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PESTALOZZIAN FORMALISM

DEGENERATE OBJECT-TEACHING; SIMPLE TO COMPLEX

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In the last two volumes of the *Elementary School Teacher*, a number of articles appeared which were intended to illustrate a method of teaching the history of education by emphasizing school practice in its relation to social conditions. This is the seventh article in this series. A textbook entitled *A History of Modern Elementary Education*, constructed on this principle, by the same author will appear in the near future.

In the history of educational changes, it is not uncommon to find that a reform which has been initiated as a protest against the formalism of words, of teaching devices, and of excessive routine, often degenerates very rapidly into the same kind of formalism that called forth the protest. This degeneration is well illustrated by the developments in Pestalozzian object-teaching, which became as pernicious in some of its aspects as it was beneficial in others. The tendency to formalism was also inherent in another phase of Pestalozzian reforms, namely in the application of the principle of proceeding from the simple to the complex in the teaching of all subjects. It is the purpose of this paper to discuss these two forms of Pestalozzian formalism. The discussion has a practical bearing on many present practices in elementary schools, practices which are essentially Pestalozzian in character and to a certain extent in origin.

Pestalozzi realized the danger of formalism.—Pestalozzi realized clearly the danger of degeneration into formalism and said:

I know too well how it will be; this poor husk, which is but the mere outward form of my method, will appear to be its real substance to a great number of men, who will endeavor to introduce this form into the narrow circle of their own ideas, and will judge of the value of the method according to the effects it produces in this strange association. I cannot prevent the forms of my method from having the same fate as all other forms, which inevitably perish in the hands of men who are neither desirous nor capable of grasping their spirit.

Herbert Spencer described Pestalozzian formalism in England.—One of the best accounts of Pestalozzian formalism versus the Pestalozzian spirit is found in the second chapter of the work by Herbert Spencer (1820–1903) on *Education*, published in 1861. Spencer's chapter contains an exposition of English Pestalozzianism which, as we noticed in an earlier article, tended toward this formal type. Spencer rejected the particular forms while approving strongly of the fundamental principles. He said:

While, therefore, we would defend in its entire extent the general doctrine which Pestalozzi inaugurated, we think great evil likely to result from an uncritical reception of his specific devices. That tendency which mankind constantly exhibit to canonize the forms and practices along with which any great truth has been bequeathed to them—their liability to prostrate their intellects before the prophet and swear by his every word—their proneness to mistake the clothing of the idea for the idea itself renders it needful to insist strongly upon the distinction between the fundamental principles of the Pestalozzian system, and the set of expedients derived for its practice.

This Pestalozzian formalism can be discussed to advantage under two main heads: (1) degenerate object-teaching, and (2) extreme and false applications of the theory of proceeding from the simple to the complex.

Degenerate object-teaching. *Pestalozzi recommended memorizing words.*—Strange as it may seem, Pestalozzi recommended and carried out in his school the practice of having children memorize lists of words. Herbart, von Raumer, and other visitors to Pestalozzi's schools commented on this anomaly. Lists of nouns and adjectives were made up from the dictionary by the teacher and memorized by the children. Pestalozzi said:

These lists of words are placed in the hands of the child, merely as exercises in learning to read, immediately after he has gone through his spelling-book; and experience has shown me that it is possible to make the children so thor-

oughly acquainted with these lists of words that they shall be able to repeat them from memory, merely in the time that is required to perfect them in reading; the gain of what at this age is so complete a knowledge of lists of names, so various and comprehensive, is immeasurable in facilitating the subsequent instruction of children.

This memorized material included such phrases as "slippery, wormshaped, thick-skinned eel," "crawling, amphibious animals," "long-tailed monkeys," etc. In geography the children memorized long alphabetical lists of the names of German towns before studying their locations on the map. Many other examples of such absurd practices could be cited which were utterly inconsistent with the theory of basing all instruction on sense perception which Pestalozzi emphasized as his most important principle.

