

PAPERS ON SCHOOL ISSUES OF THE DAY. XV.

SUPPLEMENTAL REPORT

—TO THE—

REPORT OF THE SPECIAL COMMITTEE ON PEDAGOGICAL AND PSYCHOLOGICAL OBSERVATION.

—BY—

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PRESENTED TO THE NATIONAL EDUCATIONAL ASSOCIATION, AT
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C. W. BARDEEN, PUBLISHER.

1890.

The Song Budget Music Series.

1. *The Song Budget.* A collection of Songs and Music for Educational Gatherings. By E. V. DEGRAFF. Paper, small 4to, pp. 76. 15 cts.

This book owes its popularity to two causes: (1) It gives a great deal for the money. (2) The songs are not only numerous (107), but they are the standard favorites of the last fifty years.

This is why the book contains more music *that will be used* than any other book published. For in most books two-thirds of the tunes are written by the compilers, who are of course partial to their own productions. The success of this book is due to the fact that only those songs were admitted that have proved to be universal favorites, and the result is a school singing-book of popularity unexampled. For instance, a single firm in Cleveland, Ohio, had purchased of us up to Nov. 1, 1890, no less than 15,250 copies, besides 2,000 of the *School Room Chorus*, and 3,100 of the *Century*.

2. *The School Room Chorus.* A collection of Two Hundred Songs for Public and Private Schools, compiled by E. V. DEGRAFF. Boards, small 4to, pp. 148. 35 cts.

This is an enlarged edition of the *Song Budget*, with twice the number of songs. The plates of the last edition are so arranged that it is identical with the *School Budget* as far as page 68, so that both books can be used together.

3. *The Song Century.* Small 4to, pp. 87. Paper, 15 cts. Boards, 25 cts.

The popularity of the *Song Budget* made it no easy task to prepare a similar collection to follow it in the schools where its songs had become familiar. The songs here given are a fine choice from more than a thousand which had been selected from every available source, but especially from actual and pleasing use in the school-room.

though the book contains more pages than the *Song Budget*, the price is the same. Within six months from its first appearance 14,600 copies had been sold, and now the orders nearly equal those for the *Budget*.

C. W. BARDEEN, Publisher, Syracuse, N. Y.



SUPPLEMENTAL REPORT

TO THE

REPORT OF THE SPECIAL COMMITTEE ON PEDAGOGICAL AND PSYCHOLOGICAL OBSERVATION.

(Presented to the National Educational Association, at St. Paul, Minn., July, 1890.)

The undersigned agrees to the foregoing report, but would like to add a recommendation to the Association to the effect that there shall be prepared annually a report giving an outline of the educational progress made in psychological and pedagogical observation of the year just ended, which shall be read at some general session of the National Educational Association. Such a record, it is believed, will be of service in aiding teachers to conduct reading along this line.

He presents herewith also a brief outline of important points brought out in a book published the past year by Dr. Mary Putnam Jacobi, entitled "Physiological Notes on Primary Education and the Study of Language."*

There are many considerations that entitle this book to a high place among the educational treatises of the century. There is a growing conviction that natural science, and especially training in what are called scientific methods of investigation, should occupy a larger portion of the school programs, and that the language studies at present are allotted more time and attention than their importance deserves. Besides this, the claims of a psychology founded on physiology are pressed on the attention of teachers and school supervisors with increasing emphasis. As a consequence, there is observable a tendency to question the utility of existing educational methods, and a widespread distrust of the traditional course of study. Mrs. Jacobi's book sets out with the conviction first named, and is noteworthy as a faithful and painstaking record of observations made on the progress of a child educated strictly according to the proposed scientific method. But the audacity of the experiments it describes does not command our attention so much as the strict logical consequence with which it pushes to its legitimate result the new physiological doctrine of mental operations and applies it to the question of language-study.

*Physiological Notes on Primary Education and the Study of Language. By Mary Putnam Jacobi, M. D. New York and London : G. P. Putnam's Sons, The Knickerbocker Press. 1889.

The first two essays of the book deal with the details of the author's experiment on a young child (her daughter?) with a view to inducing from the first a scientific cast of mind. In her own words (p. 37): "The mental education of even a very young child may be imbued with the scientific methods, and even ideas which should furnish suitable preparation for advanced scientific studies"; and she adds: "It cannot be a matter of indifference that such habits of mind are acquired from the beginning, or only after much previous faulty training."

