILS

Some special observations of the records of the honor pupils will help us to understand better the character of the accelerates. The honor pupils are the ten with highest scholarship records in each graduating class or department. Each department represents in the years under consideration about 40 pupils, rarely including 45, and is comprised on the average of about equal numbers of boys and girls. These are in ability, then, the top quarter of the graduates of the school. They include a large proportion of the pupils who win honors in high school, normal, and other technical school and college. It will accordingly be illuminating to discover how they compare with accelerates in general.

The thirteen honor rolls included 131 pupils, there being one tie for tenth place in one of the departments. Of these, 68 were girls and 63 boys. They were distributed among the groups that have been considered as follows:

TABLE 44

Triple Accelerates.....	2	girls and	2	boys
Double Accelerates.....	12	"	"	10
Single Accelerates.....	33	"	"	27
Total Number of Accelerates.....	47	"	"	39
Total Number of Normals.....	19	"	"	24
Arrests.....	2	"	"	0
Double Arrests.....	0	"	"	0

Two honor girls suffered arrest in the fourth and seventh grades respectively, owing to protracted illness compelling each to lose the major fraction of an entire school year. The girl who was arrested in the seventh grade had theretofore been a high rank pupil having become an accelerate at the close of her third year in school.

While accelerate graduates as a whole complete the nine-year course in 7.9 years, the honor pupils use 8.1 years. Among the

honor pupils are four who complete the work in 6 years, twenty-two who complete it in 7 years, and sixty who complete it in 8 years. Only forty-four take 9 full years, and but one takes 10 years. The average age at graduation for all graduating accelerates is 13.9 years and for honor roll accelerates it is 13.8 years.

Not only do the accelerates save time, but they maintain, despite their shorter opportunity, higher scholarship ranking than those who take from one year to three years longer to complete the same work. Comprising considerably less than one-third of the pupils, they still win nearly two-thirds of the honors.

Their high stand as a rule is maintained despite the fact that 45 per cent of them lose more than four weeks' time during some one year. They are more resistant to disease than either of the other groups, and have fewer illnesses to keep them from school for protracted periods. When illness does come, they are able on their return to school to regain the lost time and ground. Free opportunity and special help to exercise their own native powers enable them to maintain themselves in the position to which they were born, and which the home and the school have helped them to value. It will be noted that these pupils do not change school within one year before entrance on the last grade of the grammar school course.

The non-English speaking homes win 27 per cent of these honor places. We have seen heretofore that these have but 17 per cent of all the accelerates. But they have 27.5 of the normals. It seems clear that the farther these pupils go, the more completely they overcome the linguistic handicap. Remembering that accelerates are high grade pupils, and that honors are the highest grade pupils, these figures may be interpreted as follows:

The non-English speaking homes with only 17 per cent of the high grade pupils are to be credited when the end of the course is reached, with 27 per cent of the highest grade pupils. Is it because they value such distinction more, and accordingly work the harder to secure it? Is it because they respond more constantly to the growing demands of the school? Is it in part because of the absence of reluctance (so often expressed in

American homes) to let the girls try the extra work suggested by the school? Whatever the cause, the facts are worth considering.

The condition of the eyes of honor pupils, while superior to that of normals and still more so to that of arrests, is shown (see Table 43, p. 54) to be somewhat worse than that of accelerates in general. The latter have only 14 per cent with defective eyes while 16 per cent of the honor pupils show such defects. The difference is slight but it is worth marking. The visual deficiencies of these pupils are not only greater than those of accelerates in general, but greater than those of normals in the ninth grade and exactly the same as normals in the eighth grade and arrests in the ninth grade. Of course it will be recognized that the improved visual showing in every class each year after the sixth grade is passed may be due to elimination. After reaching the age and grade where the compulsory education statutes cease to operate, it may well happen that the visual defectives are an undue proportion of those who leave school.

