

calling it *the organization of acquired habits of conduct and tendencies to behavior*.

To illustrate. You and I are each and all of us educated, in our several ways; and we show our education at this present moment by different conduct. It would be quite impossible for me, with my mind technically and professionally organized as it is, and with the optical stimulus which your presence affords, to remain sitting here entirely silent and inactive. Something tells me that I am expected to speak, and must speak; something forces me to keep on speaking. My organs of articulation are continuously innervated by outgoing currents, which the currents passing inward at my eyes and through my educated brain have set in motion; and the particular movements which they make have their form and order determined altogether by the training of all my past years of lecturing and reading. Your conduct, on the other hand, might seem at first sight purely receptive and inactive,--leaving out those among you who happen to be taking notes. But the very listening which you are carrying on is itself a determinate kind of conduct. All the muscular tensions of your body are distributed in a peculiar way as you listen. Your head, your eyes, are fixed characteristically. And, when the lecture is over, it will inevitably eventuate in some stroke of behavior, as I said on the previous occasion: you may be guided differently in some special emergency in the schoolroom by words which I now let fall.--So it is with the impressions you will make there on your pupil. You should get into the habit of regarding them all as leading to the acquisition by him of capacities for behavior,--emotional, social, bodily, vocal, technical, or what not. And, this being the case, you ought to feel willing, in a general way, and without hair-splitting or farther ado, to take up for the purposes of these lectures with the biological conception of the mind, as of something given us for practical use. That conception will certainly cover the greater part of your own educational work.

If we reflect upon the various ideals of education that are prevalent in the different countries, we see that what they all aim at is to organize capacities for conduct. This is most immediately obvious in Germany, where the explicitly avowed aim of the higher education is to turn the student into an instrument for advancing scientific discovery. The German universities are proud of the number of young specialists whom they turn out every year,--not necessarily men of any original force of intellect, but men so trained to research that when their professor gives them an historical or philological thesis to prepare, or a bit of laboratory work to do, with a general indication as to the best method, they can go off by themselves and use apparatus and consult sources in such a way as to grind out in the requisite number of months some little pepper-corn of new truth worthy of being added to the store of extant human information on that subject. Little else is recognized in Germany as a man's title to academic advancement than his ability thus to show himself an efficient instrument of research.

In England, it might seem at first sight as if the higher education of the universities aimed at the production of certain static types of character rather than at the development of what one may call this dynamic scientific efficiency. Professor Jowett, when asked what Oxford could do for its students, is said to have replied, "Oxford can teach an English gentleman how to *be* an English gentleman." But, if you ask what it means to 'be' an English gentleman, the only reply is in terms of conduct and behavior. An English gentleman is a bundle of specifically qualified reactions, a creature who for all the emergencies of life has his line of behavior distinctly marked out for him in advance. Here, as elsewhere, England expects every man to do his duty.

V. THE NECESSITY OF REACTIONS

If all this be true, then immediately one general aphorism emerges which ought by logical right to dominate the entire conduct of the teacher in the classroom.

No reception without reaction, no impression without correlative expression,--this is the great maxim which the teacher ought never to forget.

An impression which simply flows in at the pupil's eyes or ears, and in no way modifies his active life, is an impression gone to waste. It is physiologically incomplete. It leaves no fruits behind it in the way of capacity

acquired. Even as mere impression, it fails to produce its proper effect upon the memory; for, to remain fully among the acquisitions of this latter faculty, it must be wrought into the whole cycle of our operations. Its *motor consequences* are what clinch it. Some effect due to it in the way of an activity must return to the mind in the form of the *sensation of having acted*, and connect itself with the impression. The most durable impressions are those on account of which we speak or act, or else are inwardly convulsed.

The older pedagogic method of learning things by rote, and reciting them parrot-like in the schoolroom, rested on the truth that a thing merely read or heard, and never verbally reproduced, contracts the weakest possible adhesion in the mind. Verbal recitation or reproduction is thus a highly important kind of reactive behavior on our impressions; and it is to be feared that, in the reaction against the old parrot-recitations as the beginning and end of instruction, the extreme value of verbal recitation as an element of complete training may nowadays be too much forgotten.

When we turn to modern pedagogics, we see how enormously the field of reactive conduct has been extended by the introduction of all those methods of concrete object teaching which are the glory of our contemporary schools. Verbal reactions, useful as they are, are insufficient. The pupil's words may be right, but the conceptions corresponding to them are often direfully wrong. In a modern school, therefore, they form only a small part of what the pupil is required to do. He must keep notebooks, make drawings, plans, and maps, take measurements, enter the laboratory and perform experiments, consult authorities, and write essays. He must do in his fashion what is often laughed at by outsiders when it appears in prospectuses under the title of 'original work,' but what is really the only possible training for the doing of original work thereafter. The most colossal improvement which recent years have seen in secondary education lies in the introduction of the manual training schools; not because they will give us a people more handy and practical for domestic life and better skilled in trades, but because they will give us citizens with an entirely different intellectual fibre. Laboratory work and shop work engender a habit of observation, a knowledge of the difference between accuracy and vagueness, and an insight into nature's complexity and into the inadequacy of all abstract verbal accounts of real phenomena, which once wrought into the mind, remain there as lifelong possessions. They confer precision; because, if you are *doing* a thing, you must do it definitely right or definitely wrong. They give honesty; for, when you express yourself by making things, and not by using words, it becomes impossible to dissimulate your vagueness or ignorance by ambiguity. They beget a habit of self-reliance; they keep the interest and attention always cheerfully engaged, and reduce the teacher's disciplinary functions to a minimum.

