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THE AGES OF PUPILS AND THEIR PROGRESS THROUGH THE ELEMENTARY GRADES

First Steps in Statewide Educational Accounting, Second Paper, April 1918

BY W. A. AVERILL, INSPECTOR IN ELEMENTARY EDUCATION

The first paper of this series of educational accounting reports was published in October 1917 in order to have ready for distribution such returns from a request sent to the schools of the State in May 1917 as were compiled at the time of the 1917 Convocation of The University of the State of New York. The limited edition of the first paper was soon exhausted and to meet the subsequent demand for copies, this second paper will contain the salient features of the first.

For the study of age and progress conditions of elementary school pupils, the cities, villages and union free school districts of the State are divided into nine groups, the basis of which division is the size of the elementary school enrolment, reported in this case on May 21, 1917. The groups of communities are:

  6 cities enrolling over 5000 elementary pupils
  8 cities enrolling 3000 to 4999 elementary pupils
  7 cities and 1 village with 2000 to 2999 elementary pupils
 16 cities and 8 villages with 1000 to 1999 elementary pupils
  4 cities, 16 villages and 28 union free school districts with 500 to 999 elementary pupils
  3 villages and 61 union free school districts with 300 to 499 elementary pupils
  1 village and 76 union free school districts with 200 to 299 elementary pupils
153 union free school districts with 100 to 199 elementary pupils
175 union free school districts with less than 100 elementary pupils

563 communities reporting data, including 41 cities, 29 villages and 493 union free school districts.

Table I

Progress percentages of 286,207 pupils in 41 cities, 29 villages and 493 union free school districts

| GROUP	PUPILS				PER CENTS			
	Rapid	Normal	Slow	Total	Rapid	Normal	Slow	Total
Less than 100......	987	6 724	3 732	11 443	8.62	58.76	32.62	100
100– 199.........	1 078	11 090	6 183	18 351	5.82	60.8	33.352	100
200– 299.........	864	11 574	6 541	18 979	4.56	61.	34.44	100
300– 499.........	1 271	13 674	7 104	22 049	5.77	62.	32.23	100
500– 599.........	2 217	17 566	9 965	29 748	7.3	59.3	33.4	100
1000–1999.........	3 123	18 118	9 691	30 932	10.09	58.57	31.33	100
2000–2999.........	2 681	10 937	6 071	19 689	13.61	55.5	30.83	100
3000–4999.........	4 483	18 361	8 389	31 233	14.35	58.79	26.86	100
Over 5000.........	10 424	66 375	26 984	103 783	10.04	63.96	26.	100
Total.............	27 128	174 419	84 660	286 207	9.48	60.94	29.58	100
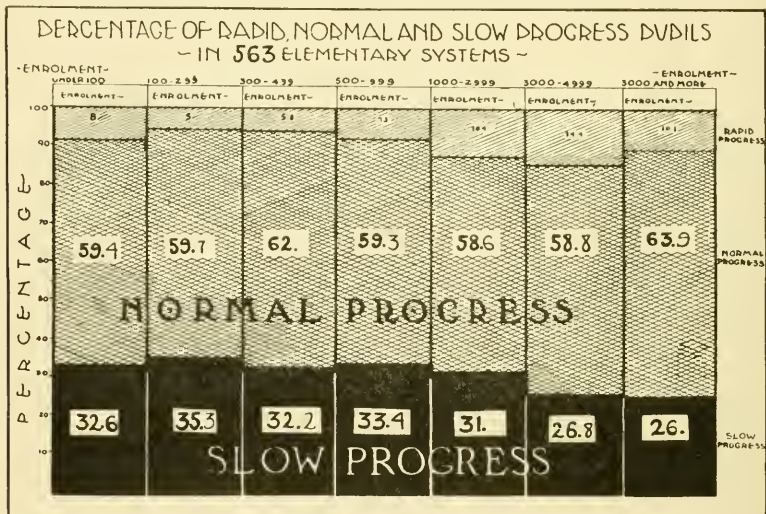
FIGURE I

Each column represents 100 per cent of the entire enrolment in each group of school systems. The groups themselves vary in size but this variation is not shown in the figure which shows only the relative percentages of rapid, normal and slow-progress pupils in each group and not the actual number of pupils. Late reports received after figure was drawn reduce the slow progress in the second column to 34 per cent.

The blank which was sent to the schools of the State in May, 1917, requesting the information on which the tables in this paper are based, called for the number of years of schooling assignable to the pupils in each grade and the number of pupils in each grade who had attended each different period of schooling. For example, the

report in the fifth grade as sent out called for the number of pupils
who had to their credit 4 years of schooling, 5 years of schooling, 6
years of schooling, etc.   In the fifth grade those who reported only
4 years of schooling were called rapid-progress pupils, those reporting
5 years were called normal and those who reported a total attendance
of more than 5 years, including the school year ending June 1917,
were reported as slow-progress pupils.   On this basis the tables in
this pamphlet have been prepared, except where otherwise specified.
Table 1 gives the total results for 286,207 pupils in 563 communities
throughout the State.   This figure does not represent the entire
elementary school enrolment of the State, as New York City is
omitted together with several of the smaller communities whose
reports for various reasons could not be used.

Note that these tables do not refer to overage but to progress alone.
In this respect they are incomplete in that they present only one
phase of retardation, namely the *time-in-school* factor, whereas the
complete statement of the retardation situation requires along with
this time factor, the age factor expressed in three subdivisions for
underage, normal age and overage.

A glance at the slow-progress percentages of table 1 shows that
they are, as a whole, unusually low.   They are in all probability
about 4 per cent lower than the percentages which would be obtained
by an analysis of the situation in which both age and time in school
are considered, and compiled to show conditions either *at the beginning*
or *after the close of* the school year.   The figures were reported as
of May 21, 1917 and do not include in the slow-progress element
those pupils who were not promoted in June 1917.   Pupils who
left school prior to May 21st do not appear on the reports, which
again tends to understate the slow-progress number.   A third factor
tending to reduce the stated amount of slow progress was the date
of the collection of the data, late in the school year, at which time
many communities were obliged to gather the figures hurriedly;
it is probable that a portion of the time in school for some of the
pupils was omitted.

The difference between the reported slow progress in September
1916 and May 1917 is shown in table 2 for ten cities which col-
lected figures at both times, the total of which shows the slow-
progress percentage to be 4.4 higher in the report at the beginning
of the school year, which is the best time to assemble age and
progress data.

There are, however, two reasons for publishing these figures in New
York State in spite of their incompleteness with reference to age and

Table 2

Progress reported by ten cities by two methods, September 1916 and May 1917

CITY	PUPILS				PERCENTAGES			
	Rapid	Normal	Slow	Total	Rapid	Normal	Slow	
1.............	13	291	380	684	1.9	42.5	55.6	Sept. 1916
	49	379	237	665	7.4	57.	35.6	May 1917
2.............	77	689	514	1 280	6.1	53.8	40.1	Sept. 1916
	133	766	359	1 258	10.6	60.9	28.5	May 1917
3.............	165	731	289	1 185	13.9	61.7	24.4	Sept. 1916
	216	645	223	1 084	19.9	59.5	20.6	May 1917
4.............	165	623	540	1 328	12.4	46.9	40.7	Sept. 1916
	159	666	479	1 304	12.2	51.1	36.7	May 1917
5.............	144	551	375	1 070	13.4	51.4	35.2	Sept. 1916
	196	661	207	1 064	18.4	62.1	19.5	May 1917
6.............	210	521	302	1 033	20.3	50.4	29.3	Sept. 1916
	133	532	398	1 063	12.5	50.	37.5	May 1917
7.............	44	1 349	860	2 253	2.	59.9	38.1	Sept. 1916
	30	1 251	902	2 183	1.3	57.4	41.3	May 1917
8.............	112	608	362	1 082	10.3	56.2	33.5	Sept. 1916
	121	731	203	1 055	11.5	69.3	19.2	May 1917
9.............	42	263	199	504	8.3	52.2	39.5	Sept. 1916
	30	259	186	475	6.2	54.6	39.2	May 1917
10.............	17	423	194	634	2.7	66.7	30.6	Sept. 1916
	25	337	227	589	4.3	57.2	38.5	May 1917
Total..........	989	6 049	4 015	11 053	9.	54.7	36.3	Sept. 1916
	1 092	6 227	3 421	10 735	10.1	38.0	31.9	May 1917

this probability of understated slow progress. The first is that a very considerable number of superintendents and principals prepared these figures with great care and the second is that they constitute the only statewide measure of progress through school which we have at the present time. While they might not serve for comparison outside the State, they show the standing of each community with reference to all other similar communities in the State on the basis of the same measure throughout.

City totals

Tables 3 to 11 show the progress figures and percentages reported by individual cities and villages in the various groups, beginning with cities enrolling more than 5000 elementary pupils. Attention is called to the fact that the total or average of any group actually *conceals* the conditions which exist in the separate components of the group.

Table 3

Progress reports from six cities enrolling more than 5000 elementary pupils

CITY	RAPID	NORMAL	SLOW	TWO OR MORE YEARS SLOW [1]	TOTAL
A..........................	613	9 887	2 006	333	12 506
B..........................	3 505	8 737	3 286	698	15 528
C..........................	1 865	15 634	5 172	831	22 671
D..........................	3 363	26 171	12 324	4 089	41 858
E..........................	745	2 926	1 768	391	5 439
F..........................	333	3 020	2 428	792	5 781
Total..........................	10 424	66 375	26 984	7 134	103 783

Corresponding percentages

A..........................	4.90	79.06	16.04	2.66	....
B..........................	22.57	56.26	21.17	4.49	....
C..........................	8.23	68.96	22.81	3.66	....
D..........................	8.03	62.53	29.44	0.76	....
E..........................	13.69	53.79	32.52	7.18	....
F..........................	5.76	52.24	41.99	13.70	....
Total..........................	10.04	63.96	26.00	6.87	....

From table 3 it is seen that the slow-progress percentage of 26 for the group of cities with over 5000 elementary pupils in table 1 represents a range of slow-progress percentages from 16 to 42. In the same manner, the percentage of pupils reported two or more years slow ranges from 2.6 to 13.7.

When a number of measurements of any sort are arranged in any given order, as in this case, in the order of slow-progress percentage, the entire number of measurements is called a *series* or an *array*, and it is customary to locate the middle member or midpoint of the series and call it the *median* (Md) and to use this median in many instances in place of the average.

The median of this series of six measurements is the average between the third and fourth members, which is 26.13 per cent. The average of the six percentages is 28.16 per cent, while the average figured from a total of all six cities is 26 per cent. Superintendents will find the median the most convenient measure both to determine and to use in making comparisons with other cities of the same group.

[1] Included in "slow"; total equals the sum of rapid, normal and slow in all tables.

Table 4

Progress reports from cities enrolling 3000 to 4999 elementary pupils

CITY	RAPID	NORMAL	SLOW	TWO OR MORE YEARS SLOW	TOTAL
A............................	561	2 071	453	109	3 085
B............................	639	2 143	586	100	3 368
C............................	821	2 461	827	186	4 109
D............................	773	2 998	1 196	317	4 967
E............................	669	2 146	894	207	3 709
F............................	470	1 720	993	223	3 183
G............................	136	2 814	1 805	523	4 755
H............................	414	2 008	1 635	527	4 057
Total.........................	4 483	18 361	8 389	2 192	31 233

Percentages corresponding to above figures

A............................	18.17	67.13	14.7	3.533	....
B............................	18.97	63.62	17.39	2.969	....
C............................	19.98	59.88	19.34	4.520	....
D............................	15.65	60.35	24.00	10.275	....
E............................	18.03	57.85	24.10	5.581	....
F............................	14.77	54.04	31.19	7.000	....
G............................	2.93	59.17	37.90	16.142	....
H............................	10.51	49.49	40.00	17.082	....
Total.........................	14.35	58.79	26.86	7.01	....

This table shows a range of reported slow progress from 14.7 to 40 per cent. In this series there are eight members and the median is the average between the fourth and fifth measures, or 24.05 per cent.

Table 5

Progress reports from seven cities and one village enrolling 2000 to 2999 elementary pupils

CITY	RAPID	NORMAL	SLOW	TWO OR MORE YEARS SLOW	TOTAL
A............................	728	1 278	361	106	2 367
B............................	000	2 127	465	104	2 592
C............................	693	1 112	649	213	2 454
D............................	166	1 626	795	197	2 587
E............................	394	1 416	806	193	2 616
F............................	534	1 174	918	274	2 626
G............................	30	1 353	861	275	2 244
H............................	136	851	1 216	379	2 203
Total.........................	2 681	10 937	6 071	1 741	19 689

Percentages corresponding to above figures

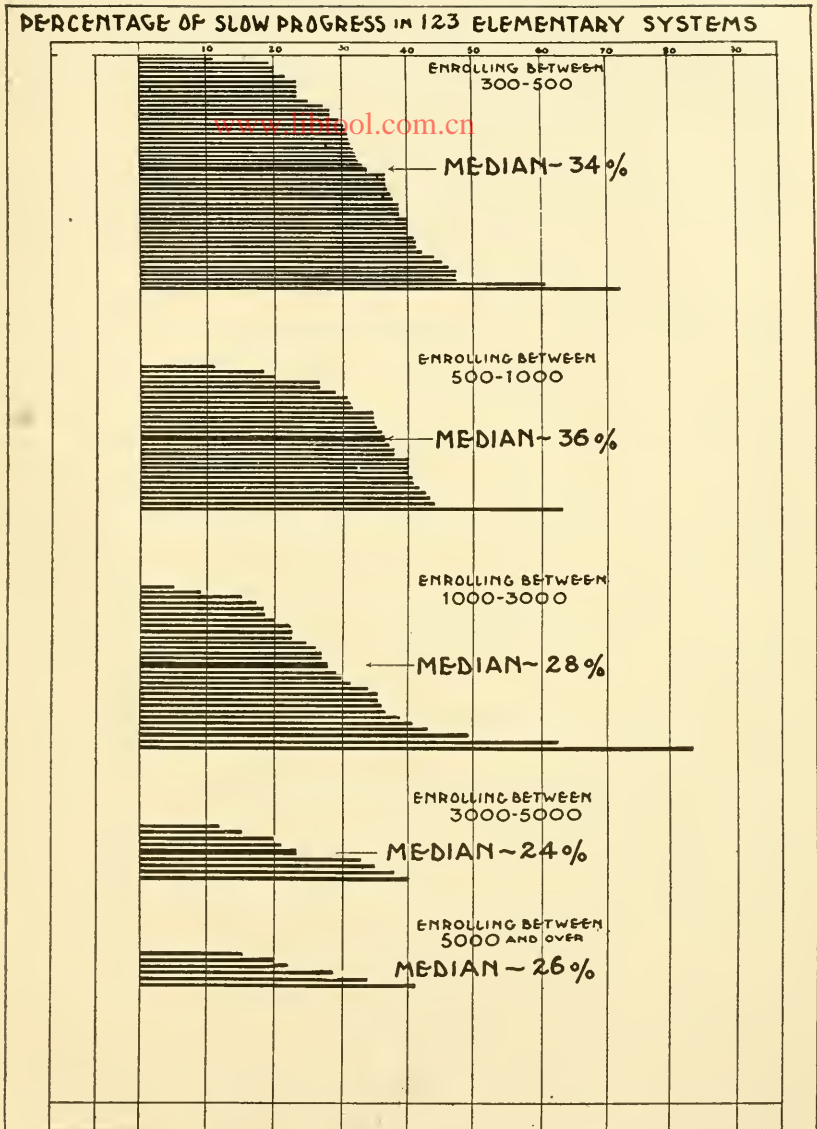|					
A............................	30.75	53.99	15.25	4.47	....
B............................	00.0	82.06	17.93	6.53	....
C............................	28.23	45.31	26.44	8.67	....
D............................	6.41	62.85	30.73	7.61	....
E............................	15.06	54.12	30.81	7.37	....
F............................	20.33	44.7	34.95	10.43	....
G............................	1.33	60.29	38.36	12.25	....
H............................	6.17	38.62	55.2	17.20	....
Total.........................	13.62	55.55	30.83	8.76	100

FIGURE 2

Each horizontal line represents the percentage of slow-progress pupils in one elementary school system. The total enrolment in each system if represented graphically would be shown in each case by a line extending entirely across the diagram. The pupils represented by the black line are retarded and all the others in each system are making normal and rapid progress.

