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Reprinted from the Tenth Annual Report of Dr. William H. Maxwell, Superintendent of Schools of New York City, 1909.

RETARDATION

Some account of a study conducted in the New York Public Schools

by the

BACKWARD CHILDREN INVESTIGATION

of the

RUSSELL SAGE FOUNDATION

1 MADISON AVENUE. NEW YORK CITY

LUTHER H. GULICK, M.D., Chairman

LEONARD P. AYRES, Secretary

Reprinted from the Tenth Annual Report of
Dr. WILLIAM H. MAXWELL
Superintendent of Schools of New York City

1909

CAUSES OF RETARDATION

Since in my Report for 1904, I first presented tables calling attention to the extraordinary number of over-age or retarded children in the grades, similar investigations have been instituted and similar reports have been made in most of the large cities of the country. Many surmises have been offered and many ingenious disquisitions have been written to explain a phenomenon so remarkable and regrettable. The first really scientific inquiry into the causes of retardation is that the results of which are presented in Appendix S. The investigation was made from the records of fifteen schools in widely separated sections of the city, distinctly diverse in the character of their populations. It was conducted by Mr. Leonard Ayres, a skilful statistician and economist, in the employ of the Sage Foundation, with the efficient assistance of Dr. Luther Halsey Gulick, until recently our Director of Physical Training.

In view of the fact that the records of somewhat less than 10,000 children out of 600,000 were investigated, due caution should be exercised in accepting, as more than tentative Mr. Ayres's conclusions. These conclusions are as follows:

(1) In the examination conducted among 20,000 children in 15 schools in Manhattan, it was found that the percentage of retardation was decidedly less than in the city as a whole (22.9 in these schools; 30.4 in the city at large).

(2) Among the 19,328 children whose records were studied, 9,489 had records sufficiently complete to give the date of first entering school.

(3) Of each 100 retarded children,
30 are retarded because of late entrance.
13 are retarded because of late entrance and slow progress.
57 are retarded because of slow progress.

(4) Of every 1,000 children,
195 started at the age of 5
512 started at the age of 6
200 started at the age of 7
62 started at the age of 8
21 started at the age of 9
6 started at the age of 10
3 started at the age of 11
1 started at the age of 12

(5) If the Compulsory Education Law should be so amended as to extend the lower limit of the compulsory school age from 8 to 7, it would affect the age of starting of perhaps 100 in each 1,000 children.

(6) Among the 9,489 children having complete records, some were found who had been in school 10 and even 11 years, without reaching the eighth grade.

(7) Five per cent of the pupils have reached their present standing in the grades by more rapid than normal progress.

(8) Fifty-five per cent have progressed normally.

(9) Forty per cent have progressed more slowly than the normal rate.

(10) Five per cent have reached their present grades in 86 per cent of the normal time.

(11) Fifty-five per cent have reached their present grades in 100 per cent. of the normal time.

(12) Forty per cent have reached their present grades in 128 per cent of the normal time.

(13) The smallest percentage of retardation is found among the Germans (16.6).

(14) The next best showing is made by the Americans (19.6).

(15) The Russians show exactly the same percentage as the entire group (22.9).

(16) The Irish make a poorer showing (29.5).

(17) The Italians show decidedly the highest percentage of retardation.

(18) Boys show substantially the same percentage of retardation as girls (boys, 22.2; girls, 23.6).

(19) The average number of transfers per child among children of normal age is .95. Among those of above normal age it is 1.18. Transfers affect retardation.

(20) Among the 19,328 pupils whose records were studied, 7,608 had been given physical examinations by the physicians of the Board of Health. This is approximately 39 per cent.

(21) Children of normal age have more physical defects than retarded children. (Normal age, 80 per cent; above normal age, 75 per cent).

(22) Children in the lower grades have more defects than those in the upper grades.

(23) Defective children in the first grade have about 2.5 defects apiece; those in the eighth grade about 1.3.

(24) Defective vision is the only defect more prevalent among retarded children than among children of normal age.

(25) All defects except defective vision decrease with age. Forty per cent of the 7-year-old children have enlarged glands; only 6 per cent of the 15-year-old ones have them. Twenty-five per cent of the 7-year-old children have adenoids; only 3 per cent of the 15-year-old ones have them. Among 8-year-old children, 17.5 per cent have defective vision. At the age of 14, 27.7 per cent have defective vision.

(26) Of the boys, 78.5 have physical defects; of the girls, 79.2. Boys average 1.8 defects apiece; girls, 1.6. Boys suffer more commonly than girls from enlarged glands, defective breathing, enlarged tonsils and adenoids. Girls have poorer teeth and poorer eyesight.

The conclusion that will cause most surprise is that physical defects play a much less important part in retarding children's progress in school than has been supposed. In view, however, of the unsatisfactory character of the physical examinations hitherto conducted by the Department of Health, too much stress should not be laid on this finding. Whether the increasing absence of physical ailments, and subsequently improved physical condition, in children as they grow older and advance through the grades, is the result of the survival of the fittest, or of the regular discipline, intellectual, moral, and physical, of the schools, or of both causes, remains to be determined.

There are five corollaries, however, from Mr. Ayres's conclusions which are self-evident:

1. Since 43 per cent of the children found to be retarded, were retarded because of late or delayed entrance to school. the Compulsory Education Law should be amended so that children shall be required to go to school at least at seven years of age, if not at six.

2. Since it is conclusively determined that children are retarded in their progress by transfer from one school to another, it is manifestly the duty of all concerned—superintendents, principals, and teachers—to take whatever measures may be necessary to minimize the necessarily injurious effects of transfer from school to school. In a constantly shifting population, such as ours—ever on the move from the country to the city, from foreign lands to our city, from one part of the city to another—the children are bound to suffer more or less in their school work when they leave one school to attend another. It is our duty to see to it, as far as may be, that the child shall proceed in his studies in the new school precisely from the point at which he left them in the old.

3. Principals have not yet taken full advantage of the authority conferred upon them to organize special classes for over-age children, in which they may be brought along more rapidly. This is shown by the fact that children were found in the grades who had been in school ten or even eleven years without reaching the eighth grade. In the past, teachers have been giving their chief attention to the advancement of bright pupils; in the future, attention must be centered on securing the more rapid progress of naturally or apparently slow pupils.

4. The records of pupils' progress are not as complete as they should be. There is really no excuse for the fact discovered that out of 19,328 children whose records were studied, only 9,489 had records so complete as to give the date of first entering school. Doubtless this date was lost in the majority of cases through the frequent transfers of children from school to school. But even this explanation is insufficient. The Board of Superintendents

recently adopted a card system for keeping the school history of each pupil. District superintendents will be expected to hold principals and teachers to a strict accountability for keeping this record faithfully and accurately.

5. It took Dr. Gulick and Mr. Ayres some five months of assiduous labor to examine and tabulate the school records of 20,000 children. No one in this office had or has the time to perform this labor without neglecting other important duties. Yet if we are to legislate and act intelligently in order to cure this crying evil of retardation, we must make certain of its causes by just such investigations. I urgently recommend, therefore, that an assistant, thoroughly equipped by training and experience to conduct such investigations, be appointed as a member of the City Superintendent's staff.

