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PUBLIC SCHOOL ADMINISTRATION

A STATEMENT OF THE FUNDAMENTAL PRINCIPLES UNDERLYING THE ORGANIZATION AND ADMINISTRATION OF PUBLIC EDUCATION

BY

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1916

HOUGHTON MIFFLIN COMPANY
BOSTON NEW YORK CHICAGO
The Riverside Press Cambridge

Snedden, D. "The Gary System; Its Pros and Cons for Other Cities"; in *Educational Administration and Supervision*, vol. I, pp. 362–74. (June, 1915.) Also in *Proceedings of National Education Association*, 1915.

Springfield, Ill. *Survey of the Public Schools*. 152 pp. Russell Sage Foundation, New York, 1914.
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CHAPTER XIX

EFFICIENCY EXPERTS: TESTING RESULTS

A new movement. Wholly within the past decade one of the most significant movements in all of our educational history has arisen. Almost everything which has been considered in the two preceding chapters is dependent on the further development of this movement. The movement is as yet only in its infancy, but so important is it in terms of the future of administrative service that it bids fair to change, in the course of time, the whole character of school administration. The numerous surveys of city school systems which have been made within the past five years, the frequent discussions of the question of standards in educational meetings, and the labors of many workers in attempting to evolve tentative standards for measurement and units of accomplishment, are all manifestations of this new movement. The movement indicates the growth not only of a professional consciousness as to the need of some quantitative units of measurement, but also, to a limited extent, of a public demand for a more intelligent accounting by school officers for the money expended for public education.[1]

Meaning of the movement. The significance of this new movement is large, for it means nothing less than the

[1] "New York City spent last year nearly $35,000,000 for education, and hardly a dollar of it was spent for measuring results. Are educators supposed to be such experts that their methods cannot be improved? Lately we have had a striking demonstration of what experimental science can do by reducing the motions in laying brick and the fatigue in handling pig iron. It can hardly be pretended that scientific efficiency is of less consequence in the schools." (Editorial in the *Springfield Republican*, 1912.)

ultimate changing of school administration from guesswork to scientific accuracy; the elimination of favoritism and politics completely from the work; the ending forever of the day when a book-publishing company or a personal or political enemy of the superintendent can secure his removal, without regard to the efficiency of the school system he has built up; the substitution of professional experts for the old and successful practitioners; and the changing of school supervision from a temporary or a political job, for which little or no technical preparation need be made, to that of a highly skilled piece of professional social engineering.[1]

The movement is of such large potential importance that any young man of to-day who desires to prepare for school administration in the future should by all means thoroughly familiarize himself with the aims and methods of this new phase of administrative service.[2]

The scientific purpose. The scientific purpose of the movement has been to create some standards of measurement and units of accomplishment which may be applied to

[1] School administration, in respect to training and professional preparation, has been until quite recently about the most backward of all the learned professions, being in much the same position the army was before the establishment of West Point, the navy before Annapolis, medicine and surgery before the days of medical schools, all constructional and engineering undertakings before the establishment of engineering schools, and when an attorney-at-law was a man of some eloquence who had served a certain apprenticeship in a law office and in the justice's court. Our successful city superintendents have been to a very large extent the Israel Putnams and the Paul Joneses of the work. In the past, when each was blazing his own trail, this answered very well; in the future, when we shall have accumulated a common body of scientific knowledge relating to the work, it will not do at all.

