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BY
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MADISON
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I.

What constitutes the significance of a thinker? Does it consist alone in the truths which he creates and hands on to posterity as a fixed and unchangeable inheritance? Or, does it rest as well in his capacity to stimulate his followers to advance into promised lands where he himself can plant no seed and consequently reap no harvests? Perhaps as science becomes less static and dogmatic we incline to recognize a man's importance more and more in terms of the problems which he sets for others to solve and less as regards his definite and tangible contribution to the fund of human knowledge. Hume in metaphysics is, of course, an illustration of this latter type. His destructive analysis of the metaphysical presuppositions of his day forced a right-about-face in theories of knowledge and a new attempt to describe the nature of the human understanding.

So, too, Herbart in his psychology. Herbart's ideas bear much the same relation to the concept of mind as do Hume's impressions of memory to an external world. Educational theory after the advent of Pestalozzi was synthesizing a mixture of philosophical conceptions. The human understanding which Kant reconstructed was a much more formidable and complex affair than that which Hume destroyed. But this in turn became identified with an organizing and self-developing will. This conception of the mind as a self-revealing entity harmonized well with Rousseau's doctrine of ripening instincts and capacities. And, consequently, in the writings of the Pestalozzians and, later, the Froebelians, we have clearly enunciated theories of inner development, and the business of the educator conceived to be more or less exclusively, as Pestalozzi puts it, that of assisting "the child's nature in the effort which it makes for its own development".

When Herbart and his followers challenged this conception of the mind and its faculties and attempted to substitute for it ideas and apperceptive masses of ideas, we had not so

much a concrete and permanent contribution to psychology as a confrontation of views supplying a basis for genuine experimental study of the nature of the mind. Such, at least, seems to have been its fruitful results.

In the 90's the conflict between the Pestalozzians and the Herbartians centered particularly upon the issue of formal discipline. The Herbartians, conscious that right makes might, appealed their case to the people and the controversy spread from technical monograph and books, from classroom and laboratory, from teachers' convention and professional magazine, to the great public forum of periodical literature.

I have made considerable effort to find a discussion of formal discipline prior to 1890. *Pool's Index* from 1887-1891 evidently contains nothing bearing upon formal discipline. The general heading, "Education," suffices to group all magazine articles from 1891-1900, but in 1902 the *Index* introduces a separate heading, "Discipline," to accommodate the stream of articles which was soon to become a veritable torrent. Indeed, if one wishes to inform himself upon the subject of formal discipline he will find even histories of education published prior to 1895 unable to satisfy his curiosity. He must wait either for histories written by the Herbartians or for histories written in the heat of the controversy over formal discipline.

When he reads these, however, he learns that John Locke furnished the philosophical basis for formal discipline. Now, the fact that John Locke who died in 1704 should formulate an educational theory which, despite his immediate and powerful influence upon the thought of his day, becomes articulate only in the nineteenth century, and comes to a focus mainly in the discussion of the last decade of that century, is sufficiently interesting to warrant an investigation.

II.

But first, what is the theory of formal discipline? Monroe's *Encyclopedia of Education* states the theory as follows:

> This expression has been used to indicate the general reaction upon the abilities of a student that is by many supposed to spring from the method of their study rather than from the content which is learned. We may distinguish, in the first place, between the information and the discipline that we may derive from the sub-

ject; and again between the specific discipline, or increased power of dealing with similar material, and the general discipline or increased ability to deal with any sort of material, the treatment of which involves somewhat the same general powers of the mind. Although formal discipline, a discipline derived from the form of the study rather than from its content, may be said to include both specific and general results, it is in connection with the latter especially that educational controversy has arisen.

Undoubtedly the strongest support that the idea of formal discipline has received in the past has come from the practically universal belief in certain abstract mental powers or faculties. . . . . The belief in these various faculties does not of necessity carry with it the conception that they may be generally improved by exercise in specific directions. However, when emphasis is placed on the form of activity, and when it is assumed that all activities of a certain form depend upon a special inner power that exerts itself equally in connection with whatsoever material, any observed increase in its efficiency in dealing with this or that content will be naturally expected to appear when attention is directed to other content.[1]

Very frequently we find opponents of formal discipline condemning a formalist because he conceives the mind as a unity. Thus Ruediger complains:

Roark assumes a mind with a homogeneous unity something like that of a carpenter's tool, say a hatchet. The variety of the uses to which a hatchet can be put corresponds to the variety of the functions of the mind, and as the whole of the hatchet is always acting in any situation, so the whole of the mind is always acting. Improving such a homogeneous object for one function would naturally improve it about equally for all functions. But it is evident to the merest tyro in psychology, that the localization of function in the brain precludes any such unity of the mind.[2]

The literature bearing upon formal discipline reveals in the minds of the opposition, at least, a progressive clarification of issues. When in 1893 the translators of W. Rein's *Outlines of Pedagogics* used the expression "formal education," they believed it necessary to add an explanatory footnote. Rein had said:

[1] Paul Monroe, *A Cyclopedia of Education* (4 vol., New York, 1911), II, 642-644.

[2] Wm. C. Ruediger, *Principles of Education* (New York, 1909), 92-93. Recent discussions of the integrated activity of the nervous system would doubtless shake our "tyro's" assurance. Localization of function is by no means as generally accepted as it was ten years ago. The discussion centering about Spearman's two-factor theory indicates that psychologists are about ready to give a rehearing to the whole problem of the relation between the specific and the general functions of the cortex.

The fiction of "formal education" must be given up. In general there is no such education at all; there exist simply as many kinds of formal education as there are essentially different spheres of intellectual employment.[3]

Thereupon the translators enlighten the reader with a definition of "formal education."

"Formal education" or "formal culture" signifies about the same as the vague expression "discipline of the mind." Its extreme defendants claim that the pursuit of classic studies renders the intellect capable in any sphere whatever, i. e., it develops all the mental faculties.

