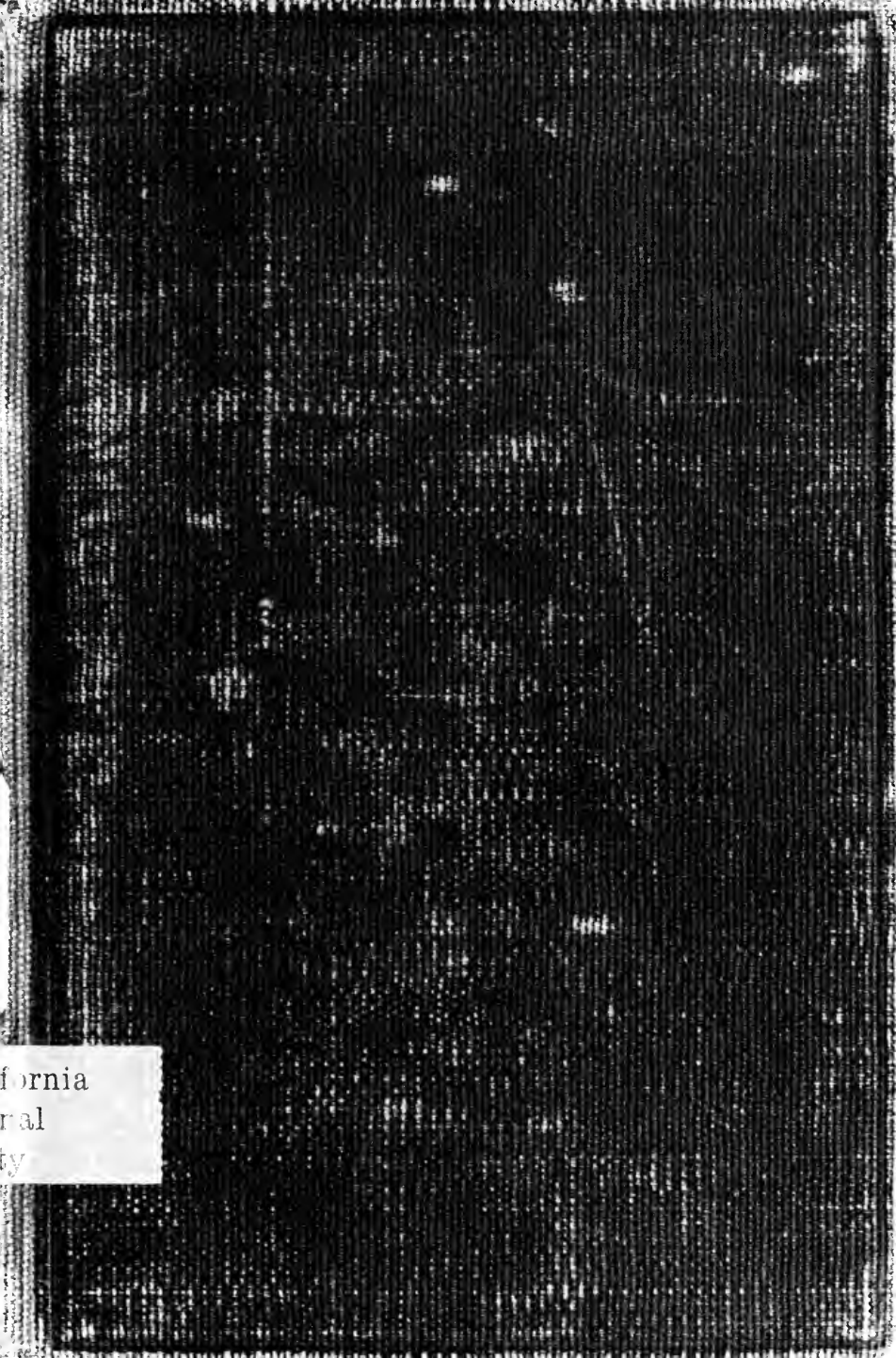

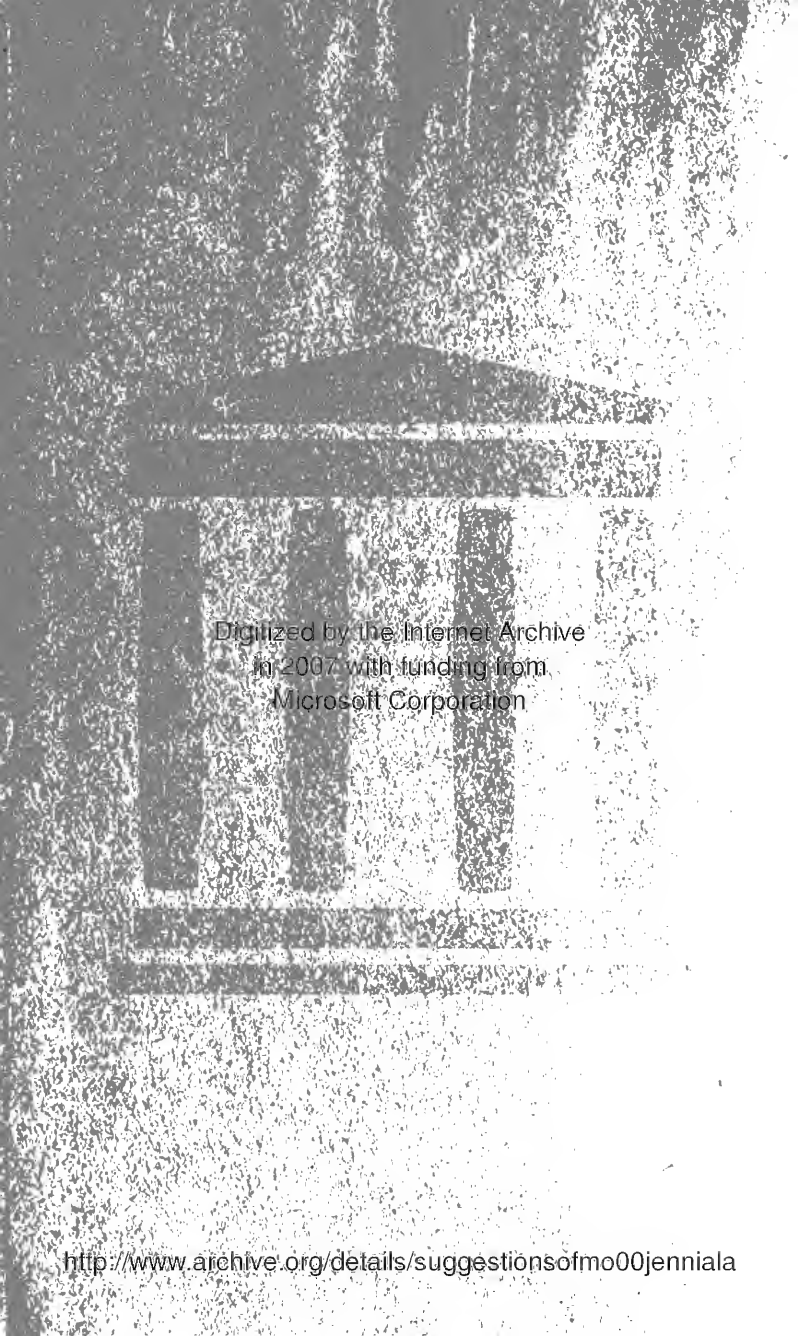

SUGGESTIONS OF MODERN SCIENCE CONCERNING EDUCATION

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SUGGESTIONS OF MODERN SCIENCE CONCERNING EDUCATION

BY

HERBERT S. JENNINGS
JOHN B. WATSON
ADOLF MEYER
WILLIAM I. THOMAS

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FOREWORD

THE Joint Committee on Education was formed to arouse an intelligent interest in public schools. Its work was threefold: to secure newspaper publicity for educational topics, to encourage school visiting based on recent school surveys and a study of experimental schools, and to seek what new light on the subject might be obtained from modern science.

Some mothers whose daily care of little children during the years when they were acquiring knowledge and developing their powers naturally, instinctively, were convinced that school hampered rather than helped them. They argued — if "sensation tends toward motion," why, during the years when life is largely sensation, do we screw our children into desks five hours a day; if variety of type is desirable, why strive for uniformity; if surplus energy is necessary to further evolution, why not conserve that wonderful superabundant vitality of childhood? Might not biology, psychology, psy-

chopathology, sociology offer suggestions concerning a school program which should secure physical, mental and moral health, and the development of individual initiative and creative power?

The committee feel in duty bound to share with all parents and teachers the remarkable series of papers written in response to their need.

E. S. D.

For the Committee.

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BY

HERBERT S. JENNINGS

JOHNS HOPKINS UNIVERSITY

SUGGESTIONS OF MODERN SCIENCE CONCERNING EDUCATION

THE BIOLOGY OF CHILDREN IN RELATION TO EDUCATION

WHAT can we do to help the children make their lives worth while, — worth while to themselves and worth while to the rest of the world?

This is the question with which these lectures deal. My part is to ask: What do we know about the nature of children, and what do we know about the rules of development, that will form a basis for our efforts? I am not to deal with the content of education, nor with the particular subjects that should be taught, nor with the methods of teaching them. For us at present education will mean merely development: how best can we help the children to develop properly?

The details to be attended to are infinite in number, but these fall into a relatively

simple system, and it is our task to bring into view the main lines of this system, so that they may serve as a guide as to details.

We are so fiercely interested in our children that we can hardly see in their proper relations the facts that touch them; our hopes, our fears, our ideals, almost cut off our perception of realities. To get a truer view, it helps to look at such matters in a new and unaccustomed setting. This I think is why I, a zoölogist, a general biologist, have been asked to open this discussion of children, — in place of some one whose daily work lies with children and schools, and who therefore knows much more about both in details than I do. What we are to do now is to study children just as the biologist studies a new group of animals or plants. How does the biologist go to work?

If he is to get a really intimate knowledge of his group of organisms, he has to cultivate them, just as we have to cultivate children. If he is to cultivate them successfully, there are three main things that he must know:

I. What is the nature of these organisms? What traits and what capabilities has nature put into them at the beginning? How

do they resemble other organisms and how do they differ from them? How do they differ among themselves?

II. What are the main laws of development, and how do they apply to these organisms?

III. How are they and their development affected by things in the world outside? What conditions, what treatment, are necessary for their full development?

Only when he knows these three things can the biologist hope to cultivate his organisms successfully, so as to obtain the finest specimens.

We must then study our children so as to get the answers to these questions. Now, in beginning the study of any particular group of organisms, there are two general principles to be kept in mind. One is, that any group of organisms is in some respects like others; so that the biologist who has studied other organisms would know something about children even if he had never seen or been one. The second principle is more important, because it is sometimes partly neglected. Every group of organisms differs in some respects from every other. In these respects therefore the biologist can know it only by

studying this group itself. No matter how thorough a knowledge of snails the zoölogist has, he will know very little about ants, unless he studies ants. This second principle is most important in the study of children, for there is no organism that differs so much from other organisms as do human beings. The things that are of most importance about children must be known from a study of children, rather than from a study of other organisms; and the same truth holds for human affairs in general.