[2] In another book in this series, dealing with the organization and administration of a school, it is the intention to go into some detail in the explanation of the type of scientific preparation which should be made, and the nature of the service which may be rendered; here we shall only sketch the work in large outline, and point out its probable future significance.

school systems, to individual schools or classes, or to pupils, to determine the efficiency of the work being done, and of substituting these for that personal opinion which has, in the past, constituted almost the only standard of measurement of educational procedure. The efficiency or inefficiency of teachers, principals, and superintendent, and of courses of instruction, have for long been measured by such personal standards, in which the opinions of laymen have often been of quite as much value as the opinions of school men. The importance of the work done in the schools and the value of their output have also been subject to the same standards of personal opinion. The school, too, and not the world outside, has framed the specifications for the training of its graduates, and these have been based wholly on personal opinions as to needs held by schoolmasters. When laymen on school boards have broken in, and have dismissed teachers and superintendents or altered courses of study, the intrusion has naturally been resented without any one being able really to prove that such an intrusion was unjustified.

In other words, the school, the most important undertaking of any community, has stood isolated in the community, unable to prove that what it was doing was the best possible, and unable to speak to the community of its accomplishments in a language which the community could easily understand. Instead, we have asked the community to accept on faith our statements that what we are doing is of very great importance, and that we are doing it very well. The result has been an isolation of the school which has defeated some of its best efforts.

The actuating purpose of this new movement for the establishment of standards of measurement and units of accomplishment has been that of removing the school from its isolation in the community; of enabling it to prove the importance of what it is doing by making it possible for it to

speak a language which the community can understand; and of making possible the measurement of its efficiency, or the efficiency of individuals in the school system, in terms of established units and standards. In other words, the purpose has been to change school supervision from the ranks of an occupation to that of a profession, — from a job dependent upon political and personal favors to a scientific service capable of self-defense in terms of accepted standards and units of accomplishment. The movement for the creation of scientific standards of measurement and units of accomplishment is a movement of vast importance to the future of the work of school administration, and one which bids fair to change its entire character. In another decade or two we shall probably need to rewrite our books on school administration in terms of this new scientific development.

Measurement by comparison. Up to very recently the only measure of accomplishment we have had, in advance of measurement by personal opinion, has been that of measurement by comparison. To learn something about costs for education we have compared costs for different items in one school system with similar costs in cities of approximately the same size; courses of instruction have been evaluated in terms of work offered and time devoted to the different studies in other cities; enrollment, attendance, and promotional averages have been compared with enrollment, attendance, and promotional averages elsewhere; and the provision of special supervision or the demands made on teachers have been measured in terms of what other similar cities provide or require.

Such a plan has many merits, as it serves to place a city among other cities of its class, and the position of a city may then be graphically shown.[1] It represents a marked

[1] *The Report of the Commission appointed to study the System of Education in the Public Schools of Baltimore* (1911), which was the first of a large number of recent school surveys, is a good example of this type of study. The method of comparison was largely used in this report, Baltimore being compared, in a large number of items, with twelve other cities which in 1910 had a total population of 300,000 or more.

The excellent *Study of Expenses of City Schools Systems*, by Updegraff (Bulletin no. 5, 1912, U.S. Bureau of Education), is a study made by this same method of comparison, with an explanation of central tendencies in expenditures.

The very valuable studies by Holmes and Jessup, in the *Report of the Committee on Economy of Time* (H. B. Wilson, Chairman), are two other examples of the use of the comparative method.

Still another example of this method is the *Report on the Organization, Scope, and Finances of the City of Oakland, California*, by Cubberley, 48 pp. Board of Education Bulletin no. 8, 1915.

advance over the method of judgment by personal opinion, and enables a superintendent or a school system to defend its requests or its practices in the light of conditions found or expenditures made in other cities of its class. Whether a city is above or below the average for other cities of its class in any item, or whether its schools or its practices are particularly different, is easily ascertained and easily shown.

Though not very exact, it is nevertheless a method which will always be useful, for certain rough comparisons, while in the derivation of more accurate standards it will be necessary to make much use of this comparative method. The difficulty with the method is that it compares good, bad, and indifferent, and tends to place the average or median standard so derived in that part of the scale which represents mediocrity, rather than placing it in that part which represents progress.

