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REPORT OF THE COMMITTEE OF THE
NATIONAL COUNCIL OF EDUCATION

ON

Standards and Tests for Measuring the Efficiency of Schools or Systems of Schools

PRESENTED BY THE CHAIRMAN OF THE COMMITTEE

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STANDARDS AND TESTS FOR MEASURING THE EFFICIENCY OF SCHOOLS OR SYSTEMS OF SCHOOLS.

Educators and laymen have always expressed opinions with respect to the efficiency of our schools. In recent years there has been developed, along with a refinement in the technique of investigation in education, a remarkable public interest in the attempts to evaluate our educational practice. School inquiries, investigations, or surveys have been conducted, or are planned, in a great many cities throughout the United States. In each case there is the supposition that such an inquiry or investigation will measure the efficiency of the schools. It has not always been clear, either to those making the survey, or to those who read the reports, that three distinct types of measurement have been employed, or three sets of standards or tests applied. It is possible to characterize each investigation, or each part of some of the larger surveys, by one of the three following methods of measurement—first, measurement by personal opinion; second, measurement by comparison; or third, measurement by more or less well-established standards or units.

Measurement by personal opinion is valuable in just the degree in which the person passing the judgment is, by training and experience, qualified to give an intelligent opinion. Such personal judgments have frequently suggested comparisons with other communities, and have at times, no doubt, been based upon more or less well-established standards. The chief characteristic of this type of report, however, is found in the fact that the author does not feel that it is necessary either to appeal to a painstaking comparison with other similar situations or to state the standards which he uses in passing his judgment. Often the individual who is expressing a personal opinion seeks to give dignity to his statements by saying that he speaks in terms of facts. In effect, his argument is that the situation as he sees it, and as he has described it, leads inevitably to a conclusion with respect to the strength or weakness of the school system that has come under his observation. Of course, no such appeal to facts can modify the situation. Unless careful comparisons have been instituted, or commonly accepted standards applied in passing the judgment, the opinion expressed in the light of the so-called facts which have been discovered remains simply an opinion.

Measurement by comparison is based upon the fundamental idea that the common practice is the result of the judgment of many men who have attempted to solve the same or very similar problems. In reports which have used the method of measurement by comparison, the most common practice is used as the standard to which each local situation is referred. Such comparisons have been made with regard to expenditures, the progress and classification of children through the grades of the school system, the amount of time devoted to school subjects, supervisory provision, teacher training, tenure, and the like. In the derivation of standards of efficiency, it will always be necessary to employ the comparative method. Any adequate derivation of standards will, however, involve much more than comparison. Measurement in any field is not successful merely because we are able to say that one quantity is more or less than another. It is only when we have a measuring stick which enables us to describe all of the quantities with which we deal in terms of definitely determined units that we can claim to have any adequate method of measurement.

We are only beginning to have measurement undertaken in terms of standards or units which are, or which may become, commonly recognized. Such standards will undoubtedly be developed by means of applying scientifically derived scales of measurement to many systems of schools. From such measurements it will be possible to describe accurately the accomplishment of children and to derive a series of standards which will be applicable to varying groups of children and to different social demands.

Standards of accomplishment will always be stated in terms of group measurements. For example, we will not demand that all children in a given grade be able to write with a certain speed and with a certain degree of excellence, nor that they all be able to perform a certain number of operations in arithmetic with a fixed speed. We shall, rather, measure the abilities of the group in terms of a central tendency, possibly the median or mode, and in terms of variability from this most common or median ability. The derivation of standards, and their application to school situations, does not mean that we shall attempt to make all children alike, or to secure the same product in every situation. It will be possible, however, for one who has some appreciation of statistical method to compare groups of children, either within the same school system or in separate systems of schools, with respect to any ability or quality which they may possess with even greater assurance than we have any right to have in comparing two individuals.

We may expect to develop standards or tests of efficiency in the several different fields, or with respect to the several different elements which constitute a school system. It will not be wise to

attempt to measure one element in the situation out of relation to others, since each part of a school system is not only related to but in some measure determines the efficiency of every other part. For example, we might consider the problems of business administration as distinct, and yet we know that successful business administration will determine in no small degree the efficiency of work done in classrooms. It is only when buildings are properly constructed, lighted, and ventilated, when supplies of the right sort are purchased and properly distributed, that we can expect to do satisfactory work. In like manner, the accomplishment of groups of children in the several subjects which we teach, and the number of promotions or nonpromotions, may be determined in considerable measure by the enforcement of the compulsory-education law. In any attempt to measure the efficiency of a system of schools it will therefore be necessary to include in such a survey all of the problems commonly considered under the head of business administration, educational organization, the recruiting of the teaching corps, and the accomplishment of children. It is not probable that it will ever be possible to establish a single standard or unit of measurement the application of which may be thought to determine the efficiency of a school system.

The business management of a system of schools is to be judged by the adequacy of the system of accounting and of reporting which is used, just to the degree that such records are a measure of business efficiency in other lines of human endeavor. In so far as we have commonly accepted standards for school buildings, one may judge of the efficiency of the school plant. Efficiency may further be determined by the degree to which the business management has succeeded in standardizing supplies and equipment to the end that waste is eliminated. It can not be too strongly urged that neither expenditure per unit of population nor expenditure per pupil measures the efficiency of a school system. The question is always not the amount spent, but the return secured for the money expended. The development of standards in business administration will be made possible when we have more adequate reporting in this field. Any comparative study which might lead to the development of standards of efficiency can be made only upon the basis of a large degree of uniformity in accounting and in reporting fiscal statistics.

From the standpoint of the enforcement of compulsory education, which is in effect putting children in touch with the education which we provide for them, the efficiency of a system of public education is measured by the ratio of the number of children in school to the number of children in the community who ought legally to be in attendance. If legal restrictions, control by agencies outside of the school system, or the lack of funds render impossible the enforcement of the compulsory-education law, one can not charge that those who are

responsible for the administration of public education are inefficient. It is not probable that any city of considerable size can hope for efficiency in this respect without the establishment of a continuing permanent census.

Efficiency in school organization demands that children be differentiated with respect to their mental, physical, and moral capacities. It is relatively simple by physical examination to determine the need for classes for the tubercular, the blind, the deaf, and the crippled. The fact that special types of education must be provided for these several groups is easily established. It is not quite so simple to determine the adequacy of the means or methods employed in the classes in which these children are found. We may, however, expect in the light of further experience with classes for these children to develop standards as adequate as those which we apply to groups of normal children.