The writers who rallied about Hinsdale after his assault upon formal discipline in the N. E. A. convention of 1894 very soon defined the term so clearly that benevolent neutrality became impossible. Thorndike, in his first edition of *Psychology*, puts the theory thus:

The mind is regarded as a machine of which the different faculties are parts. Experiences being thrown in at one end, perception perceives them, discrimination tells them apart, memory retains them, and so on. By training, the machine is made to work more quickly, efficiently, and economically with all sorts of experiences.[4]

And with the appearance of O'Shea's *Education as Adjustment*, in 1903, further attempts at a definition of formal discipline were superfluous.

According to this conception mind is so constituted that it can take any item of experience and use it for full value on every occasion without regard to the time, place, circumstances, or conditions under which it was gained. Mind receives impressions and makes such use and disposition of them as it may at any time will to do. It is not limited in present or future action to what it has done in the past; special exercise begets general power; good reasoning in cube root will give skill in reasoning in everything. Mind is self-contained, self-regulated, acting according to principles of its own without regard to the environments in which it is born or bred as it were. It can take particular experiences and use them in a general way in all kinds of situations.[5]

An examination of these definitions reveals the fact that formal discipline embodies several distinct conceptions. In the first place it holds to *faculties* of the mind,—to faculties of

[3] W. Rein, Trans. by C. C. and Ida Van Liew (London, 1893), 42.

[4] E. L. Thorndike, *Psychology* (New York, 1903), 87. Thorndike quotes from eight or more writers to substantiate his statements, but of these only three at best can be classed as psychologists and it is debatable to what degree the quotations, when restored to their context, illustrate his definition. In the quotation from Roark, if one emphasizes the word *rightly* in the statement, "rightly strengthening the memory necessitates the developing and training of the other powers" (and so throughout the quotation), he realizes how essentially ambiguous is the quotation rather than its formal character.

[5] M. V. O'Shea, *Education as Adjustment* (New York, 1903), 72-73.

perception, memory, reasoning and the like. In this respect there seem to be two classes of formalists,—if we can trust the statements of their opponents. The one views the faculties of the mind as entities or agents, after the manner of the mediaeval faculty psychology. Thorndike seems to have these in mind in his reference to the faculties as parts of a machine. And again we have the storage battery conception of the mind—a unity which functions in various ways—the whole draining into the parts and the parts into the whole. Ruediger's statement above illustrates this, and it is the conception singled out for attack by Hinsdale in his epoch making article in the *Educational Review*.[6] Secondly, formal discipline evidently contends that transfer of training is the supreme characteristic in learning. Our critics vary somewhat in their testimony as regards the extent to which formalists believe in transfer. Monroe states that formal disciplinarians unite "on the one point . . . . that a particular activity or experience especially of an intellectual character, if well selected, produces a power or ability out of all proportion to the expenditure of energy therein."[7] But in the heat of controversy this becomes too conservative a position to oppose, and it is said the formalists advocate complete and equal transfer.[8] Thirdly, the formal disciplinarians are accused of being concerned more with the method of learning than with materials of education; although at times we hear them severely condemned because they advocate some one exclusive material for educational training, such as science, or the classics.

III.

Since the appearance of Monroe's *Text Book in Education* in 1905 the preponderance of opinion holds John Locke responsible for a formulation of the theory of formal discipline. Graves, for example, speaks of Locke as "the first writer to advocate the doctrine of 'formal discipline.' "[9]

[6] B. A. Hinsdale, "The Dogma of Formal Discipline," *Educational Review*, VIII (1894), 128-142.

[7] Paul Monroe, *A Brief Course in the History of Education* (New York, 1907), 255.

[8] See O'Shea above. Also S. P. Duggan, *A Student's Text in the History of Education* (New York, 1916), 183-4.

[9] F. P. Graves, *History of Education During the Middle Ages and Transition*, (New York, 1914), 309.

Historians point to the formal character of the English public schools as indicating in part, at least, Locke's influence. Both Graves and Monroe admit that Locke was unsuccessful in his attack upon the public school curriculum but they both insist his influence tended to perpetuate disciplinary methods of teaching,[10] and, writes Monroe, "the subsequent emphasis which these schools laid upon the importance of physical and moral discipline, through games and sports and out-of-door life in general, with all the training which came from the struggle for leadership among boys thrown almost entirely upon their own responsibility for government and the regulation of their relations among themselves, was due to a considerable extent to the influence of Locke's *Thoughts*.[11]

Now, if actual training in leadership characterizes the discipline of the English schools whose main business it is to educate future leaders of English society, it would seem that the meaning of the word discipline is decidedly different in this connection from that usually ascribed to it by formal disciplinarians. Moreover, since both Graves and Monroe admit that, long before Locke wrote, the public schools had acquired the characteristics which even today distinguish them, it is at best an arbitrary procedure—out of the many possible factors influencing the situation—to select John Locke as the prime cause in determining either the prevailing mode of physical and moral education or the character of the schools in general.

How then shall we determine the nature of Locke's influence? One method, obviously, is to examine his writings and seek to reconstruct his philosophy, as free as possible from pre-conceived theories. This I wish to attempt in a subsequent study. A second method is to trace as well as we can the influence of Locke upon educational theory and practice. Educational institutions originating and developing contemporaneously with Locke and assuming their fundamental structure in the period of his dominance over thought might very well serve this purpose.

Such are the academies. While the English Academies date from the Protectorate the immediate stimulus for their development was the persecution of the Non-Conformists in the

[10] *Ibid.*, 172, 259.