In this series of seven cities and one village, the percentages of slow progress range from 15.25 to 55.2. This series, however, having eight measures has no single middle member and the median 30.05 per cent is determined by taking the average of the two middle members in this array, namely, the fourth and fifth.

Table 6

Progress reports from sixteen cities and eight villages enrolling 1000 to 1999 elementary pupils

CITY	RAPID	NORMAL	SLOW	TWO OR MORE YEARS SLOW	TOTAL
A.	43	930	60	8	1 033
B.	00	1 115	111	0	1 226
C.	121	731	204	32	1 056
D.	560	933	356	117	1 849
E.	196	661	209	44	1 066
F.	,216	645	225	43	1 086
G.	122	975	336	80	1 433
H.	54	1 050	332	39	1 436
I.	219	980	306	92	1 505
J.	281	593	295	83	1 169
K.	00	928	337	93	1 265
L.	186	624	311	69	1 121
M.	133	766	361	120	1 260
N.	141	829	412	134	1 382
O.	53	1 030	497	102	1 580
P.	62	847	443	174	1 352
Q.	125	796	502	184	1 423
R.	178	539	399	111	1 116
S.	159	666	481	122	1 306
T.	133	532	400	102	1 065
U.	49	689	576	185	1 314
V.	16	727	701	238	1 444
W.	56	338	675	328	1 069
X.	20	194	1 162	463	1 376
Total.	3 123	18 118	9 691	2 963	30 932

Percentages corresponding to above figures

CITY	RAPID	NORMAL	SLOW	TWO OR MORE YEARS SLOW	TOTAL
A.	4.2	90.	5.8	1	100
B.	0.0	91.	9.	0	....
C.	11.5	69.3	19.2	3	....
D.	30.4	50.4	19.2	6	....
E.	23.7	56.8	19.5	4	....
F.	19.9	59.5	20.6	4	....
—Q1=21.28					
G.	8.6	68.1	23.3	6	....
H.	3.4	73.2	23.4	3	....
I.	12.9	63.7	23.4	6	....
J.	24.1	50.8	25.1	7	....
K.	0.0	73.5	26.5	7	....
L.	16.7	55.7	27.6	6	....
—Md=28.05					
M.	10.5	61.	28.5	10	....
N.	10.8	60.	29.2	10	....
O.	3.4	65.3	31.3	6	....
P.	4.6	62.7	32.7	13	....
Q.	8.8	56.	35.2	13	....
R.	16.	48.3	35.7	10	....
—Q3=36.45					
S.	12.2	51.1	36.7	9	....
T.	12.5	50.	37.5	10	....
U.	3.8	52.5	43.7	14	....
V.	1.1	50.4	48.5	17	....
W.	5.3	31.7	63.	31	....
X.	1.9	14.1	84.	45	....
TOTAL.	10.09	58.57	31.33	9.57	

In this series of twenty-four cities we may add two other points to the median (Md) in the center. These points are located just half way between the median and the extremes and are called the first and third quartiles. The first quartile (Q_1) is that point along the series which has one-fourth of the measures in front of it and three-fourths of the measures following it. The third quartile (Q_3) is preceded by three-fourths of the measures and followed by one-fourth of them. In this series of twenty-four measures, the extremes of slow-progress percentage range from 5.8 to 84. The first quartile located between the sixth and seventh measures, is 21.28 per cent. The median is the average between the twelfth and thirteenth measures, or 28.05 per cent. The third quartile located between the eighteenth and nineteenth measures, is 36.45 per cent.

Between the two quartile points lie just half of the measures; in other words, the quartiles inclose the middle half of the series in the order of the item measured with the median in the center. In general terms, a superintendent may consider his system to be normal if his city schools are within the quartile range, but if his system's rating places his schools in the first or the last fourth of the series, there is occasion for further study of the local situation.

The school systems tabulated thus far are those with 1000 elementary pupils and upwards. They have been tabulated in small groups as the total number of systems of this size in the State is not large. The tables which follow comprise smaller school systems from 999 elementary pupils downwards. The details of rapid, normal and slow progress for these systems will appear in tables 19 to 27, which give these figures for the different grades. For the purpose of showing the range of slow-progress percentages reported by the larger number of small cities and villages in these groups, the tables which follow indicate merely the percentage of slow progress reported and the number of cities which report each different per cent.

Thus four columns of figures appear in each table. The first column consists of all the percentages of total slow progress listed in increasing order. The second column is the number of cities and villages reporting each per cent. The third column consists of the percentages of pupils retarded two or more years and the fourth column gives the number of places reporting each per cent. The first and third columns constitute what is known as the measure, while the second and fourth columns constitute the frequency. Measure is indicated by " m " and frequency is indicated by " f ".

Table 7

Slow-progress percentages reported by 4 cities, 16 villages and 28 union free
school districts with an elementary enrolment between 500 and 999

SLOW-PROGRESS PERCENTAGE REPORTED	NUMBER OF CITIES REPORTING	PER CENT TWO OR MORE YEARS RETARDED	NUMBER OF CITIES REPORTING
Measure (m)	*Frequency (f)*	*Measure (m)*	*Frequency (f)*
11..	1	Less than 1	1
17..	1	1	2
18..	1	2	2
22..	1	4	1
23..	1	5	4
24..	2	6-Q_1	3
25..	1	7	4
26..	1	8	1
27..	2	9	5
28..	1	10-Md	7
—Q_1=28.5			
30..	3	11	1
31..	4	12	3
32..	1	13	4
33..	2	14	1
34..	1	15	2
35..	1	16-Q_3	3
—Md=35.5			
36..	1	17	1
37..	3	18	1
38..	2	22	1
39..	2	25	1
40..	4	....	....
—Q_3=40.75			
41..	3	....	....
42..	1	....	....
43..	1	....	....
44..	2	....	....
45..	1	....	....
46..	1	....	....
47..	1	....	....
49..	1	....	....
63..	1	....	....

The range of this series is from 11 to 63 per cent for total slow
progress and from less than 1 to 25 per cent for two-year retardation.

The medians and quartiles are indicated. The medians do not
lie in the exact center of the printed columns because certain per
cents occur several times, but they are the exact middle point on
the scale of measures from one extreme to the other. The quartiles
are the exact quarter points.

Table 8

Slow-progress percentages reported by three villages and sixty-one union free school districts with an elementary enrolment between 300 and 499

SLOW-PROGRESS PERCENTAGES REPORTED	NUMBER REPORTING	PER CENT TWO OR MORE YEARS RETARDED	NUMBER REPORTING
(m)	(f)	(m)	(f)
6	1	Less than 1	1
10	1	1	1
11	1	2	1
18	1	3	2
20	2	4	5
21	2	5	5
22	2	$6\text{-}Q_1$	5
23	1	7	6
24	2	$8\text{-}Md$	8
25	1	9	3
26	1	10	6
$27\text{-}Q_1$	2	11	3
28	1	$12\text{-}Q_3$	3
29	5	13	2
31	3	14	3
32	2	15	2
33	1	17	2
$34\text{-}Md$	7	18	2
35	3	20	2
36	1	23	1
37	1	33	1
38	1	. . . .	. . . .
39	3	. . . .	. . . .
$40\text{-}Q_3$	5	. . . .	. . . .
41	2	. . . .	. . . .
42	2	. . . .	. . . .
45	1	. . . .	. . . .
46	2	. . . .	. . . .
47	1	. . . .	. . . .
48	4	. . . .	. . . .
61	1	. . . .	. . . .
72	1	. . . .	. . . .

Table 9

Slow-progress percentages reported by one village and seventy-six union free school districts with an elementary enrolment between 200 and 299

SLOW-PROGRESS PERCENTAGES REPORTED	NUMBER REPORTING	PER CENT TWO OR MORE YEARS RETARDED	NUMBER REPORTING
4	1	0	5
6	1	1	2
12	2	2	7
13	2	3-Q_1	6
16	1	4	3
17	1	5	6
18	1	6	6
19	2	7-Md	7
20	2	8	0
22	1	9	5
23	2	10-Q_3	4
24-Q_1	3	12	3
25	1	13	2
26	3	14	3
27	4	15	2
28	2	16	1
29	3	17	1
30	2	18	2
31	2	23	1
32-Md	3	24	2
33	2	. . . .	. . . .
34	3	. . . .	. . . .
35	1	. . . .	. . . .
36	3	. . . .	. . . .
37	3	. . . .	. . . .
38	6	. . . .	. . . .
39-Q_3	2	. . . .	. . . .
40	2	. . . .	. . . .
41	1	. . . .	. . . .
42	1	. . . .	. . . .
43	2	. . . .	. . . .
44	2	. . . .	. . . .
47	1	. . . .	. . . .
48	3	. . . .	. . . .
49	2	. . . .	. . . .
51	1	. . . .	. . . .
52	1	. . . .	. . . .
61	1	. . . .	. . . .
70	1	. . . .	. . . .

In this table of 77 measures the median is the thirty-ninth measure or the " last " of the three measures of 32 per cent for total slow progress and the first of the seven measures of 7 per cent for two or more years slow.

The quartile points are located $19\frac{1}{2}$ measures along the scale from either end; the first quartile is one-half of the " way " from the nineteenth measure of 24 per cent to the twentieth measure of 25 per cent, or 24.5 per cent. The third quartile is $19\frac{1}{2}$ points from the bottom or " within " the twentieth measure of 39 per cent. For the two-year retardation, the quartiles are 3 and 10 per cent respectively.
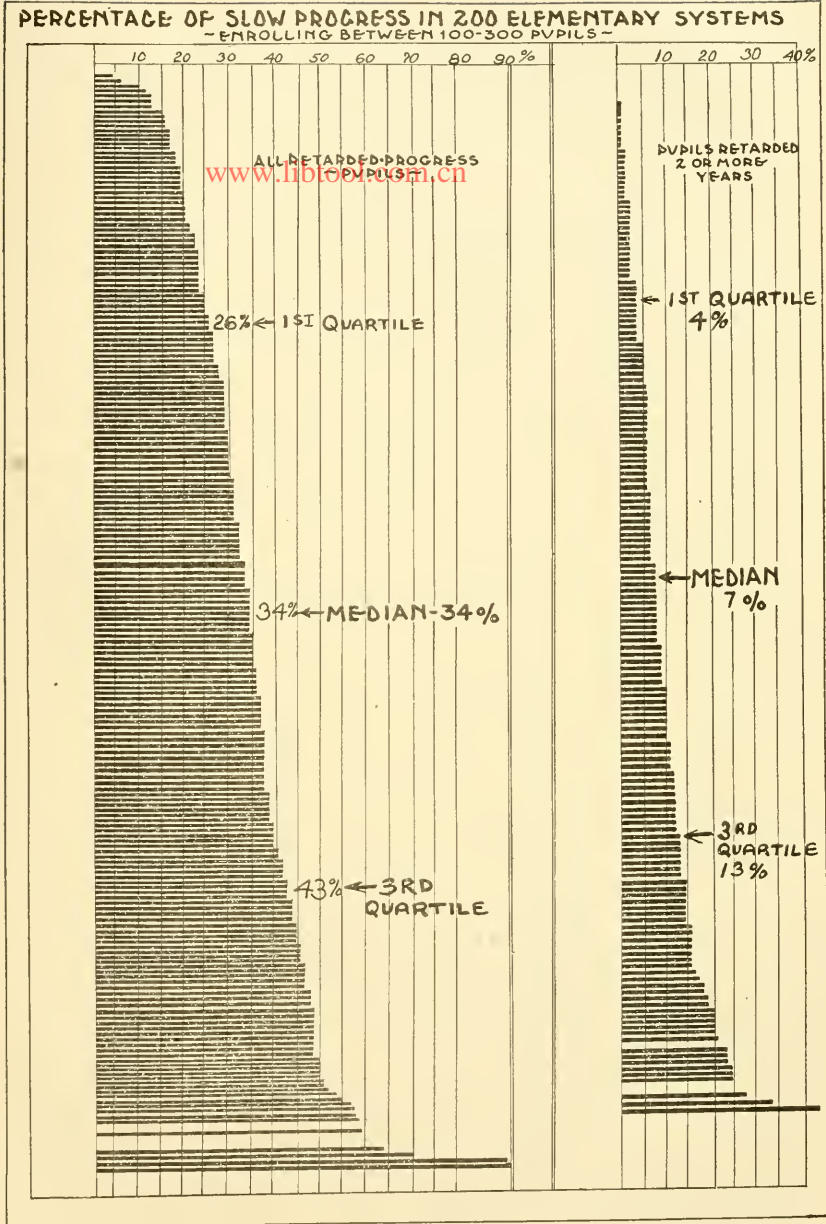
FIGURE 3

In both of the diagrams each horizontal line represents the slow-progress percentage reported by one elementary school system.

