TEACHERS COLLEGE RECORD

JAMES E. RUSSELL, *Editor*
Dean of Teachers College

CLIFFORD B. UPTON, *Associate Editor*
Provost of Teachers College

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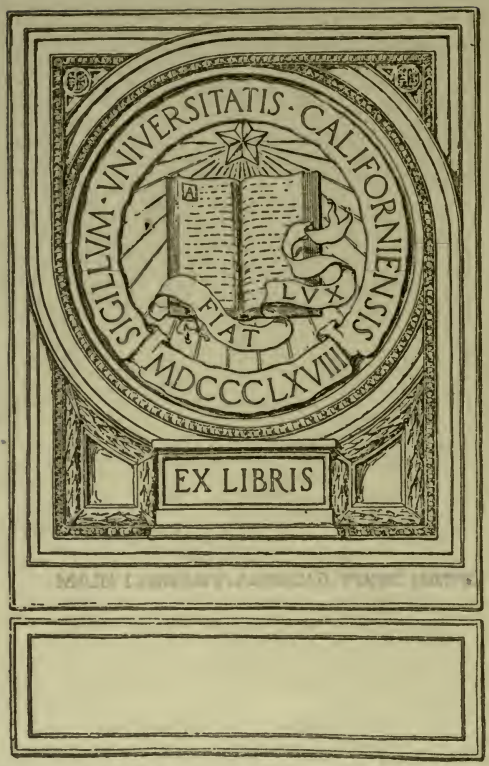
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Dean Russell is the editor of the TEACHERS COLLEGE RECORD; Provost Upton is associate editor; the contributors include the Teachers College faculty and prominent alumni.

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VITAMINES AND BABIES

By WALTER H. EDDY, PH.D.
Associate Professor of Physiological Chemistry, Teachers College

Since the discovery of the food factors which Casimir Funk named vitamines in 1911, there has been a progressive interest in these substances and in some cases a hysterical exaggeration of their importance that is hardly justified by the evidence available. The true importance of these substances and their relation to matters of diet are in fact most imperfectly established in the minds of their closest students to-day and much remains to be done before anyone can speak dogmatically about any phase of the subject.

Before discussing the particular topic selected for this article let us consider briefly some of the few facts that have been established in regard to them.

Historically, their study dates from Funk's christening in 1911 when the name he devised was applied to a substance found in rice polishings and in yeast which cured a peculiar disease known as polyneuritis or beri-beri. In the Far East, where rice forms so important a staple of diet, medical men were puzzled by the widespread development of this disease. Our own army workers in the Philippines had for a number of years, preceding 1911, given much study to this malady. Japanese workers had also investigated the subject rather minutely and, had logic decreed the course of events, the announcement of the curative substance should have come from these eastern workers. But, as often happens, the crucial experiment was developed at a point far removed from the seat of the major work in the subject. Polyneuritis had become a subject for experimental study in the laboratories of the German universities and it was there that Casimir

Funk became attracted to the problem. The work he began in Germany he carried to England with him and there several English workers, among them Hopkins and Drummond, were attracted to it as a field of research. In 1911, Funk published the papers in which he attributed the cause of the disease to the lack of a certain chemical substance, present and extractable from the hulls or polishings of rice and later shown to be present in yeast. This vitamine later came to be recognized as only one of several types of the substance and we now call it the antineuritic vitamine or "water soluble B." The development of the latter name is also interesting, for, like Funk's discovery, it represents the culmination of a second series of investigations along an entirely different line, namely, the search for the factors essential to growth. In fact, had vitamine proved to be simply a substance curative of beri-beri, the world at large would never have grown excited over it and much of the vast amount of literature that has accumulated since 1911 would never have been written.

From the historian's viewpoint the whole subject of nutrition is absurdly modern. It has not had time to acquire even a respectable amount of dust. Atwater and his standard calorie tables and the development of the calorimeter are not beyond the memory of many of your professors in Teachers College. The fight that raged about Chittenden and his low protein diet as against the statistically determined percentage of Atwater and Voit is contemporaneous with the Spanish-American War. Prior to 1911, we had reached an interesting development in regard to dietary laws. We knew how to measure food as we measure coal for a furnace. We knew how much protein, fat and carbohydrates a man must consume to maintain his weight to the satisfaction of the insurance companies. We had learned the value of water and mineral salts and that we mustn't despise the non-food material commonly classed as roughage as essential to the maintenance of our digestive mechanism in working trim. There were, however, gaps in our knowledge that needed filling in. One of these gaps was the question as to the substitution of proteins of one sort for those of another in the diet. Vegetarianism *vs.* animal or mixed diets was a controversy symtomatic of our ignorance in this particular. Then, too, a student by the name of Stepp had stumbled across a peculiar situation in his study of the relation of

fats to the diet. Basing his experiments on the fact that ether and alcohol extract fats, he proceeded to extract a diet of bread and milk with alcohol-ether to remove the fat. Such a treatment promptly proved that rats which thrived on the diet before extraction failed to grow on the extracted diet but could be restored to growth by mixing the alcohol-ether extract with the extracted diet. Having established this fact, Stepp next proceeded to test out the fats necessary to this growth by substituting one pure type after the other. But even though the fats were the same as those obtained from milk or bread this substitution failed to work. Something different from any known fat was extracted by alcohol-ether that was necessary to growth.

Mendel and Osborne reported in 1911 the results of an exhaustive series of experiments in protein feeding. Students of the subject had for some years been taking all the known proteins to pieces and determining their building stones. Such a process had revealed that about seventeen such stones (amino acids, the chemist calls them) were the materials out of which all proteins were built. Some had all the stones present; others lacked certain kinds and the amount of each stone varied rather widely with the protein. By feeding rats with selected proteins these students taught us that the animal body demands all of these seventeen stones in its diet or it goes on strike. But without going into that phase of the story it is a sort of side result to which we wish to call attention here. No matter what combination of protein, fat, carbohydrate and mineral salt they tried, they found that their animals failed to grow unless there were present in the diet two somethings; one present in butter-fat and absent in lard; another present in milk but which was neither protein, fat, carbohydrate nor mineral. These x and y of Mendel's experiments were noted in papers published simultaneously with Funk's announcement of vitamine in 1911. It was natural, therefore, to connect the two ideas—were Stepp's and Mendel's unknowns identical with Funk's vitamine?

Another worker who had been following the dietary values of food mixtures in great detail was McCollum. To him we had already owed much for his contributions to the importance of salt mixtures in particular. It was natural, therefore, that in 1911 and the years immediately following, these three schools of

workers and many others who had been attracted to it should have combined in the pursuit of the vitamines. It would be interesting to follow the development farther but enough has been given to serve our purpose here. Suffice it to say that in 1920 we find ourselves speaking and discussing the properties of three types of vitamines, each of definite functions (though our knowledge of these functions is extremely meagre), each differing from the other two in chemical behavior and usually called by the following names: "Fat soluble A," identical with Stepp's unknown and Mendel's butter fat factor; "water soluble B," the antineuritic vitamine and identical with Funk's beri-beri cure and Mendel's milk factor; "water soluble C," the newest member of the family and the substance which prevents scurvy. These terms, at least the "A" and "B," were devised by McCollum. Because of what Kipling might designate as "another story" McCollum didn't like Funk's name and since no one has yet shown what these substances are chemically, he preferred to call them the "unidentified dietary factors, water soluble B and fat soluble A." But in the absence of absolute knowledge, the name vitamine persists for lack of a better term and the McCollum terms are used to distinguish the types which are now often shortened to vitamine A, B, and C.

To-day we know they are; we don't know what they are. We know some of the things they do and don't do, we know many substances that contain them and how to extract them in a crude way from these substances. But their exact chemical nature is as much a puzzle to-day as the day of their discovery and that fact is one of the hindrances to our progress in dietetics.

Fortunately, however, the progress of science is not absolutely retarded by the absence of complete information. In fact, if we subtracted from modern medicine to-day all its empiricism, it would be a very small portion, by comparison, that would be left. By careful feeding experiments with animals other than man, we have gleaned much information as to what foods must be present to supply the A and B factors, now known to be necessary to growth. We know, in part, what effect heat, acids and alkalis have on these substances and hence a little about the relation of cookery to these factors. In case of adults with highly varied diets we know now that it would be difficult to avoid

getting enough of these factors in an average daily diet, though we don't know how they function in the adult diet. The abundance of sources, however, relieves us of much anxiety in regard to the adequacy in adult diets and the general public can safely pursue its ordinary dietary habits without much fear of missing these accessories from its menu.

And now we come to the immediate object of this paper, the discussion of what vitamines mean to the babies. Frankly, we are at the beginning of the subject. Little direct study has been made. Most of our conclusions are inferences drawn from the behavior of the baby rats, guinea pigs, etc., of the lower animal order and, unfortunately, while these results are suggestive they cannot always be shown of exact application to the human animal. Each species has its metabolic peculiarities and the human species is no exception to this rule. The two things that make the subject vital, however, are first that without the vitamines present no type of animal yet studied can grow; second, that the limited character of a baby's diet makes its selection and preparation in terms of vitamines imperative.

In 1916, the author began at the New York Hospital with the assistance of their pediatrist, Dr. Joseph Roper, a series of experiments with babies suffering from malnutrition. Aside from experiments conducted by Dr. Alfred Hess, these are the first vitamine studies in which babies have supplied the experimental material. This work was interrupted by the war but has now been resumed.

From the animal studies developed to date, it seemed that vitamines enter into infant feeding to the following extent: We must so select and prepare their diet as to provide both the A and the B type in an easily assimilable form if we expect to get growth. The avoidance of scurvy, which is now known to be definitely prevented by the "C" type and which is the basis of the orange juice feeding, demands the presence of that type in the diet. Rickets, which used to be considered purely a matter of calcium salts, has recently been stated by McCollum to be the result of deficiency of any two of four factors—quality of protein, mineral salts, fat soluble A, and water soluble B.

It follows, therefore, that avoidance of these evils for successful growth demands that we construct diets in terms of these factors and not simply in terms of proteins, fats, carbohydrates, mineral

salts and calories as heretofore. The results of this attention are already manifesting themselves. Hess has shown that while the C type is present in milk it is easily destroyed at the low temperatures of pasteurization and therefore milk must not be depended upon for this factor. It has also been shown that this type is present in other and cheaper substances than orange juice, and this expensive article may now be replaced by cheaper materials such as canned tomato juice and the like. He has also recently shown that apparently the A type is not so important in baby diets as it is in the diet of rats and guinea pigs, which makes the question of the B type still more important. For many reasons the problem of the B type appealed to the author as attractive experimentally. Though it is present in milk in relative abundance and, we know now, stable to any temperature used in milk preparation, the power of the babies to utilize it varies greatly. McCollum early showed that the B in whole milk responded entirely differently to heat from the same substance in whey from which the casein or curd had been removed. Seidell had shown that this form could be easily removed from solutions containing it by merely shaking the same with finely divided Fullers earth; in which treatment the B sticks firmly to the earth and can be filtered off almost quantitatively with it. Dr. Gibson tells me that he was unable to cure beri-beri in the Philippines by the use of milk, either cow or breast milk, although we have always considered the B type, wherever found, as identical with the antineuritic form of Funk. Finally, there are types of baby malnutrition known as marasums where no matter what combination of milk diet used the baby fails to grow.

These latter cases therefore form interesting material for testing the vitamine hypothesis, and it is with such cases that the author's experiments have dealt. The basal hypothesis was that while the B type was present in milk it was for some reason not available to the assimilation of the marasmic baby, and that if it were supplied in an easily assimilable form, the child could be made to grow. To that end experiments were devised for supplementing the ordinary diet (previously made adequate in calories, quality of protein, and in mineral salts) by extracts of the B vitamine. In the earlier experiments the material was extracted from sheep pancreas. In the later ones, the ordinary navy bean

was our source. The source does not seem to matter, and the results to date have been equally successful with B vitamine from either source.

The accompanying chart, which is a composite picture of the results with seven cases reported in 1917 in the *Journal of Diseases of Children*,[1] illustrates the apparent success of the vitamine stimulation. The results with rats 16, 17, 18, 20, and 22 are especially interesting as confirmation material in connection with the study of the boy J. G. During the first vitamine period of this child five rats were fed on the same diet as the child, with this difference—rats 16, 17, and 18 received none of the vitamine, rats 20 and 21, on the other hand, received doses of the B vitamine with their food. The difference in growth rate is obvious and striking. Furthermore, as will be noted by a glance at these figures, rat 18 made rapid recovery when at the end of twenty-five days the B vitamine was added, while rats 20 and 22 had their growth much reduced by the removal of the vitamine from the diet for a short period in the middle of the cycle. The cases shown are not all equally strong evidence, for in some cases the babies were already beginning to gain at the time when the vitamine was administered; but in every case the rate of growth increased with the addition of the vitamine and this without change in the amount or composition of the food given.

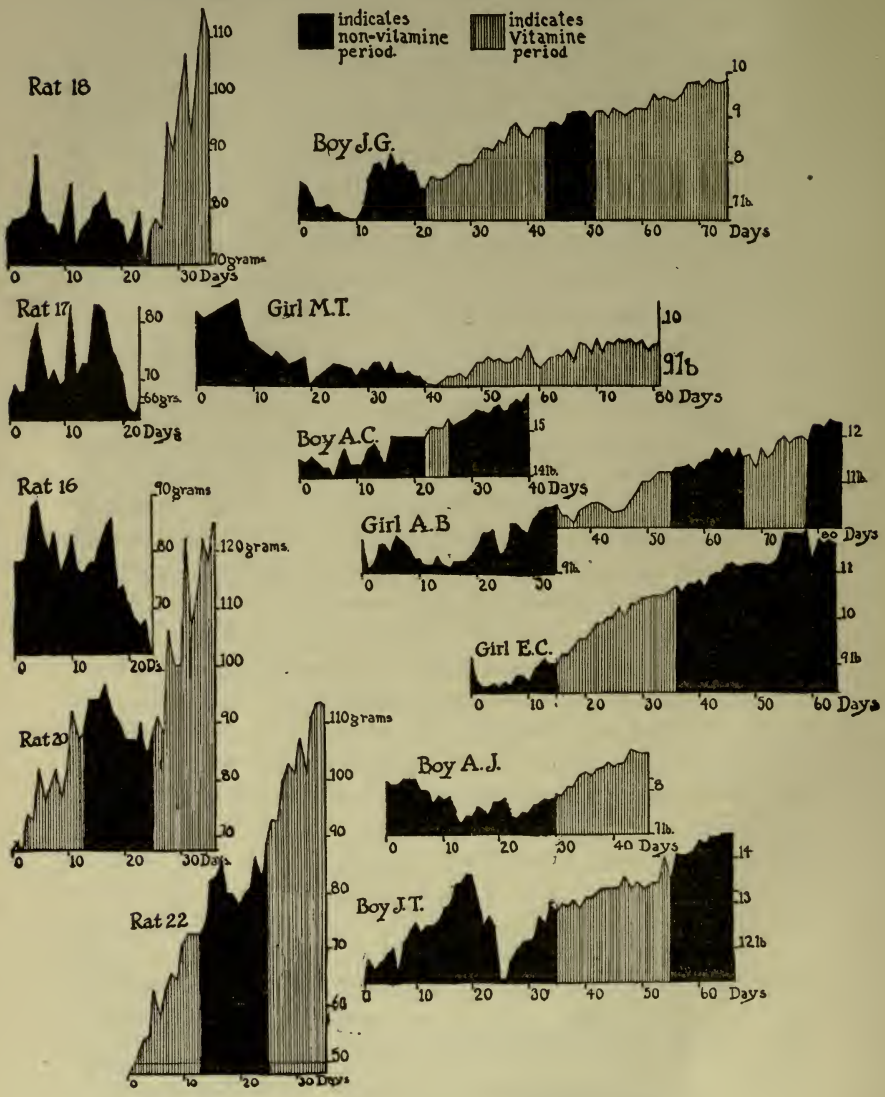
This fall, the experiments were renewed and two babies have since been discharged as cured cases following favorable response to the treatment. One of these gave particularly suggestive evidence. This baby was a girl aged four months on admission and weighing at the beginning of the experiment 6 lbs., 5 ozs. The results are shown in the following table:

Case 16
JOSEPHINE A

Period	*Days*	*Type of feeding*	*Cal. value of diet*	*Net gain or loss*
I	32	Mixed	*347*	6 ozs. loss
II	17	High calorie diet	*548*	8 ozs. gain (or .47 oz. per day)
III	32	Same as period II (plus vitamine only)	*548*	27 ozs. gain (or .84 oz. per day)

[1] Eddy and Roper, article in *American Journal of Diseases of Children* (1917), Vol. 14, p. 189.

Effects of Vitamines on Growth



Rat Charts *Patients' Charts*

In this case we have all the factors constant (so far as it is possible to control them) except the vitamine, and with the latter the weight gain per day is nearly doubled. Such evidence is impressive if not conclusive.

The results of these experiments and others not recorded here seem to justify time and attention to the vitamine control of the babies' food. As is obvious, much remains to be done. Many questions raised by these meagre details are as yet incapable of answer, such as the matter of dosage, the best form of vitamine administration, the effect of vitamine in normal nutrition as compared with malnutrition cases. The vitamine analysis of the foods used for baby diets is another problem yet barely begun.

Thanks to the coöperation of the College, the department of physiological chemistry has been enabled to take up these problems this year on a much wider scale. Several students have been assigned as research workers. Additional facilities and materials for experimentation have been provided by the opening to us of the wards of the New York Nursery and Children's Hospital and the assistance of their pediatrists. One of the Teachers College students has already worked out, in fact, the development of a dosage measurement that promises to prove a most valuable aid in the grading of results. The program includes the further study of malnutrition cases and normal cases, the study of cereal preparation in terms of adequacy in all the dietary factors, the study of breast and cow's milk preparations, and the standardization of vitamine analytical methods. It is hoped that through these studies the department of physiological chemistry may be able to add its quota to the practical contributions to both instructional and scientific progress.

IMPLICATIONS FOR ELEMENTARY EDUCATION FROM EXPERIMENTS IN DEMOCRATIZING INDUSTRY

By FREDERICK G. BONSER
Professor of Education, Teachers College

EDITOR'S NOTE. At the Alumni Conferences of Teachers College on February 21, 1920, before the elementary and lower primary sections, Mr. Robert E. Wolf, consulting engineer, presented the topic "Control and Consent—Instruction, Initiative, and Individualism in Industry." In this discussion, Mr. Wolf gave the results of extended experiments in providing opportunity and means for the participation of the employees in several paper manufacturing plants to analyze and improve their work. Records of the time variability and relative efficiency of various factors in the processes were secured in the plant and shown to the men. Explanations were made of the several elements, and the attainable standards known for each process in efficiency and time were derived and charted.

The men were invited to improve the amount and quality of their work by considering these standards. Daily records of each individual worker, of each department, and of the whole plant were posted. Rapid gains in every department soon followed with increased efficiency and earnings by nearly every worker. Each man began to study and plan to improve his own record, becoming thereby altogether more intelligent about his work and more efficient in doing it. Suggestions for better ways of working were often made by workmen. A new interest and a larger satisfaction came as the men put their initiative and creative impulses to work.

The foremen and managers all coöperated to give every worker, whatever his grade, a chance to contribute his best thought to the work, and rewarded suggestions and improvements with acceptance and increased wage returns. A spirit of democratic comradeship in a common project was developed. A premium was everywhere placed upon initiative and individual effort in the promotion of a common purpose. The industry was socialized and democratized by the stimulation and reward of the individual self-expression of each workman in the intelligent improvement of his own particular work, all the way from the superintendent down to the employee in the most humble position.

The implications of such experiments in industry for elementary education were pointed out by Professor Bonser in the paper following.

If the schools are to make their contribution in developing the creative impulse in children, and in making the work of men and women a larger opportunity for the expression of personality, they have three closely related problems to solve.

The first of these problems is that of transforming the school from a place of imposed tasks to a place of purposive activities appreciated in their relationships and worths by the children themselves. The second problem is that of aiding in the change of the general point of view of occupations as mere means of producing the goods required for the needs of life to a point of view which will regard work as an opportunity for self-expression and creative effort yielding satisfaction in itself, as well as in its material rewards. The third problem lies in the democratization of the administrative and supervisory policies and practices of school boards, superintendents, principals, and supervisors. Human nature is very much the same among all human beings. Whether industrial workers, or teachers, or children, no one likes to be coerced or driven. Under conditions of suppression or subservience, no one expresses the best that is in him nor takes much satisfaction in such work as he may do. Autocracy in any form is repugnant and hateful to all red-blooded, energetic people. Autocratic control can be maintained only through the threat or use of force, be this force openly flaunted or covertly veiled. The human quality upon which it operates is fear. No personality can express itself adequately when beset by a state of fear.