I feel that the thanks of the Department of Education are due to Dr. Gulick and Mr. Ayres for their painstaking investigation, the results of which have been placed freely at the disposal of the educational authorities. It is not too much to say that their report constitutes a new departure in the scientific investigation of popular education.

APPENDIX S

Causes of Retardation of Pupils

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Causes of Retardation of Pupils

New York, Sept. 20, 1908.

MR. WILLIAM H. MAXWELL,

City Superintendent of Schools.

Dear Sir:

In accordance with your instructions, I beg to present to you herewith a study of retardation that has been made with my co-operation by Mr. Leonard P. Ayres, formerly Superintendent of Schools and Chief of the Division of Statistics, Department of Education, Porto Rico, from the data concerning 19,328 children, furnished by you in the spring of 1908.

This study was rendered possible through a special grant from the Russell Sage Foundation. My original interest in the subject was due to the fact that it appeared that a large fraction of the retardation in our schools was due to the prevalence of physical defects and ill health. The study was an attempt to discover the facts in the case.

It is to my mind a cause of genuine satisfaction to discover, as this report indicates, that physical defects do not constitute as large a factor in producing retardation as we had imagined.

Respectfully submitted,

LUTHER H. GULICK,
Director Physical Training.

AN INVESTIGATION OF RETARDATION IN FIFTEEN SCHOOLS IN NEW YORK CITY, BOROUGH OF MANHATTAN

By Leonard P. Ayres

In view of the great importance, from both the social and economic standpoints, of the whole series of problems connected with the phenomena of retardation, it was decided during the school year just closed to make a closer study of the individual school records of a considerable number of pupils than has heretofore seemed practicable.

It has been pointed out by the City Superintendent in his annual reports for several years past that a considerable proportion of the children in the schools are behind the proper grades for their respective ages. That is, they are "retarded." The criterion adopted by the City Superintendent is that if the pupils enter the first grade at from six to seven years of age and progress normally, their ages in the several grades on the last day of the school year will be as follows:

First grade	6 to 8 years
Second grade	7 to 9 years
Third grade	8 to 10 years
Fourth grade	9 to 11 years
Fifth grade	10 to 12 years
Sixth grade	11 to 13 years
Seventh grade	12 to 14 years
Eighth grade	13 to 15 years

On this basis there were, according to the annual report for 1907, retarded children in the several grades as follows:

Grades	No. of Pupils	No. above Normal Age	Per Cent above Normal Age
1	62,001	9,073	14.6
2	83,158	19,039	22.9
3	82,241	26,514	32.2
4	79,386	30,251	38.1
5	74,790	30,813	41.2
6	61,712	22,862	37.0
7	46,817	13,502	28.8
8	30,406	6,412	21.1
Total	520,411	158,466	30.4

We are here confronted by the significant fact that nearly a third of the children are above the normal age for their grades. Where the retardation occurs that brings this about and why it occurs, the figures do not disclose. At once the thought suggests itself that the obvious explanation is to be sought in late entry or irregular progress, or both. But at what ages do children enter the schools for the first time? How many of them progress more slowly than the rate planned for them by the course of study, and how many more rapidly? Do those who enter at a comparatively advanced age progress more rapidly than the younger children, or is the contrary the case?

Again, the reports of the physical examinations conducted by the physicians of the Board of Health indicate that large numbers of the children are suffering from physical defects more or less serious. What is the relation of these to school progress? Again, we have the nationality factor, and that of sex. Under all of these headings the information we are seeking has so far been lacking.

It was to find an answer to these and similar questions that an investigation was undertaken in the spring of 1908. It was determined to make an intensive study of the existing school records of some thousands of pupils in different schools and throughout the grades. For many reasons it seemed best to confine the work to Manhattan. In order to get results which might as far as possible be representative of normal school populations, only schools were taken in which all of the grades from the first to the eighth were found. For the purpose of rendering the work of tabulation less complex, schools were chosen where boys and girls are not found together in the same classroom.

Using these restrictions as a basis for selecting the schools in which to work, a selection was made of fifteen schools in Manhattan ranging in size from 890 pupils to 2,300, and in location from the lower East Side to Audubon avenue. The identity of these schools together with the number and sex distribution of its pupils and the predominating nationality is given in the following table:

P.S. No.	Boys	Girls	Total	Location	Predominating Nationalities
1 B	1,132	.....	1,132	Henry and Oliver Sts.	Russian & Italian.
1 G	.....	1,207	1,207	Henry and Oliver Sts.	Russian & Italian.
6 B	819	.....	819	85th St. and Madison Ave.	American & German.
6 G	.....	883	883	85th St. and Madison Ave.	American & German.
16	912	.....	912	208 W. 13th St.	American.
20 B	1,470	.....	1,470	Rivington and Forsyth Sts.	Russian & Roumanian.
20 G	.....	1,424	1,424	Rivington and Forsyth Sts.	Russian & Roumanian.
21	1,004	744	1,748	222 Mott St.	Italian.
41	.....	1,049	1,049	36 Greenwich Ave.	American & Mixed.
50	.....	916	916	211 E. 20th St.	American & German.
55	925	.....	925	140 W. 20th St.	American & Mixed.
90	597	1,274	1,871	147th and 148th Sts., 7th and 8th Aves.	American, German & Irish.
169	651	701	1,352	Audubon Ave., 168th and 169th Sts.	American, German & Irish.
188 B	1,742	.....	1,742	Manhattan, E. Houston and Lewis Sts.	Russian, Austrian & Hungarian.
188 G	.....	1,878	1,878	Manhattan, E. Houston and Lewis Sts.	Russian, Austrian & Hungarian.
	9,252	10,076	19,328		

For the purpose of collecting the desired information concerning the children in these schools, large blank forms were printed and distributed to the teachers. These forms were printed in two colors, white and blue. To each teacher there was given one sheet of each color, and the instructions printed at the head of each were so worded that the records of the pupils of normal age were transcribed on the white sheets, while those of the pupils of above normal age were written on the blue sheets. Each sheet contained spaces for the records of fifty pupils. The blue sheets were identical, except for some minor changes in the wording of the instructions.

The standard adopted was that all pupils in the 1 A grade (lower first), who at the end of the school year were 8½ years old or younger were considered of normal age; those older than 8½, of above normal age. In the 1 B grade (upper first), 9 years marks the limit of the normal age group, and those older are considered

above normal age. In the 2 A grade (lower second), the limit is 9½ years; in the 2 B grade (upper second), etc., up to 16 years of age in the 8 B grade (upper eighth). It will be noted that the City Superintendent has adopted as a standard the ages 6 to 8 in the first grade, 7 to 9 in the second, and so on; but it must be remembered that his calculations of the number of "retarded" children were made on the basis of the membership of the several grades on the last day of the school year after promotion. Hence the child who had been during the year in the first grade has been promoted on the last day of the school year to the second, the second grade child to the third, etc.