Of the various systems of manual training, so far as woodwork is concerned, the Swedish Sloyd system, if I may have an opinion on such matters, seems to me by far the best, psychologically considered. Manual training methods, fortunately, are being slowly but surely introduced into all our large cities. But there is still an immense distance to traverse before they shall have gained the extension which they are destined ultimately to possess.

* * * * *

No impression without expression, then,--that is the first pedagogic fruit of our evolutionary conception of the mind as something instrumental to adaptive behavior. But a word may be said in continuation. The expression itself comes back to us, as I intimated a moment ago, in the form of a still farther impression,--the impression, namely, of what we have done. We thus receive sensible news of our behavior and its results. We hear the words we have spoken, feel our own blow as we give it, or read in the bystander's eyes the success or failure of our conduct. Now this return wave of impression pertains to the completeness of the whole experience, and a word about its importance in the schoolroom may not be out of place.

It would seem only natural to say that, since after acting we normally get some return impression of result, it must be well to let the pupil get such a return impression in every possible case. Nevertheless, in schools where examination marks and 'standing' and other returns of result are concealed, the pupil is frustrated of this

natural termination of the cycle of his activities, and often suffers from the sense of incompleteness and uncertainty; and there are persons who defend this system as encouraging the pupil to work for the work's sake, and not for extraneous reward. Of course, here as elsewhere, concrete experience must prevail over psychological deduction. But, so far as our psychological deduction goes, it would suggest that the pupil's eagerness to know how well he does is in the line of his normal completeness of function, and should never be balked except for very definite reasons indeed.

Acquaint them, therefore, with their marks and standing and prospects, unless in the individual case you have some special practical reason for not so doing.

VI. NATIVE REACTIONS AND ACQUIRED REACTIONS

We are by this time fully launched upon the biological conception. Man is an organism for reacting on impressions: his mind is there to help determine his reactions, and the purpose of his education is to make them numerous and perfect. _Our education means, in short, little more than a mass of possibilities of reaction, _ acquired at home, at school, or in the training of affairs. The teacher's task is that of supervising the acquiring process.

This being the case, I will immediately state a principle which underlies the whole process of acquisition and governs the entire activity of the teacher. It is this:--

Every acquired reaction is, as a rule, either a complication grafted on a native reaction, or a substitute for a native reaction, which the same object originally tended to provoke.

The teacher's art consists in bringing about the substitution or complication, and success in the art presupposes a sympathetic acquaintance with the reactive tendencies natively there.

Without an equipment of native reactions on the child's part, the teacher would have no hold whatever upon the child's attention or conduct. You may take a horse to the water, but you cannot make him drink; and so you may take a child to the schoolroom, but you cannot make him learn the new things you wish to impart, except by soliciting him in the first instance by something which natively makes him react. He must take the first step himself. He must *do* something before you can get your purchase on him. That something may be something good or something bad. A bad reaction is better than no reaction at all; for, if bad, you can couple it with consequences which awake him to its badness. But imagine a child so lifeless as to react in *no* way to the teacher's first appeals, and how can you possibly take the first step in his education?

To make this abstract conception more concrete, assume the case of a young child's training in good manners. The child has a native tendency to snatch with his hands at anything that attracts his curiosity; also to draw back his hands when slapped, to cry under these latter conditions, to smile when gently spoken to, and to imitate one's gestures.

Suppose now you appear before the child with a new toy intended as a present for him. No sooner does he see the toy than he seeks to snatch it. You slap the hand; it is withdrawn, and the child cries. You then hold up the toy, smiling and saying, "Beg for it nicely,--so!" The child stops crying, imitates you, receives the toy, and crows with pleasure; and that little cycle of training is complete. You have substituted the new reaction of 'begging' for the native reaction of snatching, when that kind of impression comes.

Now, if the child had no memory, the process would not be educative. No matter how often you came in with a toy, the same series of reactions would fatally occur, each called forth by its own impression: see, snatch; slap, cry; hear, ask; receive, smile. But, with memory there, the child, at the very instant of snatching, recalls the rest of the earlier experience, thinks of the slap and the frustration, recollects the begging and the reward, inhibits the snatching impulse, substitutes the 'nice' reaction for it, and gets the toy immediately, by