Children who are mentally defective can be discovered by tests which are more or less commonly accepted. The Binet-Simon tests are being applied throughout the United States for this purpose. It is probably not more difficult to discover children of superior ability, and it would seem just as legitimate to judge of the efficiency with respect to school organization of a school system in terms of the provision made for supernormal children as in terms of special classes for defectives.

Moral delinquency demands special treatment. We judge the efficiency of the organization of a school system not infrequently by the provision which is made for those who are habitually truant or who are incorrigible. We should more frequently judge of the efficiency of schools which attempt to reform the morally delinquent in terms of the later activities of the individuals placed in these special schools. We may claim to have reformed a boy or girl only when we know, because of our careful system of following up these special cases, that they do not revert to those practices which we originally sought to eliminate.

We are coming to recognize the need for a differentiated curriculum for children who have finished their elementary school course. It is not easy in the newer types of industrial, household arts, agricultural, or trade education, to determine the needs of the community nor the special aptitudes of children. Any adequate solution of the problem of vocational training will necessitate careful vocational surveys and the largest possible opportunity for the discovery of the special abilities of children. It is interesting to note that many of those who are studying the problem of vocational guidance are coming to speak more in terms of the discovery of special ability in order that adequate training may be given than in terms of places for children to work.

One of the most common tests which has been applied to school systems during recent years is found in the percentages of retardation, elimination, promotion, and nonpromotion. These statistics do not, either singly or taken all together, measure the efficiency of the school system. They are rather symptomatic. A large degree of elimination or retardation is significant mainly in showing the need for changes in curricula or in school organization, in calling attention to a lax enforcement of the compulsory education law, or in showing the need for modifications in standards employed by the school system. We shall, of course, continue to follow closely the statistics of elimination, retardation, acceleration, and promotion. Every competent administrator will introduce cumulative record cards which will enable him to trace accurately the history of all children throughout their school course. Such information will always be valuable, even indispensable, to one who would study carefully a school situation. We shall have gained greatly, however, when we learn to consider these facts as symptoms rather than as final measures of efficiency.

It has been suggested that the efficiency of schools be measured in terms of medical inspection, dental inspection and treatment, the provision for playgrounds and recreation, the satisfaction of children's needs in terms of meals and clothing, and the provision for the education of youth and adults. It is unfair to judge a school system as efficient or inefficient in terms of any one of these activities, except as the community concerned has recognized these activities as belonging to the school. If the social group has determined that these functions shall be added to those commonly belonging to the school as an institution, then it will be possible to measure the efficiency of each of these lines of endeavor by standards which we may hope to derive.

Considerable progress has been made in recent years in measuring the accomplishment of children in the subjects which are taught in our schools. The problem here is to come to recognize the necessity for group measurements and group standards. Such measurements will involve the idea of progressive increase in achievement and of central tendencies and variability within the group. Often such tests of efficiency will be most significant in comparing the units of a single school system. The work of Stone and Curtis in arithmetic, the scales for measuring the quality of merit in handwriting by Thorndike and Ayres, and the scale for measuring English composition by Hillegas, are especially noteworthy.

Possibly the most satisfactory method of measuring the efficiency of a teacher is to be found in the evaluation of her work as indicated by the growth and development of the children with whom she comes in contact. Such a method of measurement would be open to

the objection that groups of children differ greatly in capacity, and that therefore the achievements of several different groups of children during any given period would not, after all, measure the ability of the teachers who taught them. Administrative and supervisory officers constantly pass judgment upon the work of teachers and rate them without any such painstaking method as has been suggested. Any adequate scheme of measuring the efficiency of teachers must take into account those qualities which make for success, and must allow weight to each of these several qualities in proportion to their importance. Such a schedule has been prepared by Prof. E. C. Elliott, and is issued by the State Department of Education at Madison, Wis., as an "outline of a tentative scheme for the measurement of teaching efficiency."

The more we attempt to establish standards and tests the more insistent we will have to be that our practice be carefully described in the records which are made by teachers and supervisory officers. Such material will be most significant for school systems which have organized as a part of their administrative system a bureau of investigation. Indeed, the administrative or supervisory officer of the future may be expected to act largely in terms of measurements which enable him to judge accurately of the efficiency of any element or part of the school system of which he has charge. We may expect that a group of capable investigators will work under the direction of the superintendent of schools to the end that he and the community which he serves may have constantly available the most adequate information possible with respect to the efficiency of the school system.

It may not be claimed that the measurement of the several parts or elements of a school system necessarily indicates the efficiency of those charged with the administration of our schools. It may be that a school system is inefficient because a community is relatively poor, or unusually lacking in progressive leadership. Unusual facilities for the development of a most excellent system of schools may be provided by virtue of the superior intelligence and the large resources of the population of another school unit. The most significant measure of efficiency is progressive development or improvement within the system of schools measured.

Greater progress will be made in the establishment of standards and tests, and in the development of more adequate measurements of the efficiency of school systems, when we establish a committee, a board, or commission on school efficiency. It is of the utmost importance that this committee or board be representative of the most significant scholarship and of the best administrative practice known to our profession. This body should be constituted by the National Council of Education. Its functions should be as follows:

1. It should offer encouragement, expert advice, and opportunity for publication to those engaged in scientific work in the direction of the derivation of scales of measurement, in the application of such scales or units to actual school situations, or in the establishment in any other manner of standards in relation to public education.

2. It should offer expert advice with respect to the nature and scope of surveys, investigations, or inquiries to be undertaken in any part of the United States.

3. It should offer to members of our profession engaged in administrative work the opportunity to secure a scientific investigation of their systems of schools under the direction of professional experts. As the situation is at present, we have the anomaly which permits a politician, an interested book-publishing company, or a personal enemy of the chief administrative officer of a school system to attempt to secure the removal of such an officer without any adequate measure of the efficiency of the school system or the accomplishment of the man whose work is called in question. The establishment of a body of professional experts would in time render such action impossible.

For the work of a committee or board such as is contemplated in the statements made above, a liberal appropriation should be made by the National Education Association, and it is possible that further endowment should be sought in order to make possible those activities which will mean the increase in efficiency of our system of public education and the establishment of our profession.

There is appended a bibliography of 339 titles pertinent to the subject of which the report of the committee treats. This bibliography was prepared for the committee by Dr. I. L. Kandel.

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BIBLIOGRAPHY.

MEASUREMENT IN EDUCATION.

Ayres, L. P. The Binet-Simon measuring scale for intelligence. Some criticisms and suggestions. Psychological clinic, 5: 187–96.

——— The measurement of educational processes and products. New York, 1912.

——— Measuring educational processes through educational results. School review, 20: 300–9, 310–19.