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Table 10

Slow-progress percentages reported by one hundred and fifty-three union free school districts with an enrolment between 100 and 199

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SLOW-PROGRESS PERCENTAGES				TWO YEARS OR MORE SLOW PROGRESS	
(m)	(f)	(m)	(f)	(m)	(f)
0	1	41	1	0	4
10	1	42	8	1	6
13	1	44-Q₃	4	2	6
15	1	45	4	3	9
16	1	46	3	4-Q₁	13
17	4	47	6	5	5
18	3	48	3	6	17
19	2	49	6	7	10
20	4	50	3	8-Md	10
21	3	51	1	9	9
22	2	52	2	10	11
23	1	54	3	11	7
24	6	56	1	12	7
25	1	57	2	13-Q₃	7
26	3	61	1	14	4
28	3	64	1	15	5
29-Q₁	6	89	1	16	5
30	9	90	1	18	3
31	5	..	..	19	3
32	6	..	..	20	5
33	3	..	..	21	1
34	8	..	..	22	1
35-Md	6	..	..	23	2
36	3	..	..	24	1
37	3	..	..	27	1
38	4	..	..	43	1
39	5	..	..		
40	7	N = 153		N = 153	

The columns beginning with 0 and ending with 90 headed *m* mean that villages reported slow-progress percentages ranging from nothing to 90. Zero per cent, 10 per cent, 13 per cent, 15 per cent, and 16 per cent were reported by one village each; 17 per cent was reported by four villages, 18 per cent by three, 19 per cent by two, and 20 per cent by four, etc.

The column headed *f* indicates how many villages reported each per cent. This is called the "frequency." There were in all 153 village elementary school systems reporting with an enrolment between 100 and 199. If the villages were "lined up in a row" in the order of their slow-progress percentages, the extremes would be 0 and 90. The middle village would have 35 per cent. The village which is one-fourth of the way along the line would report 29 per cent, and the village three-fourths of the way through the

series would report 44 per cent. The middle percentage of 35 is called the median of the series or " array " and the 29 per cent and 44 per cent are called the first and third quartiles respectively.
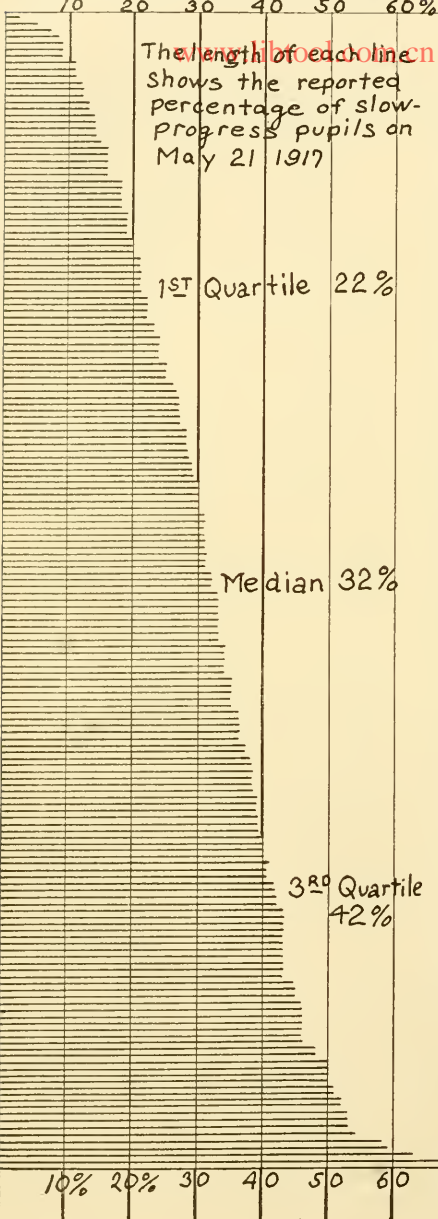
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Table II

Slow-progress percentages reported by one hundred and seventy-five union free school districts with an elementary enrolment below 100

SLOW-PROGRESS PERCENTAGES REPORTED	NUMBER REPORTING	PER CENT TWO OR MORE YEARS RETARDED	NUMBER REPORTING
2.	1	0	23
5.	1	1	1
7.	1	2	12
8.	1	3-Q_1	11
9.	3	4	11
11.	3	5	12
12.	3	6	11
13.	2	7-Md	17
14.	4	8	9
15.	1	9	10
16.	5	10	14
18.	5	11-Q_3	3
19.	4	12	7
20.	3	13	9
21.	6	14	5
22-Q_1.	4	15	7
23.	2	16	4
24.	4	17	2
25.	3	18	3
26.	2	20	1
27.	5	23	1
28.	5	25	1
29.	3	46	1
30.	5	. . . .	. . . .
31.	9	. . . .	. . . .
32-Md.	3	. . . .	. . . .
33.	8	. . . .	. . . .
34.	5	. . . .	. . . .
35.	5	. . . .	. . . .
36.	5	. . . .	. . . .
37.	2	. . . .	. . . .
38.	6	. . . .	. . . .
39.	6	. . . .	. . . .
40.	4	. . . .	. . . .
41.	3	. . . .	. . . .
42-Q_3.	4	. . . .	. . . .
43.	11	. . . .	. . . .
45.	3	. . . .	. . . .
46.	7	. . . .	. . . .
48.	2	. . . .	. . . .
50.	4	. . . .	. . . .
51.	2	. . . .	. . . .
52.	2	. . . .	. . . .
53.	3	. . . .	. . . .
54.	1	. . . .	. . . .
58.	1	. . . .	. . . .
59.	1	. . . .	. . . .
63.	1	. . . .	. . . .
73.	1	. . . .	. . . .
76.	1	. . . .	. . . .

Slow Progress Percentages In 175 Systems With Less Than 100 Elementary Pupils Each

The length of each line shows the reported percentage of slow-progress pupils on May 21 1917

1ST Quartile 22%

Median 32%

3RD Quartile 42%

Percents Two or More Years Slow

26 Systems Report zero % or no pupils retarded Two Yrs.

1ST Quartile 3%

←Median 7%

←3RD Quartile 11%

175 Systems Represented in Both Diagrams Each Line is one Elementary School System

FIGURE 4

Slow-progress Figures not Basis for Criticism

Thus far in tables 3 to 11 inclusive we have arranged the city and village communities of the State in nine groups according to the size of the elementary enrolment and within each group we have placed the members in a row in the order of their reported slow progress for the purpose of seeking out the middle member of each row and the two members which are located in the one-quarter and three-quarter points in the series. These points are indicated in the preceding tables and by means of them each superintendent may determine his relative standing with reference to the other communities of his particular group. As is indicated in the first paper of this series, there is no actual nor inferred criticism of those systems which happen to have reported large slow-progress conditions. The problem of retardation is one which exists throughout the State and the relative number of slow-progress pupils is a very precise measure of that problem and its difficulty for the local superintendent, principals and teachers. But when it comes to criticizing the efficiency of the schools on the basis of reported slow progress, so many other conditions may enter into this complex problem as to render the mere position of the school system on a progress-percentage list a very unsafe criterion for drawing conclusions about the character of the work carried on in the schools. Some of these other features which influence the " standing " of a school system with respect to retardation are:

a The late entrance of pupils into the first grade

b Varying practice in promoting children into and out of the first grade

c Different standards of promotion from grade to grade

d Differences in the health of pupils while at school

e Varying degrees of regularity of attendance

f Different degrees of familiarity with the English language

g Differences in the mentality of normally intelligent children

h The presence of mentally subnormal children in regular classes

j Physical defects of children

k Differences in the maturity of children

l Differences in the home environment of children

m Differences in the amount of time which children may devote to the preparation of lessons outside of school

n Circumstances incident to the moving of families from place to place

o The transfer of pupils from one school to another and from parochial to public schools within a city

p Differences in the type of pupil left in the system when others have been removed

q Differences in the extent to which communities offer inducements for pupils to leave school

Some of them are so general as to affect nearly all schools alike and others, while affecting different classrooms, will not materially change the result throughout city and village systems as a whole, and they are presented by no means as excuses for retarded conditions.

If a superintendent finds that his reported rating places his schools in front of the first quartile in the series, or above the median, a brief account of any features of his organization, plan of supervision and methods of teaching which in his opinion many have contributed to the success of his system and resulted in the low slow-progress percentage, might be of service to other superintendents by way of suggestion. If a sufficient number of memoranda are received on this point, they will be assembled into a bulletin, returned to the contributing superintendents and distributed to all the communities participating in this research.

While as a general rule throughout the State it may be probable that the better organized systems will be found in the schools above the median, a relatively high position in the series does not necessarily mean a superior school system. The reverse of this proposition is even more true because we know from other sources that in many cases some of the very best work in the State is being done in communities where circumstances apparently beyond the control of the schools militate against the achievement of a normal amount of successful progress through school.

Medians and Quartiles for Nine Groups of Communities

A single table showing the slow-progress percentages reported by these 563 communities in detail would be confusing rather than illuminating. For the sake of brevity it is customary to describe the conditions shown in a whole series of these measurements by tabulating five figures, the two extremes, the two quartiles and the median. This condensed table is shown for the nine groups of cities and villages which have been reported in the foregoing tables.

Table 12

Extreme, median and quartile percentages of slow progress in communities grouped according to elementary enrolment

ELEMENTARY ENROLMENT	SLOW-PROGRESS PERCENTAGES						
	Lower extreme	First quartile	Median	Third quartile	Higher extreme	Quartile range	Quartile deviation
Over 5000 . . .	16.	19.13	26.13	34.89	42.	15.76	7.88
3 000–4 999	14.7	18.36	24.05	35.4	40.	17.04	8.52
2 000–2 999	15.25	22.18	30 05	36.65	55.2	14 47	7.24
1 000–1 999	5.8	21.275	28.05	36.45	84.	15.175	7.58
500– 999	11.	28.5	35.5	40.75	63.	12.25	6.125
300– 499	6.	27.	31.	40.	72.	13.	6.5
200– 299	4.	24.5	32.	39.	70.	14.5	7.25
100– 199	0.	29.	35.	44.	90.	15.	7.5
Below 100 . . .	2.	22.	32.	42.	76.	20.	10.

The two columns of extremes show that the greatest variation in slow progress occurs in the very small systems, the range being from 4 to 70, from 0 to 90 and from 2 to 76 per cent, while the total range for the two highest groups of cities is from 16 to 42 and 14.7 to 40 per cent.

Since extremes are very unsafe criteria, it is customary to characterize a series of measurements by indicating the two percentages between which the middle half of the measures lie, that is, the range in per cent between the two quartiles, the object being to find how large a distance on the scale contains the middle half of the series. This is known as the interquartile range and is given in the next to the last column of the table.

The two columns of extremes show that the total range increases as the systems grow smaller. This last column but one shows that the position on the scale of the middle half of the measures does not bear this inverse ratio to the size of the systems but that the least variation among the middle half of the measures occurs in the two adjacent groups of systems from 300 to 499 and 500 to 999, in which groups the difference between the communities which stand one-quarter of the way from the top and the systems three-quarters of the way toward the bottom is only thirteen percentage points. This means that more uniform conditions of retardation are to be found in these two groups of communities than in the other seven groups of the above table, in which the middle half of the measures are scattered over a wider range of percentage points.

In statistical tables it is customary to express this variation by dividing the quartile range by two in order to show the amount of deviation from the midpoint or median. This distance on the

scale between the quartiles divided by two is called the quartile deviation or semi-interquartile range and is given in the right-hand column of the table. In general, when a number of large groups of measurements are tabulated for comparison, the groups with the least quartile deviation are supposed to represent more uniform conditions than those groups which show large deviations and the general inference is that this uniformity means probable similarity i n organization and administration.

Median May Not Be Proper Measure

Attention should again be called to the fact that the slow-prog-i ess percentages reported by these 563 communities are based on their own local standards of promotion and teaching and we can only assume that in the uniform course of study pursued throughout the State and in the high character and ability of superintendents and principals, which we confidently believe is likewise statewide, we have the assurance that these tables present fairly reliable estimates of superintendents, principals and teachers who are doing all in their power for the welfare of the children in the schools.

On the other hand, the fact that the median point of a group of 24 cities is 28 per cent slow progress and the median point of 77 villages is 32 per cent slow progress, is no proof that these points indicate what the amount of slow progress actually ought to be. Certainly no one would suggest that in the group of 24 cities the 12 above the median with slow-progress percentages less than 28 per cent should begin increasing their retardation until the median was reached. With reference to the school systems in the lower half of any series, we can not say that the median is the goal toward which that city should work, because we know practically nothing about the character of the school work represented by this median and we have no reason to believe that what happens to be the reported achievement of the middle community in a list of a score or a hundred is any where near the proper measure for the entire group. To be content with obtaining these median retardation rates would indeed be following a line of least resistance to the neglect of much that ought to be done for the progress of the school children. The scrutiny with which many superintendents in various parts of the country have subjected their systems to the most thoroughgoing examination has revealed both praise-worthy features and remedial and preventive defects in their schools, often in their own offices, to such an extent that we can no

longer conclude that the average attainment-results of any number of different localities represents all that ought to be expected from most of them. Appraising the work of a school system by such a standard is akin to the rather widespread but quite precarious procedure of figuring the school budget on the basis of what happened to have been spent the year before rather than on the basis of the modern budget carefully analyzed by function, character, object and location.

Some retardation will of course always be present, and from these figures we can not determine the extent to which school systems might reasonably be expected to reduce their slow-progress percentages. As already pointed out, the percentage of slow progress which actually exists in the schools is probably 4 or 5 per cent higher throughout the State than the figures reported by the schools of the State in May 1917 here presented.

These tables constitute merely the first general statewide statement of conditions showing what the schools of the State say about themselves, and enabling each city and village superintendent and union school district principal definitely to locate the place which his schools occupy among all the other self-reported ratings of the State and in particular among the school systems which enrol about the same number of elementary pupils. All this is of course only the first of a half dozen or more steps in the direction of securing for all the schools of this State definite and reliable information about the conditions of the pupils and the results of educational effort, the information finally obtained being of such a character as to be a help rather than a burden to the superintendents and principals who contribute it.

The next step is to determine by much more carefully collected data exactly what the rapid, normal and slow progress conditions are when measured by the latest methods of modern statistical research. This second step has been in progress in a number of cities and villages during the present school year. The first results of this investigation will be to show the difference in conditions reported in May 1917 and those found to exist in September 1917 and February 1918.