I. HEREDITY AND DIVERSITY IN CHILDREN

We have then before us a flock of these organisms that we are to study — a school of children. Our first question was as to the nature and capabilities of these organisms, and how they differ from others. Taking the last question first, children differ from all other organisms in a way that immensely complicates the problem of how to cultivate them. To cultivate most organisms, it suffices to protect them from blights, to keep them well nourished, and to keep the temperature and other external conditions correct; even so much is extremely difficult for many creatures. In the child all this must be done,

but the chief difficulty lies in the fact that in the child there are the germs of an immense number of diverse capabilities not found in other organisms, which must all be developed if he is to become a man rather than a vegetable. The child must develop the power to meet an infinite number of diverse situations; the power to adapt itself to situations that it has never met. In every generation the requirements that it must meet are diverse from those of any previous generation. Therefore the child cannot depend on a few instinctive ways of behaving, as other animals do — even those called higher animals; the child must develop its ways of meeting situations in close dependence on the situations to be met. This, as we have all heard, seems to be the reason why the child at birth is so incomplete in its powers, as compared with other creatures; this is why it has so long a period of immaturity. Its long infancy and childhood are fully taken up in the slow development of those powers of adaptation which we call the mind; those powers whose exercise is the main work of life. The child has a thousand things to develop where other animals have one, and this, for reasons which we shall see when we look at the rules of

development, makes the problem of cultivation extremely difficult.

Examining more closely our flock of children, the most extraordinary thing that we discover about them is the astounding diversity in their fundamental make-up; the amazing variety of type that nature has put into the collection. No two look alike, nor like any specimens in any other collection of children. It is only in the past few years that we have come to know, as a part of organized science, that this is no mere matter of superficial appearance; the diversity is in their very foundations; in their original constitution; in the very fiber of their being. It lies as much in their capabilities and tendencies, in their mentality and character, as it does in their physical features. The fact that perhaps strikes most the student of heredity is the astonishing pains that nature has taken to produce variety of type, and nowhere is this so striking as in human children. This is no mere speculative opinion; it is a fact, a material fact, which forms a part of physiology, and can be studied just as can the digestion of food or the circulation of the blood.

This fact of diversity of type at the very

foundations of our being is so basic for our question as to what we can do with our flock of children; and there is so much in education that looks like an attempt to undo what nature has done in this direction, that it will be best for us to look a bit closer at the matter, and try to form a picture of the real situation.

Most, if not all, characteristics of living things, which show in one aspect as mental or moral or spiritual, show in another aspect as chemical and physical processes that can be observed. This plain fact does not imply that one of these aspects is more fundamental or important than the other; it implies nothing more than is implied by the fact which we all know, that in order to see, one must have eyes and the eyes must be opened. But what is true is that when we get to that stage of knowledge in which we can observe the physical aspect of any peculiarity, we can follow much more precisely what happens; we can determine the laws of development and action much more completely than when the physical aspect is hidden from us.

Now of late men have gotten hold of the physical aspect of heredity; the inner physical basis for diversity and for resemblance between organisms. We find that there is a

visible physical apparatus in which a great number of minute particles present the physical aspects of the qualities which human beings show. We discover that as these particles are shifted and sorted, so in exactly the same way are the qualities of the organisms — the later physical and mental qualities of individual — shifted and sorted. We do not yet know all the details of the relations between the two sets of things — but we do know *that.*

Now, we find when we study these things that nature has worked out a most ingenious and efficient device for getting all the diversities possible between children; for so shifting and assorting the characters that no two individuals will get the same set. Looking at the physical aspects — the material particles which correspond to the qualities of the individual — we find that the device is something as follows: All the characters — the particles — possessed by any person are arranged in a set of small loop-like strings, 24 in number. These 24 strings are readily visible; they look somewhat like tiny strings of beads. When a new individual is to be produced, these 24 strings — each representing a diverse set of characteristics — separate

into two groups of 12 strings each; one of these two sets of 12 goes into the new individual. This division into two sets takes place in such a way that a different set of 12, a different combination — is given to practically every different new individual. This set of 12 from one parent is then united with another set of 12, forming another combination, coming from the other parent. No two of these unions unite the same two sets of characteristics. A more efficient device for preventing the occurrence of two individuals alike in fundamental nature could hardly be imagined. All the steps in the process are visible and can be studied in detail; we can apply arithmetic to the matter and figure out at least the minimum number of diverse combinations that may be produced by any two parents. In man, with the 24 diverse sets of characters, any single individual may produce 4096 different combinations of characters; and the number producible by two given parents runs up to more than 500,000. Any of these combinations is equally likely to appear; that is, children of any of these thousands of different characteristics might be born to a given pair of parents. But as of course only half a dozen or so are actually

realized, there is no chance for two alike,[1] and no one in the world can predict the nature of the few children that come into existence.

I wish to emphasize a bit this last statement. Men of science are very naturally so inclined to emphasize what we *know* and what we can predict as a result of our scientific knowledge, that they sometimes forget to emphasize important things that we do *not* know and can *not* predict. And one of the positive results of science — one of the results that is permanent — is that it is not possible to predict the combination of characteristics that will be produced by any two parents. Some single points you can indeed predict if you know the parents and grandparents sufficiently well, — a few things like color of eyes and hair, — but the combination of characters — even of the physical ones — cannot be predicted; and as for the mental characters, which depend on the interaction of many factors, — prediction of these is quite out of the question, save as a matter

[1] In rare cases, after the new combination has been formed, it divides into two in such a way that each of the particles divides into two, and the two halves are therefore just alike. These two then develop into what we call identical twins; the indications are that these are really as identical in their fundamental make-up as in their appearance. These are the exceptions to nature's rule of diversity.

of general probability. To be able to know beforehand from the characteristics of the parents what will be the characteristics of the offspring has long been one of the dreams of science; but, to paraphrase the words of the poet, "now we know that we never can know" how to do that, in man, — for the characteristics of the parent do not determine what combination of characters shall appear in the offspring.

This fact appears to me one of the big ones, yet I have never seen it mentioned in any of the numerous books on heredity in man. It is a fact that may come as a hope and comfort to parents whose own lives have not gone as they wished, and who wonder if heredity condemns their children to the same failure as themselves. A mother, the father of whose children had shown fatal weaknesses, asked me if I believed there was anything in heredity; what she meant to ask was whether her boys must be like their father. There is no one on earth that can predict what combination of qualities will come from the union of any two normal individuals, and there never will be. "Who toiled a slave may come anew a prince" in the next generation, — by the working out of recombinations

in heredity. However unworthy we may feel ourselves to be, we can always hope for our children — with hopes based upon the knowledge that science gives. Knowledge of these open possibilities must inspire our efforts to help our children unfold what is in them; and must lend an interest to their progress that any false belief in a set and iron law of inheritance would crush out. The literally inexhaustible variety of possibilities offered by nature realizes for practical purposes the ideal of freedom of the will; realizes in effect the dream that there are unlimited possibilities for any individual.

Looked at from the obverse, this knowledge is equally important. Superior parents have no guarantee that their children will be superior. No one can predict the qualities that will arise from *their* combination, for millions of possibilities are equally open. Superior parents must watch and help their children with the same anxious care that others must use.

Of course we know that gifted parents are much more likely to produce gifted children, — inferior parents inferior children. But it is a matter of averages when large numbers of cases are considered. No parent has a "sure

thing" in his children, either for good or ill; all may hope and all must fear.[1]

Nature then has expended all her ingenuity in making our little flock of children as diverse as she possibly can; in concealing within it unlimited possibilities which no one can define or predict. It sometimes seems as if we their parents in our process of educating them were attempting to root out all these diversities, to reduce our flock to a uniform mass. Now, there are several things to be said as to this. First, you can't do it, unless your procedure is so radical as to reduce them all to mere stupidity or lifelessness. Second, the only way that appreciable progress can be made in the attempt is by cutting off, stunting, preventing the development of the special and distinctive qualities of the individuals. Unfortunately, this can be done to a certain extent, but only by a process which may rightly be compared with the taking of human life. But why should we desire to do this? Is it not variety of powers and character that the world needs?

[1] It should be added, to avoid misunderstanding, that in certain fully abnormal human beings, such as the feeble-minded, it can be predicted (in certain cases at least) that the children will be like the parents in that abnormality. But these cases do not touch personally the normal human beings that are sending their children to school.

Does not society become steadily more and more diversified, needing in every nook men of special powers? Is not a world of variety intensely more interesting, more worth living in, than a world of monotonous uniformity? Is it not the variety of human beings that makes life entertaining? Or to put the matter from the point of view of the individual — how will your son become successful and happy — by being just like all the other sheep in the flock,—or by developing capabilities that others have not? You can be certain that he starts with a combination of qualities that no one else has; shall he not have the advantage of developing these for all they are worth?

I believe that all the world would answer this question Yes! And yet the world has developed a system of education which, until recently, and to a considerable degree yet, tends to the suppression of individuality. How did this contradiction arise? Its source I believe is not wrong ideals nor mere perversity, but, as in most cases of wrong action, a misunderstanding of the facts. Our schools, like much else in society, have been based on a false idea of the meaning of democracy; on the theory that democracy means that

all human beings are essentially alike. Hence a single impersonal method of treatment was considered possible for all cases. And until lately science could not speak the positive word necessary to place that theory with the theory that the earth is flat. But the time has come when biological science can assert positively that all individuals are diverse in their underlying constitution;[1] and can give the detailed specifications on which that assertion is based. Any system, be it of education or of medicine or of politics, that does not recognize this fundamental fact must go into the discard. Democracy, correctly understood as the freedom of each individual to develop the peculiar capabilities that are in him, is precisely what education requires.

The practical difficulty of handling a large number of children individually has of course aided powerfully this false theory. Many of the faults of our education are based on no theory whatever, but upon mere convenience.

[1] With the exception of identical twins, as mentioned in an earlier note.

II. THE RULES OF DEVELOPMENT

To sum up so far, we must then see in our flock of children a set of diverse organisms, — each endowed by nature with his own combination of powers; each with something that no one else possesses. We agree that what we must do is to preserve this variety; assist each child to so develop as to keep the advantage which nature has given him, — an advantage which need not injure his fellows, for *their* advantage lies in other combinations. How shall we proceed?

The most important thing at first is to merely let their endowments blossom; let them unfold and show themselves for what they are, and with a vigor that shall make them avail. And to do this is to first make the children stout little animals, that can exercise their capabilities with full force; and that can resist the blights which hover ready to pounce upon them from every corner of the world.

Two separate but related matters here deserve consideration:

(1) No matter what combination of qualities nature has given to the child, if he has not the force, the physical means, for making it avail, it will help him little, for he will be

like the hapless speaker whom we have all suffered under, — the man who possibly has excellent things to say, but who through weakness of voice cannot make them *carry* to his audience, so that they are wasted. An idea that flits through the mind of a weakling is nothing when compared with that same idea in the mind of a man with driving power; in the former it is a shadow, in the latter it may alter the world.

(2) Similarly, no matter what combination of qualities forms the child's endowment, if these qualities do not develop; if they fall under any one of the blights that lurk for them; if the right conditions for their development are not given, the endowment will come to naught.