The disturbing element is that while the quantity of such defect is not high, it is nevertheless higher than that of accelerates in general and much higher than that among accelerates of the seventh and eighth grades (9 per cent and 2 per cent). Is there anything in the work of the eighth grade to stimulate this condition or is it incident to the beginning of adolescence?

VII

CONCLUSIONS

Potential accelerates are present in our schools in very large numbers, comprising from one-fourth to one-third of all pupils above the first grade. The average accelerate, under favorable conditions, has the capacity to gain from one year in seven to two years in nine of the traditional city school course. The number of such pupils is so considerable as to demand that special provision be made in every school system for freeing their progress through the schools. This service, whether it is to be rendered by special teachers or special classes and in a differentiated curriculum, is too important for society to neglect. While protection against the subnormal is important, and genuine training for the rank and file is imperative under any form of government, the proper care and culture of the element that is to furnish leadership in all our activities is the most important educational function of a democracy.

The experience under consideration shows that under the conditions described the middle grades of our schools are places of large opportunity for giving the superior pupil a chance to work up to the healthful limit of his better powers. Less than this is not education in the true sense. The median point of opportunity for all accelerates is the fourth grade. For those who go on to the end of the grammar school course the median is found in the sixth grade and the mode in the seventh. In a free organization the better pupils gather headway as they proceed. The more they accomplish the more they are still able to accomplish. Of all those who gain grades, more than nine-tenths hold the ground they gain. The few that subsequently lose are so distributed as to assure that there is no grade from the second to the seventh that is necessarily unfavorable to acceleration.

More boys than girls are found in the ranks of the accelerates. The former are 32 per cent more numerous when all are considered and 86 per cent more numerous when only those who go on to the completion of the grammar school course are considered. (See Tables 4 and 6.) This difference is in part doubtless due to three causes: (1) the greater readiness with which the conventional arrangements of the fixed school organization are accepted by girls, and for girls by their parents; (2) the greater solicitude for the health of the girls, causing parents and teachers alike to hesitate about permitting them to do the extra work; (3) the stronger call which colleges, careers, professions, business and economic pressure make on the capable boy. All girls who make gains maintain them as well or better than the boys.

The age of entrance to school has a definite bearing on the chances for acceleration. The average entrance age for pupils thus successful is 5.9 years; the median, 6.3 years. These pupils graduate from the grammar schools at an average age of 13.9 years, with a median of 14.3 years. More than 67 per cent graduate before or during their fourteenth year. Too early entry is not favorable to acceleration. Of entrants to grade one who are under five years of age only one in nine ever gains a grade. One in every six entrants between 5 and 5½ years old makes such gain; between 5½ and 6 years, one in every four; and over 6 years, one in every three gains a year at some time during the course.

There are three ages especially favorable to acceleration. The eight-year-olds win nearly two and one-half times their due share of the double promotions; the nine-year-olds, nearly twice their share; the ten-year-olds, nearly one and one-half times their share.

Similarly three grades are especially fecund of acceleration. The third grade has two and one-third times its due share; the fourth and fifth each nearly twice its share.

Accelerates seem to be found in families. This experience disclosed 6.8 per cent of the families producing 24 per cent of the accelerates. Blood and family tradition prompted many of these just as the discovery and inspiration of the teacher incited others.

Accelerates incur less absence on the whole than other pupils; but this difference is not nearly so large as commonly sup-

posed. They are fortunate, however, in one bearing of their attendance. They are the pupils of higher physical resistance, or better nurture, or both; and avoid a part of the prolonged absence caused by the contagious diseases of childhood. The larger avoidance of absences of much more than four weeks in a single year, is one of the characteristics of the accelerate class.