Let us consider first the implications of this general view for the content and method of work in the school. If children are given an opportunity to participate creatively in the work of the school, the interest in self-expression as an element in whatever they do will grow and bring them to their work with an attitude of creative interest toward it and with a habit of creative effort in it. To make the school a place for the cultivation of this interest and habit means changes in school procedure almost as marked as those which have been described for industry. It means that whatever is done will be done with the full, sympathetic attitude of pupils, and that it will be entered into because of a personally appreciated sense of its worth in relationship to a satisfaction which it yields. It means that school work must be organized on the basis of problems which themselves require creative endeavor for their solution. It means the setting up of purposes derived from a desire to live more fully and richly into the natural and social environment. Through the realization of these purposes the work will contribute those elements of race

experience which have been found most valuable for efficient and satisfying civilized life. Projects in the practical arts, in geography, in history, in literature, and in all other subjects must be so pursued that each will yield a joy in the work itself—a joy that makes everything done create a desire to do more. It is a part of the teacher's work to direct interest to activities that are really creative in form, activities which call for initiative, originality, experimentation, and testing. If this is not done there may be evidences of strong interests in pursuits that are not creative at all but that are rather indications of arrested development. Children may like to engage in mechanical processes for the reason that they grow increasingly easy, increasingly automatic. All drill work which continues to be interesting when carried beyond the point where its relationship to the purpose which it serves is the motive, becomes a means of arrested development rather than of further growth.

Projects, to provide their maximum value, must be in genuinely coöperative relationships, just as has been pointed out in industry. The industrial worker contributes his portion to a finished product to which many others are also contributing their parts. His work is not socialized unless he is aware of the relationships of their common contribution to the consumers of their products, of the relationships of himself and his fellow workers, and of the relationships of themselves and their work to workers in other fields. In the school, the individual pupil should likewise appreciate his work in its relationship to the common purposes of the class as a whole, and the coöperative enterprises of the class as a whole to larger life purposes outside of the school.

This fundamental fact of social relationships in the endeavor of every pupil must be operative in the organization and promotion of the project method or it is doomed to failure. Any form of school procedure which emphasizes isolated individualism at the cost of the appreciation of coöperative relationships and an attitude of breadth and sympathetic social interests is undemocratic and unAmerican. The problem requires the selection of enterprises in which the value of the individual contribution lies in its promotion of the enterprises of the whole group.

When, through creative effort in industry, the individual discovers or invents some element which is of value to himself the

whole industry of which he is a part may profit by his contribution. There is no other way to measure the worth of his creative effort. If it can make no appreciable difference in the productive processes which can be shared by others it is rated as wasted effort. Any satisfaction derived from the activity itself is largely destroyed by the very fact that it is wanting in social value. In school, likewise, the test of worth must be social, or an attitude is developed that is selfish and unsocial. Anyone who thoughtfully observes the work of children in a class where the project method is interpreted as meaning purely individual enterprises and instruction will be struck with the breakdown of social unity, and with the absence of the coöperative spirit and attitude. There may be sufficient regard for others to produce an attitude of non-interference, but this is a negative attitude rather a positive one, it is selfish rather than social. By an appreciation of the worth of the work of others in enterprises for our common good, our feelings of relationship to others are altogether more genuinely social and democratic than when we simply do not interfere with others because we do not wish to be interfered with ourselves.

Creative effort is put forth only as the result of impulsion. It cannot be compelled. Surroundings favorable to it therefore require conditions in which children feel impelled to express themselves in response to situations in which there are problems to solve. To make the solutions which bring satisfaction may call forth an impelling activity resulting in discovery or invention. It may be in construction work, in playing games, in making investigations in geography or science, in expressing thoughts or feelings in writing or music or design, or in the solution of number problems. Whatever the situation, the full, wholehearted concentration of interest and effort will appear only when the motive force lies within the pupil himself. Working under the compulsion of a teacher for which the only personally appreciated reward is a grade or mark suppresses the creative impulse just as does working under a foreman or manager for the mere reward of the wage received. It is discouraging and deadening to work where there is no opportunity for the expression of initiative, or if an opportunity, no recognition of successful effort. Man is by nature curious, exploratory, investigative. He finds a joy in the expression of these creative impulses. Most of them may be exercised

and satisfied through successful expression in connection with his work as well as in his play. The school life of children should afford the most ideal conditions for the growth and refinement of creative impulses. It has almost no limitations to place in the way of their development. One of its most significant purposes is to provide conditions for the development of creative impulses under the guidance of social ends and ideals. It can accomplish no more valuable service than to turn the processes of creative effort in directions which will give their products the most worth for human well-being.

The implications from industry apply quite as much to the teachers, supervisors, and administrators of the schools as to the pupils. Unless there is a spirit of democracy and creative effort among these in their relationships to each other and to the children, how can we expect this spirit to exist among the children themselves? The creative impulse is highly sensitive to what we may call atmosphere. It flourishes best in an atmosphere of freedom and encouragement. It shrinks and dies in the presence of autocracy. It cannot be stimulated by dictation. Dictation destroys it. The creative impulse is stimulated in an industrial plant only in the measure in which there is a sympathetic, coöperative, democratic atmosphere among foremen, managers, superintendents, and directors, as well as among the men whom they employ. If school directors, superintendents, principals, and supervisors are autocratic and dictatorial, teachers will be autocratic and dictatorial. If teachers are autocratic, initiative in the children will disappear. Creative effort will cease and work will become a dreary routine of imposed tasks. The school may become as mechanical as a piece-work factory where men receive no more humane consideration than the machines which they operate. The great danger in industry may be roughly stated as the impersonalization and desocialization of the workers. The school is beset with these selfsame dangers. Personalizing and socializing are but vitally related aspects of the same problem. Fostering the development of the creative impulses is one aspect; so directing these that their products are of wholesome, positive social worth is the other. We have not only to ask, is the individual child engaged in producing constructions, skills, ideals, attitudes, and appreciations, working with the full play of per-

sonal interest and initiative; but also we have to ask, what is the worth of these specific products to the well being of social life as a whole? Are they positively beneficial? Are they just of no social value at all? Or are they antagonistic to the well-being of society?

To answer these questions with the children themselves means attention to the second problem raised in the beginning as well as the first. We have been speaking chiefly of the school work itself. The second question has to do with the change in the general point of view with regard to the world's work. The two problems are closely related. The personal and social values we strive to promote in the schools are the same in kind as those in productive industry and in the everyday world of intellectual and appreciative satisfactions. But we may go further with this study of work and the satisfactions which it may yield. There is a peculiar joy in the work of all men and women when that work calls forth the constant use of ideas and feelings in new ways, and stimulates the development of new ideas. Occupations which have included these opportunities have been called energizing. But where work is a routine, requiring no applications of ideas or feelings in new ways and no stimulation of new ideas, there is almost nothing of this joy in work. Occupations of this kind have been called enervating. In the mechanical, routine occupations there may often be a dogged kind of apathetic resignation, and a feeling of discomfort if the work is discontinued. But this represents a form of arrested development. The discomfort comes from the absence of activities which have become mechanical habits.

In the energizing occupations, little aside from the work itself is required to keep up the buoyancy of spirit of the worker. His work supplies a variety of satisfactions and keeps him always animated by the zest of that which is novel. In the enervating occupations, much of variety in interest is necessary outside of working time to balance the dead level of the mechanical. Fundamentally, the difference which produces the two attitudes is the difference in the occupations, as followed, to stimulate and give play and worth to the creative impulse.

The organization of the work is in itself a means by which the difference between the two attitudes is intensified. Workers in

the energizing occupations are largely free of managerial or directive oversight. The lawyer, the doctor, the artist, and the musician have no manager or superintendent or principal to whom they must yield the direction of their activities. They have personal, self-directive freedom. They are controlled by conditions and the social worth of their products, and not by individuals with authority over them. Conditions may be analyzed and adjusted to without any feeling of subservience. Yielding to them implies no feeling of personal inferiority. But, in industry, the systems of piece work and factory organization with managers, superintendents, and foremen hedge the worker about with authorities who direct his activities and control his freedom to make variations or to be guided by conditions alone. Naturally the limitations for variation in the so-called enervating occupations are greater because of the mechanical character of the methods of production. Yet, as has been pointed out by the experiments in industry, there may still be introduced opportunities for energizing elements, even in the most mechanical forms of production. These energizing factors not only save the personality of the worker, but they yield increases in the economic returns to employers and increased production for consumers. There is a problem in the study of enervating occupations to find what they may offer to utilize this creative impulse and give it both personal and social value. We may find that all occupations may be energizing, although in relatively different degrees. Some one has said that there is no unskilled work. There are unskilled workers. It may be conceived that in every kind of work nothing is so well done that we cannot find ways of doing it better. There is always room for initiative and invention.

A further implication from the studies in industry for the schools which has been much emphasized in connection with the project method seems to be clearly evident. In school, even such mechanical operations as writing, spelling, the number processes, and the mechanics of reading may be mastered and made to yield their values in the most effective way when they are approached through situations in which the pupil is impellingly engaged. The full vigor of purposive drive, and the dynamic of interest and sense of worth make the mastery a response to a personally

appreciated need. Achievement is more economical in both time and effort than when the process is laboriously learned as a prescribed task. The conditions, and not the authority of the teachers, elicit the activity.

As to the third problem, that of democratizing the administrative and supervisory officers of the school system, allusion has already been made to the importance of this factor in its relationship to the atmosphere and tone of the work with and by the children. There is another aspect of this problem that is of far-reaching significance for education. This is the question of the effect of the relationship of other school officials to the teachers upon the teachers themselves. The so-called bankruptcy of education through the flocking of teachers to other callings is, without doubt, partly a matter of salary. But, the cause, not only of many of the withdrawals from the profession but of much of the mechanical teaching by those teachers remaining, is the intolerably autocratic control of superintendents, principals, and supervisors. Before the war the economic conditions in our country made it seem to thousands of teachers that they had to endure this condition to make a livelihood. Now they do not have to endure it and they will not. The break comes hard with many who have genuine professional zeal, but it often comes as the only means for the preservation of personality and intellectual self-respect. If the schools are to be saved to do their appointed work in the service of our democracy, their boards of education, superintendents, principals, and supervisors will have to bear broadminded, sympathetic, and genuinely democratic relationships to their teachers. They will have to provide means for the participation of the teachers in the promotion of the school's enterprises and policies. They will have to learn enough about what good teaching is and about what a good teacher can accomplish if she is treated as a personality with some initiative, creative capacity, and judgment of values, to treat her as a professional equal. Some of our school systems are top-heavy with a sodden mediocrity, and there is nothing which so makes mediocrity assert itself as a little authority. Many a teacher in the grades who knows more about teaching than her principal or supervisor will ever know is browbeaten into a subservience that means either death to her personality or withdrawal from the work.

The method by which administrative and supervisory officers of schools are chosen is partly responsible for this situation. The frequent failure in school administrators to distinguish between the business aspects of the office and the professional aspects is another cause. Both of these causes are contributing to the filling of many of these offices with men and women who have wholly wrong attitudes toward supervision, some from crass ignorance, some from moral mediocrity, and some from inborn, temperamental kaiserism. But, whatever the cause, the remedy lies in changing the autocratic attitude of supervisors and administrators, where this attitude exists, into one of genuinely democratic coöperation with the teachers in the interests of the children. Unless this coöperative attitude is realized, the work of the teacher is more truly described by the term enervating than energizing. Change from the régime of authority to one of coöperative consent, and we shall see as great improvement in school work as we have seen in industry in the experiments described.

To summarize briefly, the implications for the schools from the attempts to personalize and socialize industrial occupations, I deduce in this way: The schools should organize their whole round of work on the basis of projects that will arouse in children challenges and feelings that will impel them to put forth their creative energy in carrying forward these projects; that the selection of projects should be such that the social worth of the results of effort will be constantly tested; that the projects selected should in themselves be coöperative, socialized life situations in which the individual contributions will derive their worth from the measure in which they promote the common interests of the group; and that the projects should so reflect the occupational and recreational interests of the present social world that whatever of value is derived from the point of view of the school will contribute toward a larger personalization and socialization of the occupations themselves. This means a socialized curriculum, a socialized method, and a democratic spirit of coöperation. It means putting a high premium upon creative effort and coöperative participation in all school enterprises from the superintendent's office down through principals, supervisors, teachers, and pupils to the youngest child in the kindergarten.

WHY HIGH SCHOOL PRINCIPALS SUCCEED AND WHY THEY FAIL*

By ALBERT B. MEREDITH, L.H.D.
Assistant State Commissioner of Education for New Jersey

In what I have to say I shall have particularly in mind the small high school, with fewer than seven teachers, since it is in the smaller schools that the success or failure of the principal is more marked, and the consequences of his practices and of his ideals more immediately felt. The responsibilities of the principalship, however, are no less in one type of school than in another. They differ rather in degree than in kind.

In every high school a progressive principal is the dynamic, vital, and propelling force of the organization. He sets its standards and establishes its ideals. He thinks of his school as something more than a mere aggregate of classes. The school in his mind is an organization with a life of its own, with a consciousness of its significance in the field of education, and, moreover, it is coming to have a more sensitive conscience with respect to its obligations to growing youth.

The position of the principal is strategic. He is officially responsible for the activities of the school and also for its spirit and its morale. He is responsible, in a large measure, for the health of his fellow workers, pupils, and teachers, for the quality of the teaching, and for the educational growth of those associated with him. The failure or success of the school in the eyes of the public is largely a matter of the principal's own making. The importance of the high school principalship is more fully realized to-day than ever before, if for no other reason than that there are more pupils in the high schools than formerly, and that the public has a keener sense of the social and civic value of the high school. All these factors suggest possible points of failure as well as emphasize opportunities for service.

The discriminating superintendent will delegate to the competent principal much power and responsibility. He will give him opportunities to exercise initiative and to display his own

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individuality. This freedom, at the same time, involves on the part of the principal a corresponding loyalty to the larger aims of the school system as a whole, and also to its official head. The day is past, however, when this loyalty means simply willingness and faithfulness in carrying out the instructions of the superintendent.

Why then do some principals fail?

1. One outstanding reason for failure is the lack of specific professional training for the position. Too frequently good teachers have been advanced from the class room to administrative responsibilities because the board of education has desired to recognize their worth by giving them better salaries. As a teacher, the principal may have been eminently successful; but as an administrator he may be a failure. Unless a principal thus advanced has made a special preparation for this work of administration, he usually lacks a broad and comprehensive philosophy of education. He has little or no professional background in sociology, economics, or related subjects. He has failed to get the specific training for the position of leader, however great his success may have been as an instructor. He lacks perspective and vision. He is likely to think of the high school as a separate institution, and not as an integral part of a common school course of twelve years.

Further, an untrained principal does not recognize the various types of pupils which make up the high school enrollment, in relation to their varying ages, probable destinies, and the length of time they will remain in school; nor does he consider the relations which should exist between the high school and the elementary grades. The secondary school stands for more than he thinks. Without a broad training for leadership the principal is apt to shape the school curricula in the light of college entrance requirements. He will think of the school as a place in which to administer courses, because he does not appreciate the fact that educational processes and materials are not static, since society is not static. He fails to realize that the high school is interested primarily in persons in their relations to knowledge, to aptitudes, to capacities, to training in skill, and to matters of individual and social development and growth. He does not see what these elements of personal worth have to do with the real needs of the

hour. In short, a principal without training for the work rarely comes to know what is really meant by a high school. No simple or single expression describing the high school can be easily made. Its purposes are related to knowledge, aspiration, purposeful habits, workable ideals, and to various forms of skill.

Failing to grasp the real significance of the high school, the principal is unable to get the idea over to the teachers associated with him, to the pupils, or to the public. In the degree to which this is not done, the principal has failed. On the other hand, he succeeds if he has a working knowledge of the opportunities and responsibilities of the high school as a part of the school system, and also has the skill through knowledge, insight, and ability to bring those associated with him to the same view. In other words, he succeeds if he has vision and the qualities of leadership.

2. A second reason for a principal's failure is to be found in his lack of a keen sense of relative values regarding his duties, and the time at his disposal as an administrator, inspector or appraiser, and as a supervisor.

Too much of a principal's time is spent merely in keeping the machinery going. In the business administration of the schools there is too little responsibility delegated to the teachers, to the pupils, and to the clerks who have in charge the routine matters of the school. In matters of everyday occurrence a good motto for the principal is: "Do nothing in administration that you can get others to do." Principals spend vastly more time than is necessary in the office on clerical details.

No one piece of school administration is more vital in the matter of the efficient use of the time and energy of pupils and teachers than the weekly schedule of recitations, and yet how much time is wasted in preparing the scheme of class work, through failure to apply definite principles of organization and economy. The typical schedule of recitations is a mosaic, organized more for the benefit of those who are irregular through failure than for those who advance regularly. Good business management reduces the time ordinarily taken to make a schedule, and also conserves the broader interests of the school. The principles of the "block plan"[1] as worked out in the Boston schools illustrates the desirable type of schedule I have in mind.

[1] See *School and Society*, 6:688–9.

Another source of failure as an administrator is the failure to keep adequate school records. When a pupil accomplishes a unit of work, he has a right to expect that a proper and intelligible record has been kept, which is capable of interpretation by any one who has access to it later. The matter of complete records of high school work is of growing importance in connection with the legal demands for high school education as a prerequisite to entering teaching or any of the other professions.

Scrupulous care in the matter of keeping definite office hours for the public and for the teachers adds to the confidence which should be one of the assets of a school administrator in his business relations. When office hours are advertised, the public has a right to expect that the principal will keep them, and it is characteristic of poor public business if the principal is not to be found by the public or by the teachers at the advertised time.

Many principals fail because they take all criticism of the administration as personal. The principal should be a good listener. Frequently a complainant is wholly satisfied if he has had a chance to tell his story all the way through, even if positive action by the principal does not follow. There is all the more reason for courtesy and patience if the answer has to be in the negative. Firmness and courtesy should characterize the principal's attitude in all contacts with the public and the school. He should be willing to take any criticism which makes for the common good; otherwise to this extent he fails.

As an inspector or appraiser of school results, the successful principal is familiar with the use of standard tests and measures, so far as they have been developed for high school subjects. These tests he uses to supplement his own observations of classroom activities. He regards each subject in its relation to the other units of the curriculum. He does curriculum thinking and does not regard each subject as a detached unit of school work. Failure as an inspector often comes as the result of not making clear to each teacher the bases upon which his work is being estimated. The standards used by the principal are not always understood by the teacher, and I sometimes think that this condition is more frequently found in the high school than in the elementary grades.

The business of the principal, as an inspector, is to protect pupils, teachers, and the public from incompetency. Failure to produce attainable results on the part of any teacher is a condition which demands prompt and fair treatment at the hands of a principal. He must know good school work when he sees it. All the school machinery and organization are but means to an end; viz., that the best possible conditions may be created for the act of teaching.

The chief business of the principal, however, is to supervise instruction. This activity is the largest field of service, and yet it is in this relation that a majority of principals fall short of their highest usefulness. Among the causes which operate may be mentioned lack of a technique of supervision, the great diversity of work offered in a modern high school, failure to recognize the various types of learning which are most prominent in the different subjects, and the fact that teachers are largely specialists, while the principal is a general practitioner in the field of education. Another manifest cause of failure is the lack of a working knowledge of the psychology of adolescence. A still further reason for failure is found in not knowing the factors of progression within a given subject, whereby the different stages of advancement may be clearly indicated. Too frequently there exists in the supervisor's mind no clean cut distinction between the various levels of difficulty which a sequential subject, e. g., history or English, presents.

Unless a principal teaches a class regularly, and is responsible for its progress, he is likely to be out of intimate touch with real teaching problems. To teach a class means to have a sympathy with and an understanding of the difficulties met by both pupils and teachers. At the same time, by teaching, a principal would be kept a student. Teaching offers also an excellent opportunity to enforce precept by example through having teachers visit the principal's class for help.

The successful supervisor uses his best teachers to assist those who are but apprentices or who may be failing. Not to utilize this valuable asset in any school means failure to achieve the highest success. Failure in supervision is due in part to not having a definite plan. Supervision should be definite and sympathetic, not merely incidental or accidental. While the approach

to the teacher may appear incidental, it should be a part of a well matured and constructive plan of the principal.

Many principals fail because their criticisms of their teachers are too vague and indefinite. Teachers may never have clearly understood what is expected of them, and, when criticized, the suggestions are not always given with a full knowledge of all the conditions under which they work. Fairness and definiteness in criticism, together with discriminating praise, make for the highest success in the class room, and for the success of the principal as a leader and inspirer of teachers. It is the spirit of helpfulness that counts in supervision. Principals as supervisors are successful when they can anticipate a teacher's difficulties and needs. Teachers should not have to take the initiative in all cases when help is needed.

3. A third outstanding reason for non-success is the principal's failure to utilize for citizenship ends and for their incidental values, the extra-curricular activities of the school. Good citizenship does not consist merely in having a knowledge of our civic ideals or of the institutions which represent these ideals, but rather in possessing habits of action which involve such qualities as respect for others, a sense of personal responsibility for the common weal, a spirit of the square deal. All these qualities find their expression in the athletic, debating, and social activities of the school. The successful principal knows this and encourages these interests and directs them into helpful channels.