[11] Paul Monroe, *A Text Book in the History of Education* (New York, 1905), 523-4.

reign of Charles II. With the exclusion of Non-Conformists from the public schools and universities "a high sense of duty to their fellow-sectarians, then, moved these ministers to offer the best substitute they could provide for the instruction of the higher schools."[12] The provisions of the Act of Uniformity and the Five Mile Act, says Brown "were only partially relaxed by the Toleration Act of 1689, and it was an uncertain, half-outlawed existence which was led by the schools of the ejected ministers." Nevertheless they continued and multiplied. Brown states we have information of more than thirty of these institutions which were opened in England prior to the American Revolution. "They are associated with the names of eminent men, some of them the very saints of English nonconformity, and others among the foremost churchmen of the time." From England the academies spread to America and rapidly became a determining influence in shaping the character of both secondary and higher educational institutions in the United States.

Now Locke seems to have exerted a profound effect upon the Academy. Brown writes:

> Aside from theological doctrine, the real intellectual stimulus of the eighteenth century academies seems to have come largely from John Locke and Sir Isaac Newton; and while the thought of these master minds oftenest reached the schools through the writings of Watts and other popularizers, there are other instances in which we find the original masterpieces freely studied in the academies. The deeply religious character of both Locke and Newton, and the fact that, though churchmen, they were both earnest advocates of toleration, commended them to the men concerned with the building up of academies; and the wide intellectual hospitality which they themselves displayed and their success in enlarging the range of human thought and knowledge, appealed to academy men on the side of their intellectual tastes. So the influence of these two friends is found back of the academy movement in successive stages of its progress.[13]

In his *Sketch of an English School,* prepared as a suggestive course of study for the Philadelphia Academy opened in 1751, Benjamin Franklin includes Locke among the authors to be read in the sixth class. Other influences besides that of Locke undoubtedly led to the adoption of a catholic curriculum, but Locke's spirit approved the wide course of study characteristic of the academies. Although they retained Greek, Hebrew, and

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[12] E. E. Brown, *The Making of Our Middle Schools* (New York, 1910), 162.

[13] Brown, *Middle Schools,* 166. See Chapters VIII-XI for account of the academies in England and the United States.

Latin (which were distinctly professional studies) the academies added natural philosophy, mathematics, geography, anatomy, shorthand, etc. Today we should condemn the work as superficially broad, but the aim at least was to furnish the understanding with ideas.

Isaac Watts, who attended Rowe's Academy from 1690 to 1694, was the most influential medium through whom Locke's theories were given practical application. Watts' *Improvement of the Mind* was written to serve much the same function as Locke's *Conduct of the Understanding.* It was designed to aid one in the management of the mind. We find in it the same practical suggestions as we do in the *Conduct* but it is better adapted for academy students; and it was a textbook in the academies for over a century.[14] It makes no claim to originality and it quite frankly popularizes and gives detailed application to the ideas of Locke. Consequently, an examination of the book may shed light upon the question, Was Locke interpreted by his immediate followers as a formalist in educational theory and practice?

Now we do find Watts occasionally referring to faculties and he deals specifically with the training of the powers of Observation, Memory, Attention, etc. It becomes important, therefore, to determine in what sense the term *faculty* is used. Do Watts and Locke conceive faculty in either of the two senses indicated above?

We have but to refer to the well-known section six in the chapter on Power in Locke's *Essay* as proof of the fact that Locke himself expressly warns people not to confuse faculties with the "notion of so many distinct agents within us."[15] And whether Locke and Watts believe in faculties in the second sense depends somewhat upon our interpretation of what is meant by mind as a "unit." Indeed, we cannot read many anti-formalists before we discover what appears to be a con-

[14] The edition used in connection with this paper was that of 1833, edited by "Joseph Emerson, Principal of the Female Seminary, Wethersfield, Conn.," published in Boston by Jenks, Palmer and Co.

[15] The first sentence of the *Conduct of Understanding* reads: "The last resort a man has recourse to, in the conduct of himself, is his understanding; for though we distinguish the faculties of the mind, and give the supreme command to the will, as to an agent, yet the truth is, the man who is the agent, determines himself to this or that voluntary action, upon some precedent knowledge, or appearance of knowledge in the understanding."

fusion as regards this issue. We have already witnessed Ruediger's summary dismissal of unity of mind on the ground that it conflicts with the theory of localization of function. On the other hand, Duggan, whose loyalty to anti-formalism is above suspicion, attacks formal discipline with the weapon of unity of function.

> Psychology no longer holds that the mind is made up of a number of faculties, but that it functions as a unit, sometimes as thinking, sometimes as feeling, sometimes as doing, and that any mental experience, such as the study of a school subject, develops the whole mind, and not any faculty of it. In fact modern psychology affirms that there is no such faculty as memory, but the mind has "memories," e. g., of time, place, things; it denies that an ability to remember places is necessarily accompanied by an equal ability to remember faces and dates.[16]

Evidently it is possible for Locke to believe the mind is a unit and still not be a formal disciplinarian. And, if I were to hazard a guess, I should say that Duggan's conception of the mind is not much different from that which Locke affirms. Certain it is that both Watts and Locke believe it is the mind which functions now as memory, now as observation, now as reason, and this function or power so to behave is what they designate as faculty. Watts clearly indicates as regards observation and memory, for example, that he means a method of procedure.

> Observation is the notice that we take of all occurrences in human life, whether they are sensible or intellectual, whether relating to persons or things, to ourselves or others.[17]

[16] Duggan, *History of Education,* 184.

[17] Watts, p. 37. Watts states that he means by observation what Locke does. Section 13 of the *Conduct of the Understanding* indicates clearly that Locke is not thinking of Observation in the abstract. Nor does it indicate a belief in transfer. "Particular matters of fact are the undoubted foundations on which our civil and natural knowledge is built: the benefit the understanding makes of them is to draw from them conclusions which may be as standing rules of knowledge and consequently of practice. The mind often makes not that benefit it should of the information it receives from the accounts of civil or natural historians, by being too forward or too slow in making observations on the particular facts recorded in them. . . . .