A third step in this program of educational accounting after the schools have been rated by their own standards is the measurement of these school systems by the common measure of the standard classroom tests by means of which the school ability of the pupil can be definitely appraised in addition to his general condition of retardation or acceleration, as determined by his age and promotion

from grade to grade. In addition to the many uses which progressive superintendents and principals have found for these now thoroughly tried and permanently established standard tests in the regular program of supervision throughout the school year, these definite measurements constitute a most valuable appraisal of local school and classroom standards which are particularly applicable in the analysis of the children of a school system considered in the nine standard age and progress groups in which these children find themselves placed by reason of their past school life and their apparent success or failure with local teachers. At present it is planned to send to the superintendents and principals of the State shortly after the opening of schools in the fall of 1918 the results of an amount of research work sufficient to illustrate adequately the complete correlation of age and progress locally found with the corresponding abilities of pupils as shown by standard class-room tests. The titles of 84 tests for elementary grades are here included for reference.[1]

Tests for Elementary Grades

Arithmetic

Guhin's	Bobbit's	Boston fractions	Cleveland survey
Courtis's B	Monroe's	Stone's fundamental	Stone's reasoning
Starch's A	Woody's	Courtis's reasoning	Rice's reasoning
National busi-	Thompson's	Bonser reasoning	Buckingham's reasoning
ness ability tests			Courtis's series A

Silent reading

Gray's	Monroe's	Courtis's research	Courtis's series R 2
Kansas	Brown's	Thorndike's visual	Thorn like's understanding
Starch's	Starch's English	Haggarty's visual	Minnesota scale Beta
	vocabulary		Fordyce's achievements

Oral reading

Gray's	Haggarty's	Jones's	Price's

Spelling

Buckingham's	Ayres's	Courtis's	Nebraska	Rice's	Starch's
Monroe's timed lists	Iowa dictation		National business ability		
			Jones's concrete		

Writing

Gray's	Ayres' (children)	Ayres' (adults)	Courtis's
	Ayres Gettysburg	Thorndike's	Freeman's
Breed & Downs	Johnson's & Stones	Zaner & Blossom	

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[1] Details of procedure and addresses for obtaining these tests are given in full in " Educational Tests and Measurements " by Monroe, Kelley and De Voos (Houghton Mifflin Company) and in part 2 of the 17th Year Book of the National Society for the Study of Education (Public School Publishing Company, Bloomington, Ill.). See also an article, " Measurement and Diagnosis as an aid to Supervision," by Haggarty, in " School and Society," volume 6, September 1917, page 271.

Language

Nassau county	Hillegas	Courtis's	Thorndike's extension
Willing's	Trabue completion		Harvard–Newton
Breed & Frostic	Buckingham grammar		Haggarty's grammar
National busi-	Charter's grammar		Starch's grammar scales
ness ability	Starch's grammar		Starch's punctuation
	Thompson's research		Boston copying

Geography

| Boston | Buckingham | Witham's standard |
| Thompson's standardized | Hahn–Lackey | Starch's series A |

History

| Buckingham | Boll & McCollum's |
| Harlan's information | American history | Starch's American history |

| *Drawing* | *Music* |
| Thorndike's | Seashore's talent chart |

After a school system has been properly measured by the age-progress record of the pupils and this measure checked with the standard classroom tests as indicated in the preceding types of measurement, a fourth step is the correlation of the pupils' age-progress ratings and tested abilities with their individual health and physical records. A very limited amount of research along this line is under way and will be distributed when completed. A corollary to this work with physical and health records is the application of actual intelligence and psychological tests to small groups of children found markedly deficient in all the preceding tests.

Necessarily on a still smaller scale at the present time, this phase of work has already been undertaken and a limited quantity of data will be forthcoming when the schools open in the fall of 1918.

Pupils Schooled Locally and Elsewhere

When a superintendent or principal is confronted with a retardation table of his system, he naturally seeks an explanation at least for a portion of the retardation among the conditions listed on page 17. Neither the head of a school system nor the teachers are responsible for *all the schooling* of *all the pupils*, since the local system always contains a very considerable number of pupils who come to that system after previous schooling elsewhere. In accordance with this idea, 88 school systems with elementary enrolments ranging from 25 to 500 pupils, reported progress figures at the close of the school year 1916–17, both for all pupils who had been educated exclusively in the public school system in which they were enrolled when this canvass was made, and those who had been partially educated elsewhere. The results are shown in the following tables:

Table 13

Total enrolment and pupils schooled locally in eighty-eight communities with slow-progress percentage of each

COMMUNITY	TOTAL PUPILS ENROLLED	PUPILS SCHOOLED LOCALLY	PER-CENTAGE SCHOOLED LOCALLY	PERCENTAGES OF SLOW PROGRESS	
				Among all pupils enrolled	Among pupils locally schooled
1	54	32	59	9	13
2	281	263	94	10	8
3	51	34	67	14	9
4	95	81	85	21	21
5	55	34	62	16	12
6	281	223	79	16	13
7	117	71	65	21	37
8	212	156	74	17	19
9	123	71	58	18	33
10	49	28	57	19	11
11	285	168	59	18	5
12	279	174	62	19	22
13	192	122	64	20	22
14	568	426	75	20	14
15	430	277	64	20	16
16	28	10	36	21	0
17	83	59	71	22	25
18	304	236	78	22	25
19	139	93	67	23	20
20	101	78	77	23	21
21	82	34	41	24	27
22	500	318	64	24	17
23	320	253	79	25	23
24	62	62	100	25	25
25	268	175	65	25	25
26	204	139	68	25	18
27	145	77	53	26	30
28	206	141	68	26	19
29	67	41	61	28	39
30	115	64	56	29	30
31	108	72	67	28	35
32	373	290	78	28	26
33	222	207	93	29	25
34	299	168	56	29	32
35	131	79	60	29	27
36	149	78	52	30	23
37	45	26	58	31	27
38	218	146	67	31	29
39	168	107	64	31	18
40	269	238	89	31	21
41	547	490	90	33	25
42	464	292	63	33	36
43	307	233	76	33	30
44	290	194	67	34	31
45	432	314	72	34	26
46	50	26	52	34	16
47	180	151	84	35	35
48	214	124	58	35	27
49	147	88	60	36	23
50	238	162	68	37	35
51	197	146	74	37	29
52	254	213	84	38	28
53	96	66	69	38	22
54	79	49	62	39	18
55	28	15	54	39	0
56	476	311	66	39	30
57	292	177	61	39	32
58	368	234	64	39	36
59	124	84	68	40	36
60	552	318	58	40	14
61	332	232	70	40	14
62	314	175	56	40	32
63	31	12	44	48	0
64	96	58	60	41	41

Table 13 (concluded)

Total enrolment and pupils schooled locally in eighty-eight communities with slow-progress percentage of each

COMMUNITY	TOTAL PUPILS ENROLLED	PUPILS SCHOOLED LOCALLY	PER-CENTAGE SCHOOLED LOCALLY	PERCENTAGES OF SLOW PROGRESS	
				Among all pupils enrolled	Among pupils locally schooled
65	97	55	57	41	27
66	322	200	62	41	38
67	126	67	53	42	0
68	66	66	100	42	42
69	55	44	80	43	32
70	30	19	63	43	50
71	243	243	100	44	44
72	180	110	58	43	21
73	156	126	81	44	31
74	39	23	59	46	30
75	59	48	81	46	48
76	88	63	72	47	45
77	439	330	75	48	45
78	41	41	100	48	48
79	208	161	77	48	32
80	109	77	71	48	41
81	257	235	91	49	37
82	107	62	58	49	37
83	40	24	60	50	45
84	56	27	48	50	7
85	183	151	83	51	53
86	183	115	63	54	42
87	126	84	67	56	68
88	105	100	95	89	90
Total	17 104	12 380	72	34	27

It will be noted that in the case of some of the small schools there is a greater percentage of retarded pupils among those schooled entirely in that school than among the entire enrolment. This apparent impossibility is due to the chance advancement of the pupils schooled in part elsewhere, who are sufficiently advanced to reduce the retardation of the entire school below that of the pupils who have never been elsewhere. This is of course exceptional.

Table 13 shows that of 17,104 pupils enrolled in 88 schools, 12,380, or 72 per cent, were schooled exclusively in the school where they were enrolled at the time the tabulation was made. The schools in this table are listed in the order of the reported percentage of slow-progress pupils, hence any relation between retardation and the percentage of pupils locally schooled is not apparent. As it is possible to arrange a given table in the order of but one factor at a time, this was chosen as the most important.

Table 14 shows the retardation reported in each case for the entire school listed according to the per cent of pupils locally schooled.

FIGURE 5

Each horizontal line represents the slow-progress percentage among all pupils enrolled in one elementary school system. The schools in this figure are the same as in figure 6.

FIGURE 6

Each horizontal line represents the percentage of slow-progress pupils in one elementary school system. The four systems at the top represent no slow progress pupils or zero per cent. These are the same school systems shown in figure 5. Note that in the case of these pupils who have received all their schooling in the local public system in which they were found when this survey was made, the slow-progress percentages are lower than those shown in figure 5.

Table 14

Slow-progress percentages arranged according to the per cent of pupils locally schooled

PER CENT OF ALL PUPILS SCHOOLED LOCALLY	ALL PUPILS ENROLLED				
	Percentages of retardation				
	Lowest	1st quartile	Median	3d quartile	Highest
30–39............................	....	....	21	....	....
40–49............................	24	....	40	....	50
50–59............................	9	26	33	41	49
60–69............................	14	25	32	39	56
70–79............................	22	22	30	44	48
80–89............................	31	....	43	....	50
90–100...........................	10	....	37	....	88
88 schools........................	9	25	34	42	88

In table 15 the progress percentages reported by schools are arranged in four ways, each in a double column of figures in which the first figure is the per cent of slow-progress pupils and the second figure is the number of villages reporting the percentage represented by the first figure.

Age-progress and School Locations

It is of course expected that those pupils who have not moved about from place to place will make more satisfactory school progress than those who have done any considerable amount of moving.

The division of the pupils of a public school system into groups for the study of retardation on this basis of *locations* is not so simple and is by no means limited to the two groups representing pupils who have been schooled elsewhere and those who have not.

When we go into this matter of the location of pupils' schooling we encounter the following groups of pupils which have to be analyzed separately as to rapid, normal and slow progress:

1 Pupils who have never been to school in any other building except the one in which they were found at the time of the age-progress survey
2 Pupils schooled entirely in two or more schools of the local public system
3 Groups 1 and 2 combined, constituting all pupils schooled within the local public system
4 Pupils partly schooled in local parochial and other private schools
5 Pupils partly schooled in any type of schools in other cities
6 Pupils partly schooled in foreign countries

Table 15
Slow-progress percentages reported by villages

Reading across the top of the page, the first line items in this table means that 9 per cent retardation among all pupils enrolled was reported by one village; 0 per cent retarded two or more years was reported by six villages; 0 per cent retarded at all among pupils exclusively schooled locally was reported by 3 villages; and 0 per cent of two-year retardation among pupils locally schooled was reported by 9 villages. The first figure in each double column is the reported percentage of slow progress and the second figure is the number of villages which report each particular per cent.

| ALL PUPILS ENROLLED | | | | PUPILS SCHOOLED LOCALLY | | | |
| TOTAL RETARDATION | | TWO YEARS' RETARDATION | | TOTAL RETARDATION | | TWO YEARS' RETARDATION | |
Per cent	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent	Frequency
9	1	0	6	0	3	0	9
11	1	1	2	3	1	1	2
14	1	2	5	5	1	2	6
15	2	3	5	7	1	3-Q1	13
17	2	4	7	8	1	4	11
18	3	5-Q1	4	9	1	5-Md	12
19	1	6	8	11	1	6	6
20	2	7	8	12	1	7	1
21	2	8-Md	8	13	2	8	5
22	1	9	7	14	3	9-Q3	3
23	2	10	6	16	2	10	3
24	2	12	4	17	1	11	1
25-Q1	4	13-Q3	4	18	3	12	3
26	2	14	4	19-Q1	2	13	2
28	4	15	3	20	1	14	3
29	3	16	1	21	3	15	1
30	1	18	3	22	3	16	1
31	4	20	2	23	4	17	3
33	3	23	1	25	8	18	2
34-Md	5			26	2	20	1
35	3			27-Md	5		
36	1			28	1		
37	2			29	2		
38	2			30	5		
39	5			31	2		
40	4			32	5		
41	3			35	3		
42-Q3	2			36-Q3	3		
43	4			37	2		
44	1			38	1		
45	1			39	1		
46	1			41	1		
47	1			42	2		
48	4			44	2		
49	2			45	3		
50	3			48	1		
54	1			50	2		
56	1			53	1		
88	1			68	1		
				90	1		
	N=88		N=88		N=88		N=88

As it is not worth while to make an analysis in this detail without securing complete information about pupils, the record of each pupil's age was secured, as well as a record of his progress through school. As a pupil may be young, normal or overage and may make rapid, normal or slow progress through school, the following well-known arrangement of nine age-progress groups is necessary to tell the whole truth about any group of pupils under consideration.

In point of age, the pupil is classified according to whether he is young, normal or old with reference to the standard which is as follows for *beginning* the work of each grade:

1 B, 6 years but less than 7 years   5 B, 10 years but less than 11 years
1 A, $6\frac{1}{2}$ " $7\frac{1}{2}$ "   5 A, $10\frac{1}{2}$ " $11\frac{1}{2}$ "
2 B, 7   "   8 "   6 B, 11   "   12 "
2 A, $7\frac{1}{2}$ " $8\frac{1}{2}$ "   6 A, $11\frac{1}{2}$ " $12\frac{1}{2}$ "
3 B, 8   "   9 "   7 B, 12   "   13 "
3 A, $8\frac{1}{2}$ " $9\frac{1}{2}$ "   7 A, $12\frac{1}{2}$ " $13\frac{1}{2}$ "
4 B, 9   "   10 "   8 B, 13   "   14 "
4 A, $9\frac{1}{2}$ " $10\frac{1}{2}$ "   8 A, $13\frac{1}{2}$ " $14\frac{1}{2}$ "

It is important to note that " being in a grade " is not an accurate measure for determining progress.