In most grown-up human beings many of the inborn capabilities have been cut off; much of the native driving energy has been repressed; much of the natural delight in work has been destroyed. The instinct of workmanship, as Veblen calls it, is one of the strongest that nature gives us, but many human beings have been so crippled that it is gone, and is replaced by a hatred for work. Heredity is, correctly considered, simply an inborn way of developing and acting under

certain conditions; if the required conditions do not appear, heredity alone will not give you the endowment. What we next seek then is to know the conditions which will bring about the unfolding and vigorous development of what nature has concealed in the child.

In searching for these conditions, three important general rules of development must be our constant guides. These three I may call (1) the rule of the gradual and spontaneous development of the powers; (2) the interdependence of the physical and the mental; (3) the rule of "attention" in physiology and development.

(1) The first rule is one which grown-up human beings in many respects ignore, to the great injury of the children. Much of the power gained by the young human being as the years pass is not brought to him primarily by training, by learning, by the exercise of the particular faculty involved, — but is a mere consequence of unhindered healthy development. After the child reaches a certain stage of development, it can do easily and quickly what it could not do even with much training at an earlier stage; and this silent unfolding may and should continue throughout life. Training is even harmful

when it comes earlier than the development of the power which it tries to train; it must *then* be classed with the blights which cut off the development of the powers. To take a simple but familiar example, it is quite impossible to train children at an early age to do so easy a thing as to *sit still;* they have not developed the power of inhibition required for this. Later they develop this power and have no difficulty in the matter, even though not trained to do it. This is a type of what occurs throughout development. This principle of the gradual spontaneous development of power, with its practical consequences, is one which the teacher or parent must have continuously in mind, if he is not to be misled into serious errors.

The situation here is much like that which gives rise to so much sincere fraud in medical practice. We train the child; we "keep him at his books," and he develops power, — just as the doctor gives his patient drugs, and the patient recovers. But in both cases it is largely nature that has done the work, and indeed often in spite of the confinement at the books, or of the doctor's drugs; without these things indeed the development of power in the child might have been greater, or the

recovery of the patient more rapid. Of course I do not mean to imply that proper exercise of the powers, that proper training, is not necessary at the right stage; with this we are to deal later. But what we must first see to is that the development of the powers shall take place in a healthy way, so that none are blighted, and so that there is force behind all of them.

(2) And this leads to our second rule of development. The outward evidence of the natural and complete unfolding of the young child is given in its physical development. The practical rule which we must follow is to keep the little creature growing, physically developing in a healthy way. Our method of education has been largely influenced by one of the most malignant of the superstitions of the dark ages; by the idea that spiritual and intellectual development is in conflict with physical development; that the elevation of the mental requires the debasement of the physical. We know now, as we know any other fact of science, that this is cruelly false. The physical and mental are bound together in their development; whatever metaphysical theories we hold, they are *practically* diverse aspects of one and the

same thing; if you change one you change the other; if you blight one you blight the other. This does not mean the dominance of matter over mind, any more decidedly than it means the dominance of mind over matter; this is one of the good rules that works both ways. But in the young child we can more readily watch the physical side of things; control this more directly, so that its condition must be the guide; when it goes wrong all goes wrong.

(3) Now to understand the conditions which bring about normal development of both the physical and the mental powers; to understand the enemies and dangers to such development, we must have in mind our third rule of development, — what I shall call the rule of "attention." If we can get a firm hold of this principle at the beginning, it will help much in grasping a great collection of facts and relations which at first view seem to have nothing in common; most that we shall have to say about dangers and injuries form examples of this rule. The principle is this: Throughout development and all activity, both bodily and mental, there holds a rule which is comparable to the ordinary rule of attention in the activities of the mind;

only one thing can be well attended to at once. (My expression of this rule is analogical, unanalyzed and not precise; but properly understood it will serve as a guide under many difficult circumstances.) It means that when the energy or the "attention" of the organism is thoroughly engaged in one activity, physical or mental, other activities do not prosper. All the details of our lives are examples of this, and particularly in childhood are the examples striking. When the organism is taken up with intense emotion, particularly painful emotion, digestion stops, excretion stops, growth stops; respiration almost stops; thought of everything else stops; almost everything stops save that which ministers to the affair with which this emotion is connected.[1] Intense pain has a similar effect. So has intense mental application to a particular subject; the "attention" of the body as well as of the mind is taken from everything else; digestion, assimilation, excretion, growth, sensation, all are cut down. The rule is one that works both ways, or all ways. While deeply en-

[1] The intensely interesting book of Cannon: Bodily Changes in Pain, Hunger, Fear and Rage, gives the full analysis of this aspect of the rule.

gaged in digestion, we cannot think or work well; and so of any other operation of our vegetative life. I have cited a few of the striking manifestations of this rule, but it is one that is operating at all times; one that we must think of at all times in its relation to the development of the child. A steady pain or discomfort, as from diseased teeth or poor eyes, halts the rest of development, physical and mental; and weakens the resistance to disease, in proportion to its severity and continuity. Anxiety, fear, unhappiness, whether resulting from harshness of parent or teacher, or from other conditions, have the same effect; mental and physical development and resistance are dragged back. Any derangement of one function takes the unconscious "attention" of the organism to that, deranging the performance of other functions. Driving the mental activities in directions for which development has not prepared the ground acts in the same way. Forcing too severe or too long-continued mental activity on the young organism halts the rest of its mental and physical development and lowers its resistance. These effects are not slight and hard to observe; they are the main

things that decide health and development in the child. Almost all that we have yet to say will be an illustration of this principle.[1]

III. THE CONDITIONS FOR DEVELOPMENT

We have then looked at the endowments which nature provides for the children, and we have reminded ourselves of certain rules of development. Now we come to the third matter that anyone who cultivates organisms must understand, — the effect of the outward conditions and of different methods of treatment on development; how these conditions interact with the endowments, in accordance with the rules of development.

We must first deal briefly with a number of requirements for development which are common to the child and all other organisms, — the necessity for protection from blights; the necessity for proper nutrition; the necessity for proper conditions of temperature, and the like. Owing to the much greater complexity and delicacy of development in

[1] An analysis into complex material, physiological processes, such as is given by Cannon (*l. c.*), is of course possible for everything that I have classed as a manifestation of this rule, so that the rule is perhaps a mere mnemonic device for holding together many things that might otherwise seem unconnected. I believe, however, that it serves this purpose well.

the child, proper conditions in these respects are still more indispensable than in other organisms; they are foundational. After showing the relation of these to our problem, we will come to the conditions which are peculiar to the child.

Conditions Common to the Child and All Other Organisms.

1. *Protection from Blights.* Our school of children consists of delicate organisms full of budding capabilities. As these buds slowly open they are tremendously susceptible to blights. And the world is full of blights. In the dark ages men used to think of the spaces of the universe as inhabited by malignant beings, demons, that lay in wait for human beings, pouncing upon those that were unprotected, and destroying or maiming them, through what we call diseases; the disease was a living creature and the way to get rid of it was to drive it out, as you would drive out a snake or a wolf. It is extraordinary how nearly science has forced us to return to such a doctrine. The work *is* full of living beings that prey upon human kind and particularly upon children, blasting their budding powers, maiming them or stealing them away as really as the demons and elves and goblins

of old were imagined to do; only now we call them bacteria. These bacterial blights destroy thousands of the human buds, — the opening capabilities, — even when they do not destroy the child completely. We know them mainly in the so-called children's diseases and in other diseases, particularly tuberculosis. These are the most direct, the most pitiless, the most swift, of the dangers which our children run; if all our labor is not to be vain we must watch and combat these blights. But what is the effect of our usual method of education — our schools — upon these bacterial blights? The school might from this point of view almost be characterized as a device for the exchange of blights; a device for delivering up all the children to all the blights that attack any one of them. We all know how this works in the epidemics of children's diseases. The worst of these bacterial demons is tuberculosis, and the best authorities tell us "that the school plays an astounding part in increasing the liability to tuberculosis"; [1] that indeed an actual majority of children contract tuberculosis before the end of the school period. We must think of these germs as every-

[1] Terman, Hygiene of the School Child, p. 130.

where, ready to seize upon the unprotected child.

Now, of course, we cannot completely avoid this difficulty, for children must begin some time, whatever the peril to life or limb, to mingle with their fellows. But what can we do to reduce the danger as much as possible? Of course we shall follow the directions of the medical men as to the best way to avoid the bacteria which produce the blights, and as to staving off the attacks of the children's diseases as long as possible. What I wish to speak of is a still more fundamental matter. The chief thing we can do is to keep the child's resistance high. The bacterial demons are everywhere, but one child they blight, while another blossoms. The difference is one of resistance. The time will come when medical practice will be directed even more to the keeping up of resistance than to avoiding or killing bacteria. But what *is* resistance, and how is it to be kept high? No one I think would claim that men yet completely understand resistance. But it is clear that resistance is due to an activity of the body in preparing, when attacked by enemies, substances which poison and destroy those enemies, without at

the same time poisoning the body itself. And it seems to be the fact that for each particular enemy the body prepares a different poison, precisely fitted to destroy that enemy and no other. Now this is something that chemists are quite unable to do when working consciously, and you can imagine that it is a most difficult and delicate operation for the body. It is peculiarly subject to derangement in many ways, and the cost of derangement is death or severe injury. Particularly is it subject to that general rule of "*attention*" which I gave above; if the powers of the body are too thoroughly taken up with other things; if there is continuous worry, fear, pain, hunger, cold, fatigue, nervousness, over-excitement, overstrain of any sort, — the delicate task of preparing a chemical which shall precisely resist the attacking germ fails; the bud is blighted. What we can do then to resist these blights that lurk everywhere, bent upon destruction, is just what we must do to provide in other respects for a complete and vigorous development of the capabilities that lie in the children; because the capability of resistance follows the same rules as do the other powers. The rest of our discussion is to be devoted to this matter

of providing the best conditions for all-around development.