Again, the principal fails when he does not become an active participant in the social and civic life of his community. The principal is the attorney for the high school before the public. He represents a part of the institution which, next to the church, is of most immediate interest to the public. His participation in civic affairs is to the end that he may be of greatest service to the children of the community. Moreover, the principal needs the corrective which may be supplied by his intimate contact with the public. His own philosophy of life and his professional practices are greatly aided by this relationship. The danger arising from constant contact with younger minds is averted by closer relations with adults. Teachers and principals often fail at this point.

4. Finally, a principal fails by not exercising the human qualities of tact, sympathy, friendliness, and respect for others. Some one has said that the world consists mostly of other people. I recently asked twelve adults chosen at random what qualities they admired most in the principals or teachers they knew best, and what were the reasons, as they saw it, for the success of their principals and teachers. All who were questioned said they recognized scholarship and executive skill, but that they admired and responded to tact, and understanding of youth, consideration, and big-hearted personality. One hundred teachers, when similarly questioned, said they admired most in a principal "friendly sympathy and kindly encouragement." Further, these teachers admire courage and a willingness to face administrative problems as they arise, also the principal's ability to make decisions, to act, and to take the consequences of his decisions. These are the marks of success in leadership in any undertaking. Are they not especially needed in high school principalships? Of course, every principal should be possessed of a saving sense of humor. This will illuminate many dark and perplexing situations.

To be a success as a principal means:

1. Vision and leadership due to natural ability and specific training.
2. A sense of the significance of his position and a working knowledge of the relative importance of his duties.
3. A utilization of the life of the school and all its interests for citizenship ends.
4. The exercise of judgment, fairness, and sympathy in his contact with persons.

In conclusion, the successful principal must be intensely human, for without this quality he cannot but fail.

HOW TO COMPUTE THE MEDIAN

By WILLIAM A. McCALL
Assistant Professor of Experimental Education, Teachers College

This article, written by request, purposes to give a brief summary and evaluation of the manifold methods for computing the median. The article will close with an amended definition of the median and with a recommendation as to what method of computation should be adopted for general use.

A class of fifteen pupils were tested by the Courtis Arithmetic Test, Series B, Addition. The number of problems done correctly by each pupil was as in Table I.

TABLE I

Pupil	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*	*k*	*l*	*m*	*n*	*o*
Score	6	7	10	11	4	13	7	3	10	12	13	5	5	11	10

The first step in the computation of a median is to arrange the measures of Table I in the order of their size. Such an *order distribution* is given in Table II.

TABLE II

Pupil	*h*	*e*	*l*	*m*	*a*	*g*	*b*	*c*	*i*	*o*	*d*	*n*	*j*	*f*	*k*
Score	3	4	5	5	6	7	7	10	10	10	11	11	12	13	13

What is the median for the above class? The median is, according to general acceptance, that score which has as many scores above it in size as there are scores below it in size. When scores are arranged in an order distribution, as in Table II, the median is the middle measure. Just which score is the middle one is quickly determined by the formula $\frac{N+1}{2}$, where N is the number of scores or measures. Method I shows the computation:

METHOD I

Total number of pupils = 15. $\frac{N+1}{2} = \frac{15+1}{2} = 8$

Thus the middle pupil is the eighth

Counting from the smallest score toward the largest score, or vice versa, the eighth score is 10

Hence, the median = 10

But suppose there had been sixteen pupils in the class instead of fifteen and that pupil *p* had made a score of 7. Table III gives the new situation.

TABLE III

Pupil	*h*	*e*	*l*	*m*	*a*	*g*	*p*	*b*	*c*	*i*	*o*	*d*	*n*	*j*	*f*	*k*
Score	3	4	5	5	6	7	7	7	10	10	10	11	11	12	13	13

Now, what is the median? It is not the middle score, for when the total of pupils in a class is an even number, there is no middle score. The definition for a median does not cover the case, consequently different statisticians have each proceeded to amend the accepted definition according to his pleasure. The diverse results afford a remarkably telling argument for the necessity of accurate and adequate original definition of scientific terminology. Methods II, III, and IV are the ones most frequently used to deal with this situation.

METHOD II [1]

Total number of pupils = 16. $\frac{N + 1}{2} = \frac{16 + 1}{2} = 8.5$

Drop the .5 and call the middle score the eighth score

Counting from the smallest score, the eighth score is 7

Hence, the median = 7

METHOD III

Add .5 and call the middle score the ninth score

Counting from the smallest score, the ninth score is 10

Hence, the median = 10

METHOD IV

Call the middle score halfway between the eighth and ninth scores, since $\frac{N + 1}{2}$ yields 8.5

Counting from the smallest score the eighth score is 7 and the ninth score is 10

Hence, the median = $\frac{7 + 10}{2} = 8.5$

[1] See Monroe, DeVoss and Kelly: *Educational Tests and Measurements*, page 243. (Houghton Mifflin Co., 1917.)

The traditional definition of the median is adequate (1) when there is a middle score, and (2) when there is no middle score but when the two middle-most scores are identical in size. The accepted definition is inadequate when there is no middle score and when the two middle-most scores are different in size. Method I is in perfect harmony with the original definition. Methods II, III, and IV are necessary but arbitrary amendments. Of the last three, Method IV must surely appeal to all as being in more accord with common sense. Hence, the writer proposes the following re-definition of the median: *When measures are arranged in order of size, the median is the middle measure, or (lacking a middle measure) midway between the two middle-most measures.*

We could now consider answered the question of how to compute a median were it not for some statisticians who have bequeathed us even more complicated questions. These questions cluster about the distinction between *discrete* and *continuous* scores. The significance of this distinction is such that no one can determine the median until he knows the meaning of his scores.

What is meant by discrete scores? Substitute, in Table III, *family* for *pupil*, and *number of children in school* for *score* and the scores in Table III will be changed from continuous to discrete. Table III would then read: family *h* has three children in school, family *e* has four children in school, and so on. The median number of children in school from any one family could not possibly be 8.5. Such vivisection of a child into halves would be statistical murder! According to the principle that .5 or above should be called 1., the median is 9. Discrete scores require no departure from Methods I[2] or IV. When Method IV yields a number with a decimal in it, the median may be corrected for obvious absurdity by considering it as the nearest whole number.

What is meant by continuous measures? The measurements of time, distance, weight, ability in addition, penmanship, spelling and the like are continuous. Measurement of the number of children and the like are discrete, because there are gaps between

[2] Method V may be applied to discrete scores when they are grouped into a frequency distribution whose step-intervals are larger than one unit. The effect of such grouping is to make them psuedo-continuous.

the various scores. We must say 2 children, 3 children, etc., with no intervening step. We cannot say 2.1 children, 2.2 children. But we can say 2 hrs. 20 min. 16 sec., or 3 lbs. 8.5 oz., or 6.72 examples in arithmetic. Measurements are continuous when the fact being measured is infinitely divisible.

But it is not sufficient for statistical computation to know that the data dealt with are continuous. It is necessary to know from what point to what point each score-interval is continuous. The spread of each score-interval is determined by the method of scoring. Given this method of scoring, it is a simple matter to determine the spread. Courtis directs that no pupil is to receive credit for an example which is only partly finished, even though the pupil has nine-tenths of an example done correctly when time is called. Consequently the pupil will be scored, say, 7, when his real score is 7.9 or possibly 7.943. Hence, a score of 7 means 7 to 7.9999, etc., or, as it will henceforth be expressed, 7 to 8, or 7–8; a score of 8 means 8 to 9, and so on. Had Courtis directed that each pupil finishing half or more of an example should receive complete credit, 7 would mean 6.5–7.4999, etc.; 8 would mean 7.5–8.5, and so on. Had Courtis directed that each pupil finishing the slightest portion of an example should receive credit for that example, 7 would mean 6.0–6.9999, etc., or 6.0–7.0. Suppose, further, that Courtis had directed that each pupil receive a credit of two points for each example correctly and completely done; then a score of 6 would mean, not 6–7, but 6–8, and a score of 8 would mean 8–10. In summary, it is necessary to answer two questions before beginning to compute a median, or any other measure for that matter: Are the scores discrete or continuous? If continuous, what is the spread of each score?

What is the influence of continuous scores upon the computation of the median? They have no influence whatever. Like discrete scores, continuous scores require no departure from Method I or Method IV. It is important for the reader to keep this in mind if he is to think clearly about the computation of the median. The methods yet to be described are not new methods of computing the median, as is frequently supposed. They are merely devices for correcting crude scoring. If it were convenient to determine, while scoring a pupil's paper, that his exact score is, say, 7.493 instead of merely tabulating it as 7, the median

should be computed according to Method I or Method IV. But test scoring is usually so crude that it is highly desirable that an attempt be made to correct for crude scoring by statistical methods. Let us illustrate the principle of the new methods before demonstrating them. Table IV gives scores on the Courtis Addition Test, scored according to his directions.

TABLE IV

Pupil	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*	*k*	*l*	*m*	*n*	*o*
Score	3	4	4	5	5	6	6	6	6	6	7	7	7	8	9

Since there is an odd number of pupils, Method I is applicable. But before applying Method I the scores should be corrected for crudeness. The scores are continuous and a score of 6 lies somewhere between 6.0 to 6.999, etc., or from 6.0 to 7.0.[3] There are five scores of 6. We do not know how nearly these five pupils came to completing the seventh problem. The most convenient guess is that they are distributed evenly over the interval 6–7. The fifteen scores of Table IV are re-expressed below in terms of their most probable location.

TABLE V

3–4, 4–4.5, 4.5–5, 5–5.5, 5.5–6, 6–6.2, 6.2–6.4, 6.4–6.6, 6.6–6.8, 6.8–7, 7–7.33⅓, 7.33⅓–7.66⅔, 7.66⅔–8, 8–9, 9–10

According to Method I, the middle score is in the interval 6.4–6.6. The most likely location of this score is at the mid-point of the interval 6.4–6.6 or at 6.5. Hence, the interpolated median is 6.5. Without attempting to refine the scores Method I would yield a median of 6.0. But the chances are far greater that the real median would be, by more accurate scoring, nearer 6.5 than 6.0.

What would be the median if there were another score of 9? This would make sixteen pupils, and Method IV would be applicable. The median would be midway between 6.4–6.6 and 6.6–6.8. Obviously the median would be the average of 6.5 and 6.7, or the junction-point of the two intervals, that is, 6.6. But suppose

[3] We might just as well have chosen a test where 6 means not 6–7 but 5.5–6.5. In that case Table V would be: 2.5–3.5, 3.5–4, 4–4.5, etc.

there were enough scores of 9 or larger to make a total of twenty scores, what would be the median? This would give for the two middle-most score-intervals 6.8–7 and 7–7.33⅓. The average of their mid-points, 6.9 and 7.166+, would be 7.033+. Is 7.033+ or 7 the median? In other words, shall we define midway between the two middle-most score-intervals as the average of the two mid-points or as the junction-point of the two intervals? The average is 7.033+ while the junction point is 7.

Either of the above alternatives is about as logical as the other. The traditional definition of the median makes it that measure above which and below which is an equal number of the cases. But since no middle case exists when there is an even number of measures, it would seem that the median should be called that *point* above which and below which is an equal number of the scores. Changing middle score to middle point makes the definition, as Buckingham points out, universally applicable. So changed, the definition applies to discrete or continuous scores and to an odd or an even number of scores. Now the interval 6.8–7 terminates at point 7.0 and the interval 7–7.33⅓, counting backward, terminates at point 7.0. Thus logic seems to favor the junction point of 7.0 as the median, if we think of a score as represented by its spread. But if we think of a score as at the mid-point of its interval, logic favors the average of the two mid-points, namely, 7.033+, as the median. It seems to the writer that the latter position is slightly more defensible. But practical convenience enormously outweighs the slight difference involved, at least for those who are not engaged in extremely refined research and equally refined statistical computation. All the methods simple enough for common use assume the junction-point. For general practice, then, we favor the junction-point.

Another situation remains to be considered. Continue our last supposition of twenty scores, but imagine that the two middle-most intervals are 6.8–7 and 8–9 with no score at all between 7 and 8. This situation frequently arises. Now, what is the median? There is no junction-point since the lower interval terminates at 7.0 and the upper interval terminates at 8.0. Rugg very wisely tells us that a median from such a situation as this is not worth worrying much about. But we need to agree upon how to deal with the problem. Common sense suggests that all blank

intervals be apportioned equally to the lower and upper score-intervals. This gives a median of 7.5.

A final problem. Throughout this discussion we have assumed that scores are distributed evenly over the score-interval. For example, we assigned to each of the five scores of 6 in Table IV an interval of .2. The statistical methods to be described assume this even distribution. But a closer bunching of scores just below our

METHOD V

Exam.	*Freq.*	*Computation*
3–4	1	$\frac{N}{2} = \frac{15}{2} = 7.5$
4–5	2	Counting down the "Freq." column
5–6	2	$7.5 = 1 + 2 + 2 + 2.5$ (of the 5 scores of 6–7)
6–7	5	The median is $\frac{2.5}{5}$ of 6 to 7 above 6
7–8	3	
8–9	1	Median $= 6 + (\frac{2.5}{5}$ of 6 to 7)
9–10	1	$= 6 + (\frac{2.5}{5}$ of 1)
N	15	$= 6.5$

median score-interval and a thinning out just above make it probable that the true median score falls somewhat below the mid-point of its interval instead of at the mid-point. To take the shape of the frequency curve into consideration, when computing the median, is a complicated matter. The practice of the methods for doing this will for some time be the peculiar privilege of the statistical "sharks," and hence need concern us no further in this article. Most readers who have had sufficient will-power to progress to this point in our discussion are doubtless satisfied that the program already proposed is quite sufficient.

Method V [4] applied to the scores of Table IV shows that the statistical process of computing a median and refining crude scoring at one stroke is a very simple matter after all. We have thrown

[4] See such books on Statistics as those by Thorndike and Rugg,

the scores of Table V from an order distribution into a frequency distribution. Even this is not necessary but it is more convenient.

Thus Method V gives the same median as was gotten by the more elaborate process of spacing off the score-intervals.

Some individuals prefer to compute the median by means of a formula. The process of Method V is condensed below into Kelley's formula for computing the median. The writer is indebted to Professor Kelley for this description:

"The calculation of the median may be expressed in a formula as follows:

1. Let N = the total number of cases, or the sum of the frequencies of all the classes.
2. Determine the class in which the $\frac{N+1}{2}$ measure lies. If it lies between two classes, as sometimes happens when N is even, the common boundary of these two classes is the median and no further calculation is necessary.
3. Let f = the frequency of this class.
4. Let i = the class interval, or range covered by the median class.
5. Let F = the sum of the frequencies of all the classes below (or above) this class.
6. Let v = the value of the lower (or upper) boundary of this class.
7. Let Mdn = the median value.

Then $\text{M}dn = v + \frac{\frac{N}{2} - F}{f} \cdot i$ (Calculated from below up, or going from small values to large values)

Also $\text{M}dn = v - \frac{\frac{N}{2} - F}{f} i$ (Calculated from above down)

These two values of Mdn are, of course, identical.

Using this formula upon the preceding example and calculating from below up, gives:

N = 15
The median class is 6–7 examples
f = 5
i = 1.00
F = 5 (1 + 2 + 2)
v = 6.00

Substituting $Mdn = 6.00 + \frac{\frac{15}{2} - 5}{5} 1.00 = 6.50$

The same example calculated from above down gives:

$N = 15, f = 5, i = 1.00, F = 5\ (1 + 1 + 3), v = 7.00$

Substituting $Mdn = 7.00 - \frac{\frac{15}{2} - 5}{5} 1.00 = 6.50$"

The median was located in Methods I and IV by the formula $\frac{N + 1}{2}$. It was located in Method V by the formula $\frac{N}{2}$. The formula $\frac{N + 1}{2}$ *must not be used with Method V.* Kelley's use of $\frac{N + 1}{2}$ in solving his formula is legitimate. Kelley's formula yields the same median as Method V. A close study of Method V and Kelley's formula will show why its use in one place is legitimate, while in the other place it is wrong. Courtis [5] has used $\frac{N + 1}{2}$ with Method V but he seems to have done so consciously to avoid working with fractions. Sechrist [6] has made the same error and aggravates the error on the next page by attempting to apply $\frac{N + 1}{2}$ to the computation of quartile points as well. If we use it in connection with Method V above, $\frac{N + 1}{2}$ equals 8. Counting down the frequency column, 8 gives an interpolated median of 6.6. But we have already shown that 6.5 and not 6.6 is the truer median. Methods I and IV employed $\frac{N + 1}{2}$ because there we were seeking the middle score and $\frac{N + 1}{2}$ gives us the

[5] Courtis, S. A., *Annual Accounting, 1913-1916*, p. 35. (82 Eliot Street, Detroit, Mich.)

[6] Sechrist, H., *An Introduction to Statistical Method*, pp. 260-263. (The Macmillan Company, 1917.)

ordinal number of this middle score. Method V does not seek the middle score so much as it seeks the middle or median *point*. For this purpose $\frac{N}{2}$ is preferable unless Kelley's formula is used. Furthermore, $\frac{N}{2}$ has the advantage of yielding the same median irrespective of the direction in which the counting is done. This is illustrated below.

Exam.	*Freq.*	*Computation*
10–9	1	
9–8	1	$\frac{N}{2} = 7.5$
8–7	3	Counting down the "Freq." column,
7–6	5	$7.5 = 1 + 1 + 3 + 2.5$ (of the 5 scores of 7–6)
6–5	2	Median $= 7 - (\frac{2.5}{5}$ of 7 to 6)
5–4	2	$= 7 - (\frac{2.5}{5}$ of 1)
4–3	1	$= 6.5$
N	15	

CONCLUSION

In conclusion the writer recommends the following definition of a practical median: *When measures are arranged in order of size, the median is the middle measure or (lacking a middle measure) midway between the two middle-most measures.* It is understood that when the measures are continuous, middle measure means the mid-point of the middle score-interval after the scores have been refined for crude scoring, as in Table V. It is also understood that midway means the average (corrected for absurdity) of the two middle-most scores when scores are discrete, and the junction-point of the two middle-most score-intervals when measures are continuous. If there is a gap instead of a junction-point, half the space of the gap should be added to the lower score-interval and half to the upper score-interval.

When measures are discrete these conditions are satisfied by Method I or Method IV. When measures are continuous the conditions are satisfied by Method V.[7] A few of these conditions are somewhat arbitrary, and hence should be passed upon and conventionalized by some authorized organization. The writer believes, however, that in every instance where perfect theory has been sacrificed, it has not been sacrificed to personal bias but to undoubted convenience. It is in this sense that the conditions are arbitrary.

ILL. 1. SCORES GROUPED IN STEP-INTERVALS OF TWO. SAMPLE SCORES: 2, 3, 4, 5, 6, etc.

Exam.	*Freq.*	*Computation*
2–4	3	$\frac{N}{2} = 7.5$
4–6	7	Counting down the "Freq." column,
		$7.5 = 3 + 4.5$ (of the 7 scores of 4–6)
6–8	4	
		Median $= 4 + (\frac{4.5}{7}$ of 4 to 6)
8–10	1	
		$= 4 + (\frac{4.5}{7}$ of 2)
N	15	$= 5.29$ or 5.3

Methods I and IV need no further illustration, so the remainder of this article is devoted to the application of Method V to a variety of situations.

Some tests are so scored or some data are so collected that 6 means 6–7. Such, for example, is the Courtis test already de-

[7] When an approximate median is all that is desired, continuous scores may be treated as discrete and dealt with by Methods I and IV. Use Method V when results are to be published. Also discrete scores may be grouped into larger intervals, such as in Illustration I, and treated as though pseudo-continuous; then Method V would apply in computing the median.

There are times when the computation is only for inspectional purposes, or when the cases are very few or when the concentration about the median point is very slight, or when, for some reasons, the results are known to be very unreliable. In all such cases the refinements of Method V may not be worth the trouble, even when the scores are continuous. At the same time it should be remembered that Method V is just about as easy and rapid as Methods I and IV.

scribed. Judgment scales, like the Thorndike Handwriting Scale, are usually so scored that 6 means 5.5 — 6.5. Why a score on a judgment scale usually has a different spread is easily explained. Imagine a handwriting scale with ten specimens of handwriting with values: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. If a pupil's penmanship specimen is more like 6 in merit than like either 5 or 7, it is usually scored 6. If the specimen is 5.5, it is scored 6. If it is

Ill. II. Scores According to the Thorndike Handwriting Scale. Sample Scores: 7, 8, 9, 10, etc.