The circumstances of age and progress result in nine categories of pupils:

    1 Underage and rapid progress
    2 Normal age and rapid progress
    3 Overage and rapid progress
    4 Underage and normal progress
    5 Normal both as to age and progress
    6 Overage and normal progress
    7 Underage and slow progress
    8 Normal age and slow progress
    9 Overage and slow progress

These are best shown in the following arrangement of the groups:

UNDERAGE AND RAPID PROGRESS	NORMAL AGE AND RAPID PROGRESS	OVERAGE AND RAPID PROGRESS
UNDERAGE AND NORMAL PROGRESS	NORMAL BOTH AS TO AGE AND PROGRESS	OVERAGE AND NORMAL PROGRESS
UNDERAGE AND SLOW PROGRESS	NORMAL AGE AND SLOW PROGRESS	OVERAGE AND SLOW PROGRESS

According to this plan the results of the statistical research in the cities undertaking this work during 1916–17 are given.
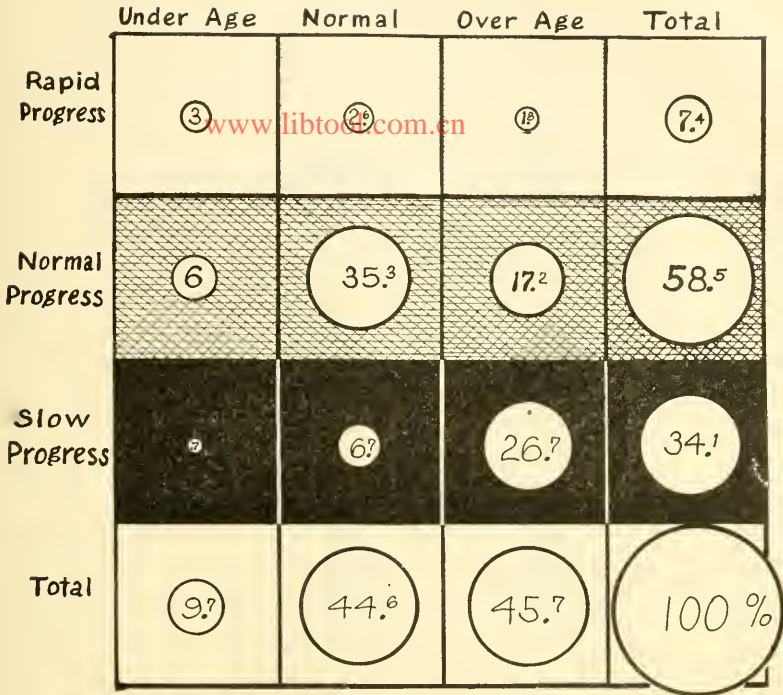
FIGURE 7

Age and progress of elementary pupils

This age-progress percentage chart represents the nine groups of pupils shown
in the text just preceding table 16. The figures show percentages alone and
not the actual number of pupils and correspond to table 16, to which additions
were made after the figure had been drawn, which slightly changed the decimals
in some of the percentage figures. The total of 100 per cent is the sum of the nine
groups, not of the 15 other circles in the figure, 6 of which, 3 at the right and 3
at the bottom, are subtotals.

Table 16

46,000 pupils in twenty-two cities in New York State

PUPILS	NUMBERS				PERCENTAGES			
	Under-age	Normal age	Over-age	Total	Under-age	Normal age	Over-age	Total
Rapid progress....	1 356	1 195	820	3 371	2.9	2.6	1.8	7.3
Normal progress...	2 710	16 220	7 921	26 851	5.9	35.3	17.2	58.4
Slow progress......	315	3 148	12 338	15 801	.7	6 8	26.8	34.3
Total.........	4 381	20 563	21 079	46 023	9.5	44.7	45.8	100

Table 17

Age-progress analysis of 3665 elementary pupils by school location

Table A — All pupils enrolled

PUPILS	NUMBERS				PERCENTAGES			
	Under-age	Normal age	Over-age	Total	Under-age	Normal age	Over-age	Total
Rapid progress.....	120	96	101	317	3.3	2.6	2.8	8.7
Normal progress...	370	641	431	1 442	10.	17.5	11.8	39.3
Slow progress.....	119	353	1 434	1 906	3.3	9.6	39.1	50
Total.........	609	1 090	1 966	3 665	16.6	29 7	53.7	100

Table B — 2289 pupils schooled entirely in local public schools

Rapid progress.....	95	59	35	189	4.2	2.6	1.5	8.3
Normal progress...	323	500	208	1 031	14.1	21.8	9.1	45
Slow progress......	100	275	694	1 069	4.4	12	30.3	46.7
Total.........	518	834	937	2 289	22.7	36.4	40.9	100

Table C — 836 pupils schooled entirely in two or more local public schools

Rapid progress.....	19	11	8	38	2.3	1.3	1.0	4.6
Normal progress...	82	148	101	331	9.8	17.7	12.2	39.6
Slow progress......	60	98	309	467	7.2	11.7	36.9	55.8
Total.........	161	257	418	836	19.2	30.7	50.1	100

Table D — 1453 pupils schooled entirely in one school

Rapid progress.....	76	48	27	151	5	3	2	10
Normal progress...	241	352	107	700	17	24	7	48
Slow progress......	40	177	385	602	3	12	27	42
Total.........	357	577	519	1 453	25	39	36	100

Table E — 785 pupils schooled partly in local nonpublic schools

Rapid progress.....	5	14	42	61	.6	1.8	5.3	7.7
Normal progress...	24	66	133	223	3.1	8.4	16.9	28.4
Slow progress......	9	45	447	501	1.2	5.7	57	63.9
Total.........	38	125	622	785	4.9	15.9	79.2	100

Table F — 458 pupils partly schooled in other cities

Rapid progress.....	18	21	21	60	3.9	4.6	4.6	13.1
Normal progress...	20	66	66	152	4.4	14.4	14.4	33.2
Slow progress......	10	29	207	246	2.2	6.3	45.2	53.7
Total.........	48	116	294	458	10.5	23.3	64.2	100

Table G — 133 pupils partly schooled in foreign countries

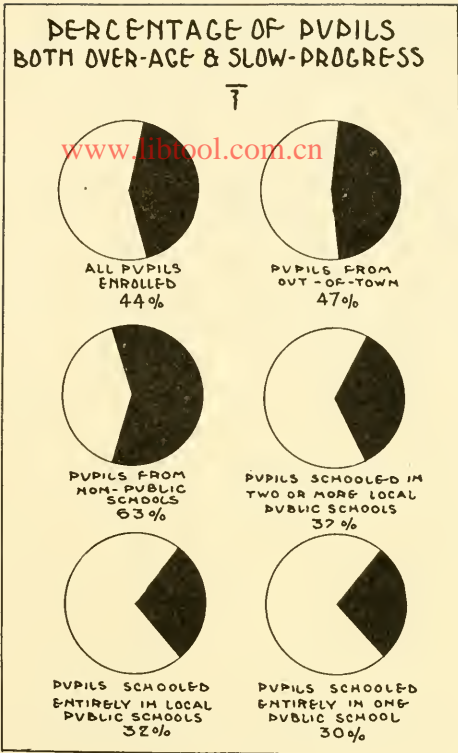|								
Rapid progress.....	2	2	3	7	2	2	2	6
Normal progress...	3	9	24	36	2	6	18	26
Slow progress......	0	4	86	90	0	3	65	68
Total.........	5	15	113	133	4	11	85	100

FIGURE 8

This figure should not be misinterpreted as showing the relative number of
pupils who have been schooled entirely in the local system or have come into
it from the outside. It represents groups of pupils based on the location of
their previous schooling, ranging in size from 133 pupils partly schooled in foreign
countries to the grand total of 3665 found in the public schools at the time of
the survey. Each circle represents 100 per cent of its own group and the black
sector shows the percentage of these that are retarded.

There are three points in each of these tables which should interest
the local superintendent. These are (1) the percentage of overage
pupils; (2) the percentage of slow-progress pupils; (3) the per-
centage of pupils who are both old and slow for their grade.

In this particular total group of 3665 pupils, the overage situation
may be stated as follows:

Overage, for all pupils enrolled................ 53.7 per cent
For pupils schooled entirely within the local
  public system............................. 40.9 per cent

For pupils who have moved from school to school
within the local public school system........   50.1 per cent

For pupils who have always attended the same
public school...........................   36   per cent

Pupils who have come into the system from
parochial or private schools...............   79.2 per cent

Pupils entering from other cities.............   64.2 per cent

Pupils entering from foreign schools..........   85   per cent

The corresponding percentages for slow progress and for both
overage and slow progress are:

GROUP OF PUPILS	PER CENT SLOW PROGRESS	PER CENT BOTH OVERAGE AND SLOW PROGRESS
All pupils enrolled......................	52	39.1
Schooled locally in public schools...........	46.7	30.3
In two or more local public schools..........	55.8	36.9
In one school only	42	27
Partly parochial........................	63.9	57
Partly out of town......................	53.7	45.2
Partly foreign..........................	68	65

This table shows that at the very start, there are three types
of location factors which have to be analyzed quantitatively before
the superintendent can even begin to interpret his own age-progress
figures: (1) changes within his system, (2) the combination of
public and parochial schooling, and (3) the combination of local
and out-of-town schooling.

The great difference between the number of pupils who are over-
age, who are slow and who are both old and slow shows the inadequacy
of either age or years-in-school alone as a measure of retardation,
and the handicap under which those superintendents are working
who have not the aid and support of a complete system of individual
permanent record cards, so essential to the demands of modern
supervision considered locally and entirely apart from any collective
research such as this discussion.

Even this sevenfold table does not tell the complete story of local
and outside retardation, to determine both of which requires the
correlation of each pupil's progress with the proportion of his total
schooling received in the local public system and obtained elsewhere,
a task which, while somewhat involved, is quickly accomplished by
means of the mechanical tabulation of these statistics with electrical

machines. The detailed data for this type of correlation are already
assembled for a number of cities in New York State and will doubtless
be given to the superintendents early in the fall.

Analysis of Progress by Grades

The tables and discussions thus far presented in this paper refer
to the progress percentages reported by communities in the form
of one figure representing the per cent of all the pupils in one com-
munity who were reported by that community as having made
retarded or slow progress at the time the figures were collected.
In tables 2 to 6 each community reported three figures, one for
rapid progress, a second for normal progress and a third for its slow
progress per cent. The remaining tables have presented slow
progress alone giving one percentage figure for each community with
reference to the total retardation in that system and another per-
centage figure with reference to the retardation which amounted to
two or more years and were likewise for the entire school system.

As the total slow-progress percentage of 32.4 for union free school
districts with less than 100 elementary pupils gives no idea of the
variety of conditions shown in the first column of table 11 where
the slow progress ranges from 2 per cent to 76 per cent, so do all
the slow-progress percentages for school systems as a whole fail to
give any notion whatever of the variety of retardation conditions
which exist within each of these 563 communities.

The reports received from all these cities and villages had
the information contained in them arranged separately by grades.
On the basis of this division of each school system into the
eight regular grades of the elementary schools, the tables which
follow have been prepared, showing first for the State as a
whole and subsequently for each of the nine groups based on the
size of the elementary enrolment, the numbers of pupils and per-
centages of rapid, normal and slow progress, likewise separately
tabulated for each grade. For example, the figures for the first
grade in table 18 were obtained by adding together the figures
for the first grades in all the 563 communities reporting. In the
same manner the first grade figures in the nine tables reporting
the nine groups of cities were obtained by adding first grade figures
reported by the cities in each group.

Figure 9 represents pupils in elementary schools arranged in
eight columns to correspond to the eight regular grades. The
shading in the columns indicates the relative amount of rapid,

normal and slow progress in each grade, expressed in per cents. Each column represents 100 per cent for each grade. The columns are of equal length to bring out the relative proportions of rapid, normal and slow progress in the different grades at a glance. This figure does not show the relative size of the different grades, as it is concerned with percentages alone and not with the numbers enrolled in each grade. There is no rapid progress reported in the first grade, but, beginning with the second grade, the rapid progress is seen to increase with each succeeding grade, through the eighth. The solid black shading indicating normal progress is affected by the increasing rapid-progress, and the slow-progress elements which increase from the start and reach a maximum in the fifth grade. The decrease in slow progress in the sixth, seventh and eighth is due to the withdrawal of retarded pupils from these grades as well as to improved school conditions, but the relative weight of these factors has not been studied in this research. The chief purpose of the diagram is to bring out the fact that there is a wide variation in the amount of rapid, normal and slow progress from grade to grade which is not revealed in an average or median figure for a community as a whole, and the careful determination and interpretation of these differences by the local superintendent are essential to the intelligent and effective analysis of the situation in each community.