The possible injurious effect of acceleration on subsequent scholarship is often suggested and not infrequently declared. The facts seem to furnish little or no warrant for the suggestion or assumption. Not only do accelerates as a rule maintain their ground but they maintain high scholarship. When it is remembered that double promotion is won by securing a scholarship standing somewhere in the undistributed maximum of the grade, it would not be strange if accelerates dropped at least two full ranks in scholarship in the year immediately subsequent to acceleration. The fact is that accelerates as a class never drop two ranks and rarely one, and that each succeeding year sees their steady climb back toward the maximum scholarship ranking. Some gain a second, and some a third double promotion. Many teachers are especially anxious to have the pupils who have just earned a double promotion assigned to their rooms. To them the liberated child is more promising and interesting than the regular who has spent the prescribed time in every grade.

Arrests are present in all schools having a uniform course of study, no matter how free the organization, nor how efficient and numerous the agencies for prevention of arrest. The experience studied showed that 24.9 per cent of all the pupils enrolled in grades one to nine were repeaters at some time in their school course and that 29.6 per cent of all pupils enrolled between grades one and nine were accelerates at some place in the course. The provision for special care of the less gifted or less fortunate, of the enforced absentees after their return, of those of low or slow mentality, undoubtedly kept the number of arrests nearer the possible minimum than is ordinarily done. It is probable that ordinarily between one-fourth and one-third of all pupils enrolled become arrests, at some time in their school course. Much of this is inevitable and possibly unavoidable under any plan of procedure. Nature and uncontrollable

environment determine it; but so far as it is avoidable waste of human endeavor and human life, it ought to be prevented by special classes, special teachers, special curricula, by any or all of these agencies and others.

In this connection it is well to note that the large spread of the ages in any one grade so often complained about can never be removed or much reduced until provision is made for saving arrest and promoting acceleration. If a few pupils five years old and a few eight years old are found along with the six-year-olds and the seven-year-olds of every hundred first grade pupils, the age distribution of grade one may run something like this:

Age.....	5 yrs.	6 yrs.	7 yrs.	8 yrs.
Number of Pupils.....	17	58	19	6

Suppose three of these five-year-old entrants gain a year, and only two of the eight-year-old entrants lose a year on the way to grade five, a very easy piece of history to duplicate in many places. Then the distribution in grade five becomes:

Age.....	8 yrs.	9 yrs.	10 yrs.	11 yrs.	12 yrs.	13 yrs.
Number of Pupils.	3	15	57	18	5	2

The spread of the ages has gone from four years in grade one to six years in grade five. Had a few bright healthy youngsters under five and a few unfortunate nine-year-olds of low mentality been added to the extremes of first grade enrollment, the same experience would have given us a spread of seven or eight years in grades four and five.

Mere spread of ages like over-ageness is not, in and of itself, any evidence that the school is derelict in its treatment of pupils or stupid in its organization. The spread of seven years in grade two, which has without undue elimination or arrest been reduced to five years in grade six, may be the best evidence that the school is meeting and understanding its children and helping them to find themselves. The fact that two eight-year-olds and two nine-year-olds appear on a given first grade roll is not in itself any suggestion of a poor school. Two may be worthy representatives of the best blood and brains in town, from homes with positive, even if not the wisest, notions about starting children to school. Two may only last month have arrived from a section of Russia without any facilities for education. If the

school holds these boys and gets them to high school at fifteen or to college at nineteen there is much to comfort the school-master and nothing of discredit to the school. These four may have been retardations, but they were never arrests. Blindness to the facts of a certain measure of necessary and unavoidable over-ageness and also of arrest, was the occasion of the historic commotion that met the first studies of retardation and elimination.

Arrest is most likely to follow too early or too late entrance to school. Fifty per cent of all children who enter grade one before the age of five years, meet arrest at some place in the course; likewise 46 per cent of those entering between seven and seven and one-half years; and 49 per cent of all entrants over seven and one-half years, become arrests.

Certain ages are particularly marked by arrest. Pupils, who do not graduate at or before the age of fifteen years, are most likely to meet arrest. Fifteen-year-olds have nearly twice their proportionate share of repeaters; sixteen-year-olds, three and one-third times their share; and seventeen-year-olds, three and three-fourths times their due share. But these three ages constitute only a small part of all enrollments. Between the ages of five and fifteen where nearly all the pupils are found, the years of especial liability to arrest are the ninth, tenth, eleventh, and twelfth.