Units or standards for measurement. Within the past decade a number of scientific workers have attempted the establishment of a series of standards of measurement and units of accomplishment, with a view to a better standardization of educational procedure and the creation of comparable units of accomplishment. Enough has already been

done to warrant the belief that, in the near future, we shall possess numerous scientifically derived scales of measurement which may be applied to a system of schools, to different systems, or to parts of a system, and by means of which we may measure the quality of the work being done.[1] This does not mean that all children are to be made alike, or that a uniform procedure is to be followed, but rather that all practices and methods are to be tested, and those which do not give good results are to be discarded. It means to substitute demonstrable proof as to the validity of a method or a procedure for the present personal opinion of teachers and school authorities.

The work of Courtis[2] and Stone[3] in measuring arithmetical ability; of Ayres,[4] Freeman,[5] and Thorndike[6] in devising scales for measuring the quality of handwriting; of Thorndike[7] in evolving a drawing scale; of Hillegas,[8] the Harvard-

[1] Chapter IV of the *Butte School Survey*, and chapter IX of the *Salt Lake City Survey*, both of which deal with the accomplishments of pupils, represent attempts to measure school systems in terms of these units, and standards. In each case the achievements of pupils in arithmetic, spelling, writing, and composition were measured and compared with results obtained elsewhere, and the results were set forth in a series of tables and graphs.

[2] Courtis, S. A. *Manual of Instructions for giving and scoring the Courtis Standard Tests*. 127 pp. Detroit, 1914.

[3] Stone, C. W. *Arithmetical Abilities and Some Factors determining them*. 101 pp. 1908. Trs. Col. Contribs. to Educ., no. 19.

[4] Ayres, L. P. *Scale for measuring the Handwriting in Children*. Russell Sage Foundation, New York, Publication E 113.

Ayers, L. P. *Scale for measuring Handwriting of Adults*. Russell Sage Foundation, New York, Publication E 138.

[5] Freeman, F. N. *The Teaching of Handwriting*. Houghton Mifflin Co., Boston, 1914. 156 pp., and scales.

[6] Thorndike, E. L. "Handwriting"; in *Teachers College Record*, vol. XI. (March, 1910.)

[7] Thorndike, E. L. "The Measurement of Achievement in Drawing"; in *Teachers College Record*, vol. XIV. (November, 1913.)

[8] Hillegas, M. B. "Standard for measuring the Quality of English Composition by Young People"; in *Teachers College Record*, vol. XIII. (September, 1912.)

Newton[1] group, and others in evolving scales for measuring English composition; of Ayres[2] and Buckingham[3] in preparing standard spelling lists; of Jones,[4] Courtis,[5] Kelly,[6] and Thorndike[7] in evolving vocabulary and reading standards; the Binet-Simon tests, as revised by Terman,[8] for determining mental capacity; the work of Elliott[9] and Boyce[10] in evolving scales for measuring teaching efficiency; the work of Elliott,[11] Hutchinson,[12] Strayer,[13] and Updegraff[14] in studying city school expenses; and the introduction of

[1] Ballou, F. W. "Scales for the Measurement of Composition"; Harvard-Newton Bulletin, no. 2. Harvard University Press, Cambridge, September, 1914.

[2] Ayres, L. P. *A Measuring Scale for Ability in Spelling*. 58 pp. Russell Sage Foundation, New York, 1915.

[3] Buckingham, B. R. *Spelling Ability; Its Measurement and Distribution*. 116 pp. 1913. Trs. Col. Contribs. to Educ., no. 59.

[4] Jones, R. G. Standard Vocabularies; in *Fourteenth Year-Book of the National Society for the Scientific Study of Education*, part I, pp. 37–43.

[5] Courtis, S. A. Standards in Rates of Reading; *Ibid.*, pp. 44–58. Also *Standard Tests in Reading, Writing, and Composition*.

[6] Kelly, F. J. *Silent Reading Tests*. Bureau of Educational Measurements, Kansas State Normal School, 1915.