As for the purpose of this study it was necessary to gather the data from the school records before the close of the school year, the ages of the pupils and the time in school were computed up to the end of the school year and the children counted in the grades in which they had been during the term—not in those in which they would be after promotion. Therefore, as the child just finishing the first grade was counted as being a member of that grade, rather than as a member of the grade to which he would belong after promotion, one year was added to the limit set by the City Superintendent; and children of the 1 B grade who were under 9 years of age were counted as of normal age, while those older than 9 were included in the above normal age group. This brings the standard adopted for the examination onto a plane approaching equality with the standard heretofore used by the City Superintendent. The application of the standard just explained to the age and grade figures for these fifteen schools gave as a result 22.9 of the entire membership in the above normal age group.

DISTRIBUTION OF PUPILS BY GRADES AND AGES

Grades	AGES															Total	Above Normal Age	Per cent Above Normal Age
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19			
1A	11	606	357	97	12	24	10	4								1121	50	4.4
1B		273	794	290		69	25	15	6	2						1480	117	7.9
2A		14	419	468		154	52	72	33	8	7					1227	172	14.0
2B		1	126	556		365		141	58	22	7	1				1277	228	17.8
3A			37	308		383		178	85	134	54	28	9	5		1231	315	25.5
3B			3	112		457		375		203	98	36	15	1		1300	353	27.1
4A			1	26		263		420		225	136	200	64	35	8	3		1385	446	32.2
4B				5		109		390		426		226	123	40	3	2		1324	394	29.7
5A				1		34		265		428		244	122	212	102	23	3	1435	462	32.1
5B						5		119		348		413		245	142	41	4	1	1	1319	433	32.8
6A						2		34		228		450		202	122	210	62	10	1	1321	405	30.6
6B								6		115		327		386		251	80	22	4	1191	355	29.8
7A								3		68		247		367		237	109	139	38	5	1213	291	23.9
7B										13		116		290		324		125	56	9	933	190	20.3
8A										7		58		197		286		136	58	64	14	2	2	824	140	16.9
8B										2		22		141		270		225		60	19	6	2	747	87	11.6
Total	11	894	1737	1881		1927		2123		2447		2614		2429		2031		906		262	53	9	4	19328	4438	22.9

It will be noted that in the row of figures giving the number of children at each of the several ages in the first grade, there is a heavy line between the figures for the ages 8 and 9. This divides the children of that grade into two groups: children of normal age, or those of less than 9 years of age; and children of above normal age, or those of more than 9 years of age. In the second grade the line is moved forward one year, falling between 9 and 10, and so on, for each of the grades, until it falls between the ages 15 and 16 in the eighth. At the right-hand end of the table will be found two columns beyond the total column. The first of these gives the number of children above normal age found in each grade, that is to say, the number on the right side of the heavy line, and the second column the per cent that this number is of the whole membership of the grade. It will be noted that while the total percentage of children above normal age, 22.9, is decidedly lower than the per cent given for the entire city in the reports of the Superintendent, 30.4, the percentages for the several grades show a similar distribution, the per cent of children above normal age being low in the primary grades, rising steadily to a maximum in the earlier grammar grades, and falling off again in the highest grades. This is a phenomenon invariably noted in similar figures from other cities.

It is not, of course, to be supposed that all of the fifteen schools contributing to make up these totals, exhibit the same proportion of retardation. On the contrary, the group is far from homogeneous in this respect. There is a considerable individuality among the schools.

But while these variations are interesting and from more than one viewpoint significant, the fact of cardinal importance that confronts us is that there are in the fifteen schools 4,438 pupils of above normal age. Moreover, these children fall into that group when we take as a dividing line the age of 9 in the first grade, counting as of normal age all under that age, thus giving the child the benefit of the doubt by adopting a liberal standard of the upper limit for the normal age of the pupils in the first grade.

But the question may be raised why after all it should be regarded as a matter for great concern that among some 19,000 school

children we find nearly 4,500 who are in marked degree older than they should be for the grades they are in. Why is this a fact of great social importance, since we have always been aware that children of different ages are found together in every grade? A partial answer may be found by referring once more to the table giving the age and grade distribution of the children. By referring to the column on the right entitled, "Above Normal Age," we find that there are 167 children in the grade 9 years of age or older. Some of these children are in the 1 A grade, some in the 1 B. That is, if they progress normally, some of them may hope to graduate in 7½ years from now, some at the end of 7 years. But they now range in ages from 9 to 13 years. Then they will be from 16 to 22 years old upon graduation. What is the probability that they will remain in school until they attain these ages? An exact computation of this cannot be made, because we have no means of finding out how many new pupils enter these schools each year. However, we may approximate it. We note that the membership of each of the first six grades is in the neighborhood of 2,500; also that the number of children at each of the ages, 11, 12, and 13, is not far from the same number. We shall not be far out of the way, then, if we say that about 2,500 new children enter these grades each year. Now, the number of children 16 years old or older in the eighth grade is only 169. That is to say, of the children who enter these schools each year, only one in fifteen stays to graduate, if in order to do so he has to remain until he is at least 16 years old. If graduating means staying in school until the age of 17, only one in fifty-five does so; the rest drop out.

In the light of these considerations, the figures assume a real and grave importance. Of the 4,438 retarded children in these schools, all will have to remain until the age of at least 16 in order to graduate if they make normal progress through the grades, and 2,063 of them will have to remain until they are at least 17 years old. In short, the chance of graduation for these children is painfully small. This would be a serious matter if it applied only to the 4,438 children whom we have been considering. But it does not. It applies to the 158,000 over-age children of this city.

If, then, retardation among school children is a condition fraught with such serious social and educational import, it behooves us to discover, in so far as we may, the conditions which operate to produce the condition. Obviously, there can be but three explanations of the circumstances that a child is older than he should be for his grade: either he entered school late, or he progressed irregularly, or both.

The relative importance of the first factor—late entrance—is susceptible of exact measurement. If a child was 8 years or more old on entering the 1 A grade, he will at the end of the year be 9 or more years old, and so fall into the "Above Normal Age" group; and he will continue to be counted in that group in each successive year of his school life, even if he is regularly promoted. It is true that he will in all probability never graduate, but at least no great blame can be laid on the school for his condition, for the cause existed before the child came under the school's influence.

Now, information as to the age at which the child first entered school exists for only a part of the children. In some cases the record has been lost. In others, the child came from some other city and we have no record of his former school history. Out of the records of 19,328 children, the date of first entering the 1 A grade was found in the cases of 9,489. Of these, 7,995 were pupils of normal age, while 1,494 were of more than normal age.

The time planned by the course of study for the completion of the work of the 1 A grade is one-half of a school year. But we find in practice that many parents take their children to school for the first time, not on the opening day of the school term, but two or three months later. The result is that many of these children are unable to do the work, and are forced to begin the grade again several months later. To allow for these cases and also with the aim of being liberal in our standard, we have considered any length of time, up to one year, as the normal time for completing the work of the 1 A grade, any time up to one and one-half years as normal for the 1 B grade, and so on up to eight and one-half years for completing the work of the eight grades.