2. *Nutrition.* If an organism is to develop, of course it must be fed. This seems so much a matter of course that it comes as a surprise to find how much trouble it gives to properly feed any kind of developing organism that you are trying to cultivate. And children form no exception to this; indeed the problem of proper nutrition turns out to be for them one of the most difficult of all. Malnutrition, says one recent authority on school hygiene,[1] "is responsible for more degeneracy than alcohol. The greatest problem throughout childhood is that of feeding." The child, at least in civilized races, seems curiously inefficient in desiring and obtaining food of the right kind and in sufficient amount, and in properly assimilating such food as it obtains. The food habits and needs of the young child are rapidly changing as the months pass, and it seems to be almost impossible, both for the child and for his parents, to keep the adjustment exact. The result is that thousands of children, perhaps the majority, — even including great numbers from the well-to-do classes, —

[1] Terman, Hygiene of the School Child, p. 98.

are ill-nourished. And the consequences are most serious. Development is directly weakened or pushed into wrong channels. But still more serious perhaps is the effect of malnutrition in laying the child open to blights and to other dangers of a similar kind. Without proper nutrition the delicate operations necessary for preparing resistance to bacteria cannot be carried out; the defenses fail, and infections and other diseases are given the opportunity they seek; "malnutrition is the almost inevitable forerunner of tuberculosis, chorea and many other diseases," remarks Terman.[1] The children in which malnutrition results from lack of proper food have been greatly helped in many schools by the supplying of even simple lunches. But more common perhaps is the malnutrition due to absent or perverted appetite, and this cannot be remedied by supplying more or better food, nor by urging or forcing the child to eat when it is not hungry. For here our principle of "attention" comes into operation in most marked degree. Appetite is precisely this "attention" of the organism to food; it is the condition in which the energies of the body are prepared to engage

[1] Terman, *l.c.*, p. 99.

effectively in the complex chemical operations of digesting and assimilating the food. If the body will not attend to the food taken — and this is what happens when food is taken without appetite — the chemical operations go wrong, and the food changes to poison. This "attention" of the body to food we call in its outward and sensible manifestation appetite, but it includes also the complex. and coördinated "attention" of a host of internal organs, going through a most complicated set of chemical and physical operations to take care of the food. Now this complex process is one most delicately poised; most easily interfered with, by the direction of the bodily "attention" elsewhere. Strong emotions of all sorts, and particularly such painful ones as worry, fear, anger, at once stop the processes; the details of these matters have lately been thoroughly studied by physiologists;[1] they are just as precise and definite as the fact that you can no longer see when the eyes are shut. Severe mental labor has the same effect; *strain* of any sort acts in the same way. Poor ventilation, and lack

[1] See the recent books of Cannon, The Mechanical Factors in Digestion (New York, 1911), and Carlson, The Control of Hunger in Health and Disease (Chicago, 1916).

of free activity, are found to have most marked effects in decreasing this attentiveness of the body and its organs to food. All these things thus strike at the very foundations of development. Malnutrition is to be combated in the same way as the bacterial blights, — by all the measures required for bringing about free and full development of all the capabilities; that is, as we shall see, by relief from strain; by happy play; by activity in the open, and the like; these things we are to deal with.

3. *The External Conditions.* Besides nourishment and protection from blights, any developing organism must have the proper external conditions, particularly as to temperature, and the nature of the medium — air or water — surrounding it. In the time we have, little can be said on these, yet any sketch of the conditions required for development in the child or any other organism would be most imperfect if the place which these fill was not at least indicated by a few strokes.

In any warm-blooded organism, such as is the child, the maintenance of the correct bodily temperature is an absolute necessity for the proper carrying on of the bodily work,

and there is in each of us a most extraordinary and elaborate regulatory system for keeping the temperature at just the right point. But this system can work perfectly only within certain limits, and we all know for ourselves that it is necessary to aid it all we can, by proper clothing.

A reduction of the bodily temperature, even though in but a part of the body, lowers the efficiency of all the bodily operations, including particularly a lowering of resistance to bacteria; and also produces apparently a derangement of our apparatus for regulating the bodily heat. This is why cold is so great an enemy to the proper development of the child and of other warm-blooded creatures. One of the classic experiments in bacteria was that of Pasteur, by which he showed that cold causes decrease of resistance to disease germs, so that organisms which are cooled off are overcome by infections that ordinarily do not attack them. (Fowls cooled below their normal temperature were susceptible to anthrax germs, though normally they are not.) This is apparently what happens in the condition known commonly as a "cold"; many sorts of blights get a start in this condition, when without the

cold the child would resist them. A harmful idea has been spread by the statements, sometimes made even by medical men, that "there is no such thing as a cold," for "what we call a cold is really a bacterial infection." From such statements the conclusion has been drawn that exposure to cold or drafts has nothing to do with this condition. There is absolutely no ground for such a conclusion, and experiment shows it to be false; exposure to cold does lower resistance. Particularly have experiments shown that cold renders animals susceptible to precisely such infections of the respiratory tracts as are characteristic of "colds." We must therefore conclude that the common name of "colds" for this condition was most aptly chosen, pointing as it does to one of the chief dangers from which such conditions of low resistance arise. In such conditions we must have ever in mind the germs of tuberculosis and other diseases which are hovering about to take advantage of such periods of low resistance. Keeping the bodies of children properly protected and at the normal temperature is one of the fundamental things demanded for development and for proper carrying out of all bodily functions; neglect of this is bound

to stunt development and at the same time to open wide the doors to the bacterial blights which destroy so many of the budding capabilities of our flock of children.

Closely related to this is the matter of ventilation. An extraordinary change in our knowledge of ventilation has been brought about by recent systematic experiments upon it. The matter has perhaps not been cleared up, but we have learned that our old ideas as to the cause of the need for ventilation, and of the evils of poor ventilation, were quite mistaken. It appears again to be really largely a matter of temperature, with certain complications. The effects of poor ventilation are not mainly due to the lack of oxygen, nor to the increase of carbon dioxide, nor to the presence in the air of poisons given off by the body. On the contrary, the chief troubles in poor ventilation seem to be: (1) a high and uniform temperature; (2) a high degree of moisture in the air; (3) lack of movement of the air. What is mainly needed is that the air shall move about so as to carry away the warm moist layer next to the skin, — at the same time giving a stimulus to the skin through slight changes in temperature. If this is not done, the organism ceases to func-

tion well; the nervous system suffers; attention and work become impossible; the inner work of the body is attended to as badly as is the outer work; the apparatus for regulating temperature gets out of order; resistance to bacteria is lowered, and the most serious consequences may result. One of the most striking effects of poor ventilation is its effect in decreasing appetite; that is, it causes the body to cease attending to nutrition, and so attacks the very foundation of resistance and of development. The required conditions are of course best met in the open air, where the temperature is correct; and this appears to be one of the chief grounds for the great value of open-air schools — though it appears probable that in the open air there are other factors which science has not yet gotten hold of, that conduce to vigorous natural development.

4. We must barely mention here the important matter of the effect on development of direct physical injuries, such as those due to bad conditions in the teeth, in the tonsils, or the like. The underlying principle here is the one we have before set forth; any source of pain or discomfort, besides possibly presenting an opening for infection, diverts the

attention of the growing organism from the processes necessary for its normal development. We all know that this is true for mental development; we cannot "pay attention" to things otherwise worth while, if we are in pain. It is equally true for the internal physical processes. Any source of pain or irritation diverts the bodily "attention" from the processes of nutrition, of growth, of resistance, — bringing thus a host of attendant evils. Such troubles therefore require immediate remedy, if such is possible.

IV. EXERCISE OF THE POWERS

The things that we have thus far mentioned, — freedom from blights, proper nutrition, proper temperature and other external conditions, — are requirements which the child has in common with other organisms. But we set forth in the beginning that the child differs from other organisms in a way that enormously complicates the problem of cultivating it, for in the child there are the germs of an immense number of diverse and complex capabilities, which must all be developed if he is to become a man instead of a vegetable. Now, there can be no complete development of these powers without their exercise, and as

a matter of fact our formal education is devoted almost entirely to the training of these mental powers. The principles that should guide in this training form the subject of the second lecture in this course, by Professor Watson. But along with these adaptive powers, the child must also develop physically, just as must a turnip or a calf. It must have a strong and normal body which can stand the strain of life, or the foundation is cut from under its intellectual powers. And this is what presents the great difficulty. Our general principle of attention holds here as it does everywhere; while the organism attends to one of its capabilities or functions, it cannot attend to the others; while it is attending to its mental development the physical functions are cut down. In our eagerness to develop its mental powers, we are inclined to overdrive these, with the result that the vegetative life is interfered with; nutrition is weakened, resistance is lowered; growth slowed, and the very foundations of all life are undermined.

There is no necessary conflict between the mental and the physical; on the contrary, correct exercise of the mental powers undoubtedly assists physical development and

conduces to health. But this requires that the two lines of development should be carried on in continued mutual interrelation and dependence — not driving one regardless of the other. The problem for solution is: How can we carry on efficiently the cultivation of the higher powers, without at the same time interfering with the physical foundations on which they rest?

Several points appear to come clearly into view here: (1) The first is a general relation: in order to keep the proper balance, the part of physical activity in our system of cultivation requires increase all along the line. Keeping the child sitting still for hours at a time, as we do in our schools, — and particularly when this is done in stagnant air, as is usually the case, — has a most marked and immediate effect in decreasing appetite (and thus shutting off nutrition); in decreasing respiration, in decreasing resistance to blights, in a general suspension or slowing of physical development. These are not mere loose general statements; precise facts and figures showing these effects could be presented if time permitted. The sitting posture when long continued is most abnormal and harmful for the growing child; to de-

mand it for many hours a day is a crime. From this point of view the changes required in our system of cultivation are: more activity, frequent alterations of position, frequent periods of play or of moving about; more manual work in place of inactive study. But all these matters are closely interlocked with the points we are to take up next.

(2) In exercising the child's powers, mental as well as physical, experimentation has come slowly and painfully to the same result which nature indicates most directly to each one of us. To develop any capability, there must be something comparable to the appetite that we find necessary for the proper nutrition of the body; the organism must have an appetite for its work. Such readiness to devote itself to the work we call interest; and work done in this condition gives pleasure. One of the most striking things in the development of modern physiology is its gradual recognition of the great value of those pleasurable emotional states which may be classified together under the abused word "joy," and of the harmfulness of the opposite emotional states — anxiety, sorrow, worry, fear, pain, and the like. The condition of happiness, of "joy," is that in which development is

unhindered, and flourishing; in which the functions are proceeding harmoniously; while worry, fear, unhappiness, are the marks of the reverse condition of affairs; something is blocked and is going wrong.

(3) Yet such is the complexity of our problem that interest itself may lead to danger. Too close and long-continued attention to one function — too severe application to one task — necessarily leads to injury and block in the other functions; and also to fatigue and exhaustion in the one carried to excess. The young child cannot attend long and intensely to anything, no matter how interesting, without injury. We have all heard the saying of the psychologist, that the dull and uninteresting teacher is a necessity in our schools, for the children could not possibly stand attention to vividly interesting teaching for the whole school day. Close continuous attention is a most exhausting activity; children take refuge from the impossible strain by the frequent spells of inattention that so perplex the conscientious teacher; by a secret diversion of their thoughts to play, or by mere vacuity of mind. We ought to recognize frankly this fact in the physiology of child-

hood by shortening the periods of work along any particular line; by suitable alternations of work with play or repose. I hope that in our lecture by the psychologist we shall have something bearing on this point.

The difficulties and dangers are a hundredfold multiplied when we try to drive the child into activities for which at the stage of development which it has reached it is not prepared, and for which it can therefore have no interest; or when we try to force long periods of activity upon budding powers that can stand but slight exercise for a few moments. We must remember our principle of the gradual development of the powers; some powers are ready for exercise when others are not, and only harm comes from trying to drive into activity those not ready.

This driving of the powers beyond what they are prepared for leads to the most serious difficulties, particularly if the child is very conscientious or nervous, and so aids in driving itself. Forced into this one channel, the bodily energy stops attending to its other duties. Appetite disappears; the body no longer can attend properly to nutrition; the chemical processes of the body get into confusion; poisons are produced instead of pro-

tective substances; resistance is broken down; the bacterial blights gain a footing; the nervous system functions badly. The beginnings of such troubles are shown in the twitchings of the face or limbs that are so common. We hardly realize how close we keep our children in school to this precipice of overstrain; many of us see even the manifest symptoms appear without realizing what they mean.