So, too, grades three, four, and five are particularly productive of arrest, just as they were particularly productive of acceleration. These three grades presenting the extremes of variability as they do, would seem to need the most skilled and sympathetic teachers possessed of clear vision of the nature of the special problem these grades present, and constant in the endeavor to solve the riddle and serve the child.

Just as more boys than girls were found among the accelerates, so, too, more boys than girls fail of promotion and are required to repeat grades.

Prolonged absence from school is an appreciable factor in producing arrest especially when it amounts to more than twenty-five days in one school year. Up to twenty-five days, 60 per cent of the absentees on their return make up for the lost time and maintain their grade. With from 25 to 45 days of absence, there is still left one chance in two for avoiding arrest. Just

as many of these absentees succeed in keeping the pace, as fail and fall behind. When the absence rises to fifty days or more, there is only one chance in four to avoid arrest.

Seventy-six per cent of all arrests lose four weeks or more some one year in seven. Sixty-eight per cent of all normals, and sixty-six per cent of all accelerates sustain such large loss, which is almost invariably the result of illness and most frequently that of contagious disease. So only better municipal, school, and household sanitation can secure much abatement of this cause of arrest.

Change of school, low deportment, and poor eyes are three factors correlated with arrest. The non-English speaking home furnishes an undue proportion of the repeaters. Arrest, like acceleration, marks certain families as its own, 7.7 per cent of the families producing 24.5 per cent of the arrests. While such arrests as these are often manifestly marked by nature for the part, there are others whose repetitions we attribute to special studies.

There is a popular notion that weakness in one subject, or occasionally in two, causes the arrest. Weakness in all subjects caused 28 per cent of the failures; 16 per cent more passed in nothing but spelling. Nearly half of all the arrests therefore have utterly no adaptation to the traditional curriculum. Possibly no modified curriculum would serve at once properly to occupy and exercise these arrests and furnish respectable mental training for normals and accelerates. Mathematics occasions 13 per cent of the failures. Mathematics together with either history, geography, or grammar causes 18 per cent; and mathematics together with some two of these, causes 14 per cent more.

Repeating a grade does not result in any permanent improvement of the scholarship of the arrest. There is usually some improvement the next year after the repeating. Then comes a loss of at least half of all that had been gained; and the third year finds the arrest back to his old level of low scholarship. Of the whole number of arrests, 21 per cent do better after repeating than before; 39 per cent show no change; and 40 per cent actually do worse.

This is clearly evidence that current organization of schools fails to meet the condition of the backward children in our schools. To go at a pace to which they are unequal, even with

the help and oversight of special teachers, and then to return and spend another year on the same work with children younger and of better capacity, and for whom the subject matter has not been robbed of its interest, is not the solution of the problem.

There is every evidence that we must accept arrests and accelerates as special classes and treat them accordingly. Our current schemes of organization and treatment are inadequate because we insist that they are not special classes. They do not differ from the others in kind, but only in degree, urges the defender of the present. But a large number of those in schools for the blind differ from other children only in degree of power to see. Most differences in either human quality or human class are resolvable into differences in the quantity of some power or capacity. No one doubts that under any scheme of organization and teaching we would still have our present arrests as slow children or weak children. We would still have our accelerates as a clearly discernible gifted group. Both groups would as now merge into our present middle group of normals. This is the problem we must face. The purpose of this study may be attained if some of the conditions of the problem have been made manifest.

But there are some implications of the evidence under examination that warrant some tentative conclusions as to needed modification of current schemes if we would adjust the public school to the gifted children and to the backward children, who together constitute almost, if not more than, half the enrollment in our public schools.