Baldwin, J. M. Differences in pupils from the teacher's point of view. Inland educator, 1: 6–11, 269–72; 2: 126–29, 232–35.

Bell, J. C. Recent literature on the Binet tests. Journal of educational psychology, 2: 101–13.

Berry, C. S. A comparison of the Binet tests of 1908 and 1911. Journal of educational psychology, 3: 444–51.

Binet, A. À propos de la mesure de l'intelligence. Année psychologique, 11: 69–82.

——— L'étude expérimentale de l'intelligence. Paris, 1903.

——— Nouvelles recherches sur la mesure du niveau intellectuel chez les enfants d'école. Année psychologique, 17: 145–201.

——— *and* Simon, T. Le développement de l'intelligence chez les enfants. Année psychologique, 14: 1–94.

——— ——— La mesure du développement de l'intelligence chez les jeunes enfants. Société libre pour l'étude psychologique de l'enfant. Tr. by Clara H. Town. Lincoln, Ill., 1912. (Bulletin, April, 1911.)

Bobertag, O. Über intelligenzprüfungen (nach der methode von Binet und Simon). Ztsch. für angewandte psychologie, 5: 105–203.
Also separately, Leipzig, 1911.

Brown, W. The essentials of mental measurement. Cambridge, 1911.

Burt, C. Experimental tests of general intelligence. British journal of psychology, 3: 94–177.

Courtis, S. A. The comparative test as an educational ruler. American education, 13–18, 1911.

Decroly, O. *and* Boulánger, —. Les tests mentaux chez l'enfant. Journal de neurologie, 11: 401–47, 1906.

——— *and* Degand, J. Les tests de Binet et Simon pour la mesure de l'intelligence. Archives de psychologie, 6:27–130.

——— ——— La mesure de l'intelligence chez des enfants normaux d'après les tests de Mm. Binet et Simon; nouvelle contribution critique. Archives de psychologie, 9: 81–108.

De Sanctis, S. Mental development and the measurement of the level of intelligence. Journal of educational psychology, 2: 498–507.

——— Types and degrees of mental deficiency. Annali di neurologia. Naples, 1906.

Descoeudres, *Mlle.* A. Exploration de quelques tests d'intelligence chez des enfants anormaux et arriérés. Archives de psychologie, 11: 351–57.

——— Les tests de Binet et Simon et leur valeur scolaire. Archives de psychologie, 11: 331–50.

Ebbinhaus, H. Über eine neue methode zur prüfung geistiger fähigkeiten in ihrer anwendung bei schulkindern. Ztsch. für psychologie, 13: 401–57.

Falkner, R. P. Some uses of statistics in the supervision of school children. Psychological clinic, 2: 227–33.

Gilbert, J. A. Researches on the mental and physical development of school children. Studies from the Yale psychological laboratory, 2: 40–100.

Gilbert, W. H. *and* Pearson, K. On the significance of the teacher's appreciation of general intelligence. Biometrika, 8: 94–108.

Goddard, H. H. Binet tests on 1,500 normal children, grades 1–5. Training school, January, 1911.

—— The grading of backward children. The De Sanctis tests and the Binet-Simon tests of capacity. Training school, November to December, 1908.

—— —— Four hundred feeble-minded children classified by the Binet method. Pedagogical seminary, 17: 387–97.

—— A measuring scale for intelligence. Training school, 6: 146–55.

—— —— Two thousand children measured by the Binet measuring scale of intelligence. Pedagogical seminary, 18: 232–59.

—— —— A revision of the Binet scale. Training school, 8: 56–62.

Healy, W. *and* Fernald, G. M. Tests for practical mental classification. Psychological monograph, 13, no. 54.

Hill, H. F. *and* Goddard, H. H. Delinquent girls tested by the Binet scale. Training school, 8: 50–56.

Huey, E. B. The Binet scale for measuring intelligence and retardation. Journal of educational psychology, 1: 435–44.

—— —— A syllabus for the clinical examination of children, together with blanks for a complete record of the examination. Baltimore, 1912.

Ieronutti, A. [Results of application of De Sanctis's tests] Rivista pedagogica, 3, no. 3. Rome, 1909.

Johnston, K. L. Binet's method for the measurement of intelligence. Some results. Journal of experimental pedagogy, 1: 24–31.

Lawrence, I. A study of the Binet definition tests. Psychological clinic, 5: 207–16.

MacDonald, A. Experimental study of children, including anthropometrical and psychophysical measurements of Washington school children. *In* U. S. Bureau of education. Report of the Commissioner for the year 1897–98. Washington, 1899. v. 1. Chapter 21. p. 989–1204.

MacMillan, D. P. The diagnosis of the capabilities of school children. *In* National education association of the United States. Journal of proceedings and addresses, 1904. p. 738–44.

Major, G. Zur erkennung jugendlichen schwachsinns. Ztsch. für experim. pädag., 9: 1–73.

Meumann, E. Experimentelle pädagogik und schulreform. Ztsch. f. pädag. psych., 12: 1–13.

—— —— Der gegenwärtige stand der methodik der intelligenzprüfungen. Ztsch. für experim. pädag., 10, pt. 1: 68–79.

—— —— Intelligenzprüfungen an kindern der volksschule. Experim. pädagogik, 1: 35–101; 2:386.

Myers, C. S. The pitfalls of mental tests. British medical journal, 1: 195–97.

Pearson, K. On a scale of intelligence in children. Journal of education, 509–10, 1908.

Ries, G. Beiträge zur methodik der intelligenzprüfung. Ztsch. f. für psych., 56: 321–43.

Schmitt, C. The Binet-Simon tests of mental ability. Discussion and criticism. Pedagogical seminary, 19: 186–200.

Spearman, J. General intelligence objectively determined and measured. American journal of psychology, 15: 201–92.

Strayer, G. D. Measuring results in education. Journal of educational psychology, 2: 5–10.