Indeed, I believe that few of us really grasp the part played by *strain* in the life of human beings. It is strain that makes men and women hate their work, instead of loving it, as is natural. It is this that disgusts the young human being with the activities in which at first it was fiercely interested. It is strain that drives humanity to some of its most disastrous practices. It is now well recognized that the immediate physiological effect of alcohol is to release from strain and repression, and the obsession of humanity for alcohol is due to the fact that they will have that relief at all costs. The use of tobacco again is due to its temporary easing of strain. It is this demand for relief from strain that leads to orgies of various sorts, in its minor aspects to outbreaks of profanity;

in more extreme cases to the tendency to "go on a spree" at intervals. All these matters have been elaborated recently in an interesting work by Patrick.[1]

In childhood the harm resulting from strain is enormously multiplied, since it cuts off in the bud the development of powers which after their unfolding and extension would form a great part of its life. The child must be protected from such overstrain at all costs.

There is one method of the exercise of powers that is almost free from these dangers, and that is what we call play. For years play was looked upon merely as a sort of inevitable waste of time among children, but scientific study of the cultivation of these organisms has shown that play is in most respects the best, the ideal form of the exercise of the powers. Particularly is this true for the younger children, but it is in large measure true as they grow older. Play is the activity which their own natures suggest and guide; it is varied as their diverse budding capabilities require; and when free it is not carried beyond the point where one activity inter-

[1] G. T. W. Patrick, The Psychology of Relaxation, Boston and New York, 1916.

feres with the development of others. The young child perhaps learns more and develops better through its play than through any other form of activity. Opportunity for varied play under healthful outward conditions is beyond doubt the chief need of children; comparative study of the mental and physical development of children to whom full opportunity for such play is given shows striking superiority, as compared with children to whom such opportunities are denied.

Of course under the conditions in which we live it becomes necessary to direct many of the activities of the young, and these directed activities we call work or study. But at this point I begin to trench upon the field of the psychologist; discretion warns me to leave the discussion of this matter to him. I could indeed present certain notions of my own, but they would lack the basis which I hope I may claim for my discussion thus far, so that I refrain.

In conclusion, let us look for a moment at our present system of cultivation, — the school — in relation to these biological needs that I have tried to set forth. What is the usual effect of the typical school on the development of our organisms?

A summary of the effects, taken from some sober standard textbook of school hygiene, presents a startling list of evils. Such a summary of course deals with the average results; the usual ones. It is something as follows:

Entrance to school stops or slows the growth of the child. Its sedentary life, bad air and mental strain, destroys or weakens the appetite, and decreases the respiration. Actual counts show a decrease in the number of red blood corpuscles, on which respiration depends. Hence the chemical processes of the body become disarranged; malnutrition with all its attendant evils comes into view. Resistance is lowered; the bacterial blights are given an opportunity. Study shows that all sorts of morbid states increase greatly as the children progress further in school; headaches, nose bleed, eye troubles, insomnia and other nervous disorders become commoner; tuberculosis increases. Further, by continued repression of many of the powers, and by forcing activity in powers not yet ready, strain is brought about; spontaneity is done away with; interest in work is destroyed; the instinct of workmanship rooted out, hate for work cultivated in place of love for it.

No one maintains that these things happen to all children, but that there is a tendency toward such results no one will deny. No one will maintain that these are all that the school does; every one will admit, on the contrary, that the good done by the school is greater than all this evil. We cannot leave our children uninstructed. But the pertinent question is — Is there any necessity for these evil effects along with the good ones?

The question must be answered — No! The good can be done without the evil. Schools already exist in which most or all of the evils have been done away with. If accounts are to be trusted, in some of the open air schools the health and development continually improve as compared with children not in school; at the same time they make better intellectual progress. Schools are now carried on where individuality and spontaneity are cultivated, not repressed; where strain is not allowed to play its fearful part; where love for work, not hatred of it, is developed. The movement for increased activity in schools; for greater opportunity for play; for shortening of the hours of sedentary labor, is tremendously improving schools in the more advanced communities. Time does not permit

my speaking of these. But the conditions are not hopeless; on the contrary, there is full knowledge available for correction of the evil condtions wherever they exist; all that is required is that people shall realize that the conditions are bad, and shall act to change them; shall be willing to spend the money to change them. The great obstacle to better conditions is not that no one knows how to make them better; it is rather a failure to realize that the conditions are bad and could be changed: perhaps also the fact that schools of the sort required cost more than the old-fashioned sort. But it is *ourselves* in the next generation that are at stake; what is cost, compared to making our next selves healthful, efficient and happy!

PRACTICAL AND THEORETICAL PROBLEMS IN INSTINCT AND HABITS

BY

JOHN B. WATSON

JOHN HOPKINS UNIVERSITY

PRACTICAL AND THEORETICAL PROBLEMS IN INSTINCT AND HABIT

Mr. Chairman, Ladies, and Gentlemen:

I sometimes feel that the laboratory man makes a mistake when he emerges from the four walls which usually surround him to report his findings to those who have most to do with the practical problems of life. And yet however badly he may do it I am convinced that at least the investigator himself profits by being afforded the opportunity to put his results before representative and interested gatherings. After all, it is such occasions as this that determine which groups of scientific data are worthy to live and which should be returned to the laboratory for further work and elaboration.

SOME GENERAL CONSIDERATIONS

Most of our biological and psychological problems now center in the processes of growth and development in particular organisms, and especially around the methods of

predicting, *controlling*, and *regulating* such development. The theory that I have advocated for many years is that psychology, when all is said and done, is a *study in behavior;* that the problem of the schoolroom and of the laboratory is to find out what an individual can *instinctively do*, what he can be *trained to do*, and the *methods* which will lead him most easily and quickly to do both those things which society demands of him and the things which he alone as an individual can do. Behavior is thus the central problem. Thought can be safely left to take care of itself when safe methods of regulating behavior can be obtained. What a man thinks is only a reflection of what he does. This seems like a rather radical statement, but you will admit with me that society's estimate of character is based upon objective factors; namely, upon what deeds the individual does during the brief span of his life. The goal the psychologist should strive for is to so familiarize himself with processes that govern behavior or conduct that: (1) given the opportunity to observe what an individual is doing he can predict the situations or factors which have led to that line of conduct, and (2) on the other hand, if it is demanded by society

that a given line of conduct is desirable, the psychologist should be able with some certainty to arrange the situation or factors which will lead the individual most quickly and with the least expenditure of effort to perform that act. The point of view which I have thus given in the barest outline is the essence of behaviorism or behavioristic psychology. This branch of psychology teaches that a man *is* the sum of his instincts and his habits. Since instincts and habits are thus all important, it is in these fields that behaviorism finds most of its problems. I venture to-night to bring to your attention some of the experimental results which we are in the process of obtaining, some which we hope to obtain, and some which we have already been able to obtain. Without further preface I invite you to follow me for a time into the behavior laboratories.

THE FEASIBILITY OF STUDYING INSTINCT AND EMOTION IN INFANTS

After having devoted some fifteen years to the study of the instinctive reactions in animals, it occurred to the members of our laboratory that it might be well to look over the field of human instincts and emotions to see whether in our opinion psychologists and

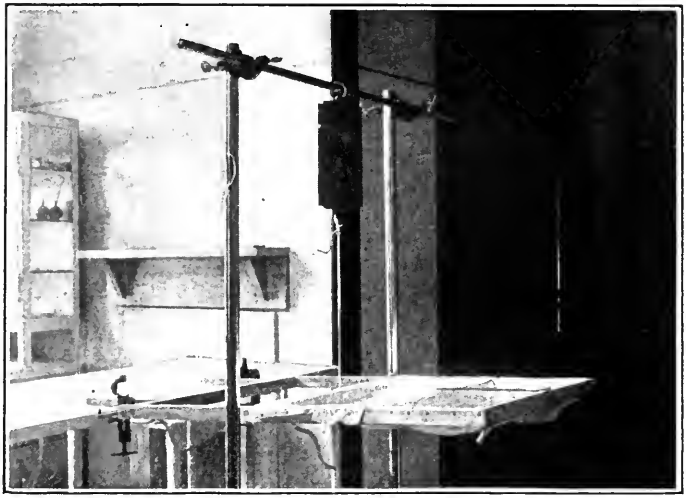
students of education had enough experimental data in this fundamental realm to afford a safe basis for guiding and shaping the child's career along vocational and individualistic lines. After our survey of this literature we came to the conclusion that our actual knowledge in this most important field is extremely meager. Probably not more than six or eight children have been studied with any degree of care from birth to the age of five or six years, and yet it is in this period that the lines of conduct are laid down which inevitably shape the child's relations to its future environment. Most of these studies have been carried out by parents, or by other interested relatives. It is hard for such interested individuals to assume the right attitude. They are used to observing the behavior of adult individuals and consequently read into the actions of the child, factors which belong only to the activity of the adult. (I am not unaware of the great work which has been done in the field of the juvenile court; for the women delinquents at Bedford Hills, etc. We are likely, though, in our interest in the darker side of humanity, to forget the normal and super-normal child.) So convinced have we become of

the importance of learning the inborn hereditary nature of the child — its possibilities of action, the native situations which bring out these actions, and the method by which these crude and imperfect responses can be transformed into serviceable habits — that we have temporarily given up our work upon animals and are devoting our time and energy, and a large part of the equipment of our laboratory, to the study of the emotions, instincts and early habits of the human infant.

Before discussing any of our experimental work I should like to say in general that the human infant is not the hothouse plant that it is supposed to be. Continued observation by a trained and sensible experimenter is feasible and does not do the child the slightest harm. We have had several hundreds of newborn infants under observation in our laboratory at Hopkins. There has never been the slightest accident under experimentation nor have the babies suffered the slightest ill health from the continued observations.