Quality	*Freq.*	*Computation*
6.5– 7.5	1	$\frac{N}{2} = 6$
7.5– 8.5	2	Counting down the "Freq." column,
8.5– 9.5	3	$6 = 1 + 2 + 3 + 0$ (of the 4 scores of 9.5–10.5)
9.5–10.5	4	Median $= 9.5 + (\frac{0}{4}$ of 9.5 to 10.5)
10.5–11.5	2	$= 9.5 + (\frac{0}{4}$ of 1.0)
N	12	$= 9.5$

5.7 it is scored 6. If it is 6.3, it is scored 6. If it is 6.48, it is scored 6. In sum, if it is anywhere between 5.5 and 6.499, it is scored 6. Hence 6 means 5.5–6.5, 7 means 6.5–7.5, etc.

Dr. Kelley has made the suggestion that every continuous score should be treated as extending from halfway between itself and the preceding score to halfway between itself and the succeeding score, according to Ill. II and III. To do so would make the median comparable to the good, old-fashioned average got by dividing the sum of the scores by their number, and thus facilitate the computation of skewness. The writer agrees with Dr. Kelley to the extent that, for the sake of greater simplification, we should arbitrarily fix the spread of each score-interval without regard to the method of scoring. Dr. Kelley's sugges-

tion, while valuable, runs counter to such a deeply-rooted practice and is so arbitrary that the writer does not feel the time has come to recommend it. But the writer does feel free to urge all to hold themselves ready to adopt a uniform practice when the call from authoritative organizations comes.

ILL. III. SCORES ACCORDING TO THE AYRES HANDWRITING SCALE. SAMPLE SCORES: 40, 50, 60, 70, ETC.

Quality	*Freq.*	*Computation*
35–45	2	$\frac{N}{2} = 5.5$
45–55	3	Counting down the "Freq." column,
55–65	0	$5.5 = 2 + 3 + .5$ (of the 4 scores of 65–75)
65–75	4	
75–85	1	Median $= 65 + (\frac{.5}{4}$ of 65 to 75)
85–95	1	$= 65 + (\frac{.5}{4}$ of 10)
N	11	$= 66.25$ or 66.3

ILL. IV. SCORES ACCORDING TO NASSAU COUNTY COMPOSITION SCALE. SAMPLE SCORES: 0, 1.1, 1.9, 2.8, 3.8, 5.0, ETC.

Quality	*Freq.*	*Computation*
.55–1.5	1	$\frac{N}{2} = 6$
1.5 –2.35	0	Counting down the "Freq." column,
2.35–3.3	2	$6 = 1 + 0 + 2 + 3$ (of the 4 scores of 3.3–4.4)
3.3 –4.4	4	
4.4 –5.5	3	Median $= 3.3 + (\frac{3}{4}$ of 1.1)
5.5 –6.6	2	$= 3.3 + .825$
N	12	$= 4.125$ or 4.1

Occasionally pupil scores are reported in terms of some judgment scale, like the Nassau County Composition Scale, whose steps are irregular. For such scales the computation is shown in Ill. IV above.

Ill. V shows how to deal with a gap in the scores. The reader should compare Ill. V with Ill. II and III in order not to get

Ill. V. Scores According to the Woody-McCall Mixed Fundamentals of Arithmetic. Sample Scores. 3, 4, 5, 6, etc.

Quality	*Freq.*	*Computation*
3–4	1	$\frac{N}{2} = 5$
4–5	0	
5–6	1	Counting down the "Freq." column, $5 = 1 + 0 + 1 + 3$ and 0 (of the 2 scores of 8–9)
6–7	3	
7–8	0	
8–9	2	Median $= 7.5 + (\frac{0}{2}$ of 7.5 to 9)
9–10	2	$= 7.5 + (\frac{0}{2}$ of 1.5)
10–11	1	$= 7.5$
N	10	

Ill. VI. Frequency of Families with a Given Number of Pupils in School. Method I

Pupils	*Freq.*	*Computation*
1	20	Since there are 67 families, the middle family is the 34th
2	30	
3	10	Counting down the "Freq." column, the 34th family is somewhere among the 30 families with two pupils each in school. Hence,
4	5	
5	2	
N	67	Median = 2 pupils per family

confused. Ill. V shows a gap at the 7–8 interval. In all such cases half the space of the gap-interval goes to the score-interval just below it and half to the score-interval just above it, as shown in the illustration. Were there a gap of two score-intervals, the lower gap-interval would go to the score-interval just below, and the upper gap-interval would go to the score-interval just above.

Lest anyone should think that frequency distributions are useful only in connection with continuous scores and Method V, Ill. VI and VII are given, showing the computation of a median of discrete measures.

ILL. VII. NATURE OF DATA AS IN ILLUSTRATION VI. METHOD IV

Pupils	*Freq.*	*Computation*
1	5	Since the number of families is an even 26, there is no middle family. The 13th family, counting down the "Freq." column, has 2 pupils. The 13th family, counting up, has 3 pupils. Hence, Median $= \frac{2+3}{2} = 2.5$. Since the answer is absurd the median can be taken as either 2 or 3 pupils per family.
2	8	
3	6	
4	4	
5	3	
N	26	

SOME REFERENCES TO MORE ELABORATE METHODS OF COMPUTING THE MEDIAN

ZIZEK, PERSONS. *Statistical Averages.* (Henry Holt and Co., New York.)
BOWLEY. *Elements of Statistics.* (Charles Scribner's Sons, New York.)
YULE. *An Introduction to the Theory of Statistics.* (C. Griffin and Co., London.)

TEACHING THROUGH THE USE OF PROJECTS OR PURPOSEFUL ACTS *

How Provide for the Development of Fundamental Skills?

By STUART A. COURTIS
Director of Educational Research, Detroit Public Schools

The topic assigned me in this morning's discussion is an important one because it deals with a question which, more frequently than any other, rises in a teacher's or a superintendent's mind when he is "on the fence" and has not yet decided on which side to get down. He may be conscious of the mechanical and deadening character of the drill work in his own school system, he may admit the essential value of "interest" and "purpose" in children's activities, he may even earnestly desire a greater freedom and a more democratic spirit in his class rooms; but the thought which is potent to inhibit these, and many other influences which make for the adoption of the project method, is precisely the fear that the new type of work will not provide for the adequate development of reading, writing, and arithmetic, and of those other fundamental skills so cherished by the American public—spelling, geography, and English composition.

The advocate of the project method who ignores this fear, or treats it with contempt, is either ignorant of the practical situation in American education to-day, or unfair to the average schoolman. In either case his action is most unwise and operates more effectively to retard the spread of the project method than the unjust criticisms of the worst enemies of the method. The situation must be faced squarely and the superintendent's question adequately answered.

Consider for a moment public pressure for results. We say education is a basic American ideal because Americans from the very first, and up to the present moment, have regarded educa-

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tion as essential to the life of the republic. This means that every true American has felt that if proper educational opportunities were provided, all would be well. He has been quite willing to turn the actual teaching over to schoolmasters, but he has expected their efforts to function in the struggle for progress in American life, and in the pursuit of happiness by the individual. When things go wrong anywhere in the social order, he, quite consistently, has a tendency to feel that the trouble must be sought back in the school, so he begins to examine his children to see whether or not the schoolmasters are doing the work for which he has paid them. Not knowing what to look for, he seizes upon the most evident products of education. "Knowledge is power" he thinks, and he judges accordingly. Read any lay criticism of the schools, past or present, and see how unvaryingly it is based upon discoveries of deficiencies of either knowledge or skill.

In recent years educational measurement has aggravated the situation. For measurement has made it easier to discover educational deficiencies and to measure their extent. Every superintendent these days knows that at any time the survey lightning may strike close at home and that if it does, it is "results" to which attention will be directed. Many of us value the project method because we believe it changes the educational perspective of the teacher, and directs her attention to children instead of to results. But there is no escape from the fact that the project method, or any other method for that matter, is, in the last analysis, a method of securing results, and that no school man whose bread and butter depends upon his meeting the demands of those who pay his salary, can afford for one instant to neglect a consideration of what the tangible outcomes of the adoption of the project method will be.

Put yourself in the place of the average American city superintendent to-day. He knows that his teachers are working under great pressure and on the whole doing their best as they see it. He knows that his courses of study have been elaborately and carefully worked out, and that much time and effort is given to drill and review. He knows, further, that his present results are very unsatisfactory and will not bear close scrutiny except by comparison with the poor work that other school systems are

doing. He knows that eternal vigilance is the price of such efficiency as he now has, and that to relax for one moment the effort and care he is expending in keeping the wheels turning smoothly, means an immediate running down of the quality of his output.

Then he hears of the project method. He sees a demonstration lesson. The theory appeals to his common sense. The promised outcome seems desirable. He notes, however, the real or apparent disorganization of subject matter and the absence of drill. Doubts arise. He looks for proof that the project method will be effective in producing the results he is expected to achieve. What does he find? He reads the TEACHERS COLLEGE RECORD for November and studies the scores of the Horace Mann School. It is not a clear, reassuring record. He reads the Gary survey. It is even more disturbing. He looks, and looks in vain, for experimental evidence that the new method has anywhere developed degrees of skill equal to those which he has already adopted as desirable standards. Too often his conclusion is, "The project method may be all right for private or experimental schools, but I simply can't afford to run any risks. I will stick to the old ways a little longer."

Face to face with these conditions, two courses are open to those who believe that the project method is the ultimate method. One is to prove that present standards of knowledge and skill are altogether too high, to try to educate the public to the acceptance of lower standards and to the appraisal at their true worth of such other outcomes of the method as there may be. The other is to frankly set before themselves the desirability of achieving accepted standards of knowledge and skill, and of proving by measurement that it is possible to attain them on the project basis.

In my judgment no contribution to American education could be made which would have greater immediate practical value than experimental proof by measurement that, hour for hour, the project method produces larger returns than compulsory mechanical drills. I have taken the time to emphasize the superintendent's viewpoint because I feel that many advocates of desirable changes in method do not have an adequate understanding of the part this viewpoint plays in determining the attitude of the

superintendent toward experimental work in the schools under his control. Personally, I am convinced that the second of the courses described is the one to follow, and I want to spend the rest of my time this morning in arraying for your consideration the principles and criteria which should guide us in our experimental attempt to achieve that goal.

The first of the questions to be considered is this. If a child works industriously all his school days at projects of value which interest him, may he reasonably be expected to acquire therefrom adequate degrees of the knowledges and skills involved? The answer is not as simple as it would appear to be. We "learn to do by doing," to be sure, but we do not necessarily learn the best ways of doing things, nor do we necessarily acquire from our activity degrees of skill which are adequate. For instance, I know an illiterate man who for many years barely made his living by keeping a grocery store in an isolated community. He could add, subtract, multiply, divide, and make change by some practical method of his own, but when competition appeared his store was quickly eliminated. In this case the activity, although fully motivated, failed to evolve adequate control over the conventional number system and symbols.

Another man I know, a college graduate, is very fond of reading. He reads a great deal but with difficulty. Somewhere in his development he acquired faulty habits of eye movement. The more he reads, the more firmly he establishes the wrong habits. In this case neither education nor purposeful activity, in and of itself, has operated to produce desirable results.

What about writing? Most of you are writing every day. Is the rate and quality of your handwriting improving because of its use in the purposeful activity? Mine isn't. I have already planned that when I get back to Detroit I shall again revert to drill to offset the undesirable effects of rapid note-taking during this year of study. I know that drill for that purpose will be effective because it has so operated in the past.

In general I believe this principle will be found to hold. If the knowledge or skill is of such a character that undesirable results follow directly from failure, purposeful activity may be depended upon to build up slowly, by trial and error methods, correct habits and adequate degrees of skill. But if the operation

of the habit or skill is obscure, so that cause and effect may not be easily and directly traced, mere activity, except by chance, will not produce the desired result.

For instance, many of you know that you do not read as rapidly or as understandingly as other people. How many of you could tell whether or not your difficulty is caused by poor habits of eye-movement? How many of you know anything at all about the type of eye-movements you personally employ in reading? On the other hand, all of us learn correct habits of speaking and of spelling. Very poor spellers who live in an environment of good spellers eventually learn to spell correctly the most frequently occurring words. Even adults who move from the West to New York soon have to struggle to retain their "r's" and "a's".

In this respect, the development curves for such abilities as multiplication and spelling are of markedly different character. At Gary, for instance, where tests of the elementary school were given in the high school also, the eighth grade scores in spelling were low but the scores on the same words rose steadily through high school years. Ultimately high school students were found who spelled the eighth grade words as well as eighth grade children in conventional schools. In multiplication, however, accuracy of work was not only low in the eighth grade but did not rise during high school years, showing, it seems to me, that as soon as direct training stopped the use of multiplication in algebra, physics, etc., did not contribute to the development of further skill. The first step in the solution of our problem, therefore, is to determine very definitely which knowledges, which habits, which skills, and what degree of each, may be left safely to the incidental selection of the activities themselves and which must be provided for systematically by special training.

There are, however, other considerations whose possible bearings on our problem need to be kept in mind. Our civilization is the product of an age-long evolution in which the best solutions for our common problems have been slowly and laboriously built up by the master minds of the ages. The basic function of the school is to transmit this social inheritance to the oncoming generation. Other things being equal, the more efficiently this duty is discharged, the greater will be the contribution to the social progress which the new generation will make.

From this point of view the school must not only see to it that the child acquires the fundamental skills, but also that he wastes no time in doing so. If compulsory drill exercises under expert teaching will short-circuit the slow evolutionary development which comes from the use of skill in purposeful activity, then not to drill a child is to handicap both him and society. Here, too, unfortunately, we can reach at present no certain conclusion; for it may be that the concomitant and accessory effects of the evolutionary development are of more value than the efficiency which the drill method might yield. For instance, if drill necessarily tended to the suppression of personality, and purposeful activity to its development and expansion, we could not afford to achieve efficiency by drill methods. The crucial experiment on this point has yet to be made.

One of the important considerations often overlooked is that no two children are exactly alike or learn in exactly the same way. On this point scientific investigation is very clear in its conclusions. No two individuals profit to the same degree by any activity, or in the same way, or at the same rate, or uniformly at all times. Even for any one individual different methods of learning may be needed for two types of activities as closely related as addition and division. Learning by doing provides for such individual adjustment while conventional class drills do not. On first thought the necessity for making adjustment for individual differences would seem to be an insurmountable obstacle to the use of class drills and an unanswerable argument in favor of the project method, but really it is not. Measurement has made possible complete individual adjustment in group drills.

So far we have not discussed the effect of the most important element of the project method; that of purpose or motive. Here measurement again bears witness in no uncertain way to the utter futility of mere drill as a method of teaching. We do not have to guess at the efficiency of unmotivated drill. We know, both in terms of general progress and in terms of individual growths, just what our schools are accomplishing at present. For instance, on the basis of tests the country over it is possible to say that out of every thousand children practicing handwriting from 75 to 100 minutes a week, less than 100 children ordinarily show a real improvement as a result of a year's practice. For

at least 90 per cent of the children the time spent in handwriting exercise is just plain waste; while for very many of them the effects of the drill are positively evil. Conventional drills in arithmetic are at best only from two to three times as effective; while the data of both Ayres and Buckingham agree in showing that drills in spelling, the most effectively taught of the drill subjects, affect about a third of the children. That is, if a word is taught during any year, about one third of the children who could not spell it correctly at the beginning of the year can spell it at the beginning of the next year.

The other day in my reading I came across the report of a survey in 1878 of twenty-four towns in Norfolk County, Mass. Among other figures it reported the number of fourth-grade children who spelled correctly "which" and "whose," two words which occur in the Ayres Scale. For "which," the results *then* were 69 per cent and *now* 66 per cent, while for "whose" the figures then were 54 per cent, now 58 per cent. That is, after 35 or 40 years of progress the general effectiveness of spelling teaching as measured by these two words has not been changed.

Other things have changed, however. In a survey of the Boston schools in 1845, the average number of floggings reported for one school on the basis of a week's observations was 65 per day, and it is explicitly stated that this is not an exceptional but a representative school. If with compulsory drills backed by corporal punishment the schoolmasters of the previous generation were unable to secure any better results in even the mechanical skills than the schools of the present day, surely there is reason to hope that eventually methods still more humane and scientific will replace those now generally employed. It seems to me that the progress from present practice to an almost ideal administration of the project method does not involve so great a change in viewpoint as the change that was made from the methods and curricula of seventy-five years ago to those of the present day.

The crux of the matter seems to be that the old adage, "You can lead a horse to water, but you cannot make him drink," holds in educational matters also. You can make a child go through the motions of practicing, but you cannot make the effects of the practice stick in his nervous system unless you secure the consent of the governed. It is not alone what a child *does* that educates

him; the motives and emotional states which accompany his activities play a crucial part. A child may be compelled *by force* to go through the motions of an addition drill, but in such cases his outward activity is usually accompanied internally by the raging resentment of an outraged personality, and by a deep-seated conviction that the activity itself is valueless. Under such conditions he may not only lose in both speed and accuracy as a result of his practice, but he is almost certain to develop a Bolshevistic, rebellious attitude toward the entire scheme of things educational, and a personal hatred of both teacher and subject.

On the other hand, some teachers make the mistake of supposing that any drill in and of itself is valueless. If we define drill as an activity carried on as an end in itself, or for the purpose of acquiring control over the activity, and not for its products, we find a great deal of drill in life outside of school. Almost all play partakes of the nature of drill. The kitten chases its tail, and the baby babbles "da-da-da" from sheer satisfaction in the activity. Most of us have drilled ourselves in the use of certain strokes in tennis, or in ways of holding or throwing a ball. How many of you learned to drive an automobile by driving at once through a busy street? Most of us preferred to be drilled by an expert until he assured us we were competent to attempt a real drive. I can find nothing intrinsically wrong with drill. Under right conditions and done with the proper motives, it is one of the most efficient forms of educational activity. It is true that all persons do not need drill. Even in Gary in all the elementary grades there were children who had spent their entire educational lives in the Gary schools, yet who were able to spell perfectly the tests for their grade. There are individuals who without drill are able to drive an automobile or an aeroplane the first time they try it, who, in other words, learn so readily by doing that they need no other training. The essential point to notice, however, is that the number of such individuals is small. On the basis of such measurements as have been made we can say with some definiteness that the number of children who are "natural-born" spellers is approximately ten per cent of the total. For the other 90 per cent the acquisition of adequate skill involves either a prolonged period of purposeful activity or some form of direct drill.

For instance, in Detroit, for one experiment, we found by testing, five common words which no child in a certain second grade class could spell correctly. They were *picture*, *circus*, *pencil*, *knife*, and *umbrella*. The class then used these words in a spelling game each day. There was no study except that which came from the use of the words in the game. The children probably were not interested in the spelling, but they did enjoy the fun. As a result of this incidental drill the first day two children learned to spell the words correctly. At the end of 5 days 12 children could spell the words, in 10 days the number had risen to 17, while at the end of 16 days, when the experiment was discontinued, there were still 13 children out of 38 in the class so limited in ability to learn spelling that opportunities adequate for most of the children were not sufficient for them.

Similar data could be shown in any amount, but there is no need. There is no individual in this room who cannot supply from his own personal experiences instances of differences in capacity to learn. For all but the specially gifted, therefore, artificially created conditions which enable ordinary individuals who really wish to learn to repeat over and over again special phases of some purposeful activity are necessary and of vital benefit.

For the present discussion the important fact is that drill is not only a natural way of learning, but an economical way for a very large percentage of our school population. The essential element, however, is not primarily the number or character of the repetitions, but the wholeheartedness of the desire of the individual to profit by the practice. It cannot be too much emphasized that drill may thus be as much a self-directed, purposeful activity as any other occupation. It is for this reason, I take it, that drill finds a place among Professor Kilpatrick's four types of projects.

May I say something, also, about the social aspects of drill? I have heard ardent advocates of the project method disparage class drills as non-social. I can find nothing in the nature of drill to prevent the motive from being the highest that can move man to action, namely, the desire to be of service to his fellow men. If a child drills himself in addition because he has come to see that skill in addition is essential to the achievement of a social purpose, what element of harm, or evil, is there in the situa-

tion? None, I think; and if it so happens that of necessity forty children agree to carry on their individual practice in the same room at the same time and under the same conditions, the apparent outward uniformity is no handicap, provided each child really drills himself on his own material, at his own rate, and in his own way. In fact, the reverse is true. The social setting operates to raise to a higher level each individual's appreciation of the meaning of his drill project. The success achieved by others will be just as truly an inspiration to effort as it is in any other social situation, and the individual's personal success may be recognized as a contribution to social progress of the group.

The last element I shall present for your consideration is the possibility of there being critical steps or phases in the development of skill. In such a case careful organization of procedure, and scientific determination of the best sequence may mean decreased teaching effort, decreased learning time, and increased final efficiency. In industry this step has already been taken. For instance, I heard an efficiency engineer describe the process of building up a proper method of drill in typewriting. Moving pictures were taken of ten of the most expert operators that could be found. These pictures constituted an analysis of the activity into minute elements. For example, my friend had nine separate pictures showing every movement of one finger from the time it started to press one key until it was ready to strike the next. These films were cut apart and each section compared, motion by motion. Selection was made of the best, and, motion by motion, a perfect expert operator was built up by a combination of the best elements in each of the ten expert performances. When the composite film was completed it was used to train new operators.