It has already been explained that a child in the 1 A grade, who at the end of the school year was older than 8½ years, is counted as above normal age; a child in the 1 B grade older than 9 is also above normal age, etc. Now, it is evident that if such children entered the 1 A grade for the first time at any age beyond 8 years, they would of necessity be counted as above normal age and fall into the class "retarded," even if they progressed normally at each regular time of promotion. By applying these standards of normal time and normal age for entering, it has been possible to discover for each grade how many pupils were above normal age, how many of these were above normal age on account of late entrance, how many on account of slow progress, and the number who fell into the group as a result of the combined influences of starting late and progressing slowly. As a result we have the following table:

Grades	Membership	Above Normal Age	Above Normal Age Because of Late Entrance	Above Normal Age Because of Late Entrance and Slow Progress	Above Normal Age Because of Slow Progress Only
1	2,377	153	100	22	31
2	1,710	219	91	29	99
3	1,393	267	61	40	166
4	1,032	189	63	26	100
5	949	257	51	31	175
6	786	213	50	24	139
7	719	117	22	14	81
8	523	79	19	7	53
Total	9,489	1,494	457	193	844

Converting our totals into relative figures, the table enables us to draw these significant conclusions:

Of each 100 retarded children, thirty are retarded because of late entrance, thirteen are retarded because of late entrance and slow progress, fifty-seven are retarded because of slow progress.

If the children of these schools are fairly representative of New York public school children, we may conclude that of every ten retarded children, three are retarded because of late entrance. But

it is not sufficient to discover how many children are retarded in their classes on account of late entrance. It is of great importance to discover at what ages the children begin their school lives. The figures giving this information, arranged by whole grades rather than by half grades, for the sake of greater convenience and simplicity, are as follows:

AGES AT STARTING BY GRADES

	AGES									
Grades	5	6	7	8	9	10	11	12	13	Total
1	382	1,404	433	110	30	12	6			2,377
2	273	943	347	94	35	10	5	3		1,710
3	265	721	284	81	28	8	5	1		1,393
4	163	525	200	102	32	6	4			1,032
5	217	440	185	74	26	5	1	1		949
6	171	337	183	64	23	5	1	1	1	786
7	237	273	151	35	14	5	3	1		719
8	141	223	111	32	13	1	1	1		523
Total 1,849		4,866	1,894	592	201	52	26	8	1	9,489

The facts disclosed are different from those that might have been anticipated. The number of children who entered at the age of 5 is surprisingly large, whereas 6 has been considered the earliest age at which any considerable proportion of the children begin their school lives in New York. Reference to the printed report of the City Superintendent for 1907, however, shows that many children do begin at 5. The number of children under the age of 7 in all schools is given as 50,616. As these figures are for the last day of the year, most of these 50,000 children must have been under the age of 6 upon entering. The number in the kindergartens was about 16,000. Hence most of the other 34,000 must have entered the grades at the age of 5. By reducing the numbers showing how many children entered the schools at each age to relative figures, we may say that if the children of these schools are fairly representative of the children in the schools of New York, of every 1,000 children in the schools,

195 started at the age of 5
512 started at the age of 6
200 started at the age of 7
62 started at the age of 8
21 started at the age of 9
6 started at the age of 10
3 started at the age of 11
1 started at the age of 12

In every 1,000 children, ninety started above the legal compulsory attendance age of 8. Two hundred started at the age of 7.

If the Compulsory Education Law should be so amended as to extend the lower limit of the compulsory school age from 8 to 7, it would affect a part of these 200. Judging from our other figures, we may estimate that it would affect the age of starting of perhaps 100 in each 1,000 children.

A table has already been given showing the number of children over age for each grade and the number of these who are in that group on account of late entrance, slow progress, or both. The following is the same table given in relative figures on the basis of 1,000 pupils in each grade:

Grades	Membership	Above Normal Age	Above Normal Age Because of Late Entrance	Above Normal Age Because of Late Entrance and Slow Progress	Above Normal Age Because of Slow Progress Only
1	1,000	64	42	9	13
2	1,000	127	52	17	57
3	1,000	189	43	28	117
4	1,000	181	60	25	96
5	1,000	269	53	32	183
6	1,000	270	63	30	176
7	1,000	162	30	30	112
8	1,000	150	36	36	101
All grades..	1,000	156	47	20	89

If we read the second column of the table in terms of per cents we see that 6.4 per cent of the first grade children are above normal age. This percentage rises to 27 in the sixth grade and then falls to 15 in the eighth. The general percentage of over age pupils for all the grades is 15.6. Now, it will be remembered that the percentage of over age children in the entire city found by the City Superintendent was 30.4. Hence it must be borne in mind that after making allowance for the slight difference in the standard adopted, we are still dealing here with a group of school children showing only slightly more than half as large a percentage of over age children as obtains in the city at large.

It must be remembered, however, that the standard by which we decide how many children are above normal age has been deliberately chosen with a view to putting in that class only the extreme cases. Many children take decidedly more than the normal time to complete their grades, and yet on account of the early age at which they start they avoid falling into the over age group. Again, others progress more rapidly than the rate planned for them by the course of study. The time in school of the 9,489 is given by whole grades in the following table:

TIME IN SCHOOL—BY GRADES

YEARS IN SCHOOL

Grades	Less than 1	1-2 years	2-3 years	3-4 years	4-5 years	5-6 years	6-7 years	7-8 years	8-9 years	9-10 years	10-11 years	11-12 years	Totals
1	1,084	1,185	88	19	1								2,377
2	23	557	904	193	29	4							1,710
3		33	371	659	256	65	8		1				1,393
4			53	388	428	137	23	2	1				1,032
5				30	206	390	218	76	24	5			949
6				1	23	135	387	163	57	17	3		786
7					8	50	176	276	142	55	11	1	719
8						6	26	151	220	96	22	2	523
Totals	1,107	1,775	1,416	1,200	951	787	838	668	445	173	36	3	9,489

Looking at the figures for the first grade, we see that one pupil has been in school more than four years without having entered the second grade. In the third grade we note that one pupil is in his ninth year of school life. Three hundred and seventeen pupils have been in school more than eight years without reaching the eighth grade. We also note that in each grade after the first, some pupils have done the work more quickly than the regular rate But it is not possible to discover from this table the true extent of normal progress, of progress more rapid than normal, and of that less rapid than normal. To show this, a table has been made up from the data obtained for each half grade. To render it more compact, this table has been condensed so as to give the facts by whole grades and terms. A term is half of a school year.

TIME IN GRADES—BY TERMS

	Terms Less Than Normal					Terms More Than Normal									
Grades.	4	3	2	1	Normal Time	1	2	3	4	5	6	7	8	9	10	Total...
1				7	1,886	366	89	9	15	4	.	1				2,377
2				46	994	376	203	56	20	11	4	.				1,710
3			15	38	661	294	185	112	49	27	8	3			1	1,393
4			32	105	457	214	118	70	20	12	2	1	1			1,032
5			13	38	358	169	148	99	64	28	16	10	5	1		949
6		5	13	32	293	161	111	83	39	23	16	6	4			786
7	6	6	24	42	259	136	102	64	40	23	11	4	2			719
8	4	9	14	38	232	86	55	50	22	11	.	1	1			523
Totals	10	20	111	346	5,140	1,802	1,011	543	269	139	57	26	13	1	1	9,489

The figures giving the same facts in aggregate, but not showing the degree less than and more than normal, are to be found in the two following tables—in the first in actual figures, in the second in relative figures on the basis of 1,000 children in each grade.