Numerous attempts have been made to meet the situation. The Pueblo Plan, the Batavia Plan, the Cambridge Plan, the Denver Plan, the Baltimore Plan, and the St. Louis Plan are six of the best types of the many earnest attempts made to free progress through the grades. There is an extensive literature setting forth these and other schemes of solution, a bibliography of which appears in the appendix to this study.¹

All these attempts met with much success. They have gone as far on the road to complete success as they can without taking

¹All of these have been critically characterized by Emmet E. Giltner in a Master's thesis in Teachers College, Columbia University, in 1907.

into account two facts. First, they accept as a fixed condition of the problem one feature of current organization that forbids the best achievement, *vis.*, the unvarying uniform curriculum. Second, they ignore the fact that the backward and the gifted, the arrests and the accelerates of the study, are definite human classes, psychologically and biologically conditioned.

All attempted to free the individual in the mass, without rescuing him from the mass. All pupils were sooner or later to complete the same curriculum. The same lessons, books, topics and processes were ultimately to be mastered, each pupil being both allowed and required to work at the top of his bent and no faster. This giving the pupil his own time, whether longer or shorter, in which to do the work was a prodigious step forward. But it took no account of the pupils who could not do the prescribed standard of work in any time. They at the proper moment eliminated themselves from the situation.

It also took no account of the fact that best development comes to the superior pupil, as to others, by being kept at work equal to his power. To do comparatively easy work in the ordinary time without great effort is the way to become an intellectual saunterer. To do comparatively easy work in quick time is not the equivalent of being compelled to do one's utmost. It is the way to intellectual vainglory. Education is training for the supreme exertion, through exercise in doing one's increasing best in quality and quantity, under conditions that makes doing one's best supremely worth while. The curriculum made for the average student and administered for the average student, does not suffice for the gifted.

The demand therefore is for a differentiated curriculum involving adjustment to arrest, to normal, and to accelerate. This is to be added to the measures provided in the plans heretofore referred to. If for example these were added to the Cambridge possibility of completing the course in six, seven, eight, or nine years, the feature of a curriculum with a minimum, a mean, and a maximum requirement, one of the two conditions that have produced eliminates, arrests, saunterers, and intellectual prigs in spite of us, would have disappeared. It is just as important that some gifted pupils be not ready for the trade school or the office or the shop until sixteen as that others shall be so

ready at fourteen. It is just as important that some bright pupils shall not be ready for high school until fifteen, and not ready to leave home for college until nineteen as it is that others should be so prepared at thirteen and seventeen. This should be accomplished without marking time in the one case or overdoing in the other. Such results can not be obtained without the differentiated course of study.

But how shall the differentiated course of study be administered? Arrests, normals, and accelerates we shall have forever with us. They are born into this world, and since the public schools are for all the children of all the people, they will come into the public schools. Equality of opportunity is what we owe them. That means opportunity for a normal to do a normal's best, to make the most of himself, to some day pass into the accelerate class if perchance he belonged near the margin of that class. It means opportunity for an arrest to strive for his best self-realization through using the powers of an arrest, on exercises and processes planned for him and not for a normal.

The sympathy of professional students of teaching and school administration, is stirred and voiced for the slow child now confessedly sacrificed in our schools with uniform courses of study built for the average child. But the difficulty is not one of method alone; it calls for re-organization of the curriculum. And again let it be remembered that the greatest sacrifice is the one that rouses the least concern. The wickedest as well as the greatest retardation or arrest in our schools, is that of the accelerate who is held for eight or nine years, sauntering through the course he ought to work through in six or seven.

Think of the cruelty of current schemes for the strong gifted boy who aspires to be a physician or a surgeon. He may not enter school until six years old. The course is nine years. What matter that he could get well ready for any good secondary school in six years. He is ready at fifteen; and that means ready for college at nineteen, for medical college at twenty-three, for hospital at twenty-seven. He may therefore begin to practice his profession at twenty-nine or thirty. What wonder that under economic pressure, and the lack of adjustment of the school to the needs of the gifted, we are tempting so many superior young

men to go without the training that makes for culture and breadth of citizenship in the learned professions.

