

**CITY SCHOOL EXPENDITURES
THE VARIABILITY AND
INTERRELATION OF THE
VARIOUS ITEMS**

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City School Expenditures the Variability and Interrelation of the Various Items by George
Drayton Strayer

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GEORGE DRAYTON STRAYER

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By

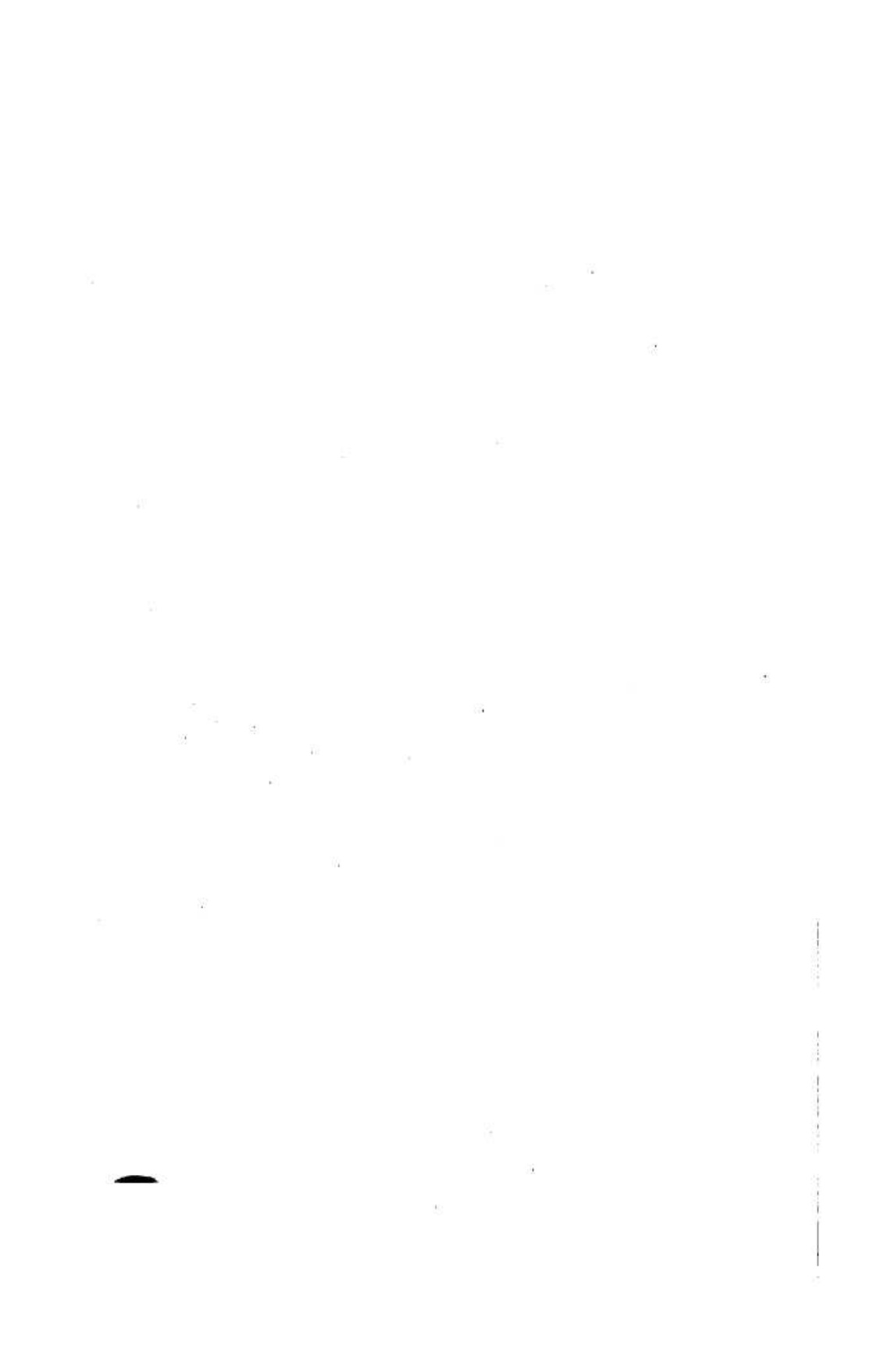
George Drayton Strayer, A.B.

Submitted in partial fulfilment of the requirements
for the degree of Doctor of Philosophy
in the Faculty of Philosophy
Columbia University

1905

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City School Expenditures

THE VARIABILITY AND INTERRELATION OF THE PRINCIPAL ITEMS

By GEORGE DRAYTON STRAYER, A.B., Johns Hopkins University;
Fellow in Education, Teachers College, 1904-05

INTRODUCTION

The importance of the subject-matter of Mr. Strayer's investigation needs no comment. The methods, being in some respects new in the literature of education, deserve some comment.

It is impossible to gain adequate insight into facts as complex as those of school expenses and school achievements without some use of technical statistical methods. If Mr. Strayer's report puzzles some readers by its tables of frequency, its constant use of the median rather than the average as a measure of central tendency, its coefficients of correlation and their corrections, it is of necessity. The facts could not otherwise be handled properly—in some cases not at all.