Table 18

Progress percentages of 286,207 pupils in 41 cities, 29 villages and 493 union free school districts

GRADE	RAPID	NORMAL	1 YEAR SLOW	2 YEARS SLOW	3 YEARS SLOW	4 YEARS SLOW	5 YEARS SLOW	6 YEARS SLOW	TOTAL SLOW	TOTAL
1......	....	38 112	7 501	841	154	19	10	6	8 531	46 643
2......	2 225	28 026	8 900	2 108	357	83	24	8	11 479	41 730
3......	2 917	24 796	8 120	2 325	631	180	41	10	11 309	39 018
4......	3 773	21 599	9 247	2 964	923	296	84	19	13 533	38 905
5......	4 152	18 815	8 990	3 109	1 053	306	58	14	13 222	36 497
6......	4 568	16 402	7 963	2 684	801	217	28	12	11 609	32 579
7......	4 854	13 875	6 126	1 693	416	67	11	1	8 314	27 043
8......	4 639	12 798	4 709	1 298	274	72	2	....	6 355	23 792
Total..	27 128	174 419	61 556	16 925	4 608	1 240	259	70	84 660	286 207

Percentages

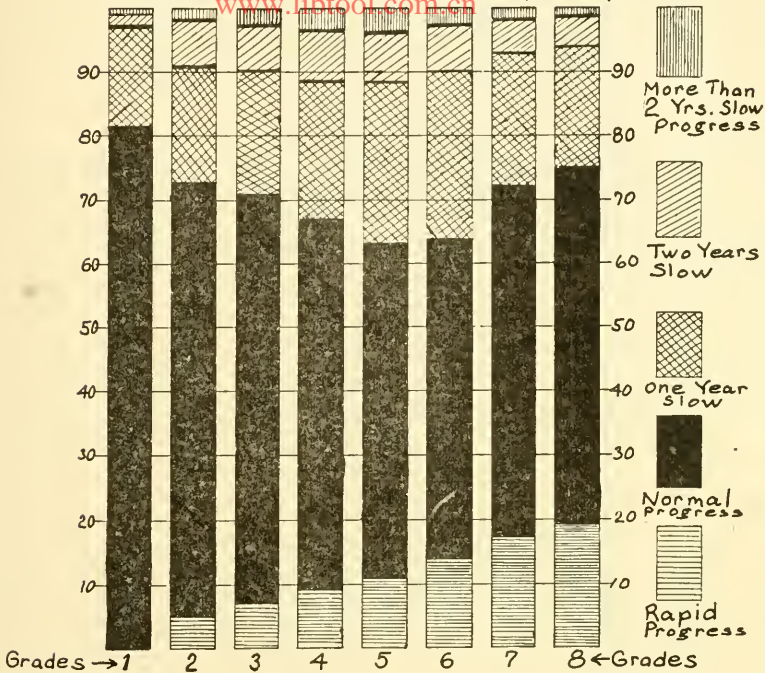| GRADE	RAPID	NORMAL	1 YEAR SLOW	2 YEARS SLOW	3 YEARS SLOW	4 YEARS SLOW	5 YEARS SLOW	6 YEARS SLOW	TOTAL SLOW	TOTAL
1......	....	81.69	16.07	1.8	.33	.047	.027	.012	18.3	100
2......	5.33	67.16	21.31	5.05	.852	.198	.057	.019	27.51	100
3......	7.47	63.54	20.81	5.95	1.617	.461	.105	.025	28.98	100
4......	9.67	55.51	26.09	7.62	2.372	.76	.215	.049	34.78	100
5......	11.37	51.55	24.63	8.52	2.885	.838	.158	.038	37.07	100
6......	14.02	50.34	24.44	7.94	2.458	.666	.088	.036	35.63	100
7......	17.94	51.31	22.65	6.26	1.53	.247	.04	.004	30.74	100
8......	19.49	53.77	19.79	5.46	1.15	.300	.08	....	26.71	100
Total..	9.48	60.94	21.51	5.91	1.608	.433	.091	.025	29.58	100

FIGURE 9

Table 19

Progress percentages of 103,783 pupils in six cities with an elementary enrolment of over 5000

GRADE	RAPID	NORMAL	1 YEAR SLOW	2 YEARS SLOW	3 YEARS SLOW	4 YEARS SLOW	5 YEARS SLOW	6 YEARS SLOW	TOTAL SLOW	TOTAL
1......	....	15 296	2 044	197	47	8	1	....	2 297	17 593
2......	1 041	10 604	2 769	483	75	18	6	4	3 354	14 999
3......	1 302	9 615	2 040	437	112	23	7	2	2 621	13 538
4......	1 492	8 181	3 019	906	302	87	26	5	4 345	14 018
5......	1 576	7 078	3 021	1 070	354	111	24	4	4 584	13 238
6......	1 638	6 150	2 982	981	311	91	6	3	4 374	12 162
7......	1 814	4 950	2 268	672	155	29	2	1	3 127	9 891
8......	1 561	4 501	1 706	424	100	42	1	....	2 282	8 344
Total..	10 424	66 375	19 849	5 170	1 464	409	73	19	26 984	103 783

38

Percentages

Grade	Rapid	Normal	1 Year Slow	2 Years Slow	3 Years Slow	4 Years Slow	5 Years Slow	6 Years Slow	Total Slow	Total
1......	....	86.94	11.6	1.15	.302	.078	.009	......	13.05	100
2......	7.94	70.69	18.46	2.97	.508	.113	.011	.011	21.36	100
3......	9.62	71.01	15.07	4.05	.885	.170	.055	.011	19.36	100
4......	10.64	58.36	21.15	5.24	2.15	.550	.106	.047	30.98	100
5......	11.72	54.15	22.92	6.27	1.94	.431	.101	.013	34.11	100
6......	13.46	50.56	21.94	4.81	1.11	.316	.014	......	35.96	100
7......	18.48	49.63	20.41	3.36	.578	.070	......	......	31.87	100
8......	18.71	53.94	15.87	2.28	.455	.109	......	......	27.34	100
Total..	10.04	63.90	www.ibtool.com.cn			.393	.070	.018	26	100

Table 20

Progress percentages of 31,233 pupils in eight cities with an elementary enrolment from 3000 to 4999

GRADE	RAPID	NORMAL	1 YEAR SLOW	2 YEARS SLOW	3 YEARS SLOW	4 YEARS SLOW	5 YEARS SLOW	6 YEARS SLOW	TOTAL SLOW	TOTAL
1......	....	3 873	736	79	10	2	......	1	828	4 701
2......	276	3 136	890	243	30	8	3	1	1 175	4 587
3......	416	2 862	1 004	286	65	27	3	1	1 386	4 664
4......	605	2 374	988	283	86	19	8	2	1 386	4 365
5......	747	2 068	935	355	91	18	3	......	1 402	4 217
6......	771	1 544	814	249	68	25	3	......	1 159	3 474
7......	904	1 417	484	104	19	3	......	......	610	2 931
8......	764	1 087	346	75	19	3	......	......	443	2 294
Total.:	4 483	18 361	6 197	1 674	388	105	20	5	8 389	31 233

Percentages

Grade	Rapid	Normal	1 Year Slow	2 Years Slow	3 Years Slow	4 Years Slow	5 Years Slow	6 Years Slow	Total Slow	Total
1......	....	82.04	15.65	1.787	.235	.047	.023	.023	17.613	100
2......	6.01	68.36	20.05	5.66	.637	.196	.073	.024	25.621	100
3......	8.91	61.36	22.20	6.63	1.475	.653	.073	.024	29.716	100
4......	13.86	54.38	23.55	7.01	2.193	.487	.204	.051	31.752	100
5......	17.71	49.04	22.26	8.81	2.365	.474	.079	......	33.246	100
6......	22.19	44.44	24.88	7.61	1.983	.781	.097	......	33.362	100
7......	30.84	48.34	17.68	3.55	.738	.116	......	......	20.812	100
8......	33.30	47.38	15.28	3.26	.845	.148	......	......	19.311	100
Total..	14.35	58.78	19.84	5.36	1.242	.336	.064	.016	26.86	100

Table 21

Progress percentages of 19,689 pupils in seven cities and one village with an elementary enrolment between 2000 and 2999

GRADE	RAPID	NORMAL	1 YEAR SLOW	2 YEARS SLOW	3 YEARS SLOW	4 YEARS SLOW	5 YEARS SLOW	6 YEARS SLOW	TOTAL SLOW	TOTAL
1......	00	2 645	493	49	6	1	1	1	551	3 196
2......	323	1 824	624	121	22	9	3	1	780	2 927
3......	337	1 610	734	214	76	21	9	......	1 054	3 001
4......	400	1 167	646	260	84	21	8	1	1 020	2 587
5......	393	1 229	634	198	74	29	6	4	945	2 567
6......	492	985	523	177	46	13	2	2	763	2 240
7......	424	843	382	112	42	4	1	......	541	1 808
8......	312	634	294	94	21	8	......	......	417	1 363
Total..	2 681	10 937	4 330	1 225	371	106	30	9	6 071	19 689

Percentages

Grade	Rapid	Normal	I Year Slow	2 Years Slow	3 Years Slow	4 Years Slow	5 Years Slow	6 Years Slow	Total Slow	Total
1......	....	82.8	15.43	1.534	.188	.031	.031	.031	17.245	100
2......	10.	56.52	21.32	4.136	.753	.375	.103	.034	33.46	100
3......	11.23	53.7	24.45	7.14	2.532	.700	.300	....	35.122	100
4......	15.46	45.15	24.97	10.05	3.247	.813	.309	.039	39.428	100
5......	15.31	47.84	24.7	7.72	2.885	1.13	.234	.156	36.825	100
6......	21.95	44.	23.34	7.91	2.053	.581	.089	.089	34.062	100
7......	23.45	46.6	21.12	6.20	2.322	.221	.055	....	29.918	100
8......	22.90	46.50	21.57	6.89	1.54	.587	....	....	30.587	100
Total..	13.62	55.55	www.libtool.com.cn			...39	.152	.046	30.831	100

Table 22

Progress percentages of 30,932 pupils in sixteen cities and eight villages with an elementary enrolment between 1000 and 1999 pupils

GRADE	RAPID	NORMAL	I YEAR SLOW	2 YEARS SLOW	3 YEARS SLOW	4 YEARS SLOW	5 YEARS SLOW	6 YEARS SLOW	TOTAL SLOW	TOTAL
1......	000	3 875	900	143	24	4	0	1	1 072	4 947
2......	·234	2 971	1 001	261	62	13	5	0	1 342	4 547
3......	376	2 476	983	386	114	40	5	3	1 531	4 383
4......	434	2 269	1 025	332	120	61	17	6	1 561	4 264
5......	462	2 025	964	362	143	44	14	2	1 529	4 016
6......	546	1 845	788	292	85	11	3	1	1 180	3 571
7......	510	1 429	620	179	52	11	1	0	863	2 802
8......	561	1 228	447	140	23	3	0	0	613	2 402
Total..	3 123	18 118	6 728	2 095	623	187	45	13	9 691	30 932

Percentages

GRADE	RAPID	NORMAL	I YEAR SLOW	2 YEARS SLOW	3 YEARS SLOW	4 YEARS SLOW	5 YEARS SLOW	6 YEARS SLOW	TOTAL SLOW	TOTAL
1......	00.00	78.38	18.19	2.89	.485	.08'	.000	.020	21.62	100
2......	5.15	65.33	22.02	5.74	1.363	.286	.110	....	29.52	100
3......	8.58	56.47	22.41	8.81	2.601	.913	.114	.068	34.95	100
4......	10.17	53.21	24.04	7.79	2.815	1.430	.399	.141	36.62	100
5......	11.50	50.40	24.00	9.02	3.564	1.095	.349	.050	38.10	100
6......	15.28	51.68	22.06	8.18	2.380	.308	.084	.028	33.04	100
7......	18.20	51.00	22.12	6.39	1.855	.392	.036	.000	30.80	100
8......	23.35	51.13	18.61	5.83	.957	.125	.000	.000	25.52	100
Total..	10.09	58.57	21.75	6.772	2.014	.604	.145	.042	31.33	100

Table 23

Progress percentages of 29,748 pupils in four cities, sixteen villages and twenty-eight union free school districts with an elementary enrolment between 500 and 999

GRADE	RAPID	NORMAL	I YEAR SLOW	2 YEARS SLOW	3 YEARS SLOW	4 YEARS SLOW	5 YEARS SLOW	6 YEARS SLOW	TOTAL SLOW	TOTAL
1......	....	3 732	1 126	151	24	4	6	2	1 313	5 045
2......	100	2 787	1 036	279	36	12	4	1	1 368	4 255
3......	160	2 689	877	266	100	29	7	3	1 282	4 131
4......	316	2 222	1 054	447	137	50	6	2	1 696	4 234
5......	381	1 804	994	353	138	30	1	1	1 517	3 702
6......	418	1 708	808	256	102	28	2	....	1 196	3 322
7......	433	1 427	654	178	43	5	1	....	881	2 741
8......	409	1 197	532	146	28	6	....	....	712	2 318
Total..	2 217	17 566	7 081	2 076	608	164	27	9	9 965	29 748

Percentages

GRADE	RAPID	NORMAL	1 YEAR SLOW	2 YEARS SLOW	3 YEARS SLOW	4 YEARS SLOW	5 YEARS SLOW	6 YEARS SLOW	TOTAL SLOW	TOTAL
1......	....	74	22.3	3	.48	.08	.12	.04	26	100
2......	2.3	65.2	24.3	6.5	1.31	.28	.09	.02	32.5	100
3......	3.9	65.1	21.2	6.4	2.42	.70	.17	.06	30.5	100
4......	4.7	32.5	24.9	10.5	3.24	1.18	.14	.05	40.1	100
5......	10.2	48.7	26.8	9.7	3.72	.81	.03	.03	41.1	100
6......	12.5	51.3	24.3	7.9	3.06	.84	.06	....	36.2	100
7......	15.6	52.1	23.9	6.5	1.37	.18	.04	....	32.1	100
8......	17.6	31.7	23	6.3	1.21	.26	....	....	30.7	100
Total..	7.3	59.3	23.6	7	2.11	.55	.09	.03	33.4	100

Table 24

Progress percentages of 22,049 pupils in three villages and sixty-one union free school districts with an elementary enrolment between 300 and 499

GRADE	RAPID	NORMAL	1 YEAR SLOW	2 YEARS SLOW	3 YEARS SLOW	4 YEARS SLOW	5 YEARS SLOW	6 YEARS SLOW	TOTAL SLOW	TOTAL
1......	....	2 690	729	86	17	....	1	....	833	3 523
2......	47	2 155	719	213	37	7	1	....	977	3 179
3......	107	1 799	750	235	51	17	1	1	1 055	2 961
4......	172	1 778	801	244	78	28	8	1	1 160	3 110
5......	193	1 530	758	275	94	38	5	2	1 172	2 895
6......	253	1 299	549	204	87	22	2	....	864	2 416
7......	213	1 131	504	155	33	4	....	....	696	2 040
8......	286	1 292	202	126	16	3	....	....	347	1 925
Total..	1 271	13 674	5 012	1 538	413	119	18	4	7 104	22 049

Percentages

GRADE	RAPID	NORMAL	1 YEAR SLOW	2 YEARS SLOW	3 YEARS SLOW	4 YEARS SLOW	5 YEARS SLOW	6 YEARS SLOW	TOTAL SLOW	TOTAL
1......	....	76.4	20.70	2.44	.48	....	.028	....	23.648	100
2......	1.48	67.8	22.60	6.70	1.16	.22	.031	....	30.711	100
3......	3.61	60.8	25.32	7.93	1.72	.57	.034	.034	35.618	100
4......	5.53	57.2	25.74	7.85	2.51	.90	.257	.032	37.289	100
5......	6.67	52.9	26.20	9.50	3.25	1.31	.173	.069	40.50	100
6......	10.47	53.8	22.72	8.45	3.60	.91	.083	....	35.763	100
7......	10.44	55.5	24.70	7.60	1.62	.196	....	....	34.116	100
8......	14.84	67.1	10.48	6.53	.83	.156	....	....	17.996	100
Total..	5.77	62	22.71	6.98	1.87	.54	.082	.018	32.20	100

Table 25

Progress percentages of 18,979 pupils in one village and seventy-six union free school districts with an elementary enrolment between 200 and 299