While it would be taking us entirely too far afield for me to present very many detailed statements of the various problems which we are attempting to solve in this most fascinating realm, I should like to illustrate our work

by giving some concrete cases. As is well known, some previous observations tend to show that the child at birth will grasp a small stick and cling to it, but so far these observations have led to very little experimentation. Our own work shows that if the stick is raised the infant will cling to it for a longer or shorter time and with greater or less strength. Some of them, indeed, will cling to the stick until they are raised up completely in the air and will hang on for an appreciable length of time. Others have not the instinct so highly developed and will let loose long before they are supporting their full weight. In the photographs on page 59 we show the method by means of which we register the full amount of the strength of the pull. In the diagram on page 61 we show the results of a very large number of observations. You will see from the chart that most of the children during the first twenty days of their lives can support their full weight with either hand. After a time, in normal cases, this reflex gives way; it is said to disappear. Later observations show that this reflex persists for the first three months of life at least. Occasionally we find the instinct weak or lacking. In some one hundred supposedly normal cases

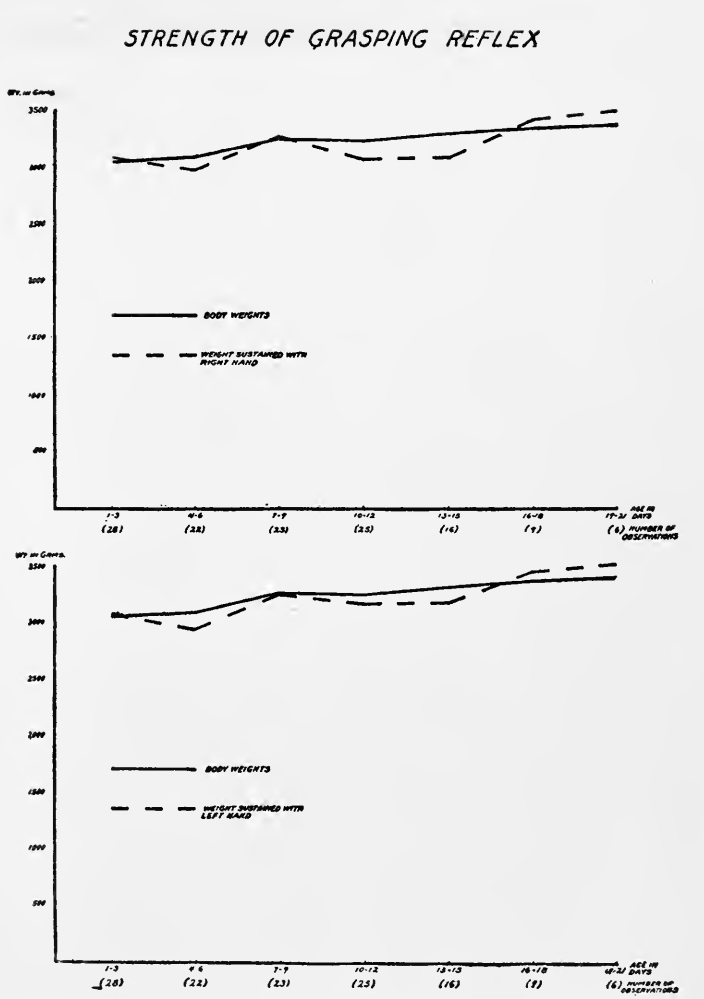


Apparatus showing method by which the strength of the grasping reflex is measured. The baby is laid in the canvas crib. The weight of the baby immediately registers. The rod is then put in the baby's hand and raised. The decrease in the weight registered shows the strength of the pull.

Method in operation.

we have found two children who did not possess the reflex: one was extremely fat, and clinging would have been almost impossible; no reason can be assigned in the other case. In abnormal cases, cases of malnutrition, the child has not sufficient strength to support its weight. It is just possible that in feeble-mindedness and in other defects this instinct persists for a much longer period of time than in normal cases. We have by no means finished our study upon this interesting instinct. I am interested for the moment merely in showing you what very definite types of experimental observation can be carried out upon the newborn child.

The study of this instinct alone is opening up a wide series of problems. For example, we find that the infants cling for a longer period of time with one hand than with the other, thus giving opportunity for the study of right- and left-handedness from infancy, something which has not hitherto been attempted. And the observation of this has led us into devising apparatus by means of which the spontaneous movements of the two hands can be recorded from the birth of the child. Along with these studies of right- and left-handedness there goes a careful and system-



Curve showing strength of the grasping reflex in the right and left hand of infants. The vertical line shows the weight in grams, the horizontal line shows the age in days.

(The apparatus and curves shown in these cuts were made in collaboration with Dr. J. J. B. Morgan of Princeton University. The total results are as yet unpublished.)

atic record of the way the child has been carried in the uterus. By such methods we hope shortly to attack the rather insistent problem of handedness. It is not necessary for me to point out the significance of determining whether handedness is inborn or whether it is really a habit. It may possibly be found to be a habit which starts really before the birth of the child. We know that the two hands are not under equal constraint in the uterus. It is a real problem before us to-day to know what to do when a left-handed child enters school. If handedness proves to be a purely intra-uterine habit and not a fundamental instinctive and cerebral endowment, no serious consequences should follow the early changing of the habit. In the pursuit of this line of work we have already stumbled upon some intra-uterine habits, such as the "preferred position" of the head, methods of holding arms, etc., all of which may affect our personal behavior and our peculiar type of adult action far more than we have any notion of at present.

Along with these more detailed studies we are attempting to work over systematically the whole field of the early emotional reactions of the child. In regard to infantile emotions, I may say that, after a good deal of observa-

tion, we find some grounds for the conclusion that in one way we have greatly overemphasized the number of original emotional reactions. I have been struck by their absence and simplicity rather than by their profusion and complexity. This does not seem to square with the multiplicity of emotional responses in adult life, but I shall try to show later that the contradiction is only apparent. We are inclined now to believe that the fundamental emotional reactions can be grouped under three general divisions:

(1) Those connected with fear.

(2) Those connected with rage.

(3) Those connected with what, for lack of a better term, we may call joy or love.

These at least deserve the name of major emotions. Whether or not other types of emotional reactions are present we cannot yet determine. Let us glance for a moment at the original situations or stimuli which call them out.

Fear. What stimulus apart from all training will call out fear responses; what are those responses; and how early may they be called out? The principal situations which call out fear responses are as follows: (1) To suddenly remove from the infant all means of support, as when one drops it from the hand

to be caught by an assistant. (In the experiment the child is held over a bed upon which has been placed a soft feather pillow.) (2) By loud sounds. (3) Occasionally when an infant is just falling asleep the sudden pulling of the blanket upon which it is lying will produce the fear response. (4) Finally, again, when the child has just fallen asleep or is just ready to awaken a sudden push or a slight shake is an adequate stimulus. The responses are a sudden catching of the breath, clutching randomly with the hands (the grasping reflex invariably appearing when the child is dropped), blinking of the eyelids, puckering of the lips, then crying; in older children, flight and hiding. In regard to the age at which fear responses first appear I can state with some sureness that with few exceptions the above mentioned group of reactions appear at birth. It is often stated that children are instinctively afraid in the dark. While we shall advance our opinion with the greatest caution, we have not so far been able to gather any evidence to this effect. When such reactions to darkness appear they are due to other causes; darkness comes to be associated with absence of customary stimulation, with noises, etc. From time immemorial children have been

"scared" in the dark, either unintentionally or as a means of controlling them (this is especially true of children raised in the South). In other words, fear, in situations other than the above, is due to bad training. Children thus learn to fear, through mishaps of training not always under the control of the parents, many things which they should not fear. Probably my own fear in the dark has made me particularly interested in this problem. My reactions in the dark are chaotic and more or less infantile. I determined to rear my two children carefully in this respect, and for four or five years they never hesitated to enter an unlighted room nor complained about being left in the dark. Unfortunately, while my wife was out for a short time one evening, a sudden thunder storm came up; and for months there was great reluctance on the part of the children to being left in the dark, and there was exceeding great fear at a threatened thunder storm. That there are possibly other situations which originally and apart from all training call out fear reactions is quite within the realm of probabilities.

Rage. In a similar way the question arises as to what is the original situation which brings out the activities seen in rage. Obser-

vations seem to show that the hampering of the infant's movements is the factor which apart from all training brings out the movements characterized as rage. If the face or head is held, crying results, quickly followed by screaming. The body stiffens and fairly well coördinated slashing or striking movements of the hands and arms result; the feet and legs are drawn up and down; the breath is held until the child's face is flushed. In older children the slashing movements of the arms and legs are better coördinated and appear as kicking, slapping, biting, pushing, etc. These reactions continue until the irritating situation is removed, and sometimes do not cease then. Almost any child from birth can be thrown into a rage if its arms are held tightly to its sides: oftentimes even if the elbow joint is clamped tightly with the finger the responses appear: at times just the placing of the head between cotton pads will produce them. Even the best-natured child shows rage if its nose is held for a few seconds.

Joy or Love.[1] The original stimuli for bringing out the earliest manifestations of this

[1] For a more detailed statement of the stimuli and responses connected with this emotion, see Emotional Reactions and Psychological Experimentation, by John B. Watson and J. J. B. Morgan, Am. Jr. Psychology, April, 1917, pp. 163–175.

emotion seem to be as follows: gentle stroking and soft tickling of the infant's body, patting, gentle rocking, turning upon the stomach across the attendant's knee, etc. The response varies: if the infant is crying, crying ceases and a smile may appear; finally a laugh, and extension of the arms. In older children and in adults this emotion, due both to instinctive and habit factors, has an extremely wide range of expression. The original responses are very hard to observe in very young children. But certainly from seventy days on they are very easy to observe.

While I wish to emphasize again that these three types of emotional expression probably do not exhaust the child's repertoire, yet I feel that they are more fundamental than any others we are likely to come across. When these emotions go wrong or are poorly controlled, we find the very greatest difficulty in starting and controlling that enormous body of habits which must be formed by every child.

Recent work in physiology tends to bear me out in the contention that these three types of reactions are of vital importance. It has been fairly conclusively shown that they are intimately connected with the functioning of

the glands of internal secretion, for example, the adrenals, the thyroids, etc.

THE PAST NEGLECT OF THE STUDY OF EMOTIONS AND A SUGGESTED METHOD FOR FUTURE WORK

I have dwelt at some length upon the subject of the early manifestations of the emotions because the whole subject of the infant's emotions has hitherto been neglected by psychologists, by parents and by teachers. The psychopathologist is the only investigator who has made any considerable use of this in his work. Our own experimental work is leading us more and more toward the view that emotions are not useless things put here by some unkind fate merely to disturb the even tenor of our ways, but that when properly controlled they can be made to serve practical uses. I think they can be made to serve as *incentives* or *drives* to many types of action. We stumbled only recently upon a good illustration of this view. In testing the grasping reflex in infants already referred to we found that in very many cases the child could not at first support its full weight, but if by *hampering its movements we could produce*

rage, the muscular strength suddenly increased and the child would immediately support its whole weight, and in other cases could sustain its weight for a much longer period of time. A possible explanation of this has been advanced by Dr. Cannon of the physiological laboratory of Harvard University. In the primary emotions certain internal glandular secretions are set free which tend to wash out fatigue products from the muscles and to increase the amount of food for the muscles, etc. Hence, when in the throes of the major emotions, we do actually possess greater muscular strength and endurance than at other times. I shall not be so bold as to suggest this procedure as a safe one to follow in the schoolroom, but it does illustrate the point that emotions when properly used can be made to serve us rather than to destroy us.