That is, in teaching typewriting it has been found wasteful to learn by doing. The beginner is shown objectively from the very first how to make each motion correctly. The result seemed to me incredible. I hesitate to quote because I dare not trust my memory, and the figures, so far as I know, are not in print; but I know that expert operators were made in a very small number of lessons. This is but one of many similar cases in the commercial field. Are there no lessons for us in this? There are best habits of adding, and a best sequence of effort in developing these habits. The same is true of every other educational skill. Formally or-

ganized drill material embodying the results of extensive investigations makes it possible for the person who *desires* to learn to achieve his goal quickly, efficiently, and with the least possible effort. For the organization of the drill material places at his disposal the experience of others more gifted and more expert than himself.

I have said enough to show that the problem of providing for the development of fundamental skills is no simple one to be left to take care of itself, or to be dismissed with a magic formula—"learn to do by doing." We need to pick and choose among conflicting elements, only a few of which I have presented here. By way of conclusion let me ask you to imagine a school in which the central core of the work was a series of projects drawn from the social life of the day, but so based upon the elemental impulses and desires of child life that they elicited from the children whole-hearted, self-directed effort. Suppose, further, that each of the projects was so objectively defined that each child could judge of his own success or failure. Finally, suppose that in event of failure, or of poor work, there was available drill material, perfectly and scientifically organized, so that it was possible for each child to give himself just the amount and type of drill which was required for each need as it arose. Would there not be provision for adequate drill, and would not final abilities be adequate for efficient social living?

It is toward such an ideal that we are working in Detroit. We have not gone far, it is true. We have the machinery for the drill work in arithmetic completed, and that for writing nearing completion. The work on the spelling drills is under way. These are the easier phases of our problem. We are just beginning on the selection and organization of suitable projects. The most important problem of all has scarcely been touched, namely, that of so adjusting the viewpoint of more than 3,000 teachers that our educational machinery may be administered democratically and with due respect for the inherent dignity of the personality of the individual. True project teaching takes time; we propose to get that time by eliminating the waste in useless drill. We shall have succeeded only when the attainment of standard degrees of the fundamental skills comes as a result of self-directed drill projects.

BIBLIOGRAPHY OF THE PROJECT METHOD

By JOHN P. HERRING
Graduate Student, Teachers College

The purpose of this bibliography is to spread such knowledge of the project method as now exists. To this end titles which present this knowledge have been sought, and others, often despite claims to relevancy, have been avoided. Time has unfortunately prevented collection in some fields where contributions have been made. A discriminating annotated biliography of the project method in agriculture is needed but is not included. Titles in other special fields of education have not been exhaustively obtained. No work, however, of general interest to the philosophy, the psychology, or the practice of the method has been intentionally omitted.

Indebtedness is acknowledged to Professor William Heard Kilpatrick of Teachers College, for suggesting that the bibliography be made, for beginning the collection of titles, and for criticising the annotations. The writer holds none but himself responsible.

ADAMS, M. G. "Home Project Work in Vocational Home Economics in Secondary Schools." *Journal of Home Economics*, 10:358–62 (1918).

Suggests projects in food, textiles, and clothing, giving general directions, steps of preparation for the teacher, projects for different years of the course, and pupil outlines.

ALLEN, I. M. Notes in the *Proceedings of the Illinois State Teachers Association*, pp. 126–33 (1917).

Reviews C. H. Johnson's philosophy of education as to discipline, method, socialized recitation, and supervised study. The absolutist's and the experimentalist's positions are stated antithetically for each of the topics named.

BATCHELDER, M. I. "Materials and Activities in the Second Grade." *Teachers College Record*, 20:205–10 (1919).

A typical day's program is described and an account given of activities in an experimental room largely dominated by the spirit and method of the project.

BOGARDUS, E. S. *Essentials of Social Psychology.* 159pp. Univ. of Southern California (1918).

Written to develop the "problem getting" method of education in the student of psychology. At the close of each chapter is a list of problems.

BONSER, F. G. "Industrial Arts." In *Teaching Elementary School Subjects* (Rapeer, L. W., ed.). pp. 281–98. Scribner (1917).

The need, values, organization, and content of a curriculum in industrial arts, with provision for projects. Will repay analysis by any one purposing to make curricula.

BRANOM, M. E. *Project Method in Education.* 282pp. R. G. Badger (1919).

Should be generally available. A full and systematic presentation. Excellent criticism of definitions thus far proposed; relation of method to instincts and to adult activities; illustrative material. The first book in its field.

———. "Project-Problem Method in History." *Historical Outlook*, 11:107–10 (1920).

Information projects, enjoyment projects, and problem projects. Effect-to-cause and cause-to-effect problems in history. Illustrations. The initiation of projects. Steps in the project process.

———. "Project-Problem Method in the Teaching of Geography." *Journal of Geography*, 16:333–38 (1918).

A general discussion of the nature of solutions, the advantages, the difficulties, and the dangers of the method, with a number of illustrations.

———. "Value of the Problem-Project Method in Elementary Education." *Elementary School Journal*, 18:618–22 (1918).

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BURKS, J. D. "Environment of the School." *Teachers College Record*, 3:273–91 (1902).

The environment is that of the Speyer School. This article admirably illustrates one kind of knowledge needed in education through projects.

BURNS, H. F. "Group Socialized Recitation." *Education*, 39:176–81 (1918).

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CARMAN, K. V. "Basing Work in Industrial Arts on the Construction of a New Building." *Teachers College Record*, 17:247–62 (1916).

"In basing the larger portion of a year's work in industrial arts upon the erection of a new high school building, he has given a practical demonstration in the enrichment of school work by deriving its motives from community activities. . . Coöperation of the teachers came as the most natural thing. . . . Mr. Carman's successful experiment should stimulate other teachers to similar effort." F. G. Bonser.

CHARTERS, J. A. "Problem Method of Teaching Ideals." *English Journal*, 8:461–73 (1919).

It is recommended that children be given problems the solution of which will develop appreciation for the ideals to be taught.

CHARTERS, W. W. *Methods of Teaching Developed from a Functional Standpoint.* 255pp. Rowe, Peterson (1909).

A suggestive reading on the multiplicity and relativity of aims, the relations of method and content, the intrinsic function of subject-matter, structure and subject-matter, motives, control of values, methods, order, concreteness, and drill.

————. "Projects in Home Economics Teaching." *Journal of Home Economics*, 10:114–19 (1918).

Definition, relation to curriculum, advantages and limitations of projects.

CHICAGO NORMAL COLLEGE STUDENTS. "Suggestive Outline for Project-Problem Teaching." *Chicago Schools Journal*, 2:17–20 (1919).

Questions to stimulate interest and bring out the suggestion by the group that a club be formed to study Chicago's achievements and needs. The plans made by the group are presented as well as plans made for the organization of a dramatic club among the pupils.

CLARK, A. B. "Experiment in Problem Teaching." *English Journal*, 6:535–38 (1917).

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CLARK, L. A. "Good Way to Teach History." *School Review*, 17:255–66 (1909).

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COLVIN, S. S. *Learning Process.* 336pp. Macmillan (1915).

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COOK, E. C. "Experiment in the Teaching of College English." *Teachers College Record*, 19:131–46 (1918).

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Vol. 2: *Morning Exercise as a Socializing Influence.* 198pp. (1913.)

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Vol. 4: *Education Through Concrete Experience.* 187pp. (1915.)

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There is as yet, perhaps, no fuller single source of clear and sound illustrations of education that has been accomplished through projects.

COOK, H. C. *Play Way: An Essay in Educational Method.* 367pp. Stokes (1917).

Unique, undoubtedly possessing style, full of epigrammatic wit and pedagogical wisdom. Discusses principles and methods of education; as play, self-government, "littleman lectures," a play town, acting, and play making. Easily skimmed for its kernels, yet sustained in quality. "The basis of educational method is regard for the interests of children," suggests a dominant attitude.

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DAVIDSON, P. E. "Educational Reform and the Manly Virtues." *School and Society*, 8:361–67 (1918).

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DEARBORN, G. V. N. *How to Learn Easily*. 221pp. Little (1916).

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DETRAZ, M. J. "Materials and Activities in the Third Grade." *Teachers College Record*, 20:210–18 (1919).

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DEWEY, E. *New Schools for Old: the Regeneration of the Porter School*. 337pp. Dutton (1919).

A solution of difficulties typical of rural education through means typically accessible in the country. The things done in the school were done with an eye to the education of the community. School and community interest were made one.

DEWEY, E. and DEWEY, J. *Schools of To-morrow*. 316pp. Dutton (1915).

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From the point of view of Dewey's philosophy of education, the basis and background of project learning are presented in relation to the learner and what is learned. Principles for the guidance of teaching; education as its own end; society as its own end; interest and motive.

———. *Democracy and Education: An Introduction to the Philosophy of Education*. 434pp. Macmillan (1916).

The general philosophic background and basis of the problem-project method.

DEWEY, J. *How We Think.* 224pp. Heath (1910).

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————. *Interest and Effort in Education.* 101pp. Houghton Mifflin (1913).

An integral portion of the Dewey philosophy and psychology of education that is the basis and background for the project method. Deals with ethical educational problems sure to arise in the earlier stages of experiment with the project method. Virtually a later edition of the author's *Interest as Related to Will.*

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————. *Moral Principles in Education.* 60pp. Houghton Mifflin (1909).

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————. *School and Society*. 164pp. Univ. of Chicago (1915).

Treats of the relation of active occupation to the development of spirit in the school, and of certain projects as recapitulations of race experiences. A fundamental discussion of the psychology of occupation for common ends.

DOPP, K. E. *Place of Industries in Elementary Education*. 270pp. Univ. of Chicago (1913).

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EARHART, L. B. "Experiment in Teaching Children to Study." *Education*, 30:236–44 (1909).

Can fourth grade pupils be taught to study a reading lesson independently? The question is answered affirmatively, and a detailed account of the method of investigation is presented. Very useful on the problem side of the project method.

————. *Systematic Study in the Elementary Schools*. 97 pp. Teachers College, Columbia University (1908).

Treats of the usual lack of effective study by children and of its possibility, of the recognition of problems, collecting data, scientific doubt, verification, memorizing, and of recognizing individuality. Illustrative material is included. An excellent analysis of the educational situation as to children's study, and of valid methods.

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————. *Types of Teaching.* 277pp. Houghton Mifflin (1915).

See especially Chap. XIV on "Training children to study." Treats of finding the aim, judging of hypotheses, collecting and evaluating data, organizing data, suspending judgment, testing conclusions, and thoughtful memorizing. Valuable for the problem aspect of the problem-project method.

FELL, E. E. "Socializing the School and the Community." *Moderator-Topics,* 38:453–55, 469–71 (1918).

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GASTON, C. R. "Social Procedure in the English Class-room." *English Journal,* 8:2–7 (1919).

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GATES, A. I. "Psychological *vs.* the Chronological Order in the Teaching of History." (To appear in *Historical Outlook.*)

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HARRINGTON, H. F. "Teaching Journalism in a Natural Setting." *Educational Administration and Supervision*, 5:197–206 (1919).

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HATCH, R. W. "Adaptation of the Project as a Basis for Teaching History." (To appear in *Historical Outlook*.)

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HAUSMAN, L. A. "Making Relief Maps." *Journal of Geography*, 16:97–100 (1917).

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HERRING, J. P. "Measurements of Some Abilities in Scientific Thinking." *Journal of Educational Psychology*, 9:535–58 (1918) and 10:417–32 (1919).

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Each boy reports upon a book he has read from time to time, the report being followed by class discussion. The fact that the teacher is never quite prepared is one of the educative features of the plan. Boys are found to read about two and one-half times as much under this scheme as before its use.

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An application of certain criteria of project education to a typical industrial arts project.

JOHNSON, A. "Written Composition in the Fourth Grade." *Central Normal Bulletin*, 15:7–8 (1919).

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JONES, W. H. S. *How We Learn*. 64pp. Putnam (1916).

The psychology and practice of scientific method as employed by boys. Induction, deduction, examples of scientific discoveries, the method of discovery, analogy, fallacies, learning, and authority. The illustrative material is well developed.

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KERR, W. H. "Problem Method and Its Library Correlation. A Librarian's Reaction." *Library Journal*, 42:686–87 (1917).

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KILPATRICK, W. H. "Education of Adolescents for Democracy: A General View and Evaluation of Present Methods." *Religious Education*, 14:123–35 (1919).

A contribution of the very first importance as proposing that we agree upon criteria and proceed to evaluate the organizations in which our adolescents are educated. Phases of educational psychology are related; criteria are proposed; a long list of institutions such as the Boy Scouts, high schools, technical schools, Y. M. C. A., and school fraternities are evaluated and ranked.

————. "Problem-Project Attack in Organization, Subject-matter, and Teaching." *N. E. A. Proceedings*, 56:528–31 (1918); *School*, 29:396–97 (1918).

Since the unit of worthy living is the project, the project should be the unit of school procedure; it utilizes the laws of learning; it leads to moral living. Four types of project are distinguished.

————. "Project Method. The Use of the Purposeful Act in the Educative Process." *Teachers College Bulletin*, 10th Series, No. 3 (1918).

A philosophic and psychologic base of the problem-project movement. A contribution presenting the psychology of the project, a concept which serves to unify three factors of education: activity, the laws of learning, and conduct. Effective purpose is the essence of project method. The purposeful act is the typical unit of worthy life and should be that of school procedure. Four types of project are distinguished.

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What children are to learn: of common affairs, of social ideals and skills, of self-reliance, and of school arts; learning to do by doing; the child's method; child doing under teacher guidance. A presentation before patrons of the Horace Mann School of the theories of a significant experiment.

———— and others. "Horace Mann Studies in Primary Education." *Teachers College Record*, 20:97–125 (1919).

Introducing a series of articles of first importance as describing the planning and executing of project experimentation of the thoroughgoing kind in the Horace Mann School. Theories, specimen activities, materials, and stimuli.

KITSON, H. D. *How to Use Your Mind.* 217pp. Lippincott (1916).

One of the how-to-study books from which one may take helpful suggestions for his own method in its general aspect.

KRACKOWITZER, A. M. *Projects in Primary Grades.* 221pp. Lippincott (1919).

A presentation from the point of view of the Dewey philosophy; play, construction, social ethics, nature, and the formal subjects are all treated as "purposeful activity." Discussion of problem and project, and of criteria. Rich with illustrations of projects for the primary grades. A type of book bound to appear more and more frequently.

LASHER, G. S. "English and the Project Method." *Journal of the Michigan School Masters' Club*, 53:61–67 (1918).

Describes the writing of a book about Chicago by a Freshman high school class, and other projects.

LEONARD, S. A. "Social Recitation." *Chicago Schools Journal*, 1:No. 10, 2–9 (1919).

The project method is not soft pedagogy. The teacher must strongly influence the purposing of the pupils. A sound discussion of certain points of modern method which are frequently called into question.

LOTT, D. W. "Twenty Minute Project." *General Science Quarterly*, 1:122–26 (1917).

Contains the quoted conversation of the class room, illustrating one project which left the pupils with drives toward other projects.

LULL, H. G. "Observation and Score Card. Project-Problem Instruction." (May be obtained from J. C. DeVoss, Kansas State Normal School, Emporia, Kansas.)

Six excellent cards presenting an elaborate analysis of project-problem abilities: (1) and (2) Pupil activities and teacher activities in the recitation period; (3) and (4) Pupil activities and teacher activities in the supervised study period; (5) Drill projects; (6) Appreciation activities.

————. "Problem of Method of Instruction and Its Probable Correlation in Library Service and Administration." *Library Journal*, 42:683–85 (1917); *N. E. A. Proceedings*, 55: 562–66 (1917).

Problem instruction requires the pupil to seek information from a variety of sources, among which the library is important. The modification of the library

service in equipment and methods is suggested, and the creation of a new type of service, that of the teacher-librarian, is proposed. The author makes it appear that our libraries might become vitally concerned with project teaching.

LULL, H. G. "Project-Problem Instruction." *School and Home Education*, 38:79–82 (1918).

Definition of the term project. A thorough treatment, covering much of the ground of the author's "What are Projects and Problems?" (*q. v.*), and in addition presenting a very comprehensive and detailed score card analysis of the activities involved. This analysis does much to suggest the technique of the method.

————. "Relation of Project-Problem Instruction to the Curriculum." *School and Home Education*, 38:114–15 (1919).

The boundaries between subjects. Drill subjects and use subjects (applied technique) in elementary and junior high schools. Acquisition of the technique of subjects of the curriculum.

————. "Schoolroom Technic in Problem Instruction in Grammar Grades." *School and Society*, 5:496–99 (1917).

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————. "Socializing School Procedure." *American Journal of Sociology*, 24:681–91 (1919).

The free play ways of children utilized in teaching. Two assignments are presented, one that hampers the free purposeful attack of pupils and one that furthers that attack. Stenographic report of class conversation. Application of the project way to discipline and planning.

————. "University How-to-Study Class." *School and Society*, 4:961 (1916).

How the author in coöperation with instructors in the engineering department of a university taught engineering students how to study. Suggests a type of work probably much needed in many schools.

————. "What are Projects and Problems?" *Teaching*, Vol. 1, No. 57 (1919); *Chicago Schools Journal*, 2:19–25 (1919).

Treats of the definition, stimuli, processes, relations to the study period, the recitation, the teacher, facilities, and examples of projects. Contains an adequate and detailed manual of practice. Twenty pages are devoted to the reproduction of children's notes, plans, revisions, outlines, and expositions of

projects in geography, English, arithmetic, and science. An attempt to define certain details of procedure implicit in Dewey's philosophy of education.

LULL, H. G. and others. "Project Method of Instruction." *Teaching*, 5, No. 1, 3–31 (1920).

The January number of *Teaching* is devoted to the project method. Function, types, descriptive illustrations, verbatim reports, means of measuring progress in project education in widely different fields. A large range of suggestion and concrete help useful to those experimenting with the method.

LUNT, J. R. "Illuminating Gas Project." *General Science Quarterly*, 1:213–5 (1917).

A detailed account of a project.

MCCALL, W. A. and others. "Experimental Measurements." *Teachers College Record*, 20:218–28 (1919).

The measurement of experimental groups using the project method and of control groups not using it justified the conclusion that the project method secured the conventional "intelligences" of the primary grades almost as well as the older methods. The project method, being new, it is suggested, may or may not later outstrip the more formal methods in the intellectual requirements of minimum essentials, and may or may not outstrip them in certain, as yet unmeasurable, qualities.

————. "Measuring the Horace Mann Elementary School." *Teachers College Record*, 19:472–84 (1918).

Reports measurements in an experimental school where the project method is used in several rooms.

MCINTYRE, MRS. H. I. "Giving Purpose to Students of High School English." *English Journal*, 6:539–41 (1917).

Describes the beginning of an attempt to increase the interest of Freshman and Junior English students by surveying their needs and organizing the course to meet the needs expressed.

MCLAUGHLIN, K. "How to Study." *Elementary School Journal*, 15:22–24 (1915).

Three common difficulties are presented and remedies proposed.

MCMURRY, C. A. *Teaching by Projects. A Basis for Purposeful Study*. 257pp. Macmillan (1920).

Treats of the growing tendency to adopt large projects and of the simplifying and enriching of study through large projects. Presents in detail a number of such projects. Relations of projects to classroom method.

McMURRY, F. M. *Elementary School Standards.* 218pp. World Book Co. (1914).

Interesting, searching, qualitative criticism of a school system in the light of four standards, which are standards for problem teaching: provision for motive on the part of pupils, consideration of values by pupils, attention to organization by pupils, and initiative by pupils. This book will long be vitally pertinent.

————. *How to Study and Teaching How to Study.* 324pp. Houghton Mifflin (1909).

Nature of study; provision for specific purposes; supplementing thought; organizing ideas; judging soundness and worth; memorizing; using ideas; tentative attitudes; individuality. An important early contribution to the project method, with special emphasis on the problem.

———— and others. "Symposium on Study in the Elementary School." *Education*, 30:242–44 (1909) and 30:311–15 (1910).

Opinions of a score of educators in response to pertinent questions.

MEISTER, M. "Guiding and Aiding the Pupil in His Project." *General Science Quarterly*, 3:209–15 (1919).

Suggestions are made as to certain elements of the technique of project method, such as use of references, card indexes, conferences, questions, lists of experiments, etc.

————. "Method of the Scientists." *School Science and Mathematics*, 18:743 (1918).

The method of scientists is essentially like that of the project. An analysis of the processes of scientific investigation and discussion of the methods used by many scientists.

————. "Science Work in the Speyer School." *General Science Quarterly*, 2:429–45 (1918).