To save both these classes from the sacrifice we must recognize them as classes, biologically conditioned. At every turn the evidence in this study points to that inevitable conclusion, and it is a conclusion which may readily be verified. Then add to the provision of the differentiated curriculum intelligent handling of each class according to its needs. This means special classes, special teachers, special departments, special schemes of grading, and mayhap at some places in the path of progress special schools. In some school systems, special grading into three groups for each year, with a curriculum providing minimum, mean, and maximum outlines of work may, with a few special teachers added, solve the problem with study, devotion, and art. In others, still more of the plans enumerated may have to be pressed into service. In all, short intervals between promotions will help to free progress; but care must be taken that when the promotion unit is reduced from one year to one term, for example, it does not result in increased arrest. It is so much easier to contemplate taking three months out of a boy's life than taking a full year, that the better shorter interval needs more careful guarding and is not in itself any removal of the necessity of special teaching for the backward pupils.

In any contingency the conditions disclosed demand the study of the problem from the physiological standpoint. Already we have seen the wisdom of letting no pupil enter on an accelerate course without careful physical examination, nor continue in it, without frequent skilled testing of the question: What is that course doing to him?

We have seen that the middle ages and grades of the course for the elementary schools, indicate an area in which accelerates and arrests disclose themselves most numerous. The children in these grades need to be carefully examined, not by directors of gymnastics or teachers of calisthenics, but by physicians who know their pediatrics and are both interested and skilled in counselling the physical and nervous conservation of the sound and gifted, as well as in directing the remedial process and regime for the limited and abnormal. Such a physician must have within his field of interest, knowledge, and skill, not simply

the morbid and abnormal child, but the sound child, and the sound child at school, in the process of becoming a youth and a man. He must come with an open mind as to educational processes, realizing that in the presence of many of them, he is just as intelligent as the highly educated school teacher would be in the operating room at the hospital,—and no more. He must come to help study and solve the problems of education, discover and disclose the hygienic and biological conditions of successful learning and teaching.

Does it not also appear that the child in the class of arrests should not be permitted to continue there very long without inquiring not simply as to eyes, ears, possible limiting conditions of teeth, throat, etc., but as to mental status as well. This is a problem which the school cannot safely turn over to the medical inspector nor the average doctor, nor to the alienist. The counsel of the student of the psychology of human efficiency is urgently needed. Might we not as well frankly acknowledge that the conditions that surround arrest, are ones which we are helpless to solve without the aid of the educational psychologist. The physician knows that bodily status conditions all mental output, but he often does not recognize either the character of the processes of that output among children of low or slow mentality. We need the consulting physiological psychologist. How shall we get him?

It is easy enough to say, this provision must be added to already heavy school expenses; and it will be economy to do this if necessary. But where medical inspection is once inaugurated as soon as there arises necessity for addition to the corps of health inspectors, why not select as one, a practical psychologist, a master of the kind of psychology now beginning to be taught in the best medical schools and used in the laboratories of schools for the education of delinquents or defectives. Medical inspection is not long going to be confined to chasing down and labelling scabies or pediculosis or measles or mumps or scarlet fever. The detection and limiting of contagious diseases is a work of tremendous importance, worth very much more than the money it has cost. But the teacher must learn to assist medical inspectors and thus reduce by half, the time now required for thorough inspection so that the physician may have

time for careful physical examination of all arrests with a view to remedial and constructive measures. Such assistance of the physician by the willing and intelligent teacher may save money enough to pay the consulting and testing psychologist. However that may be, the school that aims to do its duty by its arrests will command such service.