. . . . Between these, those seem to do best who, taking material and useful hints, sometimes from single matters of fact, carry them in their minds to be judged of by what they shall find in history to confirm or reverse their imperfect observations, which may be established into rules fit to be relied upon when they are justified by a sufficient and wary induction of particulars. He that makes no such reflection on what he reads, only loads his mind with a rhapsody of tales, fit in winter nights for the entertainment of others; and he that will improve every matter of fact into a maxim, will abound in contrary observations that can be of no other use but to perplex and pudder him if he compares them,

And,

> We are said to remember anything, when the idea of it arises in the mind with a consciousness at the same time that we had this idea before Our memory is our natural power of retaining what we learn and of recalling it on every occasion.[18]

Unity of mind thus conceived is one thing; it is another to conclude that the mind is a reservoir of energy, and to infer that "Once sharpen the intellectual axe and it is good for cutting any kind of wood; once develop mental muscle and it is good for lifting any kind of burden; once go through the gymnasium for the mind and you are ready for the tasks of life."[19] To attribute this latter view to Locke or Watts is to ignore completely their constant insistence upon wide and varied experience. Surely, if they believed any sort of material would store up power usable to an equal degree in other fields, they must have realized the absurdity of requiring, as they did, a variety of subject matter. Thus Watts writes in his rules relating to observation:

> In order to furnish the mind with a rich variety of ideas, the laudable curiosity of young people should be indulged and gratified, rather than discouraged. . . . . For this reason also, where time and fortune allow it, young people should be led into company at proper seasons, should be carried abroad, to see the fields, the woods, the rivers, the buildings, towers and cities, distant from their own dwellings. They should be entertained with the sight of strange birds, beasts, fishes, insects, vegetables, and productions both of nature and art of every kind, whether they are the products of their own or foreign nations. And, in due time, where Providence gives opportunity, they may travel under a wise inspector or tutor, to different parts of the world, for the same end, that they may bring home treasures of useful knowledge
>
> Among all these observations write down what is most remarkable and uncommon. Reserve these remarks in store for proper occasions and at proper seasons take a review of them.[20]

One may pick out passages at random from Locke's writings which emphasize two things: first, that subject matter

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or else to misguide him if he gives himself up to the authority of that which for its novelty or for some other fancy best pleases him." And, they who read, "but not reflecting on it, not making to themselves observations from what they read, they are very little improved by all that crowd of particulars that either pass through or lodge themselves in their understandings. They dream on in a constant course of reading and cramming themselves; but not digesting anything, it produces nothing but a heap of crudities." See also Section 20 on Reading.

[18] *Ibid.*, 163. It is interesting to relate Watts' definition of memory with that of James. James writes on page 287 of the *Briefer Course*, "It is the knowledge of an event, or fact, of which meantime we have not been thinking, with the additional consciousness that we have thought or experienced it before."

[19] H. H. Horne, *The Psychological Principles of Education* (New York, 1908).

[20] Watts, pp. 54-55.

counts, and secondly, that subject matter counts only in terms of what one makes of it. I quote from the *Conduct of the Understanding* because that work supposedly best illustrates Locke's formalism:

> In this we may see the reason why some men of study and thought, that reason right and are lovers of truth, do make no advances in their discoveries of it. Error and truth are uncertainly blended in their minds; their decisions are lame and defective, and they are very often mistaken in their judgments: the reason whereof is, they converse with but one sort of men, they read but one sort of books, they will not come in the hearing of but one sort of notions; the truth is, they canton out to themselves a little Goshen in the intellectual world, where light shines, and as they conclude, day blesses them; but the rest of that vast expansion they give up to night and darkness, and so avoid coming near it. They have a pretty traffic with known correspondents, in some little creek; within that they confine themselves, but will not venture out into the great ocean of knowledge, to survey the riches that nature hath stored other parts with, no less genuine, no less solid, no less useful than what has fallen to their lot, in the admired plenty and sufficiency of their own little spot, which to them contains whatsoever is good in the universe.[21]

Locke's discipline of the faculties is fairly represented in the following:

> I do not say to be a good geographer that a man should visit every mountain, river, promontory, and creek upon the face of the earth, view the buildings and survey the land everywhere, as if he were going to make a purchase; but yet everyone must allow that he shall know a country better that makes often sallies into it and traverses up and down, than he that like a mill-horse goes still round in the same track, or keeps within the narrow bounds of a field or two that delight him. He that will enquire out the best books in every science, and inform himself of the most material authors of the several sects of philosophy and religion, will not find it an infinite work to acquaint himself with the sentiments of mankind concerning the most weighty and comprehensive subjects. Let him exercise freedom of his reason and understanding in such a latitude as this, and his mind will be strengthened, his capacity enlarged, his faculties improved; and the light which the remote and scattered parts of truth will give to one another will so assist his judgment, that he will seldom be widely out, or miss giving proof of a clear head and a comprehensive knowledge.

In point of fact, a correct interpretation of Locke must leave his conception of mind unclear. Evidently Locke, as Descartes before him, does not realize the ambiguities and difficulties involved in speaking of the mind. And Locke does not realize these difficulties because they develop only after the implications of his philosophy are made more explicit by subsequent philosophy. He seems to consider the mind as a unit, but this is not un-ambiguous. Thus, after condemning the conception of the will as a faculty, in the sense of a distinct

[21] This quotation as well as the next one is found in Section 3.

agent or power separate from the mind, he says, "It is not one power that operates on another; but it is the mind that operates, and exerts these powers; it is the agent that has powers, or is able to do."[22] But if we seek to arrive at a more precise and detailed notion of what Locke means by Mind, or Understanding, we encounter great difficulty.[23] Strict accuracy probably will require us to say that he leaves the nature of mind as a problem for his successors. Its existence was for him one of those natural assumptions of common discourse which we all make, but of whose vagueness we are not aware. Not until after Hume do we have an articulate expression of the nature of mind. Whatever faults we may find with the disciplinary conception of mind, it is at least definite and formulated in such a fashion that in consequence it becomes a subject of investigation and study.