TABLE SHOWING NUMBER OF CHILDREN BY GRADES WHO HAVE REACHED THEIR PRESENT STANDING IN LESS THAN NORMAL TIME, IN NORMAL TIME, AND IN MORE THAN NORMAL TIME

	Original Data				Relative Figures			
Grades	Member-ship	Less Than Normal Time	Normal Time	More Than Normal Time	Mem-ber-ship	Less Than Normal Time	Normal Time	More Than Normal Time
1	2,377	7	1,886	484	1,000	3	793	204
2	1,710	46	994	670	1,000	27	581	392
3	1,393	53	661	679	1,000	38	475	487
4	1,032	137	457	438	1,000	133	443	424
5	949	51	358	540	1,000	54	377	569
6	786	50	293	443	1,000	64	373	563
7	719	78	259	382	1,000	109	360	531
8	523	65	232	226	1,000	125	443	432
All Grades	9,489	487	5,140	3,862	1,000	51	542	407

The conditions disclosed by these figures are significant. There are in these schools children who have spent as much as eight, nine, or even ten terms more than they normally should have to reach the grades they are in. The numbers who have spent two, three, or four terms too much, are large. Nor must we conclude that such wide variations are found merely because we have here aggregate figures for a number of schools. An examination of the original records for the separate classrooms shows that such is far from being the case. Children of widely varying ages and school experience are grouped together in one classroom. In many cases we find together in one classroom, immature little children, and young men and women. In many cases children were found who had begun their school lives before their present classmates were born.

Looking at the figures for all grades at the foot of the table giving the relative figures, we find that if we reduce the figures roughly to percentages, 5 per cent of the pupils have progressed to

their present standing more rapidly than the normal rate, 55 per cent have progressed normally, and 40 per cent have made slower than normal progress. In the fifth, sixth, and seventh grades those who have made slower than normal progress outnumber all the others. If we consider the school membership as made up of the three groups—of those who have progressed more rapidly than normal, those who have made normal progress, and those whose progress has been slower than normal—and if we compute the degree of their variations from normal progress, we get the following results:

Of the entire membership, 5 per cent have reached their present grades is 86 per cent of the normal time; 55 per cent have reached their present grades in 100 per cent of the normal time; 40 per cent have reached their present grades in 128 per cent of the normal time.

It may not be amiss at this point to again call attention to the fact that these results are found among nearly 10,000 children who show only slightly more than half as large a percentage of retardation as that which obtains in the city as a whole.

Mention has been made of the fact that in the schools in which the investigation was conducted, the students are of several different nationalities. It is, of course, of interest to discover what influence the nationality factor has on retardation. It will be remembered that the general percentage of retarded children in the fifteen schools was 22.9. The following are the percentages of retarded children by nationalities:

Nationalities	Per Cent Retarded	Nationalities	Per Cent Retarded
American	19.6	Irish	29.5
Italian	35.5	Miscellaneous	23.1
Russian	22.8	Mixed	19.3
German	16.6	Unknown	26.1
English	24.6		

In view of the facts that we have found decidedly different percentages of retardation in the different schools and that we know that in some of them one nationality is predominant, it might

easily be supposed that the different degrees of retardation found for different nationalities were the results rather of local differences than of differences inherent in the nationalities. In order to test this, the percentages of retardation among the different nationalities have been tabulated by schools, omitting the figures in all cases where the above normal age group is less than 10. This accounts for the blank spaces in the table.

PER CENT ABOVE NORMAL AGE BY NATIONALITIES AND SCHOOLS

Schools	American	Italian	Russian	German	English	Irish	Miscellaneous	Mixed	Unknown
1 B	....	39.8	21.5	16.9	....	....	25.4	....	....
1 G	26.6	26.3	18.2	....	....	....	....	....	....
6 B	17.9	....	....	12.0	....	35.3	....	7.1	....
6 G	17.0	....	....	18.2	....	....	....	16.5	45.8
16	19.0	37.5	....	18.0	....	32.3	25.0	22.9	....
20 B	....	44.4	29.1	....	....	....	36.6	22.9	....
20 G	....	52.9	30.0	....	....	....	43.3	34.6	....
21	....	37.0	....	....	....	....	52.6	....	41.6
41	24.8	20.5	....	17.9	....	31.3	18.4	21.6	27.2
50	23.8	33.3	13.5	17.7	....	34.6	27.5	27.5	....
55	19.5	28.0	20.3	16.6	....	27.4	24.3	17.5	....
90	20.9	28.3	....	17.3	26.8	27.1	17.1	20.8	....
169	16.1	43.6	....	15.3	31.9	23.6	14.3	15.7	....
188 B	....	....	15.3	....	14.3	....	26.3	....	15.7
188 G	....	....	25.0	....	50.0	....	....	17.5	37.8
Totals	19.6	35.5	22.9	16.6	24.6	29.5	23.1	19.3	26.1

The figures show on the whole a surprising regularity. While a too close comparison of the figures for the nationalities would prove unprofitable, the general conclusions seem warranted that:

The smallest percentage of retardation is found among the Germans ..... (16.6)

The next best showing is made by the Americans ..... (19.6)

The Russians show exactly the same percentage as the entire group ..... (22.9)

The Irish make a poorer showing ..... (29.5)

The Italians show decidedly the highest percentage of retardation (35.5)

The relation between sex and retardation seems to be very slight. The percentage of boys above normal age is 22.2, that of girls 23.6.

Although a great deal of work has been expended in the attempt to measure the effect of transfers from school to school on progress,

the effort has been in large degree fruitless. Data in regard to transfers are difficult to secure, and when secured far from trustworthy. Although in a general way the data secured showed that retardation increases in degree with the number of transfers, it has been felt that the figures rested on too uncertain a basis to warrant their publication. That there is a genuine relation between transfers and retardation is shown by the aggregate figures for transfers among the children of normal age and among those of more than normal age.

	Children	Transfers	Average No. of Transfers per Child
Normal Age	14,890	14,089	.95
Above Normal Age	4,438	5,224	1.18

PHYSICAL DEFECTS

In the endeavor to find out the relation between physical defect and retardation, the records of all pupils who have been examined by the physicians of the Board of Health have been carefully compiled and studied. Among the 19,328 children, 7,608 have had physical examinations. The tables given below show the distribution of these pupils by grades and defects, and by ages and defects. The derivative tables are all in terms of percentages, in order to render them more clear, and the results are given by full grades rather than by half grades for the same purpose. Tables A and B present the original data.