English books of object-lessons became manuals for memorizing.—It was in England that Pestalozzian verbal formalism was most influential in actual practice, resulting in what Spencer called "the well-conceived but ill-conducted system of *object-lessons*." In an earlier article it was pointed out that one reason why Pestalozzian methods took such a strong hold on English schools was because of the early preparation of a textbook, *Lessons on Objects*, by Elizabeth Mayo (1793–1865) and her brother. This textbook was published in 1830 and was very successful. By 1855 it had reached the fourteenth edition, a copy of which I have examined. It was a veritable little encyclopedia of the arts and sciences. The lessons were arranged in five series. The first series contained simple lists of qualities, for example, in the case of leather, it was stated that it was flexible, odorous, waterproof, tough, smooth, durable, opaque. The second series gave parts of complicated objects as well as qualities; the third series included non-sensory qualities such as *valuable*, and such classifications as *artificial* and *natural*; the fourth series continued the classifications and proceeded to discover analogies between physical and moral or spiritual qualities; the fifth series provided exercises for composition, containing lessons on various chemical substances, on solubility, on the five senses, etc. Finally there was a vocabulary of words beginning with *aromatic*, *adhesive*, *affinity*, and ending with *vitriifiable*, *volatile*, *unctuous*. All of this, according to the title-page, was intended for children from six to eight years of age.

The motive of the Mayos in preparing this text was to provide a method of object-teaching that was not limited by the dearth of suitable objects in the schoolroom, or by the uncertainties of excursions. They realized clearly the danger of the books being used in unprofitable ways. Thus in the Preface it was stated that—

Those who fall into a mechanical way of giving such instruction, and do not perceive the principle involved, completely defeat its intention, and they had far better keep to old plans and old books.

Miss Mayo intended that the facts should be discovered by the children by an actual examination of the objects, the teacher giving new names where necessary. After advising against too much telling by the teacher she said:

The writer desires particularly to enforce this remark, having in one or two instances seen the lessons entirely misused. The qualities were told, and the explanation of the terms given, instead of the object being presented to the children that they might make their own observations upon it, and learn from the teacher how to express qualities clearly discovered by them, though unknown by name.

Dickens satirized formal memorizing of Mayo books.—The practice which Miss Mayo said she had seen “in one or two instances” was really very common and led to the following classic satire on these methods by Charles Dickens in his story entitled *Hard Times*.

Mr. Gradgrind, the town magnate and school patron, is present in the model school of his own creation, where Mr. McChoakumchild surcharges the youthful Coke-townners with grim facts. After a preliminary address to the teachers in this vein—

“Now what I want is facts. Teach these boys and girls nothing but facts. Facts alone are wanted in life. Plant nothing else, and root out everything else. You can only form the mind of reasoning animals upon facts; nothing else ever will be of any service to them. This is the principle upon which I bring up my own children, and this is the principle upon which I bring up these children. Stick to facts, Sir!”

Having thus relieved himself, that his self-love may be gratified by witnessing the triumphs of his own educational scheming, he calls out, by an appropriate management and catechizing, its distinctive features.

Sissy Jupe, Girl No. 20, the daughter of a strolling circus actor, whose life, no small share of it, has been passed under the canvas; whose knowledge of horse, generic and specific, extends back as far as memory reaches; familiar

with the form and food, the powers and habits and everything relating to the horse; knowing it through several senses; Sissy Jupe has been asked to define horse. Astonished at hearing her father stigmatized as a veterinary surgeon, a farrier, and horse-breaker; bewildered by the striking want of resemblance between the horse of her own conceptions and the prescribed formula that represents the animal in the books of the Home and Colonial Society, she dares not trust herself with the confusing description, and shrinks from it in silence and alarm.

"Girl No. 20 unable to define a horse," said Mr. Gradgrind.

Girl No. 20 is declared possessed of no facts in reference to one of the commonest of animals, and appeal is made to one red-eyed Bitzer, who knows horse practically only as he has seen a picture of a horse or as he has, perhaps, sometimes safely weathered the perils of a crowded street-crossing.

"Bitzer," (said Thomas Gradgrind,) "your definition of a horse!" "Quadruped. Graminivorous. Forty teeth, namely: twenty-four grinders, four eye teeth, and twelve incisive. Sheds coat in the Spring; in marshy countries sheds hoofs too. Hoofs hard, but requiring to be shod with iron. Age known by marks in mouth." Thus (and much more) Bitzer.

"Now Girl No. 20," said Mr. Gradgrind, "you know what a horse is."

The methods of the Home and Colonial Infant School Society, mentioned by Dickens, were copied at Oswego, New York, and encountered considerable criticism of a similar sort. Many of the papers on object-teaching published during this period (1860), contain comments on the tendency of teachers to have children merely memorize facts about objects instead of providing real experiences with them.