What is Locke's relation to the second characteristic of formal discipline? Was he interpreted as advocating the doctrine that training one power leads to a transfer of energy or ability to another power? Do his followers believe that training memory in one respect increases memory ability in other particulars?

I think a critical reading of Locke and of Watts will convince us that the question of transfer simply does not occur to them. First, as to transfer from one power to another. Watts recognizes and constantly draws attention to the fact that memory and judgment are two quite distinct faculties. Memory is a basis for judgment, but "a person may have a very strong, capacious and retentive memory, where the judgment is very weak."[24] "There have been instances of others, who have had a very tolerable power of memory; yet their judgment has been of much superior degree, just and wise, solid and excellent." The cramming of memory with unorganized facts does not lead to good judgment. Watts believes the best judgments require a survey and comparison of data and "there can be no such comprehensive survey of many

[22] *Essay,* Book II, Ch. XXI, Sec. 8.

[23] Compare, for example, in Book II of the *Essay,* Ch. I, Sec. 23, Ch. VI, Sec. 2, Ch. VIII, Sec. 1, Ch. XXI, Sec. 5, and Ch. XXVII.

[24] Watts, 165-6. "It is meditation and studious thought, it is the exercise of your own reason and judgment upon all you read, that gives good sense even to the best genius and affords your understanding the truest improvement. A boy of strong memory may repeat a whole book of Euclid, yet be no geometer; for he may not be able to demonstrate one single theorem."

things without a tolerable degree of memory," but we are nowhere given to understand that he believes memory drill, for example, betters judgment, or reason. And, in this respect, he remains true to his master.[25]

It is true that Locke is frequently quoted as believing drill upon mathematics will improve judgment and reason upon all occasions. Thus Graves writes:[26]

> Hence to train the mind to make proper discriminations, he declares in the *Conduct of the Understanding* that practice and discipline are necessary. "Would you have a man reason well, you must use him to it betimes, exercise his mind in observing the connection of ideas and following them in train." As to the means of effecting this mental discipline, Locke holds: "Nothing does this better than mathematics, which therefore I think should be taught all those who have the time and opportunity, *not so much to make them mathematicians as to make them reasonable creatures, that having got the way of reasoning, which that study necessarily brings the mind to, they may be able to transfer it to other parts of knowledge as they shall have occasion.*"[27]

Now, in so far as this may mean a method of procedure consciously acquired, it is not formal discipline. I return to this below. The main objection to the use of the quotation from Locke in this connection is the one which may be urged against all selections from Locke used to indicate his formalism. It is the objection that the quotations are taken out of their context. The section from which Graves quotes is Section 6 and deals with *Principles*. Locke has been insisting that unless we accustom ourselves from youth up to reason strictly and according to sound principles we shall not do so, nor shall we perceive the want of so doing. I wish now to quote from the paragraph preceding the quotation and the immediately succeeding paragraph. The man unaccustomed to exercising sound judgment, says Locke,[28]

> . . . . "sees no such defect in himself, but is satisfied that he carries on his designs well enough by his own reasoning, or at least should have done, had it not been for unlucky traverses not in his power. Thus, being content with this short and very imperfect use of his understanding, he never troubles himself to seek out methods of improving his mind, and lives all his life without

[25] For example, see the *Conduct of the Understanding*, Section 3 and also Section 20 on Reading.

[26] F. P. Graves, *A Student's History of Education* (New York, 1915), 180-1.

[27] Italics are mine.

[28] The quotation begins with paragraph six of Section 6 on Principles.

any notion of close reasoning in a continued connection of a long train of consequences from sure foundations, such as is requisite for the making out and clearing most of the speculative truths most men own to believe and are most concerned in. Not to mention here what I shall have occasion to insist on by and by more fully, viz., that in many cases it is not one series of consequences will serve the turn, but many different and opposite deductions must be examined and laid together before a man can come to make a right judgment of the point in question. What then can be expected from men that neither see the want of any such kind of reasoning as this; nor, if they do, know how to set about it, or could perform it? You may as well set a countryman, who scarce knows the figures and never cast up a sum of three particulars, to state a merchant's long account, and find the true balance of it.

What then should be done in the case? I answer, we should always remember what I said above, that the faculties of our souls are improved and made useful to us just after the same manner as our bodies are. *Would you have a man write or paint, dance or fence well, or perform any other manual operation dexterously and with ease; let him have ever so much vigour and activity, suppleness and address naturally, yet nobody expects this from him unless he has been used to it, and has employed time and pains in fashioning and forming his hand or outward parts to these motions. Just so is the mind; would you have a man reason well, you must use him to it betimes, exercise his mind in observing the connection of ideas and following them in train. Nothing does this better than mathematics, which therefore I think should be taught to all those who have the time and opportunity, not so much to make them mathematicians as to make them reasonable creatures; for though we all call ourselves so because we are born to it if we please, yet we may truly say, nature gives us but the seeds of it; we are born to be, if we please, rational creatures, but it is use and exercise only that makes us so, and we are indeed so no further than industry and application has carried us.* And, therefore, in ways of reasoning which men have not been used to, he that will observe the conclusions they take up must be satisfied they are not at all rational.[29]

This has been the less taken notice of because every one in his private affairs uses some sort of reasoning or other enough to denominate him reasonable. But the mistake is that he that is found reasonable in one thing is concluded to be so in all, and to think or say otherwise is thought so unjust an affront and so senseless a censure that nobody ventures to do it. It looks like the degradation of a man below the dignity of his nature. It is true that he that reasons well in any one thing has a mind naturally capable of reasoning well in others, and to the same degree of strength and clearness, and possibly much greater, had his understanding been employed. But it is as true that he who can reason

[29] Italics are mine.

well today about one sort of matters, cannot at all reason today about others, though perhaps a year hence he may. But wherever a man's rational faculty fails him, and will not serve him to reason, there we cannot say he is rational, how capable soever he may be by time and exercise to become so.