—— *and* Thorndike, E. L. Educational administration, quantitative studies, No. [illegible]

Swift, E. J. Standards of efficiency in school and life. Pedagogical seminary, 10: 3–22.
Terman, L. M. The Binet-Simon scale for measuring intelligence. Impressions gained by its application. Psychological clinic, 5: 199–206.
—— *and* Childs, H. G. A tentative revision and extension of the Binet-Simon measuring scale of intelligence. Journal educational psychology, 3: 61–74; 198–208; 277–89.
Thorndike, E. L. Educational psychology. New York, 1910.
—— An introduction to mental and social measurements. New York, 1912.
Titchener, E. B. Experimental psychology. v. 2. New York, 1905.
Town, C. H. The Binet-Simon scale and the psychologist. Psychological clinic, 5, no. 8, 1912.
Treves *and* Saffiotti. La scala metrica dell' intelligenza. Milan, 1911.
Vaschide, N. *and* Pelletier, M. Contribution expérimentale à l'étude des signes physiques de l'intelligence. Comptes rendus. Académie de science, 133: 551–53.
Waite, H. Estimation of the general intelligence of school children. Biometrika, 8: 79–93.
Wallin, J. E. W. Danger signals in clinical and applied psychology. Journal of educational psychology, 3: 224–26.
—— A practical guide for the administration of the Binet-Simon scale for measuring intelligence. Psychological clinic, 5: 217–38.
Watkins, S. H. The test method in education. Journal of education (London) 43: 727–29.
Weiss, A. P. On methods of mental measurement, especially in school and college. Journal of educational psychology, 2: 555–63.
Whipple, G. M. Manual of mental and physical tests
Winteler, J. Experimentelle beiträge zu einer begabungslehre. Experim. pädag., 2: 1–48; 147–247.
Wissler, C. Correlation of mental and physical tests. Psychological review. Mon. suppl., no. 16, June, 1910.
Ziehen, T. Die prinzipien und methoden der intelligenzprüfung. Berlin, 1911.

RETARDATION AND ELIMINATION.

Apert, E. Les enfants retardataires. Paris, 1902.
Ayres, L. P. The identification of the misfit child. American school board journal, 1911.
—— Irregular attendance—a cause of retardation. Psychological clinic, 3: 1–8.
—— Laggards in our schools: A study of retardation and elimination in city school systems. New York, 1909.
—— The money cost of repetition versus the money saving through acceleration. American school board journal, January, 1912.
—— The money cost of the repeater. Psychological clinic, 3: 49–57.
—— The relation between entering age and subsequent progress among school children. Education, February, 1912.
—— The relative responsibility of school and society for the over-age child. Journal of education (Boston), December, 1911.
—— A simple system for discovering some factors influencing nonpromotion. Psychological clinic, 4: 189–93.
—— Some factors affecting grade distribution. Psychological clinic, 2: 121–33.
Blan, L. B. Retardation of elementary school pupils. Educational review, 40: 51–64.
—— A special study of the incidence of retardation. Teachers' College, Columbia University. Contributions to education, no. 41, 1911.
Book, W. F. Why pupils drop out of the high school. Pedagogical seminary, 17: 359–404.

Boston. School committee. Causes of retardation. Minutes ... December 31, 1906
See also Psychological clinic, 2: 55–56.

Bryan, J. E. A method for determining the extent and causes of retardation in a city school system. Psychological clinic, 1: 41–52.

—— Statistics of retardation from a superintendent's office. Philadelphia, 1909.

Camden, N. J. Board of education. Report, 1905–6. Percentage of promotions of half-day and all-day pupils.

Cameron, N. A new method of determining rate of progress in a small school system. Psychological clinic, 5: 251–64.

Chicago. Board of education. Percentage of promotions and percentage of attendances. *In its* Annual report, 1908. p. 299–303.

Cincinnati. Board of education. Retardation, promotion, etc. *In its* Annual report, 1907.

—— —— Retarded schools. *In its* Annual report, 1909. p. 55–57.

Cleveland, Ohio. Superintendent of schools. Measuring efficiency and progress. *In his* Annual report, 1909. p. 23–51.

—— —— Retarded and repeating pupils. *In his* Annual report, 1910.

Columbus, Ohio. Board of education. Average age of pupils in the respective grades, 1904–1908. *In its* Annual report, 1908. p. 77.

Cornman, O. P. Retardation of the pupils of five city school systems. Psychological clinic, 1: 245–57.

Cummings, E. P. Elimination and retention of pupils. Psychological clinic, 5: 20–23.

Dearborn, W. F. Qualitative elimination from school. Elementary school teacher, 10: 1–13.

Erie, Pa. Board of education. Retardation in the Erie public schools. *In its* Biennial report, 1907–8—1908–9. p. 88–100.

Falkner, R. P. Elimination of pupils from school. A review of recent investigations. Psychological clinic, 2: 255–75.

—— The fundamental expression of retardation. Psychological clinic, 4: 213–20.

—— Retardation: Its significance and its measurement. Educational review, 38: 122–31.

—— Some further considerations upon the retardation of the pupils of five city school systems. Psychological clinic, 2: 57–74.

Fenchtwahgler, A. Warum kommen viele kinder in der schule nicht vorwärts? Langensalza, 1908.

Gard, W. L. Some relations between physical defects and mental retardation. Ohio teacher, 29: 385–91.

Gayler, G. W. Age and grade of school children. American school board journal, 38: 4–5.

—— Retardation and elimination in graded and rural schools. Psychological clinic, 4: 40–45, 79–82.

Greenwood, J. M. Retardation of pupils in their studies and how to minimize it. Educational review, 37: 342–48.

Gulick, L. H. Why 250,000 children quit school. The yearly army that drops out of line—standard too high and teachers too dull. World's work, 20: 13285–89.

Harrisburg, Pa. School board. Retardation of pupils. *In its* Annual report, 1909. p. 40–45.

Heeter, S. L. The lagging half in our schools. Minnesota educational association. Journal of proceedings and addresses, 1909. p. 46–53.

Huey, E. B. Retardation and the mental examination of retarded children. Journal of psycho-asthenics, 15.

Indiana. State association of town and city superintendents. Report of committee on delinquent and dependent children, including truancy, juvenile courts, and poor relief. Statistics of retardation. Franklin, Ind., 1908.

Johnson, R. L. Irregular attendance in the primary grades. Psychological clinic, 3:89–95.

Jones, W. F. An experimental-critical study of the problem of grading and promotion. Psychological clinic, 5: 63–95, 99–120.

Keyes, C. H. Progress through the grades of city schools. A study of acceleration and arrest. New York, 1911.

Lurton, F. E. Retardation in fifty-five western towns. Journal of educational psychology, 3: 327–30.

——— Retardation statistics from the smaller Minnesota towns. Psychological clinic, 5:13–19.

——— A study of retardation in the schools of Minnesota. Elementary school teacher, 11: 457–64.

MacMillan, D. P. The physical and mental examination of public school pupils in Chicago. Charities and The commons, 17: no. 12.

Malden, Mass. School committee. Table showing the number of pupils in elementary schools by grades and ages, and the number of over-age pupils. *In their* Annual report, 1908. p. 48.

Memphis, Tenn. Board of education. Number and age of pupils in grade and high schools. *In its* Report, 1908–9. p. 23.