Thoughtful, detailed outline of the project method with concrete suggestion on certain methods in class work in the high school.

MERRIMAN, E. D. "Technique of Supervised Study." *School Review*, 18:35–38 (1918).

Very helpful, detailed, concrete outline for this phase of problem study.

MILLER, H. L. "University of Wisconsin Plan for the Preparation of High School Teachers." *N. S. S. E. 18th Yearbook*, 1:7–165.

A vigorous, suggestive presentation of the plan of preparation through participation, in which the project method is central, and from which one may learn much of the actual working of the method in one school and almost sense how it feels to learn to teach well. The earnest daily reports of the college seniors who are preparing to teach are illuminating.

MILLER, I. E. *Psychology of Thinking.* 298pp. Macmillan (1910).

Useful as an analysis of the physiological and psychological bases of thinking. Includes many specific suggestions as to procedure in guiding children in their thinking.

MILLIS, J. F. and others. "Report of Committee of Mathematics Section of the Central Association of Science and Mathematics Teachers on Real Applied Problems in Algebra and Geometry." *School Science and Mathematics*, 9:788–98 (1909).

Analysis of problem method. Method and results of the investigation of the committee. Illustrative problems. Bibliography of sources of problems.

MINOR, R. "Project Teaching in Grade Six." *Elementary School Journal*, 20:137–45 (1919).

The rise of problems; lists of problems and of pupil activities; titles of compositions; relationships among subjects of the curriculum; results; how the work of the grade as a whole was handled. Concretely helpful.

————. "Supervision of Project Teaching." *Educational Administration and Supervision*, 5:357–63 (1919).

Several definitions are presented; the value of the method is considered; a very detailed analysis of the values is presented. Selected bibliography.

MOORE, A. E. "Use of Children's Initiative in Beginning Reading." *Teachers College Record*, 17:330–43 (1916).

The purpose of the experiment was to "see what could be accomplished in beginning reading through self-directed individual effort," and to select those reactions which were most effective. A most promising first-grade project, with a list of pictures, apparatus and books used.

MOORE, E. C. *What is Education?* 357pp. Ginn (1915).

A very live presentation in everyday terms from the point of view of the Dewey philosophy and the Thorndike psychology. Presents strikingly the relativity of process, concept, etc., and the project idea of education. Especially chapters on the place of method in education and on learning by problem getting.

MOORE, J. C. "Projects." *General Science Quarterly*, 1:14–16.

Proposes for teachers of science a card catalogue system of projects in outline accompanied by references to literature. One illustration is given.

————. "Project Science, Progressive." *School Science and Mathematics*, 16:686–90 (1916).

"The results of science teaching do not measure up to reasonable expectancy." Project method is analyzed and discussed.

MORRIS, M. "Third Grade Project." *Central Normal Bulletin*, 15:1 (1919).

Valuable as suggesting that teachers who move to new fields may put their new pupils into communication with their former ones. Leaves of timber trees, peanuts on the stalk, cotton, etc., were exchanged and utilized as drives for letter-writing, spelling, and geography.

NEWBY, M. I. "The Socialized Recitation." *The Sierra Educational News*, 15:70–72 (1919).

A school magazine published by pupils, debating clubs for oral language, imaginary ownership of real estate, and oil prospecting are used to socialize the curriculum. Suggestive of projects possible in most communities.

OWEN, W. B. "Problem Method." *Chicago Schools Journal*, 1:3–4 (1918).

Treats of the problem method as a synthesis of the philosophy of experience, the logic of purpose, the psychology of the act, the method of science, and the processes of industry. Discloses clearly the vitality of relationship between the method and certain contemporaneous phases of thought and life. The psychology of purpose is dominant.

PARKER, E. P. "Partition of Africa, a Seventh Grade Geography Unit." *Elementary School Journal*, 20:188–202 (1919).

Nine periods of sixty minutes each sufficed to develop this project. Each child chose his own part. Vivid narrative of how problems lead to solutions and solutions to problems.

————. "Sixth Grade Science Projects." *Elementary School Journal*, 20:297–307 (1919).

Describes the making of telegraph instruments and magnetic toys, and the wiring of a toy theatre for electric lights.

PARKER, S. C. *Methods of Teaching in High Schools*. 529pp. Ginn (1915).

Contains much that is pertinent to the technique of supervised problem study and to the difficulties of transition from other methods to the project method. Well organized.

PAYNE, E. G. "Experiment in Motivation." *Elementary School Journal*, 17:727–33 (1917).

An experiment undertaken with boys. The plan was of two parts: visits to factories, and study and discussion growing out of the visits. Contains a general detailed outline for the study of any industry.

PEARSON, K. *Grammar of Science.* 548pp. Macmillan (London, 1900).

A work of the first rank dealing with the facts, conditions, concepts, and conclusions of science, and with the relations of the sciences. Pertinent because of the intimate relation of scientific method with problem-project method.

QUICK, H. *Brown Mouse.* 310pp. Bobbs Merrill (1915).

Fascinating fiction of a farmer lad with a country education, who was inveigled to teach the country school and who quasi-instinctively based his procedure upon an informal survey of community needs. A book that makes its own educational appeal on a basis of common sense and plain humor. The ways of the novice here strikingly suggest project method.

RAPEER, L. W., ed. *Teaching Elementary School Subjects.* 569pp. Scribner (1917).

A symposium of more than a score of leaders of thought and practice in education. Each author treats of a subject of the curriculum. In numerous places content is related with projects.

REAVIS, W. C. "The Social Motive in the Teaching of Arithmetic." *Elementary School Journal,* 18:264–67 (1917).

Describes a plan of teaching stocks and bonds to an eighth grade class. A mock bank was organized, in which each member of the class became a stockholder.

ROBERTS, A. C. "An Experiment in Socialization." *School Review,* 26:25–34 (1918).

Details an experiment in the adaptation of high school education to certain purposeful community demands.

SANDWICK, R. L. *How to Study and What to Study.* 170pp. Heath (1915).

A how-to-study book that repays reading. Discussion; pithy summary; positive recommendation; analysis of process, aspects, types, and factors of study. Good for junior and senior high school students and for adults who feel the need of help on the technique of their study habits.

SCOTT, C. A. *Social Education.* 298pp. Ginn (1908).

Describes certain atypical schools, such as the George Junior Republic and the Dewey School. Discusses self-organized group work.

————. "Social Significance of Self-Organized Group Work." In KING, I.: *Social Aspects of Education.* pp. 377–93. Macmillan (1912).

Presents a method of initiating the project plan in a school room to which it is new, and describes a number of projects. Socialization is seen intimately related with project. A most interesting, vivid, and frank narrative concerning certain difficulties and solutions in socialization.

SEMPLE, E. C. *Influences of Geographic Environment.* 683pp. Henry Holt (1911).

An invaluable source of problems and their solutions, for the teacher who realizes the necessity of being, upon her own level, a student, if she is to guide students.

SHUTE, M. C. "The Practice of Democracy in the Kindergarten." *Kindergarten and First Grade,* 3:89–94 (1918).

Usefully suggestive discussion of the problems of democratic education, e. g., that of the individual and society.

SIMPSON, J. H. *Adventure in Education.* 207pp. Sidgwick (London, 1917).

An interestingly written and carefully analytic description of an experiment in the educative effect of self-government in one of the lower forms of Rugby School, England.

SMITH, E. L. "Project of Everyday Machines." *General Science Quarterly,* 3:31–33 (1919).

An introduction to physics through everyday machines like doorknobs, crowbars, and egg-beaters. Complex machines are finally analyzed into the simple machines of which they are composed.

SNEDDEN, D. "Project as a Teaching Unit." *School and Society,* 4:419–23 (1916).

Discussion of various units: the question and answer, the lesson, the topic, and the project. Characteristics, definition, history, and classification of projects.

————. "Project Method of Teaching Home Making." *Educational Administration and Supervision,* 5:94–96 (1919).

Notes of an address which are suggestive as to method and contain a list of relevant projects.

SPEYER SCHOOL CURRICULUM. By the staff and supervisors of the experimental and demonstration school of Teachers College, Columbia University. 180pp. Teachers College, Columbia University (1913).

The interrelation of the content of the subjects of the curriculum, with projects and sources of data. Projects and sources accompany each grade curriculum. Projects are found most frequently with the subject of industrial arts. Rich in concrete suggestion from the kindergarten through the eighth grade. Excellent lists of books needed by children and teachers.

STEVENSON, J. A. "Problems and Projects." *School and Home Education*, 38:209–15 (1919).

Method; definitions; projects and problems differentiated and classified; summary.

————. "Project and the Curriculum." *School and Home Education*, 38:146–51 (1919).

Some principles of curriculum making. An analysis of a first grade project: making a flower garden. "Projects need not cut across subjects of the curriculum." Project as the basis of curriculum organization.

————. "Project in Science Teaching." *School Science and Mathematics*, 19:50–63 (1919). *School and Home Education*, 38:110–14 (1919). *General Science Quarterly*, 3:195–209 (1918).

Concept, implications, and description of the project; standards; related concepts in common use, including that of scientific method. A sound, comprehensive, suggestive study, in which Dewey's philosophy of purpose is central.

STONE, C. H. "Making a Match,—a Project." *General Science Quarterly*, 3:89–90 (1919).

The process of making a match and its meaning in education.

STRAYER, G. D. and NORSWORTHY, N. *How to Teach.* 297pp. Macmillan (1917).

The chapters entitled "How Thinking may be Stimulated" and "How to Study" are especially relevant and worth careful reading by those who teach. Our scientific knowledge of learning and of the improvement of functions is here related to the processes of education.

TALLMAN, L. "New Types of Class Teaching." *Religious Education*, 12:271–80 (1917).

Discussion of project method. Illustrative material. Emphasis on real life situations, and upon natural method and socialized activity. Bearing of project method upon religious education.

TAYLOR, W. S. "Project Methods in Teacher-training Courses." *School and Society*, 8:487–90 (1918). *N. E. A. Proceedings*, pp. 276–78 (1918).

Instruction in agriculture in the secondary school was lifeless until projects were used. The beneficial results and the criteria of the method in agriculture are discussed.

THOMPSON, C. J. "Study of the Socialized versus the Academic Method of Teaching Written Composition." *School Review*, 27:110–133 (1919).

An experimental and a control group are compared through measurements, with the conclusion that the method which utilizes the social elements of the composition and group stimuli gives decidedly better results. Recommendations as to procedure are included.

THORNDIKE, E. L. *Education, A First Book.* Chap. IX and X, pp. 168–202. Macmillan (1912).

Really, if not professedly, concerned with aspects of project method. Assuming the scientific attitude and the relevancy of purposes in educative processes, these chapters give concrete and illuminating direction.

————. "Education for Initiative and Originality." *Teachers College Record*, 17:405–16 (1916); *Teachers College Bulletin*, 11th Series, No. 4 (1919).

Two virtues basic in project method, in ethics in use, and in civic practice. "From the standpoint of education in a democratic state and for the sake of efficient democratic citizenship." The definitions proposed do much to clarify ethical educational thought. Certainly one of the best analyses of these traits.

————. *Educational Psychology.* 3 vol., 327; 452; 408 pp. Teachers College, Columbia University (1913–14).

Pertinent to project study because every method of education must concern reflexes, instincts, capacities, laws of learning, and the factors and conditions of improvement. A scientific correlate of the John Dewey philosophy of education as a base of the problem-project method.

————. *Principles of Teaching.* 293pp. A. G. Seiler (1906).

Invaluable for teachers making the transition to methods involving reasoning by children. Very helpful on the technique of handling the element of interest, on habit formation, and on much else.

TRANER, F. W. "Socializing the Study of History." *School Review*, 25:714–21 (1917).

Presents criteria for the selection of content. Favors the "topical or problem method." The aim of education is stated to be adjustment to social environment.

TWISS, G. R. "Outlook for the Application of Scientific Method to the Problem of Science Teaching." *N. E. A. Proceedings*, 52:723–28 (1914).

Contains a series of theses bearing upon the project method.

TWISS, G. R. *A Textbook in the Principles of Science Teaching.* 458pp. Macmillan (1917).

A thoroughgoing text on scientific method as fundamental in the progress of the race and of the child's education; replete with excellent suggestions of method in teaching and of the materials of equipment. Many principles of scientific method and subjects of the curriculum are treated. Problem-project method is in the last analysis scientific method.

UPTON, S. M. and CHASSELL, C. F. "Scale for Measuring the Importance of Habits of Good Citizenship." *Teachers College Record*, 20:36–65 (1919).

A scale in which certain virtues important in project method find prominent place.

VAN BUSKIRK, E. F. and SMITH, E. L. *Science of Everyday Life.* 416pp. Houghton Mifflin (1919).

A book of projects for the junior high school: air, fire, breathing, health, water, soil, foods, control of nature, homes, clothing, lighting, heating, machines, transportation, and the origin and betterment of life. A goodly wealth of the matter and spirit of projects in general science, with many and excellent illustrations. Of undoubted value for the courses in general science in junior high schools.

VON HOFE, G. D. "Development of a Project." *Teachers College Record*, 17:240–46 (1916).

"The sixth grade in the Horace Mann School are studying science regardless of every artificial division. The class chooses a project . . . the teacher then presents the information to follow . . . the trend of the thought of the pupils." One project is presented.

————. "Giving the Project Method a Trial." *School Science and Mathematics*, 16:763–67 (1916).

Certain aims are erected and cautions suggested.

WAKE, W. S. "Project in General Science." *School Science and Mathematics*, 19:643–50 (1919).

A stimulating, well-organized article dealing with aspects of the project method as follows: need of the method; laboratory; definitions by nine authors with the author's criticisms; approaching, beginning, developing, culminating, and closing projects; attitude; twelve types of projects; induction and deduction; the text-book.

WATSON, C. W. "School Home-Garden Project." *Nebraska Teacher*, 20:293–97 (1918).

Presents the organization and results of a project involving the coöperation of boys and girls of a state.

WHIPPLE, G. M. *How to Study Effectively.* 44pp. Public School Pub. Co. (1916).

Clear, sound, detailed directions for guidance of children's study in the elementary school, high school, and college. Contains much that will help many an adult.

WIECKING, A. "Some Suggestions for Primary Industrial Projects." *School Progress*, 1:3–6 (1919).

WILLIAMS, R. H. "Introductory Fire Lesson." *General Science Quarterly*, 1:216–21 (1917).

Detailed account of a project and of class conversation connected with it.

WILSON, G. M. "Motivation of Seventh and Eighth Grade History Work." *Elementary School Teacher*, 13:11–16 (1912).

A very interesting suggestion. An 8B class in United States history used Madison's Journal of the Constitutional Convention and organized itself into such a convention, the teacher being elected to play the roll of Washington. Other members of the group played other rolls. The dramatic treatment aroused undoubted interest.

WILSON, H. B. and WILSON, G. M. *The Motivation of School Work.* 265pp. Houghton Mifflin (1916).

Treats of the basis of motive, and of motivation in school subjects and in extra-curricular activities. Much concrete illustration. Very helpful.

————. "Problem Attack in Teaching." *Elementary School Journal*, 17:749–55 (1917).

The problem attack in the presence of conscious difficulty is requisite to good school work, and results in real learning and economy. Two types of problems are presented and one illustration from history is given in some detail.

WOODHULL, J. F. "Aims and Methods of Science Teaching." *General Science Quarterly*, 2:249–50 (1917).

An analysis of the project method as that used by the masters of investigation of all time. Its advantages as against topical methods. A convincing presentation.

————. "General Science." *School Science and Mathematics*, 13:499–500 (1913).

Correspondence is invited with reference to suggestions as to a survey of children's interests, the ignorances of adults, etc.

WOODHULL, J. F. "General Science,—Summary of Opinion under Revision." *School Science and Mathematics*, 14:600–602 (1914); *Educational Review*, 48:298–300 (1914).

Some unusually significant conclusions regarding children's interests, with implications regarding method. A drastic but sound arraignment of "preparatory science."

————. "Natural Method." *School and Society*, 3:64–65 (1916).

We can teach concepts only through experiences. Intimate relation of projects in physics with life. The presentation is suggestive and forceful.

————. "Project Method in the Teaching of Science." *School and Society*, 8:41–44 (1918).

What the method is and is not. The method is that of the masters of all time. It must be thoroughly acquired by teachers and used habitually by them; then we may expect results from their pupils. Sound and suggestive.

————. "Projects in Science." *Teachers College Record*, 17:31–39 (1916).

Certain problems were solved and projects done by five university professors. Three other projects are described in some detail. All were from real life and were really problems. Valuable as suggesting the compelling character of real problem-projects. The philosophy of purpose is assumed.

————. "Project of a Frozen Water-pipe." *General Science Quarterly*, 3:107 (1919).

Edited from a boy's note-book. A piece of education in a natural setting.

————. "Science Teaching by Projects." *School Science and Mathematics*, 15:225–32 (1915).

Project method is presented as research, scientific method, the method of the masters, and the method of everyday effective living. There is a considerable range of pertinent quotation. The absurdities of certain commonly used methods are rehearsed. A widely suggestive and important reading.

————. Studies of the Masters — "Lyell." *General Science Quarterly*, 3:141–46 (1919). "Scientific Orthodoxy." *General Science Quarterly*, 3:216–18 (1919). "Darwin." *General Science Quarterly*, 4:275–82 (1919).

Evidence is here adduced to prove that the method of work of certain masters of investigation is that since called project method.

WOODHULL, J. F. *Teaching of Science.* 249pp. Macmillan (1918).

Chap. XIII. Science Teaching by Projects. A sound view and a wealth of pertinent quotation. Chap. XIV. Projects in Science. Chap. XV. Natural Method.

WORKMAN, L. L. "Project in Ventilation." *General Science Quarterly,* 3:33–34 (1919).

An interesting project described.

WRIGHT, W. R. "Some Effects of Incentives on Work and Fatigue." *Psychological Review,* 13:23–24 (1906).

One of the few experimental studies bearing on the arousing of initiative. The conclusions are of prime interest in their bearing upon the problem-project method.

WRITE, R. "Socialized Recitation." *Atlantic Educational Journal,* 13:175–81 (1917).

A socialized recitation in geography.

ZIEGLER, C. W. "Laboratory Method in English Teaching." *English Journal,* 8:3 (1919).

Describes, as in a friendly interview, aspects of a new method in high school English: lengthened school day; supervised study; equipment; relations in the curriculum; content; spirit of industry; responses in educative activities beyond school requirement; aim and method in poetry; difficulties; textbooks.

COLLEGE NEWS AND DEPARTMENTAL NOTES

TRUSTEES

At a meeting of the Trustees of Teachers College on Thursday, February 19, Frank P. Graves, Ph.D., Litt.D., LL.D., dean of the School of Education of the University of Pennsylvania, was unanimously elected alumni trustee. Dean Graves will begin the customary two years of service at the next meeting of the Trustees in April.

The following new appointment to the Faculty of Education was made at the direction of the Trustees: Harold Ordway Rugg, Ph.D., to be associate professor of education, with a seat in the Faculty of Education. Dr. Rugg has been connected with the University of Chicago since 1915, first as instructor in education, then as assistant professor, and in 1918 as associate professor. He will have charge of the work in psychological measurements in The Lincoln School, with which institution he has been connected since the first of January.

The following promotions of members of the Teachers College staff were announced: Thomas Henry Briggs, Ph.D., from associate professor to professor of education; Walter H. Eddy, Ph.D., from assistant professor to associate professor of physiological chemistry; Edward S. Evenden, Ph.D., from associate in education to assistant professor of education; Arthur I. Gates, Ph.D., from instructor in psychology to assistant professor of education.

The resignation of Dr. Virgil Prettyman, for twenty-five years principal of the Horace Mann School for Boys, was accepted with regret. Dr. Prettyman's resignation will take effect June 30, 1920. As a mark of their appreciation, the Trustees granted him leave of absence from December 31, the date of his withdrawal from the School, until June 30. Dr. Prettyman has accepted a business call of an attractive nature, and the best wishes of his

associates in the College and the School go with him into his new work. The eminent success he has attained as a leader of boys, his integrity of character, his devotion to a trust, and his loyalty to his co-workers will surely make him a leader of men. The conduct of the School is now in the hands of Professor Franklin W. Johnson, formerly principal of the University of Chicago High School, now associate professor of education in Teachers College.

Leave of absence has been granted for the Winter Session of the next academic year to Professor Mary T. Whitley, and for the Spring Session to Professors Broadhurst, Nutting, Winchell, and Strayer.

The many graduates of the College in the departments of household arts will be glad to know that the Trustees have given to the Household Arts Building the name of Grace Dodge Building. That building was a gift to the College in 1909 by Miss Dodge in memory of her mother.

The Trustees sanctioned also the change of name of The Bancroft and Janus Court, the apartment houses recently acquired by purchase by the College for use as dormitories, to Bancroft Hall and Seth Low Hall, respectively.