[7] Thorndike, E. L. "Reading Scale"; in *Teachers College Record*, vol. XV, no. 4. (September, 1914.)

[8] Terman, L. M. *The Stanford Revision of the Binet-Simon Scale for Measuring Intelligence*. (1916.) A Scientific Monograph.

Terman, L. M. *The Measurement of Intelligence*. Houghton Mifflin Co., Boston, 1916. A practical guide.

[9] Elliott, E. C. "Provisional Plan for the Measure of Merits of Teachers"; in Cubberley's *State and County Educational Reorganization*, Appendix F. Macmillan Co., 1914

[10] Boyce, A. C. "Methods of Measuring Teaching Efficiency"; in *Fourteenth Year-Book of the National Society for the Study of Education*, part II. 83 pp. University of Chicago Press, 1915.

[11] Elliott, E. C. *Some Fiscal Aspects of Public Education in American Cities*. 101 pp. 1905. Trs. Col. Contribs. to Educ., no. 6.

[12] Hutchinson, J. H. *School Costs and School Accounting*. Trs. Col. Contribs. to Educ., no. 62, 148 pp. 1913.

[13] Strayer, G. D. *City School Expenditures*. 103 pp. 1905. Trs. Col. Contribs. to Educ., no. 5.

[14] Updegraff, H. A *Study of Expenses of City School Systems*. 96 pp. Bulletin no. 5, 1912, U.S. Bureau of Education.

cumulative record cards for pupils and uniform methods of accounting[1] for school systems, — these mark merely the beginning of the work of formulating standards of measurement and perfecting units of accomplishment for educational service.

Need for standards as guides. An important underlying purpose in the creation of all such standard scales for measuring school work and for comparing the accomplishments of different groups of children is to give both supervisors and teachers something definite at which to aim in the imparting of instruction. Teachers at present too often assign tasks and hear lessons without thought of other quantitative standards than the covering of the course of study and the passage of examination tests, and supervisors too often supervise without any very clear idea as to how best to direct effort to secure maximum educational results. The growth-process in a child, as in a seed, will of course do much to unfold what is latent there, but all quantitative standards so far evolved show wide variations in accomplishment in supposedly somewhat similar groups. Teaching without a measuring stick, and without definite standards of accomplishment for different groups, and trusting to luck and to the growth-process to secure results, is comparable to the old-time luck-and-chance farming, and there is no reason to suppose that the introduction of carefully formulated and well-tested standards of measurement and units for accomplishment into school work — building standards, janitor-service standards, health standards, mental-capacity standards, accomplishment standards in the different subjects, instruction standards, teacher standards, supervision standards — would not do for education what

[1] Department of Superintendence, National Education Association. *Report of the Committee on Uniform Records and Reports.* 46 pp. Bulletin no. 8, 1912, U.S. Bureau of Education.

has been done for agriculture as a result of the application of scientific knowledge and methods to farming.[1]

Importance of such standards. For the teacher such standards and units will mean definiteness. Pupils can be carefully examined, and classified in the group where they can work most advantageously. Each teacher can know definitely what is expected of her, for each type of pupil, and, with definite tasks laid down, she can know at all times whether or not she is accomplishing the things expected of her. The center of educational consciousness will be shifted for her from school machinery and courses of instruction to the child to be taught.

With the scales so far evolved teachers can be taught to test their own work. Records will need to be kept and studied. Many of the results are capable of graphic representation, and over these graphs pupil and teacher may confer. Often the pupil can chart his own record, or compare his own work, and see his own deficiencies.