GRADE	RAPID	NORMAL	1 YEAR SLOW	2 YEARS SLOW	3 YEARS SLOW	4 YEARS SLOW	5 YEARS SLOW	6 YEARS SLOW	TOTAL SLOW	TOTAL
1......	....	2 293	740	81	9	....	....	....	830	3 123
2......	51	1 759	675	213	37	6	....	....	931	2 741
3......	47	1 542	686	180	39	7	2	....	914	2 503
4......	101	1 481	644	171	38	10	3	1	867	2 449
5......	120	1 277	690	193	42	11	1	....	937	2 334
6......	116	1 178	624	150	35	5	2	....	816	2 110
7......	193	1 059	495	122	26	1	....	....	644	1 896
8......	236	985	452	125	25	....	....	....	602	1 823
Total..	864	11 574	5 006	1 235	251	40	8	1	6 541	18 979

41

Percentages

	RAPID	NORMAL	I YEAR SLOW	2 YEARS SLOW	3 YEARS SLOW	4 YEARS SLOW	5 YEARS SLOW	6 YEARS SLOW	TOTAL SLOW	TOTAL
1......	....	73.5	23.7	2.59	2.88	.....	.....	.....	26.257	100
2......	1.86	64.2	24.6	7.77	1.35	.219	.....	.....	33.946	100
3......	1.87	61.5	27.4	7.18	1.56	.279	.079	.....	36.498	100
4......	4.12	60.4	28	6.98	1.55	.408	.122	.04	37.10	100
5......	5.14	54.7	29.5	8.27	1.80	.472	.043	.....	30.085	100
6......	5.5	55.9	29.6	7.12	1.66	.237	.095	.....	38.682	100
7......	10.18	55.9	26.1	6.44	1.37	.053	.....	.....	33.963	100
8......	12.94	49.1	24.8	6.86	1.37	.....	.....	.....	33.03	100
Total..	4.56	61	26.4	6.31		.132	.042	.005	41.057	100

Table 26

Progress percentages of 18,351 pupils in 153 union school districts with an elementary enrolment between 100 and 199

GRADE	RAPID	NORMAL	I YEAR SLOW	2 YEARS SLOW	3 YEARS SLOW	4 YEARS SLOW	5 YEARS SLOW	6 YEARS SLOW	TOTAL SLOW	TOTAL
1......	000	2 428	337	14	.....	.....	.....	.....	351	2 779
2......	76	1 774	820	205	45	7	2	1	1 080	2 930
3......	63	1 367	694	215	48	15	7	.....	979	2 409
4......	120	1 304	613	200	55	12	1	1	882	2 306
5......	154	1 008	632	199	82	16	4	1	934	2 096
6......	193	981	543	182	48	18	7	6	804	1 978
7......	222	972	450	104	30	9	5	.....	598	1 792
8......	250	1 256	441	95	16	3	.....	.....	555	2 061
Total..	1 078	11 090	4 530	1 214	324	80	26	9	6 183	18 351

Percentages

	RAPID	NORMAL	I YEAR SLOW	2 YEARS SLOW	3 YEARS SLOW	4 YEARS SLOW	5 YEARS SLOW	6 YEARS SLOW	TOTAL SLOW	TOTAL
1......	.....	87.4	12.12	.54	.....	.....	.....	.....	12.66	100
2......	2.34	61.4	27.20	7.29	1.55	.387	.041	.042	35.777	100
3......	2.61	56.75	28.8	8.93	1.99	.623	.290	.042	40.675	100
4......	5.21	56.6	26.57	8.68	2.58	.521	.043	.043	38.437	100
5......	7.35	48.15	30.15	9.50	3.91	.754	.191	.048	44.553	100
6......	9.76	49.65	27.45	9.21	2.43	.911	.354	.303	40.658	100
7......	12.39	54.25	25.12	5.81	1.67	.502	.279	.....	33.381	100
8......	12.13	60.8	21.4	4.61	.76	.145	.....	.....	26.915	100
Total..	5.82	60.8	24.44	6.5	1.78	.442	.140	.05	33.352	100

Table 27

Progress percentages of 11,443 pupils in 175 union free school districts with an elementary enrolment below 100

GRADE	RAPID	NORMAL	I YEAR SLOW	2 YEARS SLOW	3 YEARS SLOW	4 YEARS SLOW	5 YEARS SLOW	6 YEARS SLOW	TOTAL SLOW	TOTAL
1......	.....	1 280	396	41	17	.....	1	1	456	1 736
2......	77	1 016	366	90	13	3	.....	.....	472	1 565
3......	109	832	352	106	26	1	.....	.....	487	1 428
4......	133	823	457	121	23	8	7	.....	616	1 572
5......	126	796	362	104	35	9	.....	.....	510	1 432
6......	141	712	332	96	19	4	2	.....	453	1 306
7......	141	647	269	67	16	1	1	.....	354	1 142
8......	260	618	289	73	17	4	1	.....	384	1 262
Total..	987	6 724	2 823	698	166	30	12	1	3 732	11 443

Percentages

1......	.....	73.7	22.8	2.36	.979	.....	.058	.....	26.26	100
2......	4.92	64.9	23.38	5.75	.831	.192	.092	.....	30.15	100
3......	7.61	58.3	24.67	7.46	1.86	.072	.....	.....	34.08	100
4......	8.47	52.35	29.06	7.70	1.46	.509	.445	.....	39.20	100
5......	8.8	55.6	25.27	7.27	2.44	.628	.....	.....	35.60	100
6......	10.8	54.5	25.41	7.35	1.45	.306	.153	.....	34.67	100
7......	12.35	56.63	23.55	5.87	1.4	.088	.088	.....	31.00	100
8......	20.6	49	22.9	5.78	1.35	.317	.079	.....	30.42	100
Total..	8.62	58.75	24.65			.263	.105	.....	32.62	100

Table 28

Grades reporting lowest, highest and " middle " slow-progress percentages

ELEMENTARY ENROLMENT	GRADE IN WHICH LOWEST PER CENT OCCURS	GRADE IN WHICH HIGHEST PER CENT OCCURS	GRADES IN WHICH THE TWO MIDDLE PER CENTS OCCUR
Over 5000...................................	1	5	7 and 3
3000–4999...................................	1	6	2 and 3
2000–2999...................................	1	4	8 and 6
1000–1999...................................	1	5	7 and 6
500– 999...................................	1	5	7 and 2
300– 499...................................	8	5	7 and 3
200– 299...................................	1	6	2 and 7
100– 199...................................	1	5	2 and 4
Below 100...................................	1	4	7 and 3

In addition to showing the number of rapid, normal and slow-progress pupils, tables 18 to 27 give the numbers and percentages of pupils who are reported as being retarded for 1 year, 2 years, 3 years up to 6 years or more of slow progress.

Table 28 shows for each group of communities which grade had the lowest percentage of slow progress, the highest percentage and the two grades of the eight which had the middle percentages for the whole elementary system. In every group except one the first grade reports the lowest slow percentage, doubtless due to the fact that promotion from the first into the second grade depends rather upon the fact that the child had spent a year in the first grade than upon any exacting test of mental achievement. The greatest amount of retardation is reported in the fifth grade in five of the nine groups. The remaining four groups being divided equally between the sixth and fourth grades for maximum retardation.

No statewide statistical computations are necessary to inform the superintendent that the fifth grade is apparently the most difficult, and it is not for this purpose that these tables have been prepared. They will, however, show each superintendent exactly how much retardation was reported by all the communities of comparable size, for each of the eight grades. By comparing these

composite tables with his copy of the report sent to this Department
in May 1917, the superintendent or grade supervisor can see at
a glance just where his schools stand with reference to the total of
his particular group of school systems. The State Department of
Education will send to any superintendent or principal who has
not a duplicate of this report, a copy of the figures for May 1917.
Superintendents who have occasion to give this matter attention
are reminded that the fall term is the time best adapted to the
collecting of retardation data and that the Department is ready to
aid in this work at all times.

The information required for each pupil in the regular eight grades
of the elementary school in making an age-progress survey is as
follows:

1 The date of birth

2 The date of entrance into the first grade (not kindergarten)

3 The number of terms (one-half years) of schooling received and
grades or half grades completed in each of the following school
locations:

    a School where registered

    b Other local public schools

    c Local parochial or private schools

    d Any schools in other cities

    e Schools in foreign countries

4 Grades or half grades skipped or doubly promoted

5 Grades repeated or doubly repeated

6 Note of extraordinary circumstances favorable to progress

7 Note of extraordinary circumstances unfavorable to progress

Superintendents contemplating an age-progress canvass of their
schools during the next two or three years will greatly lessen the
labor of this task by installing an adequate system of pupils indi-
vidual permanent record cards, securing at the time as much of
the above information as it is possible to obtain, and entering it
on each pupil's card. Where individual record cards are already
in use, the above items should be added to the existing record and
an effort should consistently be made to obtain as much of this
information as possible for pupils who come into the system from
cities not keeping these individual school histories.

Many superintendents declare that to secure this array of detailed
information is a practicable impossibility except for pupils who
have always been in the local system, and when attempts are made

to fill in these figures from the statements of pupils and parents that the replies given are so inaccurate and unreliable as to be valueless or at least not worth the efforts expended in securing them. While there is some measure of truth in this viewpoint, the objectionable features of the problem are largely eliminated by giving the teachers and principals plenty of time to look up doubtful cases and question pupils individually. The factor of uncertainty is reduced by certain relations which must necessarily obtain between the dates called for, the grades covered and the occurrence of retardation and skipping. While this detailed type of research has not been statewide, it has been made in several of the larger cities of the State where this problem of uncertainty with reference to previous schooling would be the greatest, and in these cases, while the absence of definite records frequently compelled teachers and principals to resort to estimates of this past schooling, they felt that these approximations carefully worked out for individual pupils were not far from the actual truth and constituted a record which was far more valuable than no record at all.

INDIVIDUAL AGE AND PROGRESS RECORD				DATE OF BIRTH	
NAME				Month	Year
LOCATION	½ years of schooling	Grades completed	Entered first grade Month Year	EXTRA HALF YEAR CREDITS EARNED	
				Algebra	Latin
In this school			Grade entered Sept. or Feb. 191...		
Other local public schools			OR Grade completed Jan. or June 191...	Commercial	Science
Local parochial schools					
Any out of town schools. U. S.			Grades repeated and circumstances unfavorable to progress	Grades skipped and circumstances favorable to progress	
In foreign countries					
Protracted absence					
Total			Rating (To be filled in at the central office on all slips at the same time)		
			......yrs. Normal age ......yrs. Under Over	Rapid Normal prog. Slow	

FIGURE 10.—Age-progress analysis chart

This chart shows many groups of pupils distributed horizontally by half years of age and vertically by half years of schooling. The rectangles show the numbers and percentages of pupils in each of the nine standard age-progress groups. These charts may be made separately for each teacher's class, for the total of each grade throughout the city, for the total of each school building in the system for pupils with or without physical defects and for the groups of pupils shown in table 17 and figure 8. This particular arrangement was designed by the writer and the holder of the copyright, F. E. Shapleigh, Buffalo Public Education Association, by whose permission it is reproduced.

Individual Age-progress Slip

The blank shown on page 44 has been found to be the most con-
venient among several forms used during 1917–18 in several cities
and villages in New York State for collecting the original information
from the schools. Note that this blank is not a pupil's permanent
record card. It is merely a form for gathering at one particular
time all salient features of the pupil's schooling just previous to his
entry into or immediately after his completion of a given grade.

The normal age for beginning each grade as adopted by the super-
intendents of New York State has already been indicated on page 30.
These ages are figured as of the pupil's nearest birthday as follows:

Age — September 15, 1918   *Example: Any pupil whose date of birth falls*
Dates of birth used in com-   *between June 15, 1913 and December 14,*
       puting ages   .   *1913 is considered 5 years of age, etc.*

6–15–1913 to 12–14–1913...................................	5 years
12–15–1912 to 6–14–1913...................................	$5\frac{1}{2}$ "
6–15–1912 to 12–14–1912...................................	6 "
12–15–1911 to 6–14–1912...................................	$6\frac{1}{2}$ "
6–15–1911 to 12–14–1911...................................	7 "
12–15–1910 to 6–14–1911...................................	$7\frac{1}{2}$ "
6–15–1910 to 12–14–1910...................................	8 "
12–15–1909 to 6–14–1910...................................	$8\frac{1}{2}$ "
6–15–1909 to 12–14–1909...................................	9
12–15–1908 to 6–14–1909...................................	$9\frac{1}{2}$ "
6–15–1908 to 12–14–1908...................................	10 "
12–15–1907 to 6–14–1908...................................	$10\frac{1}{2}$ "
6–15–1907 to 12–14–1907...................................	11 "
12–15–1906 to 6–14–1907...................................	$11\frac{1}{2}$ "
6–15–1906 to 12–14–1906...................................	12 "
12–15–1905 to 6–14–1906...................................	$12\frac{1}{2}$ "
6–15–1905 to 12–14–1905...................................	13 "
12–15–1904 to 6–14–1905...................................	$13\frac{1}{2}$ "
6–15–1904 to 12–14–1904...................................	14 "
12–15–1903 to 6–14–1904...................................	$14\frac{1}{2}$ "
6–15–1903 to 12–14–1903...................................	15 "
12–15–1902 to 6–14–1903...................................	$15\frac{1}{2}$ "
6–15–1902 to 12–14–1902...................................	16 "
12–15–1901 to 6–14–1902...................................	$16\frac{1}{2}$ "
6–15–1901 to 12–14–1901...................................	17 "
12–15–1900 to 6–14–1901...................................	$17\frac{1}{2}$ "

Conclusion

From the number of years in school reported by the superintendents
and supervising principals of the State as of May 21, 1917 for pupils
we may conclude that the schools as a whole report that 30 per
cent of the pupils at the time of the survey had been going to school
one or more years longer than the time usually required to place
them in the grades in which they were found.

When examined separately for groups of schools based on elementary enrolment, these years in school reports show that

1 The extra time in school affects the greatest percentage of the total number of pupils in the union free school districts having an elementary enrolment between 200 and 299 pupils where the percentage of pupils thus reported to have spent more time in school than the normal period, is 34 per cent.

2 City school systems enrolling over 5000 elementary pupils report the least number of pupils having spent extra time in school, the proportion of the total number of pupils being 26 per cent.