This illustration, narrow as is its application, serves to force the question upon us: Is there any experimental method now at hand for the utilization and control of the emotions? Suppose we try to formulate just what we should like to do with the emotions. (1) Many of the tasks which the child has to do are intrinsically unstimulating, and yet such tasks must be learned. Furthermore, in learn-

ing them great endurance is often called for. Now if emotions do furnish a "*drive*" and do give *increased endurance,* our problem would be solved if we could in some way make the unstimulating task call out emotional activity. (2) Again we find many children whose emotional life has been warped by improper training. Many objects and situations call out emotional activity where emotional activity is neither called for nor needed. Our problem in (1) above calls for the *attachment* of an emotion, while in (2) above it calls for the *detachment* or breaking up of an emotional response. Stated more generally, then, our quest is for a method whereby we can both attach emotions to situations at will and similarly detach them from situations where they are not useful. I have not time at my disposal to go very far into the means by which such attachments and detachments can be brought about. Indeed, experimentation has not gone far enough to warrant any general presentation of a method. I cannot, however, resist the temptation to point out that the *conditioned reflex* method will possibly give us the solution. This method is a new development in objective psychology which has not had time to enter into the schoolroom,

but it is now one of the central topics of discussion and experimentation in psychology. It has possibilities of wide application to schoolroom problems. I can only briefly describe it. If our finger is suddenly pricked or shocked with an electric current, the finger draws back immediately — there appears a defensive reflex. Now a gentle sound, say that of a tuning fork, will not call out such defensive reflex of the finger. But if an experimenter sounds the fork and pricks the subject's finger simultaneously on several occasions, the sound alone will in time come to cause the finger to jerk back.

In this same way certain objects and situations in our daily life which originally have nothing to do with emotions come later to stir them up by the process of substitution. An interesting example of this is seen in the lightning flash. Many of us show fear reactions to flashes of lightning. I have never seen a child show these reactions even to flashes of sunlight in a dark room. Loud noises, however, will produce the fear reactions even in very young children. The flash of lightning is usually followed immediately by thunder. Hence in a short time we begin to react to the flash of lightning as we would

to the thunder. A stimulus which originally produced no reaction except a closure of the eyes now produces an extremely powerful reaction. The conditioned reflex thus serves to explain why it is that although the number of original emotions is very small, they still play, through habit ramifications, such an enormous rôle in adult life. Suppose there are originally only a few situations which will call out rage in me as an infant, for example, constraining my movements, holding my nose, etc. In a short time the mere *sight* of an individual who holds me badly or hampers my movements will set off the emotional reaction. Finally, more and more remote stimuli serve to set off the movements. In a similar way many thousands of objects and situations which originally had no intrinsic value for the arousing of our major emotions come finally to possess that power.

You may think that I am setting up a distinction without a difference, but I assure you I am not: if we do possess, as is usually supposed, many hundreds of emotions, all of which are instinctively grounded, we might very well despair of attempting to regulate or control them and to eradicate the wrong ones. But according to the view I have advanced

it is due to environmental causes, that is, to habit formation, that so many objects come to call out emotional reactions. If habit thus plays the most important rôle in the attachment of the emotions, it lies easily within our control to perfect and regulate and reshape and use practically the emotional life of the individual. My view throws a still greater burden upon the already heavily burdened parent and teacher and less upon heredity. But even so I think most of you will welcome any view which will put this important field under our control.

In order that you may not think I am overstating the case in regard to the early age at which such shifts in emotional responses may occur, I shall give one or two specific cases chosen at random from a much larger number. In very young infants, far too young to have formed any extra-uterine habits with their hands (some as young as five to seven hours), I have tried several experiments of the following kind: As I have pointed out, infants cry or become enraged when the head is held. In one of my experiments when testing whether coördinated eye movements are present from birth, it was necessary to turn out the light and then hold the infant's head in a truly vertical position to

see if its eyes would follow a faint experimental light. In a very short time the infant began to cry as soon as the light was turned out and *before the head was touched.* In another experiment while testing the grasping reflex on an eighty-seven day old child it was necessary to lay the child on a couch. When the mother first laid it down, it smiled and babbled. I then tested its grasping reflex, which threw it into a rage. The mother then picked it up and soothed it and once more made it smile. Then when she laid it down it immediately began to struggle and cry, and long before I came near with the rod to make another test. I have tried many such experiments with the same results, and I have come to the conclusion, possibly without sufficient experimental data, that the first few years are the all-important ones for shaping the emotional life of the child. We have hardly given this matter a thought in our educational systems or even in our home life. We have centralized on teaching the child proper conventional habits of study and conduct while neglecting almost entirely its emotional training. We look upon the infant before it begins to crawl and play with objects as an animal of a somewhat mysterious and little understood nature,

or else we consider it a plaything upon which we may shower our own too exuberant emotional life. In general, we too often misshape its emotional life by forcing upon it too many exciting emotional attachments and even harmful ones, such as fears, rages, etc. In so far as I have learned anything from my work on infants and very young children I should say that it shows, first, that parents, and, second, the early grade teachers, equally must share the responsibility for making or marring the emotional life of the average child. We can only gradually educate the general run of parents in this point of view, but we can more rapidly improve matters by making the positions of the early grade teachers the most desirable and the best paid ones in our schools. When this has been done we must next secure exceptional teachers for those grades. If modern conditions would permit it, we should like to see these early grades given over to genuine students of child psychology — men and women who have specialized in psychology and psychopathology and who have made *actual observations* upon infant and child life. If the early grades were manned by these widely trained specialists we could be sure that many of the mishaps to the emotions due to

home training could be corrected, and we could certainly be sure that from their entrance into the school system of our country no further mistakes would occur.

My remarks may seem to throw criticism upon the grade teachers who are already nobly doing their best. I have no wish to cast stones, but I do wish to decry the tendency in our American schools to think that any teacher is good enough to teach young children. As a result of this tendency we find all too often grade teachers being recruited from the ranks of high school graduates, from inexperienced normal school graduates, and in some places at least even from among relatives of school officials who are graduates from nowhere.

These highly trained specialists of the early grades could aid America's professional and economic life in another way. Vocational training is looming large upon the educational horizon. A good deal of it is crass and superficial. We know far too little of the bents and trends of childish activity. In order to put this work on solid ground the individuals who come in contact with the child must be trained to observe these bents and to devise situations in which such bents and vocation tendencies may appear.

THE NEED OF AN EXPERIMENTAL NURSERY FOR THE STUDY AND CONTROL OF INSTINCTS, EMOTIONS AND EARLY HABITS OF INFANTS

I see no way of gaining the information we so much desire except by the use of slow and intense experimental methods. We have been trying an easy way to find out how to shape development — that of making superficial and incidental examination of the children, of sending out questionaries, and of running them through the ubiquitous "mental tests." These easy methods have profited us little or nothing. At fourteen years of age, when the majority of children leave school, they have no measure of themselves and drift into anything and everything that offers. The sheltered college youth knows no more about his place in life at graduation than does the less favored boy or girl at fourteen years of age. As a possible way out of this difficulty and out of the many others that beset us, I suggest the establishment of an experimental nursery where fifteen to twenty children can be brought up during the first five years of life. These children should be kept under strict experimental conditions. Naturally the first things to provide are

adequate housing, attention from well-trained nurses, and a physician's care. The child's activities, however, should be under the hourly observation of two or three well-trained psychologists who have had preliminary training in animal experimentation and a good grounding in psychopathology. The function of the nurses and the physician would be that of caring for the physical comfort and development of the children. Their complete upbringing during this period should be in the hands of the psychologists. A wealth of problems would be opened up and most of the questions which now agitate us and which we settle by theory could be answered by experimental results. I should hope to see grow up from such a nursery a fairly complete method of evaluating the behavior possibilities of children at, say, five years of age. Not tests of the Binet-Simon type but an experimental procedure which would give cross-sections of habits already established, of instincts and instinctive tendencies, and of emotional development and equipment. I have something in mind far more scientific and far more important than any material which can be gathered from the use of the so-called scales of measuring "intelligence,"

however useful such scales may be. It would be strange indeed if the close observation of twenty children from birth to five years of age would not revolutionize the present point of view of child life, if it would not give us methods of determining instinctive bents, of experimentally controlling emotional life, and efficient methods of implanting habit formation. With such a body of data before us we should be prepared to turn those twenty children into the hands of our highly competent grade teachers. We should furnish each child with a "reaction chart" to be placed in the hands of his first instructor. On this chart we should show the lines of activity which the child most easily follows, his particular bents, his emotional tendencies and how to strengthen or correct them, and the chief points in the systems of habits which he had put on during the five years' residence in the experimental nursery. With such a guide before a sympathetic and properly trained grade teacher the whole relationship between pupil and teacher would at once be altered. The children would then be looked upon as individuals, each one with a definite future before him, and the tendency would rapidly grow up for the teacher to regard each pupil as a "hopeful"

experiment. At odd moments encouragement could be given in this direction or in that. This would serve to save our children from all being run through the same mould. All of them probably must be moulded along certain conventional lines — all must be given a certain amount of mathematical training, training in the use of language, etc., but I am inclined to agree with Dr. Abram Flexner that we can easily overdo in the matter of required subjects. We would not attempt to prescribe just what the child's curriculum should be, but we do affirm with a good deal of confidence that his individuality and tendencies should determine in large measure what we should teach him.

You will probably smile at my naïveté. Why go to such an enormous expense to try an experiment upon twenty children when millions have to be trained? But we must consider that with the enormous data and with the improved methods which we should get from this experimental nursery, we would be in a position to shape the establishment of infant laboratories in every important educational institution in the country and certainly in the public school systems of our large cities. These laboratories would be at the command

of the parents. Children could be brought in almost from birth for periodic examination and study. The mothers could be guided and warned about the way the children were tending to develop. The child's over-reactions, wrong emotional attachments, and the lines along which its habits were forming could be pointed out. The mother would thus get expert guidance and intelligent help. [I am speaking now for the normal child, if such a thing exists.] She calls for expert advice now from the physician when she is in doubt about the child's health. The school even now forces her to have her child mentally tested, if retardation is suspected. It is then often too late for advice. Why not afford her the opportunity of having the instinctive, emotional, and habit systems of her normal child gone over periodically so that she may receive at seasonable times advice in matters which may be as useful to her as the physician's counsel now is? But we must study child life during this period before we can give advice of a scientific character. Only a charlatan would presume now to give "expert advice." Not the least useful purpose of such infant laboratories would be the possibility of training our public school

teachers in the accurate observation of infant and child life. I venture to say that if I were to take a thousand teachers chosen at random from schools in the United States and put a two months' old infant in front of them and ask them to experiment upon it for a few days and then to write down the important things they saw, not five of them would know how to go about the task. And yet we expect our teachers to look after the instinctive bents and original characteristics of our children! This is not their fault but the fault of the institutions which train them and of a society which permits them to *teach* instead of to *guide* the child's own development. They have had no opportunity to observe child-life in the making. But in my interest in this possibly visionary scheme I have been neglecting some other matters which I wish to put before you.

SOME EXPERIMENTS TO DETERMINE THE LAWS OF HABIT FORMATION

Equally as important as this early scrutiny of instinct and emotional training are the methods of initiating, correcting, and controlling the growth of habits after entrance into school. Let us not criticise the schools

unduly for being conservative and loth to change their methods of implanting habits. I think though we can criticise any school system which is inclined to believe that the present system of school instruction is adequate and that it cannot be improved upon. Even the most satisfied school official must admit that our school curricula are now based upon conventions, and not upon science. Even the number of minutes to be devoted to a given subject and the number of days per week that each subject must receive attention, as well as the number of subjects that must be taught simultaneously, are heritages from early times. These conventions may turn out to be not wholly bad. Certainly I should not advocate giving them up until science has something better to offer. I am merely imploring the schools to remain in an expectant attitude and to watch for our laboratory results and to seize upon those which look promising. It has not been possible for us so far to find an opportunity for making an extensive study of habit formation in children because of the well-grounded reluctance one meets in trying out experiments of a radical kind upon the human species. It has been a case literally of trying these things

out upon the "dog," or rather upon the white rat! I wish to present here four of the most important conclusions we have arrived at in our study of habit formation and then to illustrate these tentative formulations by citing the experimental data upon which they are based; they are:

(1) The law of diminishing returns from practice. Within certain limits the less the frequency of practice the more efficient is each practice period.