Miller, C. A. A.J. Progress and retardation of a Baltimore class. Psychological clinic, 3: 136–40.

Neighbours, O. J. Retardation in the schools and some of its causes. Elementary school teacher, 11: 119–35.

New York City. Superintendent of schools. Ages by grades in the elementary schools of New York (City). *In his* Report, 1904. p. 42–49.
See also Report, 1909. p. 61–67. Tables.

New York State. Department of Education. Elimination. *In its* Report, 1906. p. 532.

——— ——— Table showing successive grades in New York cities. *In its* Report, 1908. p. 580.

Newark, N. J. Board of education. Retardation and elimination of pupils. *In its* Report, 1908–9. p. 44–53.

Oakland, Cal. Board of education. Number of pupils in the grades. *In its* Report, 1900. p. 105.

Payne, B. R. Virginia high-school enrollment and graduation. Virginia journal of education, 3: 564.

Payne, I. D. Retardation in the schools of Palo Alto, Cal.; A study of pedagogical life histories. Psychological clinic, 5: 139–48.

Pennsylvania. Statistics first to ninth grades. Pennsylvania school journal, 57: 85–86.

Philadelphia. Reduction in the number of retarded children in the Philadelphia schools, and some causes of retardation (1908). Psychological clinic, 2: 252–53.

Providence, R. I. School committee. Report, 1907–8. Non-promotion and graduation ages. p. 57–60.

Russell Sage foundation. Backward children investigation. Retardation; some account of study conducted in the New York public schools. New York, 1909.
Reprinted for the Tenth annual report of Superintendent of schools, New York City, 1909.

Schaeffer, N. C. Retardation in the grades and the new code. Pennsylvania school journal, 57: 422–23.

Schmitt, C. Retardation statistics of three Chicago schools. Elementary school teacher, 10: 478–92.

Sheldon, W. D. A neglected cause of retardation. Educational review, 38: 1910.

Squire, C. R. Our responsibility for retardation. Psychological clinic, 4: 46–59.

Sterling, E. B. Gymnastics as a factor in the treatment of mental retardation. Psycho-

Strayer, G. D. Age and grade census of schools and colleges. A study of retardation and elimination. Washington, 1911. 144 p. 8°. (U. S. Bureau of education. Bulletin no. 5, 1911)
Bibliography: p. 141–44.

Thorndike, E. L. The elimination of pupils from school. Washington, 1908. 63 p. 8°. (U. S. Bureau of education. Bulletin no. 4, 1907)

——— Promotion, retardation, and elimination. Psychological clinic, 3:232–43, 255–65.

——— Repeaters in the upper grammar grades. Elementary school teacher, 10:409–14.

Twitmyer, E. W. Clinical studies of retarded children. Psychological clinic, 1:97–103.

Uffenheimer, A. *and* Stählin, O. Warum kommen unsere kinder in der schule nicht vorwärts? Der arzt als erzieher, 28. Munich, 1907.

U. S. Bureau of education. At what age do pupils withdraw from the public schools? Report of the Commissioner for the year 1894–95, v. 2, p. 1161–70.

——— The unsolved problem of school attendance. Report of the Commissioner for the year 1906, v. 2, p. 1284–86.

——— When and why pupils leave school. How to promote attendance in the higher grades. Report of the Commissioner for the year 1899–00, v. 2, p. 1364–74.

Van Denburg, J. K. Causes of the elimination of students in public secondary schools. New York, 1911.

Wagner, A. E. Retardation and elimination in the schools of Mauch Chunk Township. Psychological clinic, 3:164–73.

Wallin, J. E. W. Rationale of promotion and elimination of waste in the elementary and secondary schools. Journal of educational psychology, 1:445–66.

Witmer, L. The study and treatment of retardation; a field of applied psychology. Psychological bulletin, 6:121–26.

——— What is meant by retardation? Psychological clinic, 4:121–31.

BACKWARD PUPILS.

Abelson, A. R. The measurement of mental ability of backward children. British journal of psychology, 4:268–314.

——— The measurement of mental ability of backward children. London, 1912.

Atwood, C. E. The school training of backward children in the New York City public schools. New York medical journal, 86:430–33.

Chicago. Superintendent of schools. *In his* Report, 1906.

Deuchler, G. Über das Mannheimer schulsystem. Ztsch. für pädag. Psychology, 10:384–420.

Frenzel, F. Die hilfsschule für schwachbegabte. Ztsch. für d. behandlung schwachs. u. epil., 20:69–82.

Green, M. B. A class of backward and defective children. Psychological clinic, 3:125–133.

Gündel, A. Zur organisation der hilfsschule. Ztsch. für d. behandlung schwachs. u. epil., 20:1–7; 26–40.

Hellman, J. D. A clinical examination blank for backward children in the public schools. Psychological clinic, 1:189–97; 217–30; 258–67.

Huey, E. B. Backward and feeble-minded children: clinical studies in the psychology of defectives with a syllabus for the clinical examination and testing of children. Baltimore, 1912.

Loewy, S. Beobachtungen und untersuchungen an den kindern der hilfsschulklassen in Meiningen. (Leipzig, 1909.)

London county council. Report of the medical officers for 1907.

Maennel, B. The auxiliary schools of Germany. Washington, 1907. 137 p. 8°. (U. S. Bureau of education. Bulletin no. 3, 1907)
Bibliography: p. 135–37.

Noyes, W. B. An introduction to the psychological study of backward children. New York medical journal, 72:1076–80.

Shattuck, G. B. Grading of defective public school children. Boston medical and surgical journal, 148:349–50.

White Plains, N. Y. An experiment in special coaching for backward pupils in the public schools. Psychological clinic, 2:28.

FEEBLE-MINDED CHILDREN, ETC.

Baracelli, S. E. Deficienci e tardivi. La scuola per i tardivi. Cremona, 1903.

Binet, A. *and* Simon, T. L'intelligence des imbeciles. Année psychologique, 15:1–47.

Cornell, W. S. Mentally defective children in the public school. Psychological clinic, 2:76–86.

Decroly, O. La classification des enfants anormaux. Ghent; 1906.

——— La frontière authropométrique des anormaux d'après M. Binet, appliquées à des enfants de Bruxelles. Ann. soc. roy. Brux., 14 (2).

Demoor, J. Anormale kinder und erziehliche behandlung in haus und schule. Altenburg, 1901.

——— *and* Daniel. Les enfants anormaux à Bruxelles. Année psychologique, 7: 296–313.

Ferrari, G. C. Examen médico psychologique des arriérés. Paris, 1910.