A formalist surely can derive little satisfaction from this passage.

If the reader will compare Graves' quotation with the passage I quote, he will notice that I omit that part of the sentence (as given by Graves) which follows the word *opportunity* and which reads, "not so much to make them mathematicians as to make them reasonable creatures, that having got the way of reasoning, which that study necessarily brings the mind to, they may be able to transfer it to other parts of knowledge as they shall have occasion." I omit this because Locke did not write it thus. The first part of the sentence is found in Section 6, as I give it, and the second, the part I have just quoted, is the second half of the first sentence of Section 7. The failure to indicate large omissions in Graves' text is not my carelessness. Perhaps a printer's error stands uncorrected. If so, it is very unfortunate, for the result is to give a student a completely false impression of Locke's meaning. I have traced this quotation back to Monroe's *Text Book,* published in 1905. In most histories (which appear to select their quotations from Monroe rather than from Locke) the signs of ellipsis occur, but none indicates that in the first portion of the quotation Locke is talking about faults in reasoning, and, in particular, about "a custom of taking up with principles that are not self-evident, and very often not so much as true," and in the second about mathematics as a general method of reasoning. Even though we should acquiesce in the questionable assumption that texts for students do not require the scientific care one employs in preparing tracts for members of his profession, an historian can hardly escape the moral obligation he owes both the author he interprets and the student whom he informs, of fairly representing the author's views.

And in this particular situation the results of misinterpretation are peculiarly significant. If we read the mutilated fragment, torn from Section 7, in the context which Graves and others supply, we naturally infer that Locke believes studying mathematics *as mathematics* gives one a power of reasoning

which he can transfer to any concrete case of reasoning; whereas Locke means in the first place that the mathematical *method of procedure* is superior to the scholastic method which, in his time, was accepted as a model in the schools, and secondly, he believes that the mathematical method of arranging argument is the most effective arrangement of our ideas when reasoning. Whatsoever we may say about mathematical procedure as a logical method, to advocate it as a model to follow in reasoning is not the same thing as to maintain that the study of mathematics as mathematics gives us a power of reasoning which we may transfer with advantage to any concrete situation.

But let us read the sentence in the original paragraph as Locke himself wrote it:

> I have mentioned mathematics as a way to settle in the mind a habit of reasoning closely and in train; not that I think it necessary that all men should be deep mathematicians, but that, having got the way of reasoning which that study necessarily brings the mind to, they might be able to transfer it to other parts of knowledge as they shall have occasion. For in all sorts of reasoning every single argument should be managed as a mathematical demonstration, the connection and dependence of ideas should be followed, till the mind is brought to the source on which it bottoms, and observes the coherence all along, though in proofs of probability one such train is not enough to settle the judgment, as in demonstrative knowledge.[30]

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[30]The use which in turn Monroe, Ruediger, and Graves make of these quotations from Locke indicates a striking agreement of interpretation; an agreement not alone of thought, but of procedure as well. On page 519 of his *Text Book* (1905), Monroe writes: "The entire treatise," referring to the *Conduct*, "is devoted to a reiteration of the idea that intellectual education is a formation of habit of thought, through exercise and discipline.

" 'The faculties of our souls are improved and made useful to us just after the same manner as our bodies are. Would you have a man write or paint, dance or fence well, or perform any other manual operation dexterously and with ease; let him have ever so much vigor and activity, suppleness and address naturally, yet nobody expects this from him unless he has been used to it, and has employed time and pains in fashioning and forming his hand or outward parts to these motions. Just so is the mind; would you have a man reason well, you must use him to it betimes, exercise his mind in observing the connection of ideas and following them in train.' "

Monroe breaks the quotation at this point to observe, "Respecting the choice of subject matter appropriate to this end, he continues in the manner characteristic of this entire school of educational thought." And then, Monroe joins the two passages as follows:

" 'Nothing does this better than mathematics, which therefore I think should be taught to all those who have the time and opportunity, not so much to make them mathematicians as to make them reasonable creatures; for though we all call ourselves so because we are born to it if we please, yet we may truly say, nature gives us but the seeds

It seems then, we may conclude that Locke and his disciple, Watts, do not advocate the possibility of transfer from one power to another. What do they maintain as regards transfer within a given function? A careful reading of Watts' rules for improving the memory will reveal no evidence that Watts believes in training memory as such; that is, that memorizing one fact directly increases ability to memorize other facts. Indeed one may raise the question, Does the problem of transfer of training arise until philosophers become conscious that all minds are not alike? It is true that men speak of acquiring mental power by continuous application, but this is not necessarily transfer of training. They may mean general mental habits of work, or they may mean increased facility in a given field of work. Neither of these is transfer of training in the formal sense. In his well-known chapter on Imagination, William James [31] states that Fechner in 1860 was the first to

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of it; we are born to be, if we please, rational creatures, but it is use and exercise only that makes us so, and we are indeed so no further than industry and application has carried us. . . . I have mentioned mathematics as a way to settle in the mind a habit of reasoning closely and in train; not that I think it necessary that all men should be deep mathematicians, but that, having got the way of reasoning, which that study necessarily brings the mind to, they might be able to transfer it to other parts of knowledge as they shall have occasion.' "

In 1909 appears Ruediger's *Principles of Education* with a discussion of formal discipline similar to that of Monroe; similar to Monroe even in the selection of Fouillée, Huxley, and Locke as a background for his presentation. We are concerned alone with his treatment of Locke. Reudiger, as Monroe, quotes Locke on mathematics, but abbreviates Monroe's selection. Thus, Ruediger unites the two sections as follows: "Would you have a man reason well, you must use him to it betimes, exercise his mind in the connection of ideas and following them in train. Nothing does this better than mathematics which therefore I think should be taught to all those who have the time and opportunity, not so much to make them mathematicians as to make them reasonable creatures. . . . Not that I think it necessary that all men should be deep mathematicians, but that, having got the way of reasoning, which that study necessarily brings the mind to, they might be able to transfer it to other parts of knowledge as they shall have occasion."