(2) The less the number of habits formed simultaneously, the more rapid is the rise of any given habit. At the same time the first law is valid here, too.

(3) Again, within certain limits, the younger the animal, the more rapidly will the habit be formed. This law is to be taken with some reservation.

(4) The higher the incentive to the formation of a habit and the more uniformly this incentive is maintained, the more rapidly and the more uniformly will the habit be formed. Under such conditions the curve illustrating the growth of the habit will rise steadily. Whenever the incentive decreases in intensity (oftentimes with the actual onset of boredom) there appear pauses

and resting places in the curve (places of no improvement).

Let us turn to the experimental justification of these conclusions.

1. *The Law of Diminishing Returns from Practice*

A few years ago we knew nothing concerning the way in which practice periods are related to learning. Scattering and inconclusive experiments had been carried out in the schoolroom but the number of cases tested was too few for safe conclusions. In order to get a sufficient number of subjects whose daily life was under our control we used white rats.[1] Our methods were as follows: we took one group of animals and allowed each member to solve a specific problem once per day; the members of a second group were allowed to solve the problem three times per day; and of a third group, five times per day. As soon as an animal could solve the problem — which was to open a simple latch box in two seconds without making an error — it was considered to have learned the problem, and its total

[1] These experiments were carried out by Dr. J. L. Ulrich. See Behavior Monographs, No. 10.

number of trials before reaching this stage of perfection was counted. This procedure was adopted for all the groups at work. The results came out in a rather clear-cut and surprising way: those animals having one trial per day required very much fewer trials than those having a larger number. In other words, given the same amount of practice, it is far better to distribute that practice over a longer period of time than to concentrate it in a relatively short period of time, if we wish to get the maximum efficiency out of each practice period. These experiments were continued further by letting a group of animals solve the problem once on alternate days, thus giving one day of rest between practices; and by allowing still another group to have a two-day rest period between practices; and a third group a three-day rest period. The maximum efficiency per practice was obtained in that group which had at least one day of rest between practice periods. Dr. Helen Hubbert of Randolph-Macon Woman's College is carrying out a similar experiment upon young women, which likewise shows the value of rest between practices. Her results are not yet published.

Dr. Lashley of our laboratory has already

made a somewhat similar test upon human beings.[1] He used for this purpose the acquisition of skill in archery. The archery ground was set up on the University campus. The subjects were all forced to shoot five hundred times; in other words, the total amount of practice was the same for all groups. The groups were all carefully selected, none of the subjects having had previous practice on the English long bow and all having about the same degree of initial efficiency. After each shot was made, the distance of the arrow from the center of the bull's eye was measured. The subjects were thrown into the following groups: one group had to shoot five times per day; another twelve times per day; another twenty; and the fourth forty. The final accuracy of the last twenty-five shots was chosen as a measure of the amount of improvement which had taken place. The results strongly confirm those already reported for the rat: the group shooting five times a day could shoot approximately twice to three times as accurately as the group having to shoot forty times per day. There seems to be no question but that this law is universal in its application.

[1] The Acquisition of Skill in Archery. Publications of Carnegie Institution of Washington, No. 201, p. 107.

I think some practical conclusions may be suggested from these experiments. In the first place they show that we may utilize isolated bits of time in the schoolroom (and in the business world) for getting our pupils to acquire skill in directions which harmonize with their bent. We may work with the full confidence that the practice periods in these isolated moments will yield splendid results. The student ought to be encouraged to take half an hour each day, or even one hour a week, to perfect himself along some particular line towards which he is especially attracted — it may be in the playing of some musical instrument or in the perfecting of skill in some form of sport, in typewriting and stenography, photography, bookbinding, drawing, painting, etc., hobbies which he may have no time or opportunity to ride during school hours. The more of such habits an individual has at his command, the more safety valves he will have in time of trouble. If the student properly systematizes his out of school hours, he will find that he has more time both for work and for play. Personal efficiency does not mean that the individual needs to become cold and unlifelike. It does mean more satisfactory work and more time for the putting on of

useful habits of work and the equally useful habits of play.

2. *The Less the Number of Habits Formed Simultaneously, the More Rapid is the Rise of Any Given Habit*

In a similar way evidence was obtained that the smaller the number of habits an animal is learning simultaneously, the more rapidly will he learn each of the habits. The experiments were carried out by a method similar to the above. We first established a norm of learning for three problems by using three different groups of animals. Each group was allowed to learn only one problem. We then took three other groups and forced them to learn the same three problems simultaneously. We wished to see whether law 1 held here also. Accordingly we allowed one group to solve problem number 1, once per day and immediately thereafter problem number 2, and immediately thereafter problem number 3. The second group was forced to solve each of the three problems three times per day; the third group had to solve each of them five times per day. Our results show fairly clearly that the group learning one problem at a time could learn more rapidly than any of the above

groups having to learn three problems abreast. At the same time, we got a perfect demonstration here also of the law of diminishing returns. The group solving each of the three problems once per day learned much more rapidly from the standpoint of the number of trials than either of the other two groups. So far these experiments have not been carried out on human beings in any conclusive way, but I have not the slightest doubt but that the same law will hold there also, at least for certain types of habits. The question arises, though: would we have had this interference if our problems had been different, or might we not indeed have found groups of problems which could be learned more easily abreast than in rotation? Some very recent work on the human being tends to support the view that we may not only have *no interference* among acts which contain few or no "identical elements" but that we may have actual facilitation. The search for non-conflicting and mutually facilitating habits, if such exist, must go on until we can be sure that we have the best possible selection of studies to be pursued simultaneously in each and every grade.

3. *The Younger the Animal, the More Rapidly will the Habit be Formed*

These experiments have been carried out mainly upon animals. One of our students at Hopkins allowed nearly one hundred animals of different ages to learn a very complex maze, taking the while an accurate record of the number of trials required to master it.[1] The animals were divided into four groups: a twenty-five day old group, which is the age at which they become independent of the mother; a sixty-five day old group, or the age of sexual maturity; a two hundred day old group, which might represent the middle of adult life; and a three hundred day old group, to represent the beginning of old age. The twenty-five day old rats and the sixty-five day old rats, which represent our most youthful groups, learned the maze in approximately thirty trials; whereas the two hundred and three hundred day old animals required nearly a third more trials — about forty-two. The young animals required about six seconds for their finally perfected runs; the old groups required about ten seconds. These

[1] The Effect of Age on Habit Formation. By Helen B. Hubbert, Behavior Monographs, No. 11.

experiments show clearly two things: first, that, as everyone has hitherto suspected, the young animals do learn faster than the old ones; but in the second place, that the old animals can learn very fast indeed, all things considered. We have continued these experiments with a few very old animals and we find that animals even five and six hundred days old still have the ability to learn this complicated maze. I think two things are indicated from these experiments if you will permit me to "carry over" conclusions from the animal world to the human. In the first place they suggest that the earlier we can get a child to work upon a problem, assuming that he is of the general level to begin the problem, the better our results will be. This conclusion is, I should say, strengthened by the schoolroom observations of Baldwin, namely, that those children who enter school a year or two earlier, in general, maintain their lead and consequently graduate a year or two earlier. In these days of economic pressure this gain is not without its significance. In the second place, I think these experiments should give those of us who have passed the first bloom of youth a good deal of hope. Many of us in that too often unfor-

tunate condition say that we do not know how to dance, to skate, and to play games because we did not learn such things when we were young; but this excuse is no longer valid. We now have experimental evidence to show that the contention of William James concerning the non-plasticity that is supposed to go with old age, which has been so universally accepted, is completely unfounded. Any one of us who cares to put on the highly skillful acts needed in either work or play can do so provided he is willing to spend approximately a third more time than a youth would have to spend in acquiring the same acts. I have been at some pains to verify this contention by asking some of our better musical teachers whether they have ever had any success in teaching, for example, the pipe organ to people who are forty years of age or over. They tell me that their success has been surprising. One of my friends, fifty years of age, is at the present time trying to learn to play the violin. If he succeeds in acquiring any degree of skill upon this instrument, I should predict that there is hardly any line of activity which will not yield to "middle aged" effort. James puts the fixation or crystallization point at thirty. I should

extend the point indefinitely. Convention has more or less frowned at middle age putting on so-called youthful habits: we look askance at a middle-aged individual who is trying to learn such acts. We say such a person is kittenish. I should say that here our conventions are wrong; that middle age and early old age would be much more exciting periods for all of us if we would only become willing to scorn such conventions and dare to learn whatever we please to learn. Fortunately, modern times show, apart from experimental laboratories, a rather pronounced move in the right direction. This is shown in the tendency of the middle-aged to learn the modern dances, to drive their own cars, to play golf, and, in general, to add other strings to their bows. I have been extremely interested in watching the spread of the modern dances. When these came in, the older members of the community took a rather scornful attitude on the side lines and were rather prone to condemn the "immorality" of such dances. Two years saw a complete change in this respect, and now when I go to the cafés of New York I sit and watch with all amazement the middle aged and the agéd giving no mean exhibition of the fact that the human race is

never too old to learn. Such revolts against a playless and stereotyped old age ought to be encouraged by using our schoolhouses outside of school hours as places where parents can be taught to play.

4. *The Higher the Incentive and the More Uniform the Incentive, the More Rapid and Steady will be the Improvement*

We owe the work upon which this law is based to experiments which have been carried out in the psychological laboratories. Long ago Bryan and Harter showed in their studies in telegraphy that individuals working in this field very early reached a certain stage of development and then ceased to improve. These low levels of adjustment were due to environmental conditions.[1] Most of the learners in telegraphy as soon as they become competent to send and receive messages in small stations cease to improve, in other words, they reach only the first level of adjustment which will just enable them to hold a job. They are then on a par with the majority of their group; consequently there is no further incentive or drive to improvement. The

[1] For a summary of these and related results, see Thorndike, Educational Psychology, Vol. 2.

same thing occurs in typewriting and in practically all of the vocations. The great mass of individuals takes the lowest level of adjustment which will enable it to earn a living; and then the environment ceases to offer any adequate incentive for the continuation of practice. How can we get a learner away from this low level? This is the cry of the business world to-day. It is the cry of the schoolroom as well. It has been shown in these experiments that if high stimulating values can be obtained, the learning curve will again immediately begin to rise. Curves of animal learning, where the incentive is kept high by controlling the food and other factors, show no plateaux. We might illustrate how the addition of an incentive will produce improvement by a hypothetical example in the field of typewriting. As soon as an individual can just take care of an office adequately, say at fifteen dollars per week, there comes a slump in the learning. Now suppose that a larger office is willing to try out this individual's services. She goes there and finds that her work is not so rapid nor so accurate as that of certain other girls in the office. The record of