TABLE A—DISTRIBUTION OF PUPILS BY GRADES AND DEFECTS

Grades	No. Examined	Without Defects	Enlarged Glands	Defective Vision	Defective Breathing	Defective Teeth	Hypertrophied Tonsils	Adenoids	Other Defects	Total Defects
1 A	678	104	288	22	141	427	277	142	120	1,417
1 B	1,151	175	503	39	290	749	454	293	191	2,519
2 A	951	102	364	159	252	660	359	275	194	2,263
2 B	788	133	274	193	155	416	253	164	108	1,563
3 A	663	96	183	153	111	358	177	98	79	1,159
3 B	620	119	107	128	55	350	163	59	93	955
4 A	533	139	52	137	52	227	100	57	75	700
4 B	531	152	59	138	40	209	127	71	81	725
5 A	338	115	48	86	29	101	65	28	22	379
5 B	299	122	5	72	13	97	41	15	14	257
6 A	314	122	11	84	48	91	38	10	31	313
6 B	167	55	7	34	12	64	25	11	13	166
7 A	212	55	8	56	31	76	24	16	28	239
7 B	159	69	12	44	12	17	30	3	17	135
8 A	134	27	11	38	8	64	11	4	15	151
8 B	70	19	7	28	3	7	15	2	5	67
	7,608	1,604	1,939	1,411	1,252	3,913	2,159	1,248	1,086	13,008

TABLE B—DISTRIBUTION OF PUPILS BY AGES AND DEFECTS

Ages	No. Examined	Without Defects	Enlarged Glands	Defective Vision	Defective Breathing	Defective Teeth	Hypertrophied Tonsils	Adenoids	Other Defects	Total Defects
5	9	2	6	...	4	4	1	1	2	18
6	586	100	231	24	124	378	235	135	105	1,232
7	1,286	173	536	81	321	850	508	322	210	2,828
8	1,197	169	427	210	241	728	439	259	188	2,492
9	1,019	185	286	206	166	567	290	188	136	1,839
10	911	202	178	228	118	453	209	124	127	1,437
11	839	219	132	201	103	355	177	98	109	1,175
12	663	199	65	176	70	222	128	58	87	806
13	510	163	35	121	50	182	84	33	67	572
14	393	125	26	109	37	112	60	23	37	404
15	144	53	10	37	13	45	21	5	10	141
16	42	12	5	15	4	15	7	1	6	53
17	7	2	1	2	1	2	..	1	2	9
18	2	..	1	1	..	..	..	..	..	2
	7,608	1,604	1,939	1,411	1,252	3,913	2,159	1,248	1,086	13,008

Of course, it must be remembered that there are several reasons why these 7,608 children do not form a homogeneous group. Not only do we have the factors of age and grade, but the schools differ in racial and social characteristics among themselves. Moreover, the personal equation enters largely in the results of the physical examinations as reported. There is a great difference among school physicians as to discovering and reporting physical defects. Again, very few children were examined in some of the schools, and a considerable proportion of the entire membership in others. These several factors result in quite widely varying figures for the percentage of physically defective pupils among those examined in the different schools. The figures for the schools are as follows:

School	Membership	Number Examined	Per cent Examined	Having Defects	Per cent Defective
1 B	1,132	45	3.9	44	.97
1 G	1,207	89	6.8	83	.93
6 B	819	367	44.8	271	.73
6 G	883	230	26.0	208	.88
16	912	414	45.4	349	.84
20 B	1,470	343	23.3	306	.89
20 G	1,424	669	46.9	571	.85
21	1,748	615	35.2	543	.88
41	1,049	674	64.2	430	.63
50	916	465	50.7	362	.77
55	925	808	87.3	471	.58
90	1,871	1,725	92.2	1,330	.77
169	1,352	671	49.5	600	.89
188 B	1,742	148	8.5	140	.94
188 G	1,878	345	18.3	341	.99
Totals	19,328	7,608	39.4	6,044	.79

Among the 7,608 pupils 6,084 fell within the normal age group and 1,524 in the above normal age group. The following table shows the percentage of physically defective pupils in each group by grades:

Grade	Normal Age Per cent Defective	Above Normal Age Per cent Defective
1	85.	81.3
2	86.8	84.5
3	83.2	83.3
4	71.6	74.7
5	63.8	60.2
6	63.8	61.7
7	68.2	60.2
8	77.1	75.0
Total	79.8	74.9

Of course, the immediately striking feature of this table is that nearly 80 per cent of the normal age children are found to have physical defects, while only about 75 per cent of the above normal age children are defective. This feature was an unlooked-for surprise to the investigators.

The second noteworthy point is that the percentage of defective children in the lower grades is decidedly greater than in the upper grades. It is to be remarked, too, that the percentage of defectives in the first grade would have been decidedly greater than that in the second grade, had it not been for the fact that practically no children are tested for defective eyesight in the first grade, thereby decidedly reducing the percentage of defectiveness. It is likewise true that the seventh and eighth grades show a much higher per cent than would normally be the case. This is due to the fact that the figures for the seventh and eighth grades are almost exclusively for one school having a high percentage of defectives, and for comparatively small numbers of cases. The reason for this is that in most schools no physical examinations were made in the upper grades.

Our investigations lead us to believe that under normal conditions physical examinations as now conducted in New York City would show—if the eyesight of children in the first grade could be tested—a percentage of defectives of about 90 in the first grade, and that this per cent would gradually reduce through the grades to about 50 in the eighth.

A computation of the average number of defects per child in the normal age and above normal age groups gives results not dissimilar from those discussed.

AVERAGE NUMBER OF DEFECTS PER DEFECTIVE CHILD

Grade	Normal Age	Above Normal Age
1	2.5	2.3
2	2.5	2.6
3	1.9	2.1
4	1.8	1.8
5	1.5	1.6
6	1.5	1.5
7	1.5	1.5
8	1.3	1.6
Total	2.1	2.0

Here, again, we are confronted by the same phenomena of more defects among the children of normal age than among those of above normal age, and of the reduction in the number of defects from the first grade to the eighth. Of course, a question which immediately presents itself is whether this unlooked for discrepancy between the number of defects among normal age children and the number among those of more than normal age is to be accounted for by a consistent preponderance of each separate kind of defect among the normal age children, or whether some sorts of defects are more prevalent among those of normal age, and others among those of greater than normal age. Light is shed on this problem by the following table:

PER CENT HAVING EACH DEFECT

	Normal Age	Above Normal Age
Examined	100.	100.
Defective	79.9	74.8
Enlarged glands	26.9	19.5
Defective vision	23.5	26.9
Defective breathing	16.7	15.2
Defective teeth	53.3	43.8
Hypertrophied tonsils	29.9	22.0
Adenoids	17.1	13.4
Other defects	14.1	14.9

Here we see that each separate sort of defect is found more frequently among children of normal age than among those of greater than normal age, with two exceptions. These are vision and "other defects." The difference in regard to vision is striking. Whereas in the case of the other defects there is considerable preponderance among the normal age pupils, in the case of vision only 23.5 per cent are found to be defective in the normal age group, while 26.9 per cent of those in the above normal age group have defective vision. This at once leads to the suspicion that in its relation to retardation, vision does not follow the same rules as do other forms of defects.

Having discovered that the same rules do not uniformly apply to all of the several sorts of defects, it becomes worth while to study each defect separately by grades and ages. The following table presents the per cent of each individual age suffering from each defect.