EDUCATIONAL ADMINISTRATION

One of the greatest needs in education to-day is to secure a more intelligent public interest in the work, aims, and methods of our public schools. Realizing this, Dean Russell suggested at the recent Alumni Conferences that the College should provide training in this work. It was his opinion that the task was primarily the school administrator's, and he recommended that courses be organized to train school superintendents for it.

These courses are now being arranged in the department of educational administration where they will be given under the direct supervision of Professors Strayer, Engelhardt, and Evenden. It will be the purpose of the courses not only to acquaint students with the best publicity methods, but also to give them actual practice. The publicity campaign for Teachers College and the work of its various departments and schools will furnish the laboratory material.

"How to secure citizen coöperation through public information" was the problem which caused Professor Strayer to meet early in January with Superintendent H. S. Weet, of Rochester, N. Y.; Superintendent Henry Snyder, of Jersey City, N. J.; Superintendent Frank V. Thompson, of Boston, Mass.; Superintendent-elect R. G. Jones, of Cleveland, Ohio; Mr. W. J. Donald, secretary of the Chamber of Commerce, Buffalo, N. Y.; Mr. Harold S. Buttenheim, president and Mr. F. A. Richardson, secretary of the American City Bureau.

It was decided at this meeting that one of the necessary steps in giving publicity to facts about the public schools in the United States was to enlist the coöperation of civic and commercial organizations in cities throughout the country. Accordingly, a group of school superintendents and secretaries of chambers of commerce were invited to meet at Cleveland during the meeting of the Superintendence Section of the N. E. A. Those who attended the meeting at Cleveland represented cities of all sizes in all sections of the United States. They unanimously decided to undertake, through the coöperation of school officials and civic and commercial organizations, a publicity campaign which would present the facts about school conditions to the people of the United States. An executive committee was chosen to plan the execution of this publicity campaign. This committee consists of Dr. George D. Strayer, president, Mr. F. A. Richardson, secretary, Superintendents H. S. Weet, of Rochester, N. Y.; J. H. Beveridge, of Omaha, Neb.; R. G. Jones, of Cleveland, Ohio; Henry Snyder, of Jersey City, N. J.; Messrs. H. H. Davidson, secretary of the Chamber of Commerce, Erie, Pa.; W. J. Donald, secretary of the Chamber of Commerce, Niagara Falls, N. Y.; F. B. Pierce, secretary of the Chamber of Commerce, Bridgeport, Conn.; and E. L. McColgin, secretary of the Chamber of Commerce, Dayton, Ohio.

The executive committee met at Teachers College on March 18 and perfected plans for carrying out a nation-wide campaign through the efforts of school officials and civic and commercial organizations. Information is to be collected and published along these five lines:

1. What sort of teachers do American cities employ and how well do they reward them?

2. How well do American cities house their school children?
3. How adequately is the health of school children safeguarded?
4. How will the rising costs of education be met?
5. What is to be the future educational program in American cities?

The inquiry relative to the teacher situation is already under way, and it is expected that the information coming from this investigation will be of great assistance in educating public opinion on the work which must be done in order to get and keep good teachers.

The department has been engaged in making a school building survey and developing a school building program for the school system of Greensboro, N. C., under the direction of Professors Strayer and Engelhardt. The group of graduate students from the practicum in educational administration who were engaged in this survey include the following: P. R. Stevenson, dean and director of research, University of Omaha, Neb.; W. S. Hertzog, formerly principal of State Normal School, California, Pa.; R. G. Reynolds, of the Vermont State Education Department; F. B. Knight, formerly superintendent of schools, Danvers, Mass.; A. J. Lang, principal of elementary school, Kingston, N. Y.; J. C. Morrison, superintendent of schools, Leonia, N. J.; M. W. Longman, of the Western State Normal School, Kalamazoo, Mich.; W. W. Curfman, formerly superintendent of schools, Mulvane, Kan.

The survey party left New York January 18 and spent the following week collecting data to be put into report form and made available for an extensive publicity campaign in Greensboro before March 15.

EDUCATIONAL PSYCHOLOGY

Twelve graduate students of psychology have undertaken a mental survey of Public School 11 (Manhattan) during the current semester. The work is under the immediate direction and supervision of Miss Elizabeth Farrell and Professor Leta S. Hollingworth. Mr. Benjamin B. Greenberg, principal of Public School 11, is a former student of Teachers College.

Professor William A. McCall will be engaged during the spring and summer in the construction of a series of reading scales and in the study of public school problems in silent reading.

FINE ARTS

Miss Sallie B. Tannahill, instructor in fine arts, has been giving a series of four lectures, with lantern slides, on the subject of "Lettering in Decorative and Commercial Art" at the Metropolitan Museum of Art to high school boys and girls who are especially interested in the subject of lettering. Miss Tannahill designed and made the book which was presented to Mr. and Mrs. V. Everit Macy containing the signatures of those present at the opening of the Teachers College Country Club, in appreciation of the generosity and thoughtfulness of Mr. and Mrs. Macy. The book was presented by Professor Henry C. Pearson.

Professor Grace Cornell opened the course at the New York Public Library on The Art of the Book with a lecture on "The Principles of Design."

FOODS AND COOKERY

The department of foods and cookery is planning to issue a Teachers College Cook Book in the course of the next academic year.

The department held a conference at the College on March 23. The subject was "The Relations Between Teachers of Home Economics and Certain Phases of the Business World."

On March 24 delegates from the Community Councils of New York held a meeting regarding marketing conditions. Professor Van Arsdale spoke on "How the New York State Department of Farms and Markets Can Help the New York City Consumer," and Miss Anna Barrows gave a demonstration on potatoes.

Miss Marion E. Dickenson, instructor of the class in large quantity cookery, died very suddenly early in January. Miss Elizabeth H. Bohn is conducting the class this semester, assisted by Miss Alice Conway.

During the annual reunion and conferences of the Alumni Association the department served the household arts luncheon. About one hundred and fifty were present.

Interesting experiments are being carried on in experimental cookery in coöperation with the department of physiological chemistry. Miss Anna Colman and Miss Mary Barber, instructors in experimental cookery, are working on problems in cookery with Professor Walter H. Eddy, of the department of physiological chemistry. This coöperation indicates an interesting growth for the future of this work.

HOUSEHOLD AND INSTITUTION ADMINISTRATION

Miss Katharine A. Fisher, instructor in household arts, has completed a bulletin on school lunches for the Child Health Organization. The bulletin will be published by the Federal Bureau of Education. Miss L. Ray Balderston, instructor in household arts, has prepared a bulletin on laundering to be published by the Federal Department of Agriculture.

A recent round table conference was held for household administration students. The following students, former graduates of the department, took part in the discussion: Miss Mary Elizabeth Cooley, director of The Home Efficiency School; Miss Eleanor Wells, social service dietitian, Post Graduate Hospital, New York City; Miss Alice Boughton, director of statistical department, J. Walter Thompson Company, New York City; Miss Doris Tisdale, director of lunch room, Horace Mann School for Boys; Miss Stella Sondheim, manager of Wayside Coffee House, Richmond Hill, New York.

Mrs. Louise Nellis, M.A., 1916, has recently completed in Greenwich Village a survey of activities linked with the home. Teachers of household arts, visiting nurses, settlement workers, and others have formed a Greenwich Village Home Conference. The slogan at present is "Every Child in Greenwich Village up to Par."

A conference on problems of the industrial canteen was held recently for students in public health nursing and institution administration. Talks were given by Miss Grace Billings, director of employees' lunch room at the Federal Reserve Bank; Mrs. Pendergast, of National Cloak and Suit Company; Miss Prentice, of Lord and Taylor's.

A conference is being arranged on "Group Living" to be held at Lake Placid, May 26 to 31. Organizations coöperating in-

clude the Institution Section of the Home Economics Association; American Dietetic Association; Conference of Deans of Women; Economic Secretaries of the Y. W. C. A. Topics to be discussed include community service, coöperative buying, personnel problems of employees. There will be an important session on research, at which methods now used at the Harvard School of Business Research, Bryn Mawr, and bureaus of social and industrial research will be discussed. Professor E. H. Gunther is acting as chairman of the program committee.

HOUSEHOLD ECONOMICS

The department of household economics is being constantly called upon for advice regarding individual and family budgets of expenditure, and has started a considerable service of consultancy on problems of this sort. Such questions come not alone from persons of small income. The problem of making ends meet seems to be acute with incomes that would ordinarily be called very liberal. In some cases graduate students of the department are working with individual families, studying their expenditure problem. In other cases the matter has been presented before clubs of women or mixed groups of men and women followed by individual conferences.

Recent addresses have been made by Professor Benjamin R. Andrews before the State Conference of Extension Workers of New York State, at the State College of Agriculture, Ithaca, N. Y.; the Massachusetts Conference of Extension Workers, at Amherst, Mass.; the Women's Club, Elizabeth, N. J.; the Book Club, Edgewater, N. J.; the Homemakers Club, Hartford, Conn.; the Homemakers Association of the Oranges at East Orange, N. J. Professor Andrews has also continued an informal relationship as adviser on thrift problems with the Savings Division, United States Treasury Department, Washington, D. C., where he served as associate director during 1919 while on leave of absence from the College.

Professor Andrews has been appointed chairman of the Committee on Home Economics of the Charity Organization Society of New York for the year 1920. This committee is supervising the development of household arts in the social work field, both

in the activities of the Charity Organization Society and in the field of social work generally. The secretary of the committee is Miss Emma A. Winslow, who is director of home economics social work for the Charity Organization Society and who, as a member of the staff of Teachers College, gives courses in Homemaking Adjustments in Social Work, Field Work in Family Visiting, and Social Work in Household Arts. Under this committee several important studies have been made in the past few years in the field of budgets and homemaking and of the application of home economics to social work.

This committee, through a sub-committee of which Professor Cora M. Winchell is chairman, organized in June, 1919, a month's course in Homemaking Adjustments which was taken by twenty-five leading home economics workers from various parts of the country. This course will be offered in a more extended form in June, 1920, and Teachers College will give credit for it to those registering.

MATHEMATICS

Professor David Eugene Smith was elected president of the American Mathematical Association at its meeting during the Christmas holidays. This association is composed of more than 1200 mathematicians in this country.

Professor Smith addressed the mathematics students at Hunter College on January 9.

The department of mathematics held a round table on the occasion of the Alumni Meeting February 21; Miss E. L. Noonan, of Teachers College, was chairman. The general topic discussed was the work of the Committee on Mathematical Requirements established by the Mathematical Association of America, with addresses as follows: "The General Nature and Progress of the Work of the Committee," by Professor J. W. Young, Dartmouth College. "The Tentative Report on the Reorganization of the First Courses in Secondary School Mathematics," by Miss Vera Sanford, Berkeley Institute, Brooklyn. "The Status of the Work with Respect to Demonstrative Geometry," by Professor Smith. "The Nature of the Investigation being Carried on with Respect to Mathematics in Experimental Schools," by Mr. Raleigh Schorling, The Lincoln School.

MODERN LANGUAGES

Professor E. W. Bagster-Collins has recently been appointed to serve on the executive committees of the National Federation of Modern Language Teachers, and the Modern Language Association of the Middle States and Maryland. He is also a member of the Committee of Fifteen appointed by the National Federation to coöperate with a similar committee of the Modern Language Association for the purpose of drafting resolutions expressing the guiding principles of these two leading associations of modern language teachers.

Mr. M. A. Bach, instructor in German, is to give on March 20, a lecture before the Association for Social Service on "The Social and Cultural Background of German-Austria."

Miss Helene Harvitt, instructor in French, has obtained a fellowship awarded by the Society for American Fellowships in French Universities for 1920–1921.

RECREATIONAL LEADERSHIP

The department of scouting and recreational leadership, under the direction of Professor Elbert K. Fretwell, and in coöperation with the New York State College of Forestry, the Camp Department of the Palisades Interstate Park, and various other organizations interested in camping, is conducting, from March 8 to May 3, a series of eight meetings designed to promote camping, train camp leaders, and increase the efficient utilization of the camper's time while in camp. The meetings will be held at Teachers College. The week of March 27 will be devoted to actual camp life in the Palisades Interstate Park. Regular directors of the course will be assisted by specialists from the New York College of Forestry and others, who will lecture, lead discussions, and conduct daily instructional, recreational, and exploratory hikes in Interstate Park.

Among the special leaders taking active part in the course are Dean James E. Russell, Professor Elbert K. Fretwell, Dr. Jesse F. Williams, Mrs. Charles H. Farnsworth, Dr. George L. Meylan, and Mr. Abraham Rosenthal.

SECONDARY EDUCATION

The Speyer Junior High School is continuing as a coöperative experiment under the direction of Teachers College and the City of New York, with approximately 550 pupils, mostly boys. The school is now an annex of Public School 43, Dr. J. K. VanDenburg, principal. Professor Thomas H. Briggs, the educational adviser, holds weekly meetings with the teachers for the purpose of improving the instruction; and all activities are directed by the regular staff of the school. The homogeneous grouping of pupils, which began with the opening of the school in 1915, has proved so successful that it has spread to a number of other public schools in the city. The Otis tests have been used during the past year for the preliminary classification of pupils when they are promoted to the seventh grade; after work has progressed for several months pupils are transferred according to the ability and industry that they have manifested. The social work of the school, described by Professor Fretwell in the TEACHERS COLLEGE RECORD for September, 1919, is continued with the pupils in the school and also with the alumni, both those who are in high schools and those who have gone to work. Each group holds monthly meetings, and the entire alumni body meets twice a year to report how they are carrying out the traditions of the school. The alumni are also publishing a monthly paper, called the "Creedonian," the name suggesting the purpose of the association, the popularizing of the Speyer Creed.

Under the direction of Professors Briggs and Fretwell, the students in the department of secondary education are conducting a survey of the Boys High School of Reading, Pa. Five students assisted Dr. Briggs and Dr. Fretwell in the field work; and all of the students in Education 481–82 are participating in writing the report of the survey.

On January 29–30, Professor Briggs spoke twice before the Conference of Secondary School Principals of Maine, at Augusta. Practically all the principals of the state and a number of the superintendents were in attendance.

At the January meeting of the Secondary Club Dr. F. J. H. Paul, principal of the DeWitt Clinton High School, spoke on the work of a city cosmopolitan high school. He told with interest-

ing detail of the organization of his school, which enrolls more than 5000 pupils, and of the various means used to look after the interests of the individual boy. The club members were especially interested in the account of the General Organization, which under the direction of the faculty takes charge of the major extra-classroom activities.

At the February meeting of the Secondary Club, Professor Arthur W. Dow gave a lecture before a large and appreciative audience on "The Appreciation of Art." The lecture was illustrated by lantern slides of masterpieces, both ancient and modern.

TEXTILES AND CLOTHING

An exhibition of ready-to-wear clothing is being shown by Professor Jane Fales in the Grace Dodge Building. The clothing, which includes as nearly as possible a complete wardrobe for a college girl, is of good wearing material, simple in design, and—from the standpoint of present prices—inexpensive. Two clothing budgets are posted, one showing figures compiled in Washington, D. C., during August and September, 1919, by the Bureau of Labor Statistics for a wardrobe for a government employee; the other giving the 1920 figures in New York for the same list of articles. In addition, various garments and their prices are shown, making the budget more directly applicable to the college girl's requirements.

Copies of these budgets will be sent upon application to Professor Fales. Suggestions and discussion regarding the exhibit and the budgets are requested, in order that the work done may fulfil its purpose, which is primarily to give assistance to the college students who find it necessary to do some buying this spring.

HORACE MANN SCHOOL

Principal Henry C. Pearson, who has been in constant service both summer and winter for a number of years, had a leave of absence for the month of February, spending his vacation in the South.

Miss M. E. Carroll, teacher for the past year and a half of the class for exceptional children, has resigned to accept the position of assistant local director of the Manhattan Council of the Girl

Scouts of America. Miss M. H. Holmes, who has been acting as the primary assistant, is now teaching the class for exceptional children.

The school auditorium has been equiped with two Simplex motion picture machines, and films illustrating geography, history, science, and fairy stories have been shown. It is planned to use the school as a laboratory to test the possibilities of the motion picture for various school purposes.

The teachers of the school have conducted a course in Yonkers during the winter under the auspices of the Department of Extension Teaching of Columbia University. The course has dealt with the theory and practice of project teaching and has been under the direction of Mr. Charles W. Hunt, vice-principal of the School. After a preliminary discussion of the underlying theory, the following members of the staff gave lectures: Miss Agnes Burke, "The Reorganization of the First Grade"; Miss Mildred Batchelder, "The Materials and Objectives of the Second Grade"; Miss Marie Hennes, "The Program and Method in the Fifth Grade"; Mr. Roy W. Hatch, "The Teaching of Civics"; Miss Mary Kirchwey, "The Teaching of Composition"; Miss Caroline W. Hotchkiss, "The Teaching of Geography"; Principal Pearson. "The Teaching of Silent Reading."

TEACHERS COLLEGE COUNTRY CLUB

In June, 1919, Mr. V. Everit Macy, chairman of the Board of Trustees of Teachers College, and Mrs. Macy offered to the staff of Teachers College the grounds and buildings of the former Holbrook School at Scarsborough, N. Y., to be used as a country club. The offer included $7500 for remodeling and equipping the buildings. The generous gift was accepted, and the buildings were opened on September 1.

The club affords rest and recreation in one of the most beautiful spots in Westchester County. Its location commands an impressive view of the Hudson and of the Jersey highlands beyond. At present about twenty guests can be accommodated but there will be room for many more as other parts of the building are equipped.

The permanent officers of the club are Professor H. C. Pearson, president; Professor M. A. Nutting, vice-president; Mr. Raleigh

Schorling, secretary; Professor N. L. Engelhardt, treasurer. The chairmen of the committees are Miss Bertha E. Shapleigh, house committee, Professor E. K. Fretwell, recreation, and Mr. C. W. Hunt, membership.

THE ADMINISTRATION CLUB

The Administration Club held its first meeting of the new year on January 16 at the home of Dr. and Mrs. George D. Strayer. The meeting took the same form as those held during the fall. Five of the members of the club acted as the school board of the city of Acheron. Others present took the part of the superintendent and strenuously endeavored to persuade the school board to make certain changes in the curriculum of the public schools. The board was just as strenuously opposed to any changes; and the point was carried only after the superintendents had summoned to their command all the knowledge and experience available.

On Friday, February 13, Professor Frank M. McMurry addressed the club on "The Responsibility of the Superintendent for Quality of Instruction." Milbank Chapel was filled, and the address was followed by an hour of vigorous discussion.

A large contingent of members of the club attended the meetings of the Department of Superintendence of the N. E. A. at Cleveland, February 21 to 27. Past and present members were well represented on the program.

On Friday, March 12, the club coöperated with other student organizations in arranging a meeting to be addressed by Dr. Albert E. Winship, editor of the *Journal of Education*, which proved highly profitable.

ALUMNI ACTIVITIES

THE ENDOWMENT CAMPAIGN

Following the suggestion made by the retiring alumni trustee, Commissioner Milo B. Hillegas, a committee of Alumni was appointed at Cleveland to determine methods of participation by Teachers College graduates in the campaign for endowment.

One of the first and most important suggestions which came to members of the alumni committee was that the Alumni themselves suggest to the Trustees a larger objective than the Trustees had fixed. It was felt that while other institutions of learning are asking for ten, twelve, or fifteen million dollars endowment, Teachers College ought certainly to attempt more than three million dollars. This point is important when one realizes that approximately only fifteen per cent of the expenses of the College can be met from the endowment at present available. The committee made, therefore, as its first recommendation the suggestion that we organize and undertake a campaign for not less than six million dollars.

The committee recommended, in the second place, that the primary appeal to our alumni and graduates be for information and assistance rather than for money. Those who feel able to contribute something to the endowment fund will have the opportunity, but every former student of the College is asked to furnish helpful information about people who may be interested in contributing to a nationally important educational institution. An alumnus might, for example, report that Mr. John Smith, engaged in a certain business in his locality, is greatly interested in Boy Scout work and may possibly be persuaded to give largely to an educational institution where this type of work is emphasized. The further information might be given that Mr. Smith is a special friend of Mr. Jones, who in turn is a friend of a certain member of the Board of Trustees of Teachers College. With such information at hand, the member of the Board of Trustees might seek and obtain an introduction to Mr. Smith and possibly secure a large subscription.

It is suggested by the committee that a responsible administrative head be selected to conduct this campaign among the alumni, and that sub-heads throughout the United States be appointed by the executive in general charge. Teachers College clubs throughout the country could contribute extensively to the effectiveness of the campaign by discussing in their next meetings possible sources of revenue in their own local communities. All available information regarding men who may be interested in placing their wealth at the service of the educational profession should be obtained; such as what newspapers they read, what their favorite sports are, to what enterprises they have contributed in the past, through what sources they were brought to contribute to any of these philanthropies, to what community activities they contribute, facts which might give us a basis for deciding how to make an approach for Teachers College.