The step which Graves makes is now easily taken. When he published in 1914 his *History of Education During the Middle Ages,* he omitted all indications of ellipsis; referred neither to Monroe nor to Ruediger, and inserted the quotation as I have given it, and attributed it to Locke as though the latter originally wrote it thus in the *Conduct.* And not only did he commit this error in 1914, but repeated it in his *Student's History of Education,* published in 1915.

Had Locke known that such treatment was to be accorded his philosophy, I can imagine him pleading much as does Shakespeare for his body:

"Good friend, for Jesus' sake forbeare,
To digg the dust enclosed heare."

[31] *Psychology,* II, 50.

draw attention to the fact that men differ in types of mental imagery. Prior to Fechner philosophers spoke as though there were a typical mind. Subsequent studies of Galton and others drew attention forcefully to the fact that men's minds differ. With this discovery, experimental psychology begins,[32] and then it is that we have speculations as regards transfer of training.

By this I do not imply that Watts and Locke did not recognize the importance of method of procedure. Indeed, perhaps it is a false identification of their emphasis upon acquiring an effective method of procedure with the quite different conception of formal discipline which accounts for a classification of Locke as a formalist. Watts has much to say as to method—but it is method as applied to concrete material. Consequently, to confine ourselves to memory,—Watts emphasizes the importance of attention as an aid to memory. "Due attention and diligence to understand things, we would commit to memory, is necessary, in order to make them take more effectual possession of the mind."[33] Frequent reviews and careful repetitions are important, etc. Watts' discussion, like Locke's chapter on Retention in his *Essay,* surprises one with its modern tone.

As with memory, so with the other faculties: Locke undoubtedly intended what Watts continually insists upon—the necessity of developing a method for an economical use of the mind. He assumes that a consciousness of an efficient method of procedure arrived at by analyzing and studying an activity actually engaged in will improve that activity. Locke, as we have seen, believed the mathematical method represents the ideal procedure of the reasoning process, but we have to distinguish between an error in his description of the correct method of thinking—if he was in error—and the validity of his general position. If consciousness of successful method has no effect upon actual practice, a revolution would seem necessary in the courses of study of our educational training

[32] For historical review of studies on mental correlations, see Spearman's study "General Intelligence," *American Journal of Psychology,* XV (1904), 206 ff.

[33] Watts, pp. 173-175.

schools. Just as the logician [34] assumes that the scientist, who is conscious of scientific method, will benefit in the concrete application of it to a specific problem, so Watts and Locke believed we can better our procedure of inquiring and learning when we are conscious of the technique or method used in successful thinking. The logician as well as Locke and Watts may be wrong, but, again, we must not identify this position with the quite different belief in a transfer of power usable in any concrete situation.[35]

The nearest approach to transfer that we find in Watts is the common sense opinion so frequently expressed by Locke that we may work over our experiences and use them to solve varied problems. Thus he insists:

> Every man, who pretends to the character of a scholar should attain some general idea of most or all the sciences; for there is a certain connection among the various parts of human knowledge, so that some notions borrowed from any one science, may assist our acquaintance with any other, either by way of explication, illustration, or proof; though there are some sciences conjoined by a much nearer affinity than others.[36]

And throughout his book Watts insists upon personal meditation and organization of the materials secured by reading, lecture, observation or what-not in order to be of value. "It is

[34] Thus J. S. Mill writes: "We need not, therefore, seek any further for a solution of the question, so often agitated, respecting the utility of logic. If a science of logic exists, or is capable of existing, it must be useful. If there be rules to which every mind consciously or unconsciously conforms in every instance in which it infers rightly, there seems little necessity for discussing whether a person is more likely to observe those rules, when he knows the rules, than when he is unacquainted with them." *Logic,* Intro., Sec. 6.

[35] See John Dewey, "Method as General and as Individual," *Democracy and Education* (New York, 1916), 200.

"The artist studies the progress of his own attempts to see what succeeds and what fails. The assumption that there are no alternatives between following ready-made rules and trusting to native gifts, the inspiration of the moment and undirected "hard work," is contradicted by the procedure of every art.

"Such matters as knowledge of the past, of current technique, of materials, of the ways in which one's own best results are assured, supply the material for what may be called *general* method. There exists a cumulative body of fairly stable methods for reaching results, a body authorized by past experience and by intellectual analysis, which an individual ignores at his peril. As was pointed out in the discussion of habit-forming, there is always a danger that these methods will become mechanized and rigid, mastering an agent instead of being powers at command for his own ends. But it is also true that the innovator who achieves anything enduring, whose work is more than a passing sensation, ut es classic methods more than may appear to himself or to his critics. He devotes them to new uses, and in so far transforms them."

[36] Watts, pp. 211-12.

our own meditation and the labor of our own thoughts that must form our judgment of things." Were Watts writing in 1903, after a reading of Thorndike's *Psychology,* he would undoubtedly have seized upon the suggestive figure, "identical elements," as illustrative of his dominant attitude in learning. His substitute term is meditation.