Because the data were collected near the close of the school year before the June promotions, the figures submitted by the superintendents and principals do not include two classes of pupils: (1) those who dropped out of school for various reasons and in particular those who gave it up as a bad job before May 21, 1917, and (2) those who were not promoted in June as a result of the fact that they were not prepared to enter the next higher grade in September 1917. These features, together with other less important statistical discrepancies such as the omission of age data and reporting the schooling of midyear entrants by numbers representing whole school years, make it impossible to consider these reported extra years in school and the resulting percentages of the total number of pupils affected as synonymous with *actual retardation*.

Measured in a manner reliably to determine actual retardation, ten cities found that this condition affected 4.4 per cent more of their total enrolment than the proportion of pupils reported to have received extra schooling according to the method used throughout the State. While for these reasons the statewide years in school figures can not be used for exact comparison with communities throughout the country, they constitute, owing to the large number of communities reported and to a certain degree of uniformity which may safely be assumed in these reports, a valuable measure for superintendents and principals in locating the position of their local systems among others of comparable size in New York State.

Reported retardation and intelligence. Applying a very loose construction to the reported number of years in school in excess of the number normally required to place a pupil in a given grade as indicating a proportionate amount of *retardation*, we should obtain a self-made picture of the pupils in the elementary schools of the State which would take the form of figure 11. In this diagram the great mass of the children are making normal progress (61 per cent) and at the bottom of the high column there are two short columns

at the right representing about 9 per cent of the pupils who are making *rapid* progress. To the left of the center normal-progress column four columns represent pupils who have made one, two, three, four, five and six years slow progress through the elementary grades as far as they had gone at the time of the survey. After considering the 21 and 6 per cent represented by the 1 year-slow and 2 year-slow columns, we might regard the small proportion of the total pupils who are reported three to six years slow as practicably negligible so far as being a cause of any " alarm " about the welfare of the entire pupil body.

The schools then say that of every ten pupils in the elementary schools one is ahead of his grade, six are progressing normally and three are behind the procession. In general terms, the schools may be said to have their pupils in these proportions.

Let us glance at a similar diagram representing the distribution of " 1000 unselected children " according to the Stanford revision and extension of the Binet-Simon intelligence scale, figure 12. Here we find the minds of the children themselves represented in quite a different looking distribution than the arrangement in figure 11, based on where the schools " have " the children. On this particular basis of supposedly measurable intelligence we find a center area of 55.5 per cent of the total represented as possessing *normal intelligence*. This column is flanked on the left by areas representing, respectively, relatively low intelligence in the proportions 20 per cent, 8.6, 2.3 etc., based on so-called "intelligence quotas" or the ratio of mental age to physical age. The groups indicated at the bottom of the figure signify: 14.35[1] per cent dull but not feeble-minded, 5.45 per cent borderline cases, 1.48 per cent definitely feeble-minded, or 21.28 per cent below normal.

Note that these percentages of something the matter with the children's minds are much smaller than those in figure 11 expressing something the matter with their progress through school. Many students of these problems question the validity of this intelligence scale, and this paper emphatically questions the validity of the reported years in school and the resulting progress per cents shown in figure 11. But the objectors to the intelligence scale tend to *reduce* the number of mentally defective children, while the correction of the progress scale would *increase* the number of children retarded in the schools. In other words, there appears to be *less* trouble with their minds and *more* trouble with their schooling than these figures would indicate on their face value.

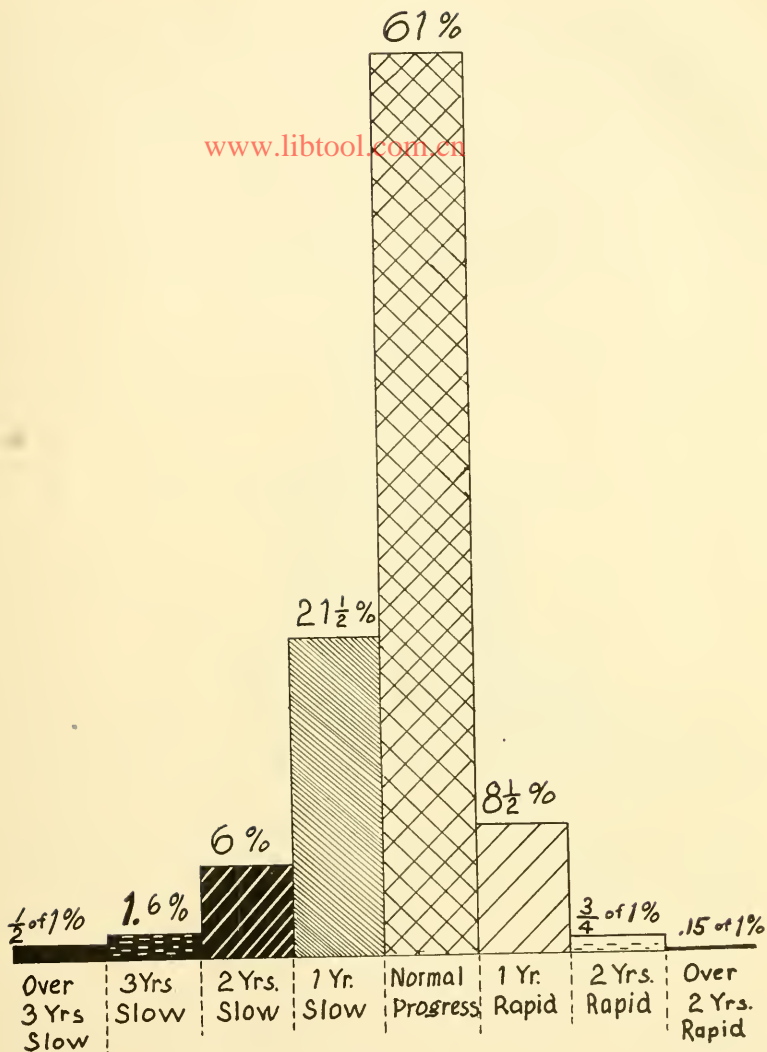[1] Figures obtained by taking halves of adjacent columns.

FIGURE 11

Rapid, normal and slow progress of 286,207 elementary pupils in 563 public
school systems in New York State

This figure shows where the schools have the children located with reference
to the normal advancement of one grade a year. Note that relatively a larger
number of pupils are found on the slow side of the normal than in the portion
of the diagram representing rapid pupils.

Proceeding to the right-hand part of the diagrams, we have in the school-progress figure but 10 per cent of the total who are accelerated, while the intelligence diagram shows three gradations, two of which are of very considerable relative dimensions: 16.05[1] per cent of superior intelligence, 5.92 per cent of very superior intelligence, .28 per cent "near genius" and genius, 22.25 above normal intelligence. However little one may care for this alleged intelligence scale or whatever opinion of its reliability is entertained, it is more in keeping with hundreds of other studied factors of biological
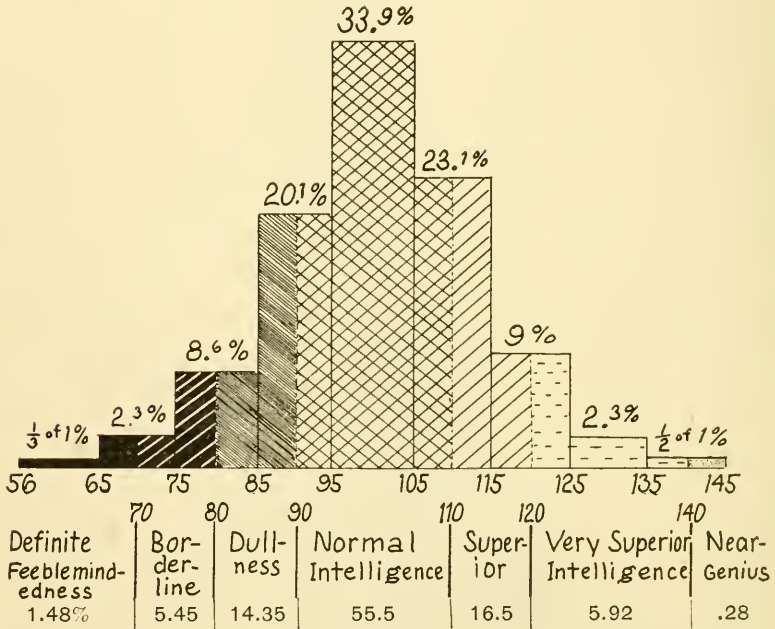
FIGURE 12

Intelligence distribution of 1000 unselected children

This figure should be examined in connection with figure 11. Note that so far as the children's minds are concerned: (1) the number below normal is considerably less than the proportion of children whose progress through school is below normal as shown in figure 11, and (2) that the number of children who appear in any way to be mentally slow is more than counterbalanced by the number of children of corresponding degrees of mental superiority. This is in marked contrast to the relatively few children who are making rapid progress through school. This figure is a modified form of a diagram in " The Measurement of Intelligence " by Lewis M. Terman, published by the Macmillan Company and reproduced here with the permission of the author and the publishers. Together figures 11 and 12 would appear to show that there is considerably more trouble with the children's schooling than there is with their minds and that whatever is the matter with their schooling is quite out of proportion to anything wrong with their minds.

[1] Figures obtained by taking halves of adjacent columns.

research for the " intelligence quota " to be normal in the " middle
half " of all the children and then to be higher in a few groups, rapidly
decreasing in one direction with an almost equal proportion of low
quotas in a few groups rapidly decreasing in the opposite direction,
than the exceedingly irregular distribution of the school-progress
diagram with only one-tenth of the children exceptionally favorably
situated, an excess of normal progress and at least one-half again
as many behind in school as are backward in intelligence.

Reported retardation and physical defects. A report from a single
village school system with 518 pupils in grades 1 to 6 inclusive
shows the following table which, while " proving nothing because
it is only one village," is interesting in demonstrating that physical
defects are present among retarded pupils but are by no means
limited to that group.

Table 29

Under, normal and overage and physical defects

GROUP OF PUPILS	WITHOUT PHYSICAL DEFECTS	WITH PHYSICAL DEFECTS	TOTAL	PERCENTAGES		
				Without defects	With defects	Total
Underage	22	79	101	4.2	15.2	19.4
Normal age	69	258	327	13.3	50	63.3
Overage	21	69	90	4	13.3	17.3
Total	112	406	518	21.5	78.5	100

The above table shows the distribution of physical defects among
underage, normal and overage pupils. Note that in this
particular school system there are more children with physical
defects among those who are underage than among the overage
children both numerically and relatively. Note further that of
406 pupils with defects, 337 or 83 per cent, are of normal age
or young for their grades. The actual significance of physical
defects as influencing retardation is of course not brought out
at all in this table. The proper statistical correlation requires
a detailed examination of individual school-progress and physical
record cards. The problem is further complicated by the fact
that while each pupil has but one rating with reference to progress,
he may have several different physical defects. This is, however,
readily accomplished by means of mechanical tabulation and it is
hoped that a limited research of this type will be ready for dis-
tribution in the fall.

The achievements of pupils with standard classroom tests would result in still other distributions of the children. In school systems where these tests are used, the results when diagrammed show the large columns of average ability with shorter columns of superior and low ability tapering off in either direction from the center normal. We appear to have this general form of distribution in about everything that we subject to definite measurement both in physical and in mental growth. The place where we find children in school, however, appears to depart radically from any form of distribution which could be called normal and there are surely plenty of factors contributing to this resulting statistical discrepancy, that is, to the 30 per cent slow-progress group as opposed to the 10 per cent rapid-progress element. Absence from school, late entrance, transferring back and forth between public and parochial schools, physical defects, often the demands of the curriculum itself and other causes already enumerated in this paper continue to reduce the rapid-progress element and augment the slow-progress groups. As already stated, there is no criticism expressed or implied in the general slow-progress conditions in which a superintendent happens to find the children in his public schools. The first step in the solution of any problem of this sort is to determine just how large a problem it is and whether the situation in a given locality differs materially from the situation throughout the State, particularly in the group of comparable sizes, to see the direction in which the difference tends and finally to examine the local system with such scrutiny as time and available clerical help will permit and as far as possible to apply the known standards so far as that relatively recent branch of science has been developed.

Preventive and Remedial Measures

The query naturally arises, now that we have this information about nonpromotion, What is to be done about it? In several places, notably in Rochester, N. Y., considerable attention has been given to the preventive and remedial measures used by elementary teachers against retardation. It is significant to note that where teachers have reported in detail their efforts to reduce retardation, they have enumerated measures all of which should be employed by every good teacher in her regular work with normally successful pupils as well as with those in danger of nonpromotion. There is indeed little doubt that the most effective way to reduce retardation is to improve the teaching itself, and this is already the superintendent's constant problem.

Many cities have certain features in their organization, which, entirely apart from the effort to improve the effectiveness of the instruction in the regular classroom, make it easier to grapple with the retardation problem and have been of material assistance in reducing its effects. These special features in the organization of the school and of the whole local system do not apply to pupils who are making normal or rapid progress but to retarded pupils and those in danger of nonpromotion, and for this reason they may be called preventive and remedial measures with more propriety than those which ought to be a feature of the effective and successful teaching of all pupils. It is planned to make these measures the subject of a later bulletin. A tentative list of some of these measures is given by way of illustration.

1 *Primarily concerning the teaching*

a Those which allow the pupil repeating the grade to remain with the class which is regularly taking the grade for the first time. The remedial work is performed by the teacher in the course of her regular instruction, and the retarded pupil is supposed to have the chance of finishing the grade with the rest of the class.

b Those which involve the services of an assistant working in the classroom with the regular teacher.

c Those which involve a temporary transfer to a special class and a prospective return to the regular grade in time to complete it with the class at the close of the term.

d Those which involve a transfer to a special class with a return to regular work some time after the class from which the transfer was made has completed the work of that grade.

      (1)   Ungraded classes
      (2)   Foreign classes
      (3)   Special catch-up classes
      (4)   Classes for atypical pupils
      (5)   Open-air classes

e Those which involve the substitution of a modified, though regularly graded, course of study in place of the regular elementary curriculum.

f Those which involve a transfer to another sort of school or institution which substitutes a special curriculum for that of the graded school.

2 *Primarily concerning the administration of the school*

Those which relate to the principal's office and to the school district as a unit rather than to the instruction in the classroom. The keeping and actual use of special individual records of scholarship, health and standard test results; special features of organization within the school and of cooperation with the home.

3 *Primarily concerning the administration in the entire local school system*

Those which relate to the department as a whole and to cooperation with other city departments and organizations. Analysis of retardation records of schools and use of data in the supervisory program. Employment of clerk or establishment of a bureau of research and educational measurement. Cooperation with all city departments having to do with children. Study of the methods used in other cities of comparable size.

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