The one matter of technique which needs explanation and perhaps apology is the use of the Pearson Coefficient of Correlation. This measure of the general relation of a deviation of the amount of one item in the budget from the typical amount of that item to the deviation in the same city of some other item from its typical amount, is indispensable but necessarily obscure. It is indispensable: (1) because it presents to the mind in a single figure a mass of individual relationships which

in their detailed form leave no definite impress on even the most skilled examiner of statistics (*e. g.*, let any one try to measure accurately the facts of the relation of teachers' salaries to janitors' salaries without its aid); (2) because it makes all relationships between any one and any other of the same order of facts comparable and commensurate (*e. g.*, let any one without its use say whether the total cost per pupil is more or less closely followed by the cost per pupil of text-books and supplies than by that for janitors' salaries). It is necessarily obscure: (1) because the general tendency for which it stands represents a result which an indefinite number of different arrangements of relationships could all equally give, and (2) because the variability of the individual relationships, from which it rescues us in part, still remains to prevent any prophecy of the coefficient's implication concerning any special case other than a most complicated statement of probabilities. Readers who are familiar with modern statistics will have gained a concrete acquaintance with coefficients which will make tables XXXVII, XXXIX, etc., clear and emphatic. To others they cannot be. On the whole, although the arithmetical labor of calculating these coefficients is enormous, they should be used in all studies of relationships of mental and social traits. Those calculated by Mr. Strayer will increase in importance as we obtain from the budgets of private schools, colleges, business corporations, and the like, similar coefficients to compare with them.

One other feature of Mr. Strayer's method of presentation needs comment—his careful arrangement of the individual measures from which all his later results are derived. The publication of these in full enables any critic to verify the conclusions, any investigator of the same problem to combine new data with them so as to get better advantages from both, and any investigator of other problems to use in his own way a body of facts which could be obtained now only at a cost of hundreds of hours, and in a few years could not be obtained at all. The reader who is irritated, as well as awed, by the pages of individual records must remember that in the social sciences lumping facts into averages and totals conceals far more truth than it reveals, and destroys half the value of the record to the expert.

EDWARD L. THORNDIKE

THE PROBLEM

The financial problem in connection with our public schools is fundamental. We may devise improved courses of study, we may provide for the proper training of teachers, our aim may be sound and our method well grounded, and still we must have the money to build and properly equip and maintain buildings, to provide the necessary books and supplies, to hire the competent supervisors and teachers, or all will count for naught. We believe that our schools have advanced in this country during the past fifty years, and we know that along with this advance the amount of money spent for public education has increased in a ratio altogether out of proportion to the number of people educated. Still further, we believe that those sections of our country which to-day spend the most money for public education are the sections which are doing the best work. Especially with the growth of cities and the great increase of urban population has the amount of money spent for public schools grown larger. But even the great increase in expenditure, amounting in some cases to ten- or even twenty-fold during the past fifty years, has not been sufficient to satisfy the demands of those who believe in the efficacy and necessity of public education in our modern democracy.

President Eliot, in his address before the Connecticut State Teachers' Association in 1902, argued for more liberal expenditures for public education, in order that we might accomplish by this means certain desirable ends which we have as yet failed to attain. He sums up his argument in one part of his address as follows: "My first argument in support of this proposition is that, as a nation and on the whole, in spite of many successes, we have met with many failures of various sorts in our efforts to educate the whole people, and still see before us many unsurmounted difficulties. It is indisputable that we have experienced a profound disappointment in the results thus far obtained from a widely diffused popular education. It was a stupendous undertaking at the start, and the difficulties have increased with every generation. Our forefathers expected miracles of prompt enlightenment; and we are seriously disappointed that popular education has not defended

us against barbarian vices like drunkenness and gambling, against increase of crime and insanity, and against innumerable delusions, impostures, and follies. We ought to spend more public money on schools, because the present expenditures do not produce all the good results which were expected and may reasonably be aimed at."¹

In a second address to the New Hampshire State Teachers' Association in the same year, President Eliot maintained that more money should be given to the public schools, because of the great gains that have been made in public education. Some of the improvements to which he called attention were the establishment of kindergartens, improvement in the curricula of elementary schools, increase in the number of high schools, improvement in school buildings, new kinds of schools (manual training, the mechanic arts high school, the evening school, and the vacation school), improvement in normal schools, improved methods of selecting and appointing teachers, pensions for teachers, increased employment of educational experts in supervising and executive functions of urban school systems, the increased use of high schools, the introduction of the costly elective system, better university teachers, improved professional training, increased opportunity for the higher education of women, and increased attention given to the welfare of the body. Every one of these educational improvements, says President Eliot, "has been costly; but every one has justified itself in the eyes of the tax-payers, or of those who voluntarily pay for it; not one would now be recalled, and the total result encourages the expectation that large new expenditures would commend themselves to the people at the start, and in the end would prove to be both profitable in the material sense and civilizing in the humane sense.

"You have doubtless noticed that the gains I have reported are chiefly in education above fourteen years of age. There has been improvement in the first eight grades since 1870, but it is relatively small. Yet the great majority of American children do not get beyond the eighth grade. Philanthropists, social philosophers, and friends of free institutions, is that the fit educational outcome of a century of democracy in an unde-

¹ Eliot, *More Money for the Public Schools*, p. 23.