Johnson, G. E. Contribution to the psychology and pedagogy of feeble-minded children. Pedagogical seminary, 3: 246–301.

Kelly, R. L. Psycho-physical tests of normal and subnormal children, a comparative study. Ztsch. für psych., 44: 50–144; and Psychological clinic, 10: 345–72.

Krohn, W. O. Minor mental abnormalities in children as occasioned by certain school methods. *In* National education association of the United States. Journal of proceedings and addresses. 1898, p. 168–72.

Kuhlmann, F. Experimental studies in mental deficiency. American journal of psychology, 7: 86–90.

Lobsien, M. Einige untersuchungen über das gedächtnis bei schwachbefähigten. Kinderfehler, 8: 157–68, 193–203.

Meusy, ———. Note sur l'éducation des enfants arriérés à l'école de la Salpêtrière. Année psychologique, 11: 83–91.

Norsworthy, N. Psychology of mentally deficient children. Archives of psychology, no. 1.

Rauschburg, R. Vergleichende untersuchungen an normalen und schwachbefähigten schulkindern. Kinderfehler: 5-18, 1905.

Simon, T. Expérience de copie. Essai d'application à l'examen des enfants arriérés. Année psychologique, 7: 490–518.

Smith, W. G. A comparison of some mental and physical tests in their application to epileptic and to normal subjects. British journal of psychology, 1: 240–61.

Vaney, V. Les classes pour enfants arriérés; recrutement, organisation, exercises d'orthopédie. Paris, 1911.

Wylie, A. R. T. Taste and reaction time of the feeble-minded. Journal of psycho-asthenics, 4: no. 3. A study of the senses of the feeble-minded, 4: no. 4. Memory of the feeble-minded, 5: no. 1. Motor ability and control of the feeble-minded, 5: no. 2.

PHYSICAL DEFECTS.

Ayres, L. P. The effect of physical defects on school progress. Psychological clinic, 3: 71–77.

Cornell, W. S. Medical inspection. Philadelphia, 1912.

Cornell, W. S. The need of improved records of the physic conditions of school children. Psychological clinic, 3: 161–63.

—— The relation of physical to mental defect in school children. Psychological clinic, 1: 231–34.

Elmslie, P. C. School provision for physically defective children. School hygiene, 1: 322–34.

Giry, N. Du rôle du médecin dans les écoles. Nancy, 1899.

Greef, R. Augenärztliche und hygienische schuluntersuchungen. Klin. jahrb., 12: 1–92.

MacDonald, A. Measurements of Chattanooga school children. American medicine, 3: 313–15.

Schiller, H. Die schularztfrage. Berlin, 1899.

Thorn, L. T. The physical development of the London schoolboy. 1890 examinations. British medical journal, 1: 829–31.

Wallin, J. E. W. Medical and psychological inspection of school children. Western journal of education, 2: 433–66.

Warner, F. Mental and physical conditions among 50,000 children seen in 1892–1894, and the methods of studying recorded observations, with special reference to the determination of the causes of mental illness and other defects. Journal of the royal statistical society, 59: 125–68.

West, G. Observations on the relation of physical development to intellectual ability made on school children of Toronto, Canada. Science, n. s., 4: 156.

Zirkle, H. W. Medical inspection of schools. Investigating department of psychology and education, University of Colorado, 1: 66.

FATIGUE.

Arai, Tsuru. Mental fatigue. New York, 1912.

Baker, S. Fatigue in school children. Educational review, 15: 34–39.

Bellei, ——. Alteriore contributo allo studio della fatiga mentale nei fanciulli. Rivista sperim. di Freniatria, 30; also, Année psychologique, 11: 369.

Beyer, H. G. The relation between physical and mental fatigue. Journal of the Boston society of medical science, 5: 437–46.

Block, R. Untersuchungen über die brauchbarkeit des ergographen zu ermüdungsmessungen. Veröffentlichungen des instituts für experimentalen Pädagogik und psychologie des Leipziger lehrervereins. Leipzig, 1911.

Burgerstein, L. Die arbeitskurve einer schulstunde. Ztsch. für schulgesundheitspflege, 4: 543–64, 607–27.

Claviere, J. Le travail intellectuel dans ses rapports avec la force musculaire mesurée au dynamomètre. Année psychologique, 7: 206–30.

Féré, C. Note sur l'influence réciproque du travail physique et du travail intellectuel. Journal de l'anat. et de la physiol., 37: 625–37.

Friedrich, J. Untersuchungen über die einflüsse der arbeitsdauer und der arbeitspausen auf die geistige leistungsfähigkeit der schulkinder. Ztsch. für psych., 13: 1–53.

Hieronymus, I. Der stundenplan in hygienischer beleuchtung. Ztsch. für schulgesundheitspflege, 17: 14–27.

Holmes, M. E. The fatigue of a school hour. Pedagogical seminary, 3: 213–324.

Keller, R. Über den 40 minuten unterrichtsbetrieb des gymnasiums und der industrieschule in Winterthur. International magazine of school hygiene, 2: 298–330.

Kemsies, F. Arbeitshygiene der schule auf grund von ermüdungsmessungen Schiller-Ziehen. Sammlung von abhandlungen aus dem gebiet der pädagogischen psychologie und physiologie, vol. 2, 1898.

Kraepelin, E. Die arbeitskurve. Philos. studien, 19: 459–507.

Laser, H. Über geistige ermüdung beim schulunterricht. Ztsch. für schulgesundheitspflege, 7: 2–22.
Marsh, H. I. The diurnal curve of efficiency. New York, 1906.
Müller, R. Über Mossos ergographen mit rücksicht auf seine physiologischen und psychologischen anwendungen. Philos. studien, 17: 1–29.
Offner, M. Die geistige ermüdung. Berlin, 1910.
Ritter, C. On measurements of fatigue. Ztsch. für psych. und physiol. der sinnesorgane, 24: 401–44.
Thorndike, E. L. Mental fatigue. Psychological review, 7: 466–82, 547–79.
—— Mental fatigue. Journal of educational psychology, 2: 61–80.
Treves, Z. Über den gegenwärtigen stand unserer kenntniss die ergographie betreffend. Archiv f. d. ges. physiol., 87: 7–67.
Wagner, L. Unterricht und ermüdung. Ermüdungsmessungen an schülern des neuen gymnasiums in Darmstadt. Berlin, 1898.
Wimms, J. H. The relative effects of fatigue and practice produced by different kinds of mental work. British journal of psychology, 2: 153–96.
Winch, W. H. Mental fatigue in day school children as measured by arithmetical reasoning. British journal of psychology, 3: 315–41.
—— Mental fatigue in day school children as measured by immediate memory. Journal of educational psychology, 4: 18–24, 75–82.
—— Some measurements of mental fatigue in adolescent pupils in evening schools. Journal of educational psychology, 1: 13–23; 83–100.
Yonkum, C. S. An experimental study of fatigue. Psychological monographs. Whole no. 46.
Zieler, A. Wie verändern sich die körperlichen leistungen der schüler an den verschiedenen tageszeiten durch einwirkung des schulunterrichts. Veröffentlichung des instituts für exper. päd. u. psych. des Leipziger lehrervereins. Leipzig, 1911.