Proceeding from simple to complex. Favored by Spencer.—The second large group of formalized Pestalozzian practices resulted from the extreme application of the principle that in the process of instruction the teacher should proceed from the simple to the complex. The validity of this principle will be discussed later in this section. It is open to a variety of interpretations. Thus Herbert Spencer states it as the first of the Pestalozzian principles which he would "defend in its entire extent" but rejects the practices which Pestalozzi described for its application. Spencer defended the principle in these words:

That in education we should proceed from the simple to the complex is a truth which has always been to some extent acted upon; not professedly, indeed, nor by any means consistently. The mind grows. Like all things that grow it progresses from the homogeneous to the heterogeneous; and

a normal training system being an objective counterpart of this subjective process, must exhibit the like progression. Moreover, regarding it from this point of view we may see that this formula has much wider applications than at first appears. For its *rationale* involves not only that we should proceed from the simple to the combined in the teaching of each branch of knowledge, but that we should do the like with knowledge as a whole.

Pestalozzi desired to mechanize instruction.—With Pestalozzi this principle was bound up with his desire to mechanize instruction. Describing his work in the second school in which he taught at Burgdorf (1799), Pestalozzi said:

I once more began crying my ABC from morning to night. . . . I was indefatigable in putting syllables together and arranging them in a graduated series; I did the same for numbers; I filled whole notebooks with them; I sought by every means to simplify the elements of reading and arithmetic, and by grouping them psychologically, enable the child to pass easily and surely from the first step to the second, from the second to the third, and so on. The pupils no longer drew letters on their slates, but lines, curves, angles, and squares.

Shortly after this, when Pestalozzi was explaining his experiments to a visiting French-Swiss official, the latter said, "I see, you want to mechanize instruction." "He had hit the nail on the head," said Pestalozzi, "and supplied me with the very word I wanted to express my aim and the means I employed."

Later, Pestalozzi said that he meant that he desired to psychologize instruction; but the fact remains that what he really did was to reduce much of instruction to a mechanical routine by application of the principle of proceeding from the simple to the complex.

Would organize an alphabet of every subject.—In one of Pestalozzi's last publications, *The Song of the Swan*, he said:

I now came to consider the idea of elementary education from the point of view of means of instruction. From its very nature, it demands the general simplification of its means, which simplification was the starting-point of all the educational labors of my life. At first I desired nothing else, but merely sought to render the ordinary means of instruction for the people as simple as to permit of their being employed in every family. And so in every branch of popular knowledge or talent, I set to work to organize a graduated series of exercises, the starting-point of which was within everybody's comprehension, and the unbroken action of which always exercising the child's powers without exhausting them, resulted in a continuous easy and attractive progress, in which knowledge and the application of knowledge were always intimately connected.

Pestalozzi said that these graduated series of exercises would make teaching so easy that "schools would gradually almost cease to be necessary, so far as the first elements are concerned."

Thorough mastery of each step required.—Closely connected with the practice of using a minutely graduated series in each subject was the emphasis on the mastery of each step or element before proceeding to the next. This notion of thoroughness was another factor in establishing mechanized routine among the Pestalozzians.

The influence of these principles in the teaching of special subjects in the elementary schools was very great, particularly in the case of reading, arithmetic, drawing, writing, and form study.

From simple to complex in teaching reading.—In the teaching of reading the influence of Pestalozzi was to fix and stereotype the synthetic method of beginning with long drills on the letters, then proceeding to syllables, to words, phrases, etc. The first steps in this alphabet-syllable-spelling method of teaching reading, Pestalozzi described in these words:

The spelling-book must contain the entire range of sounds of which the language consists, and portions of it should be repeated daily in every family. . . . No one imagines to what a degree the attention of infants is aroused by the repetition of such simple sounds as *ba, ba, ba, da, da, da, ma, ma, ma, la, la, la*, etc.

The spelling-book contained all the possible combinations of vowels and consonants for such drill. After these had been mastered, words were to be learned by spelling them. As was the case in Salzman's school, Pestalozzi provided large movable letters to be inserted in a frame by the teacher as a means of class instruction. These methods were copied in the Prussian schools which were described in Professor Stowe's report to the Ohio legislature in 1839. After telling how the children were drilled on the elementary sounds of letters and syllables till they were mastered, Stowe said:

They were now prepared to commence reading. The letters are printed in large form on square cards; the class stands up before a sort of rack, the teacher places one upon the rack . . . [and says], What letter is that? [Pupils answer] *H*. He places another. What letter is that? *A*. I now move these two letters together, thus: *HA*. What sound do these letters signify? *Ha*. [And so on adding a letter at a time, the teacher proceeded until he had formed *hard, hard fist, hard fisted, hardfistedness*.]