From an examination of the pupil-results, building principals and supervisors can tell, almost at a glance, whether pupils or rooms are making proper progress; when any group has made all desirable progress and should advance; whether instruction is directed to what are the weak points for the group; where teachers who need help are located, and in what particulars they need help; in what rooms the load and the teacher are not properly adjusted; and what teachers are so inefficient or indifferent or incapable of

[1] "For the sake of argument, suppose all of the usual protests against standard tests are conceded. Grant that the tests themselves are not scientifically developed; that they are inaccurate; that judgment in their application is faulty; that the results are not what is claimed; that certain elements in good teaching are immeasurable — granting all of these things and more, the fact still remains that the conclusions reached by such tests are far more accurate than those based upon vague impressions of what ought to be." (Don C. Bliss, in *Educational Administration and Supervision*, vol. I, p. 88.)

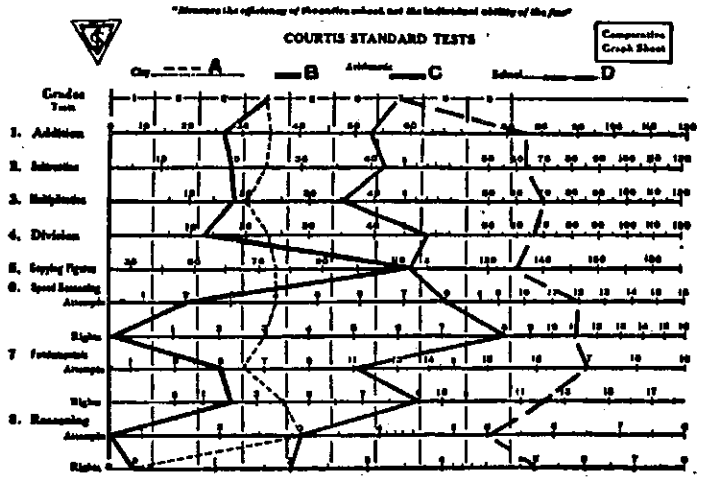

FIG. 30. A COURTIS SCORE CARD IN ARITHMETIC

(Reproduced by permission of Mr. S. A. Courtis)

In the figure above curves A and B are of two individuals in the same class. From an Indiana school. Note that A is practically normal except in the last test (shown by the fact that the curve is almost a straight line and lies almost wholly within the boundaries of the fourth grade), while B is below grade in every test but one and is particularly weak on reasoning.

Curves C and D are two measurements of the same child, one in September and the other in June. From a Michigan school. Note the correction of many defects and the balance of the final scores.

progress that they should be dropped from the service. For the purpose of vocational guidance of pupils such records will be of great value. The superintendent, too, can use the results to talk to his school board and to his community and can justify both the work and the expense of his schools.

Efficiency departments. It will require time to evolve and perfect standards for the general measurement of pupils and the evaluation of the different features of school work, and the coöperation of a number of individuals will be required. Chief among these, after the principals and teachers, will be the clinical psychologist, the school nurses and physicians, efficiency experts along different lines, and a competent body of record clerks.

The need for careful individual records is not likely to be over-emphasized with a professional body which in the past has kept only mass records, often of a more or less meaningless type. A small staff of clerks will be needed to make tabulations and record data, as any system of measurements and standards will be of but little value unless careful and somewhat detailed individual and group records are kept from year to year. What is needed is a series of clear, adequate, incontestable, and accessible records of the educational results from time to time achieved in the schools. The lesson of the business world, from which we have much to learn in the matter of efficiency, is that detailed records more than pay for their cost, and that an accurate knowledge as to manufacturing processes is impossible without such records.

There is need now for the creation of an efficiency bureau or department, either on a small or a large scale, in connection with every city school department of any size.[1] In time such departments will probably come to be connected with small city and county-unit organizations as well. Since the whole efficiency movement is so recent, and is as yet not very clearly defined, there naturally are but few persons prepared for such service. Such departments will need to be started in the smaller cities by the superintendent, with the aid of a clerk, and in the larger cities by finding some young man of good training and imagination, who is interested in the study of difficult educational problems,

[1] A number of cities have already created such, among which may be mentioned: —

Boston, Department of Educational Investigation and Measurement.
New York, Division of Reference and Research.
New Orleans, Department of Education and Research.
Detroit, Department of Education and Research.
Kansas City, Director of Research and Efficiency.
Rochester, Bureau of Efficiency.
Oakland, Department of Reference and Research.

and who can be put in charge and left to find his lines of greatest service. In time the work will become more standardized and the duties more definite. Such positions are almost certain to multiply rapidly, and they will offer attractive careers to certain types of men.