EXCEPTIONAL CHILDREN. (SUPERNORMAL.)

Petzold, J. Sonderschulen für hervorragend befähigte. Leipzig and Berlin, 1905.
Secor, W. B. Credit for quality in the secondary school. Educational review, 35: 486–90, May. 1908.
Stern, W. Das übernormale kind. Der säemann, 1910; 67–72, 160–67.
Translation in Journal of educational psychology, 2: 143–48, 181–90; see also 164–65.
Van Sickle, J. H. Provision for exceptional children in the public schools. Psychological clinic, 2: 102, 111; Elementary school teacher, 10: 357–66.
—— Witmer, L. *and* Ayres, L. P. Provision for exceptional children in public schools. Washington, 1911. 92 p. 8°. (U. S. Bureau of education: Bulletin no. 14, 1911)

TEACHERS.

Bell, J. C. Merit in teaching; New York system of grading high school teachers. Journal of educational psychology, 3: 165.
Book, W. F. The high-school teacher from the pupil's point of view. Pedagogical seminary, 12: 239–88.
Boyce, A. C. Qualities of merit in secondary-school teachers. Journal of educational psychology, 2: 144–57.
Chrisman, O. Child and teacher. Journal of pedagogy, 12: 112–25.
Elliott, E. C. Outline of a tentative scheme for the measurement of teaching efficiency. Madison, Wis., State department of education, 1910.
Hall, G. S. Certain degenerative tendencies among teachers. Pedagogical seminary, 12: 454–63.
Ruediger, W. C. Agencies for the improvement of teachers in service. Washington, 1911. 157 p. 8°. (U. S. Bureau of education. Bulletin no. 8, 1911)

Ruediger, W. C. *and* Strayer, G. D. The qualities of merit in teachers. Journal of educational psychology, 1: 272–78.

Swift, E. J. Teachers and teaching. *In* Report of the State superintendent of public schools, Missouri, 1905, p. 130.

Wichmann, R. Zur statistik der nervösität bei lehrern. Ztsch. für schulgesundheitspflege, 17: 304–18, 543–54.

SCHOOL SUBJECTS.

English.

Dall, W. H. Measuring the merit of English writing. Science, 34: 115–16.

Hillegas, M. B. A scale for the measurement of quality in English composition by young people. Teachers college record, 13: no. 4.

Rice, J. M. Educational research: the results of a test in language. Forum, 35: 269–93.

——— English, the need of a new basis in education. Forum, 35: 440–57.

Thorndike, E. L. A scale of merit in English writing by young people. Journal of educational psychology, 2: 361–68.

——— A scale for measuring the merit of English writing. Science, 33: 935–38.

Writing.

Ayres, L. P. A scale for measuring the quality of handwriting of school children. New York, 1912.

Binet, A. La sexe de l'écriture. Revue, 17–34, October, 1903.

Downey, J. E. Control processes in modified handwriting: an experimental study. Psychological review. Monograph supplement, 9: no. 1.

Freeman, F. N. Some issues in the teaching of handwriting. Elementary school teacher, 12: 1–7, 53–59.

Gesell, A. L. Accuracy in handwriting as related to school intelligence and sex. American journal of psychology, 17: 394–405.

King, I. *and* Johnson, H. The writing abilities of the elementary and grammar school pupils of a city school system measured by the Ayres scale. Journal of educational psychology, 3: 514–20.

Thompson, M. E. Psychology and pedagogy of writing. A résumé of the researches and experiments bearing on the history and pedagogy of writing. Baltimore, 1911.

Thorndike, E. L. Handwriting. Teachers college record, 11: no. 2.

Drawing.

Leuba, J. H. *and* Hyde, W. An experiment on learning to make hand movements. Psychological review, 12: 351–69.

Levinstein, S. Untersuchungen über das zeichnen der kinder bis zum 14 lebensjahr. Leipzig, 1904.

Lobsien, M. Einige experimentelle untersuchungen zu einigen grundfragen der kunsterziehung. Langensalza, 1905.

Meumann, E. Aesthetische versuche mit schulkindern. Experim. pädag., 3: 74–88.

Arithmetic.

Brown, J. C. An investigation on the value of drill work in the fundamental operations of arithmetic. Journal of educational psychology, 2: 81–88; 3: 485–91.

Brown, W. Some experimental results in correlation. Biometrika, 7: pt. 3.
Also in Journal of philosophy, psychology, and scientific methods, 526–28, 1910.

Cole, L. W. Adding upward and downward. Journal of educational psychology, 3: 75–94.

Courtis, S. A. Manual of instruction for giving and scoring the Courtis standard tests in arithmetic. Detroit, Mich., 1910.

——— Measurement of growth and efficiency in arithmetic. Elementary-school teacher, 10: 55-74, 177-99; 11: 171-85, 360-70, 528-39; 12: 127-37.

Eckhard, K. Boebachtungen über das zahlenverständnis der schulrekruten. Ztsch. für experim. pädag., 7: 232-35.

Fisher, S. C. Arithmetic and reasoning in children. Pedagogical seminary, 19: 48-77.

Fox, W. S. *and* Thorndike, E. L. The relationship between the different abilities involved in the study of arithmetic. Columbia contributions to philosophy, psychology, and education, 1903, p. 32-40.

Lobsien, M. Korrelation zwischen zahlengedächtnis und rechenleistung. Ztsch. für pädag. psych. u. experim. padag., 1911.

Rice, J. M. Educational research: a test in arithmetic, etc. Forum, 24: 117-30, 281-97, 437-52, 588-607.

Rietz, H. L. *and* Shave, J. Correlation of efficiency in mathematics and efficiency in other subjects. University of Illinois bull. 6: 301-04.

Schanoff, B. Die vorgänge des rechnens. Leipzig, 1910.

Schulze, R. 500,000 rechenaufgaben. Eine experimentelle untersuchung. Praktische schulmann, 44: 340-ff.

Starch, D. Transfer of training in arithmetical operations. Journal of educational psychology, 2: 306-10.

Stone, C. W. Arithmetical abilities and some factors determining them. New York, 1908.