In the next higher grade the reading proceeded as follows according to Mr. Stowe:

The sentence is first gone through with in the class, by distinctly spelling each word as it occurs; then by pronouncing each word distinctly without spelling it; a third time by pronouncing the words and mentioning the punctuation points as they occur [and so on until the sentence is finally read with expression]. Thus one thing is taken at a time, and pupils must become thorough in each as it occurs, before they proceed to the next.

In the Oswego schools, similar synthetic methods were used but with special emphasis on the phonic values instead of the names of the letters.

Study of form, drawing and writing.—Applying the general principle of reducing each subject to its elements, Pestalozzi maintained that the elements of drawing and writing are lines and geometrical figures of various sorts and that long drill in these elements as arranged in his “alphabet of form” should be the first step in instruction. These practices were copied in England and America.

The elements of form with which the children were to be made acquainted occupied sixty pages in N. A. Calkins’ *Primary Object Lessons* (1861), one of the best of the numerous books on object-teaching published in America at about the time of the Oswego movement. This included instruction about corners, sides, straight and curved lines, plane and curved surfaces, right, acute and obtuse angles, equilateral and right-angled triangles, perpendicular, horizontal, and parallel lines, the square, rhomb, and parallelogram, pyramids, prisms, cubes, circles, semicircles, circumferences, arcs, center, radius, diameter, cylinders, cones, spheres, hemispheres, and ovals. Calkins’ book was largely an imitation of Miss Mayo’s which included in addition to the above the tetrahedron, octahedron, pentagonal dodecahedron, icosahedron, rhombic dodecahedron. All of this was to be taught in infant or primary schools and was partly correlated with the teaching of drawing.

The teaching of drawing was to begin with the making of these geometrical figures, starting with various kinds of lines, etc. Spencer, while defending the principle of proceeding from the simple

to the complex, said that he wholly disapproved of this "formal discipline in making straight lines and compound lines." A drawing-book constructed on these principles he denounced as "the most vicious in principle" which he had seen.

Writing was taught in connection with drawing in the Pestalozzian methods. The letters were analyzed into straight, curved, and slanting lines, into acute and obtuse angles, etc., and drill given on these before proceeding to write letters, words, and phrases.

Thorough mastery of elements in arithmetic. Grube method.—In an earlier article improvements in the teaching of arithmetic by applying the Pestalozzian principle of sense perception were discussed in connection with Warren Colburn's *Arithmetic*, published in Boston, in 1821. The Pestalozzian principle of reducing each subject to its elements and requiring thorough mastery of each element before taking up the next was also very influential as applied to the teaching of arithmetic. This application was emphasized by a German, Grube (1816–84), in a work published in 1842. Grube was not original in his system of teaching arithmetic. He copied a number of Pestalozzi's characteristics, notably the sense-perception basis, as well as ideas from other sources. The essential characteristic for our present purposes and the one by which the system is most commonly known is the practice of considering each number as an individual, and mastering all the possible operations with it, namely, addition, subtraction, multiplication, and division before taking up the next number. This differs radically from the common practice of first teaching counting, sometimes clear up into the millions, then addition of all numbers, then subtraction of all numbers, then multiplication and division. In as much as Grube began with the number one, which was mastered, before proceeding to number two, and so on up to ten, counting was definitely eliminated. The first year was to be spent on the numbers from one to ten in order, and the first three years on the numbers up to one hundred.

Grube method popularized in America, 1870.—One of the chief influences in popularizing the Grube method in the United States was an essay describing it, read by Mr. L. Soldan before the St. Louis Teacher's Association in 1870. According to its author

this essay was "republished extensively in state and city school reports and educational magazines . . . from California (see San Francisco Report of 1872) to New Hampshire (see State Report of 1876)." A larger treatment of the subject was contained in *Grube's Method of Teaching Arithmetic*, by Levy Seeley, published in New York, in 1888. According to Professor Smith,

it thus became . . . almost the only German "method" known in America. Thus it has come about that Grube has been looked upon as a name to conjure by, and neither the faults nor the virtues (much less the originality) of the system seem to have been well considered.