Lines of service; experimental pedagogy. However, some of the lines of service for such efficiency departments are already clearly defined. Part of these lie along the line of business organization, part lie along the lines of special-type educational adjustments, and part lie in the field of experimental pedagogy. These lines include at least the following: To study all phases of the process of preparing pupils for life-careers, and for efficient community service; to study the needs of life and the industries, with a view to restating the specifications for the manufacture of the educational output; to study means for increasing the rate of production, and for eliminating the large present waste in manufacture; to test the product at different stages of manufacture, and to advise the workers as to the results of their labors; to test out different methods of procedure, and gradually to eliminate those which do not give good results; to study the costs of production, not so much to cut down costs as to be able to show how the efficiency of the plant may be increased by a proper adjustment or even an increase in expenditures; to supply the superintendent with concrete data with which he may deal more intelligently with his board, the public, and the teaching staff; and to organize material for publication in the annual printed report of the school department.

The clinical psychologist and his work. Any important work in increasing the effectiveness of schoolroom instruction must, almost of necessity, presuppose the adjustment of the load to the pupil, and of the type of work to the pupil's possibilities and probable future needs. To-day we

do this very roughly or not at all. The differentiated-course plan of instructing and promoting pupils, as shown in Figure 26, is a step in this direction, as are all of the differentiated types of schools which have been organized by different cities. All of these efforts are valuable, but they go only about so far.

There is need, in all school systems of any size, in addition to the efficiency expert or experts so far described, of a clinical psychologist, whose prime function shall be to have charge of the psychological study of all peculiar children, and to oversee the instruction of all children of the retarded or subnormal types. In small cities this work will need to be done as a phase of the service of the efficiency department, and as a part of the work of adjusting teacher and pupil-load. Oftentimes the work comes closely in touch with the work done by the health department, and is occasionally classed as a phase of such service, though it more properly belongs with that department whose chief work lies along the line of experimental pedagogy. In all large cities, say of 200,000 or 250,000 and upward, the clinical psychologist has a position important enough to warrant the creation of a separate department, coördinate and coöperating with the health department and that part of the efficiency department which deals with the problems of experimental pedagogy.

A continuous survey of production. The work described in this chapter is new work, and work of a type with which schoolmasters are as yet but little familiar, but it is work of great future importance, work which will professionalize teaching and supervision, and work destined to do much to increase the value of the public service rendered by our schools. By means of standards and units of the type now being evolved and tested out it is even now possible for a superintendent of schools to make a survey of his school system which will be indicative of its points of strength and

weakness, and to learn from the results better methods and procedures. In time it will be possible for any school system to maintain a continuous survey of all of the different phases of its work, through tests made by its corps of efficiency experts, and to detect weak points in its work almost as soon as they appear.

Every manufacturing establishment that turns out a standard product or series of products of any kind maintains a force of efficiency experts to study methods of procedure and to measure and test the output of its works. Such men ultimately bring the manufacturing establishment large returns, by introducing improvements in processes and procedure, and in training the workmen to produce a larger and a better output. Our schools are, in a sense, factories in which the raw products (children) are to be shaped and fashioned into products to meet the various demands of life. The specifications for manufacturing come from the demands of twentieth-century civilization, and it is the business of the school to build its pupils according to the specifications laid down. This demands good tools, specialized machinery, continuous measurement of production to see if it is according to specifications, the elimination of waste in manufacture, and a large variety in the output.