Winch, W. H. Accuracy in school children. Does improvement in numerical accuracy transfer? Journal of educational psychology, 1: 262-71, 334-36.

Foreign Languages.

Binet, A. La question des études classiques d'après la psychologie expérimentale. Rev. de rev., 28: 461-70.

Libby, W. An experiment in learning a foreign language. Pedagogical seminary, 17: 81-96.

Enquête sur les méthodes dans l'enseignement des langues vivantes. Revue universitaire, 8: 348-51.

Zoology.

Gilbert, J. C. An experiment on methods of teaching zoology. Journal of educational psychology, 1: 321-31.

Reading.

Becher, E. Experimentelle und kritische beiträge zur psychologie des lesens bei kurzen expositionzeiten. Ztsch. für psych. u. physiol. der sinnesorgane, 36: 19-73.

Boggs, L. P. How children learn to read: an experimental study. Pedagogical seminary, 12: 496-502.

Dearborn, W. F. The psychology of reading. Columbia University. Contributions to philosophy and psychology, xiv: 1.

Dockeray, F. C. The span of vision in reading and the legibility of letters. Journal of educational psychology, 1: 123-31.

Dodge, R. The psychology of reading. Psychological review, 8: 56-60.

Erdmann, B. *and* Dodge, R. Psychologische untersuchungen über das lesen. Halle, 1898.

Gill, E. J. Methods of teaching reading: a comparison of results. Journal of experimental pedagogy, 1: 243-48.

Huey, E. B. The psychology and pedagogy of reading. New York, 1908.

Schwender, J. Die wichtigsten ergebnisse der experimentellen untersuchungen über das lesen. Leipzig, 1910.
Taylor, J. S. Principles and methods of teaching reading. New York, 1912.

Spelling.

Cook, W. A. Shall we teach spelling by rule? Journal of educational psychology, 3: 316–25.
Cornmann, O. P. Spelling in elementary school; an experimental and statistical investigation. Philadelphia, 1902.
Gill, E. J. The teaching of spelling. Journal of experimental pedagogy, 1: 310–19.
Pearson, N. C. The scientific study of the teaching of spelling. Journal of educational psychology, 2: 241–52.
Rice, J. M. The futility of the spelling grind. Forum, 33: 163, 172, 404–19.
Schiller, H. Studien und versuche über die erlernung der orthographie. Berlin, 1898.
Suzzallo, H. The teaching of spelling. Teachers college record, 12: 5.
——— *and* Pearson, H. C. Comparative experimental teaching of spelling. Teachers college record, 13: 1.
Wallin, J. E. W. Spelling efficiency in relation to age, grade, and sex, and the question of transfer. Baltimore, 1911.
——— Has the drill become obsolescent? Journal of educational psychology, 1: 200–13.
Whipple, G. M. Relative efficiency of phonetic alphabets. Baltimore, 1912.

HIGH SCHOOL PROBLEMS.

Dearborn, F. W. The relative standing of pupils in the high schools and in the university. Madison, Wis., 1909.
——— School and university grades. University of Wisconsin bulletin, no. 368, 1910.
Johnson, F. W. Comparative study of the grades of pupils from different elementary schools in subjects of the first year in high school. Elementary school teacher, 11: 63–78.
Judd, C. H. On scientific study of high-school problems. School review, 18: 84–98.
Miles, W. R. A comparison of elementary and high school grades. Pedagogical seminary, 17: 429–50.
Miller, H. L. Comparative study of the grades of pupils from the different ward schools based upon the first year of high school. Elementary school teacher, 11: 161–70.

MISCELLANEOUS.

Bagley, W. C. On the correlation of mental and motor ability in school children. American journal of psychology, 12: 193–205.
Bolton, T. L. The relation of motor power to intelligence. American journal of psychology, 14: 351–67, 615–31.
Bonser, F. G. The reasoning ability of children of the fourth, fifth, and sixth school grades. New York, 1910.
Brown, W. Some experimental results in the correlation of mental abilities. British journal of psychology, 3: 296–322.
Burris, W. P. The correlation of the abilities involved in secondary school work. Columbia contributions to philosophy, psychology, and education, 2: 16–28.
Campbell, C. V. Kindergarten training and motor development. A study of a thousand children. Kindergarten magazine, 15: 135–42.
Chicago. Superintendent of schools. Speech defects. *In his* Report, 1910.
Chicago parental school. Experimental and statistical studies of truant and delinquent children. *In its* Fifth annual report, 1906.
Clement, J. A. Standardization of the schools of Kansas. Chicago, 1913.

Conradi, E. Speech defects and intellectual progress. Journal of educational psychology, 3: 35–38.

Cornell, W. S. Age per grade of truant and difficult boys. Psychological clinic, 4: 239–40.

Cornman, O. P. Size of classes and school progress. Psychological clinic, 3: 206–12.

England. Board of education. Report of the chief medical officer, 1912. p. 64–96, 225–30.

Herford, ———. Über feststellung und häufigkeit der tuberkulose in den schulen. Ztsch. f. schulgesundheitspflege, 22: 687–710.

Hillenberg, ———. Die verwendbarkeit der von Pirquet-reaktion zur bekämpfung der tuberkulose in der schule. Ztsch. f. schulgesundheitspflege, 23: 605–22.

Jones, C. E. A concrete example of the value of individual teaching. Psychological clinic, 2: 195–203.

Lobsien, M. Beliebtheit und unbeliebtheit der unterrichtsfächer. Langensalza, 1909.

Lorentz, F. Die mitwirkung der schule im kampf gegen die tuberkulose. Charlottenburg, 1910.

[References to practice in London and Geneva in cases of tuberculous children] Journal of educational psychology, 1: 490.

Simpson, B. R. Correlation of mental abilities. New York, 1912.

Smiley, W. S. A comparative study of the results obtained in the elementary branches of graded and rural schools (arithmetic, geography, grammar, history, and spelling). Elementary school teacher, 11: 249–65, 308–22.

Spearman, C. *and* Krueger, F. Die korrelation zwischen verschiedenen leistungsfähigkeiten. Ztsch. für psych., 44: 50–114.

Thorndike, E. L. Heredity, correlation, and sex differences in school abilities. Columbia contributions to philosophy, psychology, and education, 11: no. 2.

Winch, W. H. Social class and mental proficiency in elementary school children. Journal of experimental pedagogy, 1: 9–18.

——— When should a child begin school? An inquiry into the relation between age of entry and school progress. Baltimore, 1911.

Woodworth, R. S. Social differences in mental traits. Science, n. s., 31: 171–86.