PER CENT HAVING EACH DEFECT BY AGES

Ages	Defective	Enlarged Glands	Defective Vision	Defective Breathing	Defective Teeth	Hypertrophied Tonsils	Adenoids	Other Defects
6	82.9	39.4	....	21.1	64.5	40.1	23.0	17.9
7	86.5	41.6	....	24.9	66.0	39.5	25.0	16.3
8	85.8	35.6	17.5	20.1	60.8	36.6	21.6	15.7
9	81.8	28.0	20.2	16.2	55.6	28.4	18.4	13.3
10	77.8	19.5	25.0	12.9	49.7	22.9	13.6	13.9
11	73.8	15.7	23.9	12.2	42.3	21.0	11.6	12.9
12	69.9	9.8	26.5	10.5	33.4	19.3	8.7	13.1
13	68.0	6.8	23.7	9.8	35.6	16.4	6.4	13.1
14	68.1	6.6	27.7	9.4	28.4	15.2	5.8	9.4
15	63.1	6.9	25.6	9.0	31.2	14.5	3.4	6.9

A study of the table reveals additional characteristics of the several sorts of defect. For instance, under enlarged glands we note that the percentage steadily falls from about 40 among 6 and 7-year-old children to something over 6 among 13 and 14-year-old children. In the case of vision, on the other hand, it increases from 17 per cent among 8-year-old children to 25 per cent among 15-year-old children. The percentage of defective breathing, again, decreases somewhat as does that of enlarged glands, falling from about 25 per cent among 7-year-old children to 9 per cent among 15-year-old children. A similar steady decrease is found in the case of defective teeth, where the percentage falls from 66 among 7-year-old children to 31 among 15-year-old children. A like condition is found in the case of hypertrophied tonsils. In the case of adenoids the phenomenon is even more marked, the percentage falling from 25 among 7-year-old children to 3.4 among those 15 years old. A steady, although not nearly so rapid, fall is also found in the case of other defects.

In compiling this table, data for the ages of 5, 16, 17, and 18 years have been omitted, for the reason that the number of cases under each of these ages is so small as to render them insignificant. Percentages of defective vision at the ages of 6 and 7 are not given because pupils at those ages are almost without exception in the first grades, and as they cannot write, they are not tested for de-

fective vision. In all of these cases attention must be called to the fact that the decrease in the per cent of defective children is not due to the falling out or leaving school of the children suffering from these defects. This might be put forward as an explanation if we had to do with children above the age of compulsory attendance, or if the characteristic decrease did not take place until the age of 14 or 15; but such is not the case. We have to do with children of from 6 to 15 years of age, and the marked decrease begins among the 8, 9, and 10-year-old children, and continues steadily.

As the older children in general are found in the upper grades and the younger children in the lower grades, it is certainly to be expected that a tabulation of defects by grades will show the same characteristic reductions and the same exception in the case of vision. This expectation is realized in the tabulations made.

PER CENT DEFECTIVE BY DEFECTS AND WHOLE GRADES

Grades	Enlarged Glands	Defective Vision	Defective Breathing	Defective Teeth	Hypertrophied Tonsils	Adenoids
1	43.2	....	23.5	64.2	39.9	23.7
2	36.6	20.2	23.4	61.8	35.1	25.2
3	22.6	21.9	12.9	55.1	26.5	12.2
4	10.4	25.8	8.6	40.9	21.3	12.0
5	8.3	24.8	6.5	31.0	16.6	6.7
6	3.7	24.5	12.4	32.2	13.0	4.3
7	5.4	26.9	11.5	25.0	14.5	5.1
8	8.8	32.3	5.3	34.8	12.8	2.9

Apart from the fact that the eighth grade, for reasons already stated, cannot be considered as representative, the table presents many analogies with the preceding. The percentage of defects dwindles as the grades advance, though here again vision stands in a class by itself, increasing rather steadily with the higher grades.

The foregoing tables have shown clearly the fact that age is the important factor in considerations having to do with the percentage of physically defective school children. It is evident that it is not enough to say merely that in a given city 66 per cent of the pupils are found to be physically defective to a greater or less extent. We

need to know the percentage of defectiveness for each separate defect and something of the age of the children. It is evident that if vision were omitted, the general percentage of defectiveness might be expected to be great if examinations were conducted among the lower grades, and comparatively small if they were conducted among the upper grades.

The same would, of course, be true if the results were tabulated by ages rather than by grades. For instance, in the investigation in point a computation was made to find the number of defects per hundred children in each grade, omitting vision and defective teeth, and basing the calculation solely on cases of enlarged glands, defective breathing, hypertrophied tonsils, and adenoids. The computation resulted as follows:

Grades	Defects per 100 Children	Grades	Defects per 100 Children
1	130	5	38
2	120	6	35
3	74	7	36
4	52	8	29

The same striking falling off is shown if a similar computation is made by ages, instead of by grades:

Ages	Defects per 100 Children	Ages	Defects per 100 Children
6	123	11	68
7	131	12	47
8	114	13	39
9	91	14	24
10	69		

It is entirely probable that had the results of the physical examinations performed in the schools by the physicians of the Board of Health of New York City taken into account age and grade, the announced results and conclusions would have been very different. Reports on the examinations of more than 100,000 school children have been published and the per cent of defectives has run from 66 to 72. From these results it has been argued that as there was no reason to believe that these were exceptional children, it might

fairly be concluded that they were typical of school children in New York, and even of children throughout the United States. On this hypothesis calculations have been based, showing the probable number of children in the United States in need of medical, surgical, or dental attention, and of the probable number of cases of enlarged glands, defective eyesight, poor teeth, adenoids, etc., existing among them. Now, it must be remembered that the examinations performed in New York have very largely been among the very young children in the first and second grades. As these children represent a larger proportion of defectives and very much greater percentages of those suffering from such defects as enlarged glands, hypertrophied tonsils, and adenoids, it is at once evident that they are not only not representative of children in the United States, but not even of children in New York or in Manhattan. They are representative only of very young school children in Manhattan, and it is—to say the least—dangerous to argue anything concerning the number of children in the United States having each of the different sorts of defects from data published so far by the New York Board of Health.

Another question which so far has had little attention is that of the relation of sex and physical defects. The tabulation of the percentages of defectiveness by sexes for each kind of defect gives the following results:

PER CENT HAVING EACH DEFECT BY SEXES

	Boys	Girls
Defective	78.5	79.2
Enlarged glands	32.2	20.3
Defective vision	15.7	20.8
Defective breathing	19.1	14.3
Defective teeth	48.4	53.5
Hypertrophied tonsils	33.1	24.7
Adenoids	17.4	15.6
Other defects	13.6	14.7

DEFECTS PER CHILD

Boys	Girls
1.8	1.6

Here, again, we have some surprising variations: 32.2 per cent of the boys are suffering from enlarged glands, while we found only 20.3 in the case of the girls. Again, under defective breathing we have 19.1 per cent for the boys and 14.3 per cent for the girls; while hypertrophied tonsils are present in 33.1 per cent of the cases among the boys and only 24.7 per cent among the girls. On the other hand, the boys outstrip their sisters in regard to vision and teeth. These results are derived from the examination of a comparatively large number of cases, the boys numbering 3,301 and the girls 4,305.