If it be objected that education is not working with iron and brass and leather, but with human beings where heredity and the growth-process modify production, then we can turn to agriculture for a closer analogy. In this field we are now providing expert county agricultural advisers, at large expense, to assist farmers in improving their methods and increasing the value of their output. This is not being done because the farmers have asked for such assistance, — often they have laughed at the idea and ignored the assistance offered, — or because of any philanthropic idea on the part of the National Government, chambers of commerce, or

produce exchanges, but solely because such advisers pay for themselves in the increased and better standardized output, or the change in the character of the output which results from the better methods and procedure which the advisers persuade the farmers to adopt. There is no reason to assume that the results arising from expert advice and guidance would be particularly different in the field of popular education.

QUESTIONS FOR DISCUSSION

1. Would the development of standards for measurement of instruction enable school officers to give a more intelligent accounting to the public for the money spent on public education? How?
2. What do you understand by the statement that "the school, and not the world outside, has framed the specifications for the training of its graduates"?
3. Explain your conception of what is meant by: (*a*) the present isolation of the school in the community life; (*b*) enabling the school to speak a language which the community can understand.
4. Illustrate a good use of the method of comparison. Why does this method give results representing mediocrity rather than progress?
5. The schools of Butte measured high in spelling, very irregular in penmanship, fairly satisfactory to high in the four fundamental operations in arithmetic, and low in reasoning tests and in composition. From this, what would you conclude as to drill work there?
6. Do supervisors have, in their supervision, an advantage over teachers in their teaching, with regard to aim? How and why?
7. Illustrate the use and possibilities of standards in the following matters: —
   (*a*) Building standards.
   (*b*) Janitor-service standards.
   (*c*) Health standards.
   (*d*) Mental-capacity standards.
   (*e*) Subject-matter standards.
   (*f*) Instruction standards.
   (*g*) Teacher standards.
   (*h*) Supervision standards.
8. Illustrate how the introduction of such standards will benefit: —
   (*a*) The classroom teacher.
   (*b*) The school principal.
   (*c*) The superintendent of schools.
9. Will the general introduction of such standards of accomplishment

mean uniformity for all, or just the opposite? Why? What will be their effect on uniformity in courses of study?

10. How could a series of student records be made of service to a vocational-guidance bureau?
11. Illustrate the service of such a department in helping to organize or to reconstruct: —
    (*a*) The work in manual training.
    (*b*) The household-arts work.
    (*c*) The high-school commercial department.
    (*d*) A city industrial school.
12. Explain what you understand to be the field and chief services, in a city school system, of a clinical psychologist.
13. Is the present movement for part-time industrial schools, in which two sets of students alternate with a week in the shops and a week in the schools, likely to contribute toward a better adaptation of instruction to community needs?
14. Were the transformations in purpose made in the Newton school system, as shown in Figure 28, along lines that an efficiency department probably would have suggested?
15. In the present struggle for funds in the annual city budget, do the water, sewer, health, fire, and street departments have an advantage over the educational department by reason of the latter's lack of standards for work and units of accomplishment?
16. State the importance of the movement for standards for work and for units of accomplishment as a means of defense of the schools against unjust criticism and attacks.
17. What advantages would such standard records have over per cents in the transference of student records from school to school, or school to college?

TOPICS FOR INVESTIGATION AND REPORT

1. Examine a few courses of study, of school systems you know, to see how far the courses in (*a*) domestic science, (*b*) manual training, and (*c*) commercial work seem to have been built up from specifications furnished by life conditions, and how far on the basis of what school men think is desirable preparation.
2. Examine the vocational-guidance work done in one or more cities, to find upon what basis it rests.
3. Examine into the business needs of some city you know, and report as to what extent the courses of instruction in the schools prepare pupils to meet such needs.
4. Carefully read Superintendent Spaulding's "Application of the Principles of Scientific Management," and outline a study to obtain data for some other problem in the study of schoolroom efficiency.
5. Take a series of records in any school subject, for which standards have been evolved, and score the results.

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