For this purpose a cultivation of the habit of mathematical accuracy is the first requisite. The technical terms and definitions of geometry were accordingly taught the child in its fourth and fifth years. It learned to analyze and describe all the forms that it saw around it in the world with accuracy, using such words as equilateral, isosceles, right-angled and scalene, trapezium, trapezoid, pentagon, hexagon, semi-circle, ovum, ovoid, etc. "She did not merely know the names of these things, but to her eye the whole perceptible universe arranged itself spontaneously into these fundamental forms" (p. 12). At the age of five and a half years, ideas of geometric necessity began to be taught.

The next step after this training in accuracy was the study of cosmical phenomena, such as the rainbow, the points of the compass, sunrise and sunset, and experiments with the ruler, spirit level, pulley, wedge, and balance, care being taken to teach the metric system of weights and measures.

Next followed the notion of perspective and the art of drawing, and after this the study of geographical maps, and relief globes.

In learning the technical terms above mentioned the child was taught the meaning of the syllables *gon*, *hedron*, *tri*, *tetra*, *penta*, *hexa*, etc., and of course learned to count. It is difficult therefore to understand what is meant by the statement on page 27, that arithmetic was begun several months after the first studies of form and outline, inasmuch as geometric figures cannot be described or even distinguished one from another without the mental capacity to recognize number. Of course only elementary operations of arithmetic are required in defining the figures, but the highest operations, such as deal with ratio and the squaring of numbers, are demanded before the completion of the first book of geometry. The science of geometry aims first to find a statement of the fundamental relation of spacial form in terms of number, and it accomplishes this in the famous Pythagorean proposition, which gives the ratio of the sides of the simplest form of the triangle (the right-angled) in terms of the second power. After this, geometry has nothing to do except to explain all other figures by the triangle and measure them.

The child studied the growth of some beans planted in cotton-wool, describing a catastrophe in the biology of one of them in the following language: "The episperm on the under surface is all black, and has split, leaving a space the shape of an equilateral triangle with the apex pointing to the convex edge of the cotyledons" (p. 33).

At the age of five and one-half years the child was taught to read, but it seems that it had learned the alphabet some time before in the kindergarten (at four years of age), "where she taught herself by incessantly copying the letters, until she was familiar with them" (pp. 35, 13).

We are surprised at this early mastery of the arts of reading and writing, the child being "allowed to follow her own inclination" in the matter; for the author speaks strongly of the "glaring crudity of the educational methods which persist in beginning mental training with a forced drill in these complex processes of gymnastics," referring to the pathological discoveries made by studying the brain-lesions connected with aphasia and writer's cramp, which "have revealed a hitherto unsuspected complexity in the muscular movements involved in writing, and of mental processes necessary to language." The knowledge of this complexity of brain structure seems to have led her *a priori* to the conclusion that the school should not begin with teaching reading and writing. But the school usually does this for children only in their seventh, eighth, or ninth year; while Mrs. Jacobi's child mastered these complex movements and brain processes in her fifth and sixth years without any outside suggestion.

These notes regarding early scientific training cease when the child attains the age of six and one-half years.

Now follows the more remarkable part of the book, the part treating of the place for the study of language. There is, however, a chapter by way of appendix to the first part, in which Mrs. Jacobi answers (and I think successfully) the strictures made by Miss Youmans on the course adopted in the child's study of plants—the flower being preferred to the leaf for first analysis by the former, while Miss Youmans thinks the leaf should be the first study on the ground of the educational maxim, so often juggled with, that the simple should come before the complex, leaving out of mind apparently another maxim (still oftener misunderstood), that intellectual education should be begun by vivid sense-impressions. This latter maxim justifies Mrs. Jacobi's method of procedure. "It is unphilosophical to study the flower containing the corolla just merely because it is more showy," says Miss Youmans. But the showiness of it strongly appeals to the senses and therefore especially fits it for first study.

This language essay seems to have been written some years later than the essay on the science-experiment, and its value consists in the circumstance that its author has followed out in the meantime to their logical conclusion the physiological premises which had been misinterpreted by other observers, and at first even by Mrs. Jacobi herself.

I must pause here to commend the noble spirit of the author, who is interested solely in setting down an accurate record of her experiments and inferences, and is not swayed by any false pride to prefer the appearance of self-consistency to a true statement of all the actual details of the growth of her present convictions.

She undertakes to discuss the problems of language-study—whether it exercises a different effect upon mental development from the study of physical science, or mathematics, or history; whether the modern or the classic languages are best, also the amount of such study, the best period for it, and the devices or methods to be followed.