The results that have been discussed, showing so consistently, as they do, that retarded or above normal age pupils have fewer defects than do those of normal age, furnish food for careful thought. Were further data not available, it would certainly be difficult to explain the seeming anomaly, but the data showing the percentage of defectives by ages and grades are illuminating. We see at once that age is the important factor. With the exception of vision, the percentage of pupils found to be suffering from each separate sort of defect decreases rapidly as age increases. Naturally, similar conditions are found when children of upper grades are compared with those of lower grades.

It is evident that we have here a field for many further interesting and important investigations. Without entering into any one of them, however, we are confronted by one consideration of prime importance, which is that *defects decrease with age.*

The importance of this on all investigations into the influence of physical defects on school progress is at once evident. Whether the term "retarded" is used to express a condition or an explanation, it will always follow from the definition itself that retarded children will be older than their fellow pupils in the same grades. This condition will exist, whether time in grade or an arbitrary age dividing line be taken as the criterion for separating pupils into "retarded" and "not retarded," or "normal age" and "above normal age" groups. In any case, it will always be true that the "backward pupils" will be the older pupils.

Now, the older pupils are found to have fewer defects. This is true, whether they are behind their grades or well up in their studies. Therefore, it is not surprising that we find that 80 per cent of all children of normal age have physical defects more or less serious, while only 75 per cent of those of above normal age are found to be defective. This does not mean that pupils with more physical defects are brighter mentally. It simply means that those who are above normal age are older, and that older pupils have fewer defects.

Why this should be so it is not easy to explain. It is probable that we have here a condition brought about by a number of influencing factors. In the first place, it must be remembered that the higher grades are to a certain extent made up of the survivors of the more fit. Those who reach the higher grades are at least to some extent made up of the brighter, the more ambitious, the more physically fit, those of higher social standing, and those whose parents are in better economic circumstances. If the child, whose physical defects and mental dullness render him exceedingly slow in his studies, leaves school at the earliest possible moment permitted by the compulsory education laws, or even anticipates that moment, he naturally is not present to be counted among the older children or those in the higher grades. This factor, while undoubtedly operative, is probably not one of comparatively great importance.

A second consideration, and one of probably far greater weight, is that children do actually outgrow their defects. No other conclusion sems possible as an explanation of such great falling off as we have in the case of enlarged glands, with which 40 per cent of the 6-year-old children suffer, but which are found present in only 12 per cent of the 16-year-old ones; or in that of defective breathing, where the reduction is from 21 to 10 per cent ; or in that of adenoids, with a fall from 23 to a little over 2 in the same years. Even in the case of defective teeth it is found that nearly 65 per cent of the 6-year-old children are included among those needing attention, and only 35 per cent of the 16-year-old ones. Of course, in this connection it must be remembered that the older children have their permanent teeth, and undoubtedly, too, a much larger proportion of them have received dental attention.

In studying the problems of school progress and physical defects, we must not forget that school success is to only a limited extent a true measure of real ability. It may often be rather an indication of adaptability and docility. Indeed, it would not be surprising to find that the child of perfect physical soundness and exuberant health had so many outside interests as to render him not particularly successful in school work, and that he found the rigid discipline of the schoolroom so irksome as to cause him to fail of approbation by his teachers.

CONCLUSIONS

The problem of retardation is one of great and far-reaching importance. The ever increasing study and attention being given to it by educators in all parts of the country testify to the awakening recognition to its significance. It is a problem of which we as yet know little and which will require a great deal of painstaking investigation and careful study. The present investigation, while it has entailed an expenditure of time and work by no means inconsiderable, has touched but lightly some of the more important factors. With existing school records, exhaustive work is impossible. Nevertheless, from the brief data here presented some conclusions of value may be drawn. Among them are the following:

(1) In the examination conducted among 20,000 children in 15 schools in Manhattan, it was found that the percentage of retardation was decidedly less than in the city as a whole (22.9 in these schools; 30.4 in the city at large).

(2) Among the 19,328 children whose records were studied, 9,489 had records sufficiently complete to give the date of first entering school.

(3) Of each 100 retarded children
30 are retarded because of late entrance,
13 are retarded because of late entrance and slow progress,
57 are retarded because of slow progress.

(4) Of every 1,000 children
195 started at the age of 5
512 started at the age of 6
200 started at the age of 7
62 started at the age of 8
21 started at the age of 9
6 started at the age of 10
3 started at the age of 11
1 started at the age of 12

(5) If the Compulsory Education Law should be so amended as to extend the lower limit of the compulsory school age from 8 to 7, it would affect the age of starting of perhaps 100 in each 1,000 children.

(6) Among the 9,489 children having complete records, some were found who had been in school 10, and even 11 years, without reaching the eighth grade.

(7) Five per cent of the pupils have reached their present standing in the grades by more rapid than normal progress.

(8) Fifty-five per cent have progressed normally.

(9) Forty per cent have progressed more slowly than the normal rate.

(10) Five per cent have reached their present grades in 86 per cent of the normal time.

(11) Fifty-five per cent have reached their present grades in 100 per cent of the normal time.

(12) Forty per cent have reached their present grades in 128 per cent of the normal time.

(13) The smallest percentage of retardation is found among the Germans (16.6).

(14) The next best showing is made by the Americans (19.6).

(15) The Russians show exactly the same percentage as the entire group (22.9).

(16) The Irish make a poorer showing (29.5).

(17) The Italians show decidedly the highest percentage of retardation.

(18) Boys show substantially the same percentage of retardation as girls (boys, 22.2; girls, 23.6).

(19) The average number of transfers per child among children of normal age is .95. Among those of above normal age it is 1.18. Transfers affect retardation.

(20) Among the 19,328 pupils whose records were studied, 7,608 had been given physical examinations by the physicians of the Board of Health. This is approximately 39 per cent.

(21) Children of normal age have more physical defects than retarded children. (Normal age, 80 per cent; above normal age, 75 per cent).

(22) Children in the lower grades have more defects than those in the upper grades.

(23) Defective children in the first grade have about 2.5 defects apiece; those in the eighth grade about 1.3.

(24) Defective vision is the only defect more prevalent among retarded children than among children of normal age.

(25) All defects except defective vision decrease with age. Forty per cent of the 7-year-old children have enlarged glands; only 6 per cent of the 15-year-old ones have them. Twenty-five per cent of the 7-year-old children have adenoids; only 3 per cent of the 15-year-old ones have them. Among 8-year-old children, 17.5 per cent have defective vision. At the age of 14, 27.7 per cent have defective vision.

(26) Of the boys, 78.5 have physical defects; of the girls, 79.2. Boys average 1.8 defects apiece; girls, 1.6. Boys suffer more commonly than girls from enlarged glands, defective breathing, enlarged tonsils, and adenoids. Girls have poorer teeth and poorer eyesight.

It has already been stated that the present investigation makes no claim to being exhaustive, nor are the conclusions put forth as in any sense final. But there should be no difference of opinion as to the importance of the problem under consideration, or the social and educational significance of such statistics as have been here presented. It is to be hoped, too, that the matter has been so presented and discussed as to indicate what might be accomplished in the discovery of existing conditions, if our school records gave accurately for each child even a few of the more simple and easily obtained data.

These and similar ways and means of testing methods, processes, and results are possible of development and application and are destined to be an important factor in enhancing the efficiency of our public school systems.

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