> It is meditation, that conveys the notions and sentiments of others to ourselves, so as to make them properly our own. It is our own judgment upon them, as well as our memory of them, that makes them become our property. It does, as it were, concoct our intellectual food, and turns it into a part of ourselves; just as a man may call his limbs and his flesh his own, whether he borrowed the materials from the ox or the sheep, from the lark or the lobster; whether he derived it from corn or milk, the fruit of trees, or the herbs of the earth. It has now become one substance with himself.[37]

And nowhere can I discover that Watts believes the character of the food matters not, or, that the "one substance with himself" would be the same "substance" regardless of whether he partook of a well-balanced diet of proteids, carbohydrates, etc., or fed energetically, albeit economically, upon an exclusive diet of sawdust. In short, for both Locke and Watts knowledge results from two factors—sensation and reflection. The mind is not a *tabula rasa* for Locke. He used this expression in refuting innate ideas, but in refuting innate ideas he did not abandon innate powers.[38] Extreme partisans may emphasize exclusively one factor in knowledge to the neglect of the other, and, consequently, insist upon content alone or inner development primarily, but Locke considers one indispensable for the other.

We may therefore conclude, I think, that Locke's theories, as interpreted and his teachings as applied in the academies were quite the reverse of those associated with the dogma of formal discipline.

III.

I have emphasized Locke's relation to the academies because they should reveal his influence upon educational practice and theory in England and America. His influence upon the continent is a separate study. Historians admit he influenced

[37] *Ibid.,* 47.

[38] Failure to distinguish between denying innate ideas and innate powers is the point in Thomas Burnet's criticism of Locke which particularly irritated the latter. See the excellent monograph, *The Moral and Political Philosophy of John Locke,* by S. P. Lamprecht (Columbia Univ. Press, 1919), 72.

Rousseau, but not in the way of formal discipline. Through his influence upon Basedow Locke directly affected the development of secular schools in Germany. Parker says of Locke:

> Locke's influence on German pedagogy was very great. This influence was exerted not only through Rousseau's "Emile", but directly. Basedow (1723-1790), especially, was indebted to Locke and Commenius as two of the chief sources of his theories, and through Basedow many of these ideas found a place in the new schools which grew out of his propaganda in Germany. One of Basedow's co-laborers, Campe, (1746-1818), translated Locke's "Thoughts" into German. . . . The theories of Locke which Basedow and his associates organized most effectively in practice were, (1) those concerning physical health, freedom, exercise, etc., and (2) those which advocate making all instruction pleasant by basing it on children's games."[39]

Admittedly, then, Locke's influence upon European educational development was not of the character of formal discipline.

There is little value in seeking to determine Locke's influence upon educational theory after the writings of Rousseau and Pestalozzi. With the publication of the *Emile* in 1762 and the establishment of Pestalozzi's school at Burgdorff (1799), the determining of educational theory passed distinctly into other hands. In America Horace Mann plainly looked to Prussia as a model for the American public school system and Barnard, Woodbridge, Russell, and others used their journals as means of disseminating Pestalozzian ideas.

And yet it is in this literature that one finds constant reference to the discipline of the faculties. And here too we find a conception of the mind as a unit. Russell develops this view clearly in *Barnard's American Pedagogy,* which contains, in Part 1, Russell's contribution on Intellectual Education. I do not wish to dwell upon this treatise because it connects with Pestalozzi and not with Locke. I do wish to point out, however, that Russell realized the term *faculties* was beginning to cause trouble. He writes:

> From the imperfection of our language, in relation to topics strictly mental, or purely philosophical, the word *faculties* is unavoidably employed to represent the diversities in modes of action of the mind, which in itself, is, properly speaking, one and indivisible. But if we keep fully before us the etymological signification

[39] S. C. Parker, *The History of Modern Elementary Education* (New York, 1912), 159.

of the term *faculties* (resources, means, powers) we shall regard it but as a figurative expression, suggestive of the indefinitely diversified states, acts, operations, processes, powers, or modes of action, attributable to the mind—itself a unit.[40]

Evidently, Pestalozzi's emphasis upon cultivating the child's instincts and capacities was becoming subject to misinterpretation or abuse, and the unfoldment of one's powers, or the "development of the faculties" was already conceived in a formal manner. This is manifest in the report of the Oswego Board of Education in 1862.[41] Referring to Pestalozzi, it says, "He sought to develop and strengthen the faculties of the child." And "He wished the *art of observing* should be acquired. He thought *the thing perceived of less importance than the cultivation of the perceptive powers.*" And, writes Parker, "As a consequence there was established the dreary grind of 'sense training.'"

It would seem then that it is Pestalozzi and not Locke who must bear responsibility for the theory of formal discipline, as expressed in popular literature. His theory of inner development and his own lapses into a purely formal procedure are more akin to the theory of formal discipline than anything we find in Locke.

To be sure, we can show that Pestalozzi drew from Rousseau and Rousseau acknowledged his indebtedness to Locke, but to infer that Locke should consequently assume responsibility for the theory of formal discipline which the Herbartians opposed,[42] is to argue after the manner of the old exercise in logic textbooks:

> The child of Themistocles governed his mother; she governed her husband; he governed Athens; Athens, Greece; and Greece the world; therefore, the child of Themistocles governed the world.

If it is granted that Locke is not a formal disciplinarian, the question obviously arises, how came historians so to interpret him? The answer constitutes an interesting chapter in the history of education as yet unwritten.

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[40] *American Pedagogy, Education, The School and the Teacher in American Literature* (Republished from Barnard's *American Journal of Education*) Edition of 1876. Russell was editor of the first American Journal of Education, (1826-31), taught elocution at Harvard and in other colleges and from 1849-59 conducted a private Pestalozzian "Normal Institute" in New Hampshire. "Intellectual Education" is compiled from professional lectures delivered at the Normal Institute in New Hampshire and the New England Normal Institute, Lancaster, Mass.

[41] Parker, p. 278.

[42] Ribot writes in his *La psychologie allemande contemporaine*, p. 4, "J'incline à croire, pourtant, qu'elles avaient été suggérés à Herbart moins par ses propres réflexions que par la lecture de Locke," quoted in John Adams' *The Herbartian Psychology Applied to Education* (Boston, 1899), 33.