Finally since arrest and acceleration are physiologically conditioned, the best treatment of both demands that the highest standards of hygiene shall dominate in school plant and program and general regime. Pure air must be brought in and sunshine must not be kept out. What use is a ventilating system when floors are unswept or unwashed and a janitor is abroad with a feather duster? What use are windows equal in area to one-fifth of the floor space, with a teacher who draws her shades to a parlor-like height? What use are adjustable seats and desks that are rarely or but annually adjusted? What use are play rooms or playgrounds to children kept in at recess or after school? What use is the warranted heating system that keeps things so hot that both teacher and pupils are as the complaining prophet described Israel, "a cake half-baked." How can we expect half-baked teachers to teach half-baked children whether the latter are accelerates, arrests, or normals? The physiological demands of successful treatment of these three classes call for a stricter hygienic regime in the schoolroom than is needed in any other institution for human service save possibly the modern hospital.

The solution of the problem of how to adjust our programs and policies so as to free progress through the grades for all the children of all the people, depends upon two conditions. We must look squarely at the facts that are manifest and apply to them all the truth that is known. We must scrutinize carefully and with infinite patience the elements of the problem which are not so apparent, that we may discover new truth and apply it to further clearing of the situation.

APPENDIX

The coefficient of correlation between Scholarship and Department was calculated as follows: First, a group of records, representative in both number and distribution, was obtained by random drawing of 20 double accelerates, 200 single accelerates, 200 normals, 200 single arrests, and 20 double arrests. Second, the rankings A, B, C, D, E, etc., were put in figures as 1, 2, 3, 4, 5, etc. That is, the highest or A grade of scholarship or department was represented as 1; the next lower or B grade, by 2, and so on. Third. (A.) The sum of the numerical rankings of each of these 640 pupils in Scholarship for the second, fourth, and sixth years covered by the study, (B.) the sum of the scholarship rankings for the third, fifth and seventh years of this time, (C.) the sum of the rankings in Department for the earlier three years, (D.) the sum for the later three years, (E.) the sum of the Scholarship rankings for the six years, and (F.) the sum of the Department rankings for the six years in the form of which the following are six sample lines:—

Pupil	Scholarship		Department		Scholarship	Department
	A	B	C	D	Totals E	Totals F
I	16	11	7	7	27	14
II	13	11	12	10	24	22
III	11	8	8	6	19	14
IV	8	5	7	5	13	12
V	6	8	4	3	14	7
VI	5	4	3	3	9	6

Fourth. When the records of these 640 pupils had been thus tabulated, five direct correlation-tables were prepared, *viz.*, A-C, A-D, B-C, B-D, and E-F. Then for correction purposes tables showing the correlation of A-B and C-D were compiled. These are the seven tables which follow, and are numbered 45 to 51, inclusive. The coefficient of correlation in each case is calculated by the cosine π U tables accompanying Thorndike's "Empirical Studies in the Theory of Measurement" (q.v. pp. 15 to 25).

Fifth. For Table 51, showing the E-F correlations, the medians of array were calculated and the total result shown graphically in the plate immediately preceding this table. The probability is that this table, based on the totals of the standing in both scholarship and department, furnishes us the most reliable of these measures of correlation. This is disclosed to be .48.

TABLE 47

C. DEPARTMENT	B. SCHOLARSHIP										B-C CORRELATIONS						
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
3	20	20	13	16	21	8	8	13	9	8	4	2	2	2			
4	18	10	13	15	13	15	16	9	6	9	7	11	5				
5	6	15	5	4	12	8	11	11	4	10	10	7	2	1	2		
6		3	4	6	6	9	6	11	7	11	11	3	6	1			
7	1	2	3	6	5	3	2	4	5	5	3	3	3	3			
8			1	3	3	7	1	7	3	1	2	5	2	2	1		
9			1	2	1		4	4	3	3	1	2	1	2	2		
10			1	1	1		2	2	3	6	2	1	1	2			
11				1		2		2	1	2	1				2		
12			1					1	3								
13																	
14													2				
15											1		1		1		

From this table, $U = \frac{234}{640}$; $r_{p^2q^1} = .426$.