Every reader of the RECORD who has enjoyed the benefits of even one summer session at Teachers College should make this a personal matter and contribute, at once, without waiting for further invitation or urging all the *information* he can secure. Here is an opportunity for you to prove your loyalty to the College by rendering a tremendous service at very slight expense to yourself. If you have suggestions to make, write to Professor M. R. Trabue, director of the Bureau of Educational Service.

NEW OFFICERS OF THE ALUMNI ASSOCIATION

At the annual business meeting of the Alumni Council of the Teachers College Alumni Association, held Friday, February 20, the election of the following new officers of the association was announced: First vice-president, Miss Wilhelmina Spohr, professor of household arts, Teachers College; second vice-president, Mr. J. Cayce Morrison, superintendent of schools, Leonia, N. J; treasurer, Dr. M. R. Trabue, director of educational service, Teachers College; recording secretary, Miss Ethel C. Bratton, principal of elementary department, Ethical Culture School. Each of the above officers is elected for a term of two years beginning March 1, 1920, except the treasurer whose election is for a term of one year beginning March 1, 1920.

DR. GRAVES ELECTED ALUMNI TRUSTEE

At the meeting of the Trustees of Teachers College held on February 19 Dr. Frank P. Graves, dean of the School of Education, University of Pennsylvania, was elected alumni trustee for a period of two years beginning March 1. Dr. Graves succeeds Dr. Milo B. Hillegas, commissioner of education for the state of Vermont.

Dr. Graves is a graduate of Columbia University, having received the A.B. degree in 1890, the A.M. degree in 1891, and the Ph.D. degree in 1912. He also received the honorary degree of Litt.D. from Heidelberg (Ohio) University in 1897 and the LL.D. degree from Hanover College in 1897.

Dr. Graves has had wide professional experience in universities as follows: president, University of Wyoming, 1896–1898; president, University of Washington, 1898–1903; professor of history of education and acting dean (1906) of Teachers College, University of Missouri, 1904–1907; professor of history of education and dean of Summer Session, Ohio State University, 1907–1913; professor of history of education and dean of the School of Education, University of Pennsylvania, 1913——.

Dr. Graves is also the president of the Society of College Teachers of Education for the year 1920. He is the author of the following publications: *Great Educators of Three Centuries*, *History of Education in Modern Times*, *Peter Ramus and the Educational Reformation of the Sixteenth Century*, *A Student's History of Education.*

The Alumni Association and the graduates of Teachers College are very fortunate in having such an able representative on the Board of Trustees.

ANNUAL ALUMNI CONFERENCES

The Annual Reunion and Conferences of the Alumni Association of Teachers College were held at the College this year on Thursday, Friday, and Saturday, February 19–21. The first meeting was of the alumnæ of the nursing and health department, which celebrated on Thursday afternoon, February 19, its twentieth anniversary. This celebration included addresses by Dean James E. Russell, Dr. C. E. A. Winslow, of Yale University, and

Miss Lillian D. Wald, of the Henry Street Nurses' Settlement, with a report by Miss Sara Parsons, of Boston, on the "Services of the Department to Training Schools and Hospitals." This group of alumnæ continued its meetings throughout Friday and Saturday with much enthusiasm and interest.

A splendid audience was present on Friday morning at the meeting of the Administration and College Teachers of Education Section. The discussion in this meeting was opened by Superintendent Fred. M. Hunter, of Oakland, Calif., and Superintendent Frank V. Thompson, of Boston, Mass., and dealt with the degree to which classroom teachers might be allowed to participate in the administration of public school systems. There seemed to be general agreement that teachers should be allowed a considerable voice in school affairs, but the different types of machinery for putting these policies into effect varied quite widely.

The Secondary Education Section, on Friday afternoon, was of special interest on account of the emphasis placed by the different speakers on the idea that the training of a high school principal should be very definitely and distinctly for that particular job. The idea of training a man for general school administration and then placing him, as a school superintendent if he does first class work, as a high school principal if his work is second rate, and as an elementary school principal if his ability seems to be third rate, appears to have been pretty thoroughly discarded, at least by the secondary school administrators.

The first general alumni conference, held on Friday afternoon, preceding Dean Russell's reception to the alumni, was addressed by Professor Frederick G. Bonser on "The New Status of Practical Arts Subjects in the Problem of Education" and by Professor Paul Monroe on "Review and Prospect in the School of Education." An unusually large number of the alumni was present to enjoy this excellent program.

The Horace Mann Auditorium was filled Friday evening for the second general alumni meeting. The program for this meeting had been arranged by the Lower Primary Education Section and the Rural Education Section. Professor E. L. Thorndike gave a very interesting talk on the "Measurement of the Intellect of Children from 4 to 8 Years of Age," illustrated with samples of

the group tests now available for use with children and illiterate adults. President George H. Vincent, of the Rockefeller Foundation, then gave in his usual, brilliant style an address on "Public Health in Rural Communities."

The Saturday morning sectional conferences were very well attended and very much worth while. More than usual interest was shown in the combined meeting of the Elementary Education and Lower Primary Education Sections. Mr. Robert E. Wolf, a consulting engineer of national reputation in the industrial world, spoke on "Control and Consent—A Discussion of Instruction, Initiative, and Individualism in Industry." Professor Bonser followed with a splendid paper showing the implications of these experiments in industry to the problems of elementary education. Professor Frank M. McMurry closed the formal part of the program with a much needed discussion of "A Teaching Technique Adjusted to the Project Method."

Following the sectional luncheons at noon on Saturday, the third general alumni conference was held in the Horace Mann Auditorium, before a thoroughly loyal but unfortunately small group of the alumni. The president, Miss Roxanna A. Steele, reviewed the work of the Association for the year and called attention to the increased possibilities of alumni activities resulting from the establishment of the Bureau of Educational Service. The retiring alumni trustee, Commissioner Milo B. Hillegas, and Dean Russell each spoke of the critical situation in which Teachers College now finds itself. Dean Russell emphasized the opportunity of the College for increased service to the profession in the years to come, while Professor Hillegas put special emphasis upon the unusual opportunity which is at hand for the Teachers College Alumni to repay the institution for some of the benefits they have derived from it. He suggested that although the members of the Teachers College alumni body might not be in financial circumstances which would enable them to contribute money to the institution in any large degree, it was, nevertheless, possible for them to furnish information and assistance to the Trustees in the discovery of sources from which large financial contributions might be obtained. It is hoped by members of the executive committee that every alumnus will contribute such information and assistance at once.

ANNUAL TEACHERS COLLEGE FESTIVAL

An unusual amount of interest was aroused this year by the Teachers College Festival, which was held on Thursday and Saturday evenings, February 19 and 21, during the week of the Alumni Conferences. This was the seventh year of the Festival, the fame of which seems to have spread far beyond the limits of Teachers College and its alumni. All tickets were sold and standing room was at a premium for a week before the first performance.

"The Spirit of the East" was a very appropriate title for the performance this year, which opened with three episodes of the East, gotten up and produced by some of our own foreign students in native costume, with accompanying Oriental music. These three pictures—a bit of home life from Japan, a Hindu wedding ceremony from India, and a symbolic pantomime of China (Old and New)—were an interesting contrast to the imaginative interpretation of the Orient by our native American students which followed. This part of the program consisted of a romantic pantomime, full of color and movement, with symbolic dancing and interpretative music to add atmosphere.

The usual academic procession of the seniors was this year for the first time led by the "College Spirit." Miss Marion Knighton, of the physical education department, represented "College Spirit," having been chosen for this office by popular vote. Another feature of the program this year was a series of contests at the very beginning of the performance, which brought in some new elements of undergraduate rivalry and merrymaking. The freshmen carried away the honors in this part of the program. Refreshments were served and merrymaking by both participants and audience began immediately after the Grand Finale.

A large measure of the success of this year's performance must be credited to Miss Belle Northrup, instructor in fine arts, under whose direction both students and faculty coöperated for the success of the festival.

TEACHERS COLLEGE DINNER IN CLEVELAND

At the Teachers College dinner, held on the evening of February 24 at the Statler Hotel in Cleveland during the meeting of the Department of Superintendence of the National Education Asso-

ciation, seven hundred and fifty Teachers College alumni were present. The big dining-hall was overtaxed, and many loyal Teachers College folk had to be accommodated in adjoining rooms. When the dinner had ended and the tables had been removed, all who could crowd into the dining-hall did so, while the rest flocked to the balcony to enjoy the program.

From the center of the long table on the dais, Dr. Charles B. Keyes, president of the Skidmore School of Arts, seventy years young and primed for the occasion, conscripted the speakers at either side of him with rare cleverness.

"White Hope" Jesse B. Newlon, superintendent of schools, Lincoln, Neb., told how the spirit of Teachers College had enabled him so to impress his people in Lincoln with the gravity of educational conditions that they had even anticipated state legislation in order to pay teachers a living wage.

Miss Mary Pennell, primary supervisor of schools in Kansas City, reviewed wittily the principles which Teachers College alumni carry with them into the educational field. Her remarks were followed by one of the most brilliant mixtures of satire and seriousness that has ever emanated from a Teachers College banquet table. Superintendent Geoffrey F. Morgan, of Athens, Ohio, in a spirit of exquisite drollery held a curved mirror before the College faculty, to the uproarious delight of the alumni. Suddenly he turned upon the alumni body and issued a challenge so vital and impressive that every heart was imbued with new courage and deeper resolution.

Commissioner Milo B. Hillegas, of Vermont, retiring alumni trustee, made a farewell address in which he appealed to the loyalty of every alumnus to uphold the principles and work of Teachers College. Dean Russell followed with a review of the financial and educational situation in which Teachers College finds itself. His description of the unselfish devotion of members of the faculty to the interests of the college and the profession brought to the heart of every alumnus present the resolve to work as never before for the success of education as a profession and particularly of Teachers College as a source of professional training.

Greetings were exchanged with the University of Chicago Alumni who were holding their annual dinner at the same time

and in the same hotel. Professor Otis W. Caldwell acted as representative of Teachers College, while Professor Frank N. Freeman was the representative of the University of Chicago.

Professor E. K. Fretwell led in a series of cheers and songs which interspersed the courses and addresses, and seasoned both with a spirit of youth and devotion. The alumni unanimously pledged their moral and financial support to their professional alma mater in this crucial moment. Devotion to education and dedication to service were the keynotes of the program; and never have the alumni of Teachers College gone back to their work with a higher resolve or happier memories.

TOLEDO TEACHERS COLLEGE CLUB

On Saturday, February 28, sixty members of the Toledo branch of the Teachers College Alumni Association gave a dinner at the Woman's Building. Dean James E. Russell was the speaker of the evening. Other guests of honor were Mrs. James E. Russell, Professor and Mrs. Charles Russell, Dr. and Mrs. W. B. Guitteau, and Dr. George Johnson. Short after-dinner talks were given by Professor Russell, Dr. A. M. Stowe, and Professor D. W. Henry, of Toledo University.

The places were marked by effective dinner cards, the work of Miss Mary McKinnon, a former student of Teachers College.

DR. OBRIEN'S STUDY OF HIGH SCHOOL FAILURES

A study of the failures of high school pupils, a recent dissertation by Dr. Francis P. OBrien published by the Bureau of Publications as No. 102 of the Teachers College Contributions to Education, traces the records of more than 6,000 students from the time they enter high school to the time they either drop out or graduate. The pupils studied were found in the classes of eight different high schools of New Jersey and New York. Only public, coeducational schools with complete cumulative records were selected for the study.

The facts recorded were studied in considerable detail regarding the failures in academic and commercial subjects as they pertained to time, number, age, subjects, graduation, repetition

and remedies, and they are reported separately for boys and girls, under the chapter headings: How extensive are the failures? What basis is discoverable for a prognosis of failure? How much is graduation or continuance in school conditioned by the occurrence of failures or by their numbers? Are the school agencies employed in remedying the failures adequate for the purpose? Do the failures represent a lack of capability or fitness on the part of the failing pupils? There is also a final chapter in which the author suggests some of the probable educational implications of the facts disclosed, but it is less an integral part of the study than an attempt to give more of meaning and interpretation to the statistical facts, especially for the type of reader who is so often confused or repelled by tables of cold statistics.

In the whole study there is no statistical feature employed that is more difficult than distribution tables and simple percentages. The initial chapter states the purpose of the study, the meaning of the term 'failure', the sources and extent of the data employed, and the classifications or arbitrary decisions made for the handling of the data. Each chapter is followed by its own concise summary. This feature is intended to relieve the oft-repeated criticism that the average teacher finds research studies of little direct value because they are too technical or involved to make much of an appeal to any but the student of research.

Some very interesting and significant disclosures are made in this study, for Dr. OBrien finds that the percentages of the graduating and of the non-graduating pupils who have failed one or more times are almost identical; and that of the failing and the non-failing pupils, the same percentage of each finally graduates. According to the records of the schools studied, the non-failing students drop out much earlier than do those of the failing group. Even as the number of failures per pupil increases, his chances of graduating are not impaired, and the extension of time required by him is slight. The younger pupils at entrance are distinctly more successful than those older in years. Certain subjects are found to be especially fruitful of failures. It is made evident that much valuable time is wasted in the great number of subject repetitions. It is found that the percentages of failure by semesters do not show a decrease with the longer time period in school, but the reverse is found for the semesters

up to the seventh. Thus by their own official records the schools appear to have been put more on the defensive than have the pupils who have failed.

RECENT ALUMNI APPOINTMENTS

The following recent appointments are announced by the Bureau of Educational Service of Teachers College.

ARBOGAST, GERTRUDE, instructor in domestic art, University of Wisconsin, Madison, Wis.

ARMENTROUT, W. D., principal of Junior High School, Lawrence, Kan.

AYER, GLENNA, instructor in domestic science, Atlantic City Vocational School, N. J.

AVERY, EDNA I., associate professor of household arts, Washington State College, Pullman, Wash.

BARBER, GENEVIEVE, instructor in physical education, Community School, Short Hills, N. J.

BEECHER, EMILY S., supervisor of industrial arts, public schools, Seattle, Wash.

BELTING, PAUL E., assistant professor of secondary education, University of Illinois, Urbana, Ill.

BENNETT, BERTHA, head of department of physical education, State Manual Training Normal, Pittsburgh, Kan.

BENNETT, IDA M., assistant supervisor of practice, State Normal School, Trenton, N. J.

BENNETT, VIRGINIA C., instructor in physical education, The Lincoln School, New York City.

BRINTON, GRACE, instructor in domestic science, Bradley Polytechnic Institute, Peoria, Ill.

BROMLEY, ANNA O., instructor in psychology, State Normal School, Trenton, N. J.

BUCK, BEATRICE, instructor in physical education, Summit School, St. Paul, Minn.

BUSSE, FLORENCE, head of foods department, Iowa Agriculture College, Ames, Iowa.

BEECH, MARY L., instructor in English, High School, Lakewood, N. J.

CAMPBELL, BLANCHE, elementary supervisor, public schools, Atlanta, Ga.

CAMPBELL, HARRIET, critic in Junior High School, Sam Houston Normal Institute, Huntsville, Tex.

CHAPLIN, EUNICE, instructor in domestic science, High School, Durham, N. C.

CHAPLIN, ARDENIA, instructor in domestic art, College of Industrial Arts, Denton, Tex.

CHAPPELL, CLEO, head of geography department, State Normal School, Trenton, N. J.

CLEAVER, W. G., instructor in educational psychology and pedagogy, State Normal School, East Stroudsburg, Pa.

COOK, SHERMAN R., superintendent of machine shops, Robert College, Constantinople, Turkey.

CONDHEY, LUCIUS, head of manual training department, High School, Dover, Del.

CRAIG, GERALD, instructor in mathematics and science, Oak Lane Country Day School, Philadelphia, Pa.

CRANE, EDITH ADELAIDE, in charge of an orphanage, Armenian-Syrian Relief, Turkey.

CRANOR, KATHERINE, professor of home economics, James Millikin University, Decatur, Ill.

CUMMINS, ROBERT, director of teacher-training, State Normal School, Natchitoches, La.

CURRIER, MILDRED, instructor in physical education, State Normal School, Natchitoches, La.

DALGLIESH ALICE, first grade teacher, The Lymann School, Ardmore, Pa.

DAVIS, MARY D., supervisor of kindergarten and primary grades, Public Schools, Duluth, Minn.

DAVIS, SHELDON E., president of State Normal School, Dillon, Mont.

DEMAREST, IRVING C., head of Latin department, Westport High School, Kansas City, Mo.

DEVER, MARY M., instructor in physical education, University of Washington, Seattle, Wash.

DOUGAL, MARGARET, P., instructor in French, High School, Bridgeport, Conn.

ELLIOTT, RUTH M., instructor in fine arts, High School, San Antonio, Tex.

EARHART, LIDA B., professor of elementary education, University of Nebraska, Lincoln, Neb.

FAULKNER, ELIZABETH, assistant professor of English, University of Kansas, Lawrence, Kan.

GIFFORD, WALTER J., head of department of education, State Normal School, Harrisonburg, Va.

GRAY, ANNIE B., instructor in industrial arts, private school, Scranton, Pa.

HAINES, EDNA E., supervisor of kindergarten training, West Texas State Normal School, Canyon, Tex.

HAMILTON, F. R., president of Marshall College, Huntington, W. Va.

HANCKEL, MARION S., kindergarten-primary supervisor, Public Schools, Richmond, Va.

HAROUNIAN, FRANK J., instructor in French and Spanish, Western Military Academy, Alton, Ill.

HARRIS, MAUDE L., instructor in English, State Normal School, Salem, Mass.

HARRISON, FLORENCE, director of home economics, State College, Pullman, Wash.

HERSHEY, EDYTHE, extension work in domestic science, University of Texas, Austin, Tex.

HOLDEN, BERTHA, state extension staff, University of Vermont, Burlington, Vt.

HOTCHKISS, E. A., director of training school, Colorado State Teachers College, Greeley, Col.

HUBBARD, JULIA M., supervising critic, State Normal School, Winona, Minn.

INKS, EDITH, instructor in mathematics, Arsenal Technical High School, Indianapolis, Ind.

JAMES, LORETTA, head of department of domestic science, State Normal School, Trenton, N. J.

KERN, FRANCES, supervisor of kindergarten and primary department, State Normal School, Willimantic, Conn.

LA GANKE, FLORENCE M., director of home economics, public schools, Oakland, Cal.

LANGNER, HENRIETTA M., instructor in home furnishing, North Carolina College for Women, Greensboro, N. C.

LAWTON, WILHELMENIA, instructor in household arts, State College, Pa.

MCNALLY, FRANCES M., instructor in home economics, Normal School, Stratford, Ontario, Canada.

MCGUIRE, GRACE A., instructor in domestic science, State Normal School, Harrisonburg, Va.

MCNEAL, WYLLE B., state supervisor of home economics education, St. Paul, Minn.

MEDLAR, REBA M., instructor in French, High School, Yonkers, N. Y.

MESEROLL, SARAH, supervisor of kindergarten and elementary grades, public schools, Cortland, N. Y.

MILLER, NORMA M., instructor in household management, St. Andrews Priory School, Honolulu, T. H.

NAYLOR, JANE, supervisor of primary grades, public schools, Harford County, Md.

O'NEALE, LILA M., assistant professor of domestic art, State Agricultural College, Corvallis, Ore.

O'NEILL, HAROLD H., instructor in French, Montgomery School, Wynnewood, Pa.

OSLER, FLORENCE, manager of tea room, Los Angeles, Cal.

POTTER, SARAH E., director of dormitory and cafeteria, Bradley Polytechnic Institute, Peoria, Ill.

RAYNOR, ANNE W., head of modern language department, Trinity University, Waxahachie, Tex.

REIGART, CATHERINE M., instructor in English, American College for Women, Constantinople, Turkey.

ROBINSON, WILLIAM M., principal of village school, Orleans, Vt.

ROBSON, HELEN, instructor in domestic art, State College, Pullman, Wash.

SALE, ANNIE E., instructor and manager of practice house, Industrial Institute and College, Columbus, Miss.

SALE, SARAH F., instructor and manager of practice house, Industrial Institute and College, Columbus, Miss.

SAUNDERS, AGNES, instructor in home economics, State Normal Manual Training School, Pittsburgh, Kan.

SAXMAN, ETHEL, instructor in physical education, State Normal School, Springfield, Mo.

SEALOCK, W. C., head of department of history of education, University of Nebraska, Lincoln, Neb.

SIMMONS, NELLIA A., instructor in home economics, Indiana University, Bloomington, Ind.

SMITH, ELVIRA T., instructor in domestic art, Drexel Institute, Philadelphia, Pa.

THOMPSON, ALTA, grade teacher, Lenox School, New York City.

TUTTLE, MARGARET, instructor in physical education, State Normal, Mankato, Minn.

WOODY, WALTER T., assistant professor of history of education, University of Pennsylvania, Philadelphia, Pa.

WILSON, SARAH M., instructor in home economics, State Normal School, Harrisonburg, Va.