Starting with the proposition that language is “the highest physiological acquisition that distinguishes the human race from the lower animals,” the author proceeds to consider the recent theories of brain action in local centers, and, comparing the number of centers involved in the use of language, comes to infer “That to learn the name of a thing and to learn how to use this name involves much more mental action than is required simply to acquire sense-perceptions about it” (p. 73). This is inferred from the structure of the nervous tissue of the brain, “composed of an immense quantity of microscopic cells, traversed by delicate fibers, connected with each other by fine fiber-like prolongations of their own substance.” She sums up the physiological discussion thus: “The acquisition of foreign languages in addition to the native tongue multiplies the number of verbal signs which the mind habitually couples with visible impressions.” More brain-cells and more of the interconnecting filaments are brought into action. Hence, by learning foreign languages, “Impressions are immensely multiplied and the mind becomes accustomed to take cognizance of such subtle differentiations that its delicacy of perception is indefinitely increased. The capacity to appreciate subtle distinctions, more subtle than those in existing nature outside of the mind, is essential to scientific work” (p. 83).

Here is stated the surprising result that language-study is necessary in order to train the mind for truly scientific observation. Mathematical processes she finds to be less fitted for scientific preparation, for good physiological reasons: “The more concrete and sensuous character of verbal signs is associated with an incalculable multiplicity and qualitative variety of interrelation; hence they bring the mind much nearer to the infinite variety of nature than does mathematics” (p. 85).

Considering the two parts of physical science—1st, the acquisition of sense-impressions; 2d, the classification of these and the discovery of their laws—the author points out that the second step corresponds to the mental activity that reacts upon its sense-impressions, generates words, and thus creates language. “Words are the first products of the action of the mind upon nature, as science is the latest and most complex expression of the same action. Thus language is the earliest and most perfect type of science.”

To this unexpected but incontestable conclusion, Mrs. Jacobi has been led by a more careful scrutiny of the logical inferences to be drawn from the data of physiological psychology. She next proceeds to weigh the respective values of the three parts of language-study, to wit: of words, of grammar, and of literature.

The capacity to use words of general or abstract meaning is essential to all

thought about our perceptions, and "essential also to all perceptions themselves if they are beyond the simplest and most obvious; far the larger part of what the mind perceives is what the mind brings to the object from its previous store of knowledge and reflection. Every word is a condensed generalization of experiences or of observations." This is a profound and altogether important principle, and the entire question of language-study hinges on it.

Grammar study is shown to be a still "higher training in the mental processes involved in scientific study, . . . for it calls into play more prominently the concept centers of the brain, as compared with the sensory centers; and it emphasizes the excitation of the connecting fibers of the brain rather than that of the ganglion cell-areas which they connect" (p. 92).

Literature is still more important as preparatory training for scientific observation. Literature mirrors the thought and life of mankind. "In words and grammar are already found outlined and reflected the history and philosophy of European nations" (p. 93).

The functional grouping of brain regions must be changed in the process of acquiring a new language. This causes a consciousness of difference of point of view. "The physical basis of this consciousness is the space occupied by the nerve-fibers of the brain, which propagate vibrations from one convolution to another. When an English-speaking person projects his consciousness into the form of language-construction peculiar either to Latin or Greek, he seems to traverse a much wider space than if he simply pass from English to French, or even to German. The reärrangement of direction for the intracerebral propagation of vibrations or excitations must therefore be more extensive for the ancient languages than for the modern. Hence the mental development or stimulus derived must be much greater."

Another physiological suggestion might be added to those of Mrs. Jacobi. The inheritance of culture from the Greeks and the Romans has certainly had its effect on our Teutonic brain-cells and interlacing fibers, so far as to express the results of those civilizations. Now to study their language and literature is to excite into activity other brain-cells and filaments, which are so connected with the former that they facilitate their action, inasmuch as they were the original cells and fibers out of which grew in a normal manner the derivative cells expressing the logical conclusions and results of the primitive views of the world formed by those people. For we are told (p. 103) that "Any kind of knowledge is only thoroughly grasped and digested when all parts of the brain tissue impressed by it vibrate easily and harmoniously upon its suggestion."

If this be so, it follows that the brain-cells that stand for original acquisition should "vibrate" together with the brain-cells and fibers that stand for systems of theory and rules of practice built up from those original acquisitions as a foundation. Hence whatever a nation presupposes as the origin of its culture should belong to its education as an object of study. It will aid its comprehension of its own methods of thought and practice, and we suppose

the physiological equivalent of this to be "easier and more harmonious vibration of the brain tissue."

"The construction of the Latin language as a whole compels the translation of the modern mind into a form of consciousness sufficiently remote from its own to necessitate a great change in the general synthesis of cerebral activity. The same is true of Greek" (p. 116).