Grube method unnecessarily thorough.—The Grube method has been severely criticized by the two leading American writers on the theory of teaching arithmetic. Professor D. E. Smith says:

To know all there is about a number before advancing to the next one is as unnecessary as it is illogical, as impossible as it is uninteresting. . . . [Two of] the chief defects of the system are these: 1. It carries objective illustration to an extreme, studying numbers by the aid of objects for three years, until 100 is reached. 2. It attempts to master each number before taking up the next, as if it were a matter of importance to know the factors of 51 before the child knows anything of 75, or as if it were possible to keep children studying 4 when the majority know something of 8 before they enter school.

Professor John Dewey, the other prominent critic of the Grube method, says:

It seems absurd, or even worse than absurd, to insist on thoroughness, on perfect number concepts, at a time when perfection is impossible. . . . If the child knows 3, if he has an intelligent working conception of 3, he can proceed in a few lessons to the number 10, and will have all higher numbers within comparatively easy reach.

Criticism of proceeding from simple to complex.—Pestalozzi thought he was psychologizing instruction by having the teacher analyze each subject into a graduated series of elements which were to be learned by the pupil in order. He thought that the work of the educator should be analytic and that of the learner synthetic. This implied that the natural process of learning which he was trying to discover, consisted in building up complex wholes from elements which could not be further analyzed.

Pestalozzian theory held by English associationists.—This theory of the way in which we learn was not unique with Pestalozzi.

Many psychologists have believed it. Prominent among these were the whole English school of "associationists" and Herbart, the German follower of Pestalozzi. The subject is too involved to be discussed here in a clear and satisfactory manner, but a little must be said to suggest the recent criticisms of Pestalozzi's fundamental principle. Reference has been made several times to Spencer's discussion of this theory. What he believed is not perfectly clear, but certainly, one of his most important contentions would be rejected by many modern psychologists as being just the opposite of the truth. I refer to his statement that—

Manifestly decomposable states of consciousness cannot exist before the states of consciousness out of which they are composed . . . [thus] no articulate sound is cognizable until the inarticulate sounds which go to make it up have been learned.

It was on this theory that Pestalozzi said that the mother should address the infant with *ba, ba, ba, da, da, da*, etc., before she tried to teach him to recognize whole words like "bottle," "mother," etc.

William James rejected associationist theory of learning.—The best criticism of this theory occurs in William James's chapter on "Discrimination and Comparison" in his *Principles of Psychology*. In direct opposition to Spencer's point he says that the child's experience instead of beginning with nicely separated elements is

one big, blooming, buzzing confusion. That confusion is the baby's universe; and the universe of all of us is still to a great extent such a confusion, potentially resolvable, and demanding to be resolved, but not yet actually resolved into parts. . . .

Experience from the very first presents us with concreted objects vaguely continuous with the rest of the world which envelops them in space and time, and potentially divisible into inward elements and parts. These objects we break asunder and reunite.

Analysis by the learner prominent in ordinary learning.—As a rule in the ordinary process of learning, the individual things with which we become acquainted are complex wholes; we recognize, identify, and remember them without completely analyzing them, and may never analyze them unless some practical necessity requires it. Thus in the case of the so-called taste of coffee or

onions, this necessity usually does not arise, and as a consequence we do not ordinarily know how much of the so-called "taste" is really taste and how much is odor. Or to take the example that Spencer suggests, as a matter of fact, the child recognizes spoken words as wholes long before he has gotten separately acquainted with the articulate elements which compose these words. In the same way the child recognizes visual wholes (doors, windows, etc.), long before he has gotten acquainted with the various kinds of lines, angles, and shades of color which are fused in the total experience.

In mastering any new situation or material, for example, in becoming familiar with a strange city, or in solving a geometry exercise, or in studying pictures to determine their artistic qualities, the following process takes place. The mind begins by apprehending the situation as a vague, unanalyzed whole; proceeds by comparison or selective attention to break this whole up into its parts (as far as necessary for the practical purpose of the moment); and then reconstructs (synthetizes) these parts into an organized whole in which the relation of the parts is more or less clearly perceived.

Partly as a consequence of this change in psychological theory, the Pestalozzian methods of teaching reading and drawing by proceeding from simplified elements to complex wholes have been rejected in many places, and methods substituted which are more in harmony with the theory of the psychology of learning maintained by James and his followers.