TABLE 48

D. DEPARTMENT	B. SCHOLARSHIP										B-D CORRELATIONS						
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
3	26	20	17	19	16	12	9	9	7	6	7	6	2	1	2		
4	17	15	10	13	15	13	9	17	12	5	8	12	1				
5	7	9	9	8	14	12	12	13	6	14	6	3	4	1			
6		3	9	6	9	14	12	4	6	7	6	5	2	1			
7		1	4	2	7	5	4	6	8	14	6	3	3	3			
8			7	4	2	2	2	5	2	4	3	1	6	1	1		
9				1				1	3	1	3	5	2	2	2		
10									5				1				
11									1								
12																	
13								1									
14													1				
15									1					1			
16															1		

From this table, $U = \frac{234}{640}$; $r_{p^2q^2} = .426$.

TABLE 49

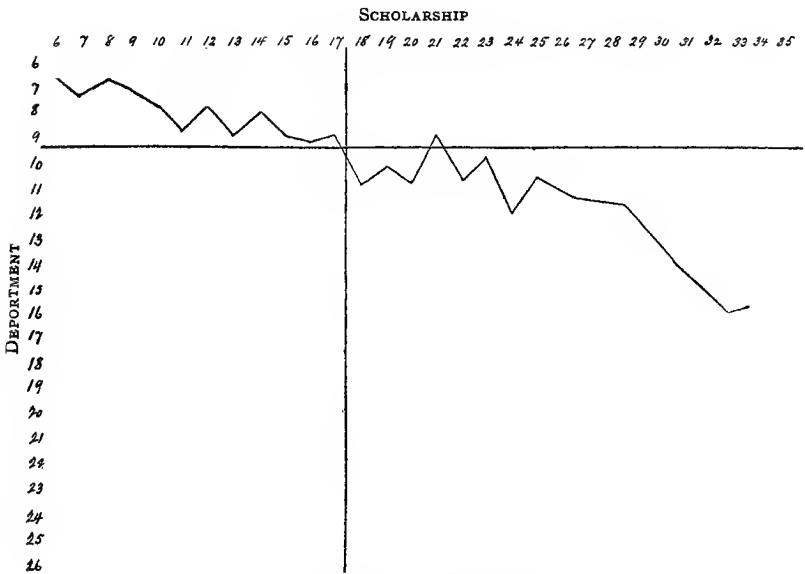
GROUP B RECORDS OF SCHOLARSHIP	GROUP A RECORDS OF SCHOLARSHIP																
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
3	28	14	6	1	3												
4	19	10	6	6	3	1	1										
5	4	6	9	14	6	2	5	3									
6	2	9	9	7	10	5	3	2	3								
7	3	10	11	10	7	7	1	1	4	1							
8	1	3	4	9	9	10	4	4	4	2	3						
9		1	2	10	10	4	10	6	4	4		1					
10		1	1	3	11	12	4	6	7	5	10	3	2				
11			1	3	1	4	4	9	9	7	5	1	2	1	1		
12				1	1	5	5	7	12	2	9	3	1	3			
13				1		2	3	5	5	11	3	2	6	3			
14						1	5	5	6	3	4	3	5	2			
15								1	2	3	5	6	2	3			
16								2	1	2	1	2	2				
17											1	3	2				
18																1	

From this table, $U = \frac{115}{640}$; $r_{p^1p^2} = .843$.

TABLE 50

GROUP D RECORDS OF DEPARTMENT	C-D CORRELATIONS FOR CORRECTION											
	3	4	5	6	7	8	9	10	11	12		
3	92	51	9	4								
4	54	39	33	17	3							
5	12	39	31	19	14	4	1	1				
6	6	16	18	19	8	8	3			1		
7	2	6	15	13	12	9	6	2	1	1		
8		2	2	11	6	7	3	3	1	2	1	
9			2	2	4	4	5	1	2			1
10					2			5				1
11							2			1		
12												
13										1		
14												1
15								1				1
16									1			

From this table $U = \frac{149}{640}$; $r_{qd}^2 = .75$



(GRAPH FOR TABLE 51)

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