The study of Latin and Greek is in fact the study of the embryology of our civilization, and necessary for gaining an insight into our modes of thought and forms of social action, political and legal usages. "Language, which alone perfectly expresses all internal thought," says the author in concluding her treatise, "also mirrors all external things that have ever been impressed on the mind of man." Hence the inference which is stated at the beginning of her essay, that the physical sciences failed to develop until after the renaissance of classical learning, for the reason that "the human brain could not advance in analysis of the external world until it had been disciplined and developed in its internal activity by training in language."

For those who are looking for the Messiah of psychology in education, here at least is a psychological John the Baptist, of far more significance to education than all that has hitherto proceeded from the school of Wundt, Meynert, Hitzig, Exner, Ferrier, and the professors of La Salpêtrière. We may safely say this, because Mrs. Jacobi alone has had the enterprise to fully elaborate the physiological influences, and lead them up to the ethical and spiritual influences heretofore recognized.

W. T. HARRIS.

School Issues of the Day.

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 The 15 Numbers will be sent to any address on receipt of \$1.50, or bound in half leather for \$2.00.

Nos. 1 to 7 were read at the meeting of the National Association in 1889, and Nos. 9 to 15 at the meeting of the National Association in 1890. No. 8 was read at the meeting of School Commissioners and Superintendents in New York City, 1888.

C. W. BARDEEN, Publisher, Syracuse, N. Y.

School Records and Reports.

1. *The Bulletin Class Register*. Designed by EDWARD SMITH, Superintendent of Schools, Syracuse, N. Y. Press-board cover. *Three Sizes*, (a) 6x7, for terms of twenty weeks; (b) 5x7, for terms of fourteen weeks. When not otherwise specified this size is always sent. Pp. 48. Each 25 cts. (c), like (b) but with one-half more (72) pages. Each 35 cts.

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3. *Ryan's School Record*, 112 blanks to a sheet, per dozen sheets, 50 cts.

4. *Keller's Monthly Report Card*, to be returned with signature of parent or guardian, card-board $2\frac{1}{2} \times 4$, per hundred, \$1.00.

5. *Babcock's Excelsior Grading Blanks*, manilla, 3x5, with blanks on both sides. Comprising (a) Report Cards; (b) Grade Certificates for each of 9 grades; (c) High School Certificate (double size). Price of (a) and (b) \$1.00 a hundred; of (c) \$1.50 a hundred.

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They save time by avoiding the drudgery of Record keeping and Reports. They abolish all notions of "partiality" by determining the pupil's standing with mathematical precision.

They naturally and invariably awaken a lively paternal interest, for the pupil takes home with him the witness of his daily conduct and progress.

They are neat in design, printed in bright colors. The Certificates are prizes which children will cherish. The Single Merits and Half Merits are printed on heavy card board, the Cards and Checks on heavy paper, and both may be used many times—hence the system is cheap, as well as more attractive than any other to young children.

9. *Mottos for the School-Room*. By A. W. Edson, State Agent of Massachusetts. Per set of 12 on heavy colored card-board 7x4 inches, printed on both sides, \$1.00, post-paid, \$1.10.

These mottos are "Never too Late," "Above all, be Useful," "Dare to Say No," "God Bless our School," "Avoid Anger," "Be Good, Do Good," "Think, Speak, Act the Truth," "Fear to Do Wrong," "Misspent Time is Lost Forever," "Speak the Truth," "Act Well Your Part," "Strive to Excel," "Try, Try Again," "Be Diligent, Prompt, and Useful," "Think Good Thoughts," "Learn to Study," "Before Pleasure Comes Duty," "Think First of Others," "Dare to Do Right," "Order is Heaven's First Law," "A Will Makes a Way," "Study to Learn," "Hold Fast to Honor," "God Sees Me."

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C. W. BARDEEN, Publisher, Syracuse, N. Y.



—THE SCHOOL BULLETIN PUBLICATIONS.—

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No feature of the school-room is of more vital importance to the health of scholars and teachers than the Blackboard. If it be gray or greasy the amount of chalk used fills the air with dust which produces catarrhal and bronchial difficulties, and yet makes so faint a mark that the children's eyes are permanently injured. Choice should be made among the following materials.

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But it is better to put either upon the plastered wall, or upon the wall covered with manilla paper, or upon wooden boards, one of the following preparations.

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3. *Slate Pencil Slating.* This remarkable preparation does away altogether with chalk-dust, having sufficient grit to take a distinct mark from a slate-pencil. *Soft crayon should never be used upon it, unless it is first rubbed down to smoother surface.* It is a pure alcohol slating, and therefore durable. Price per gallon, covering 600 ft., one coat, \$10.00; quarts, \$2.75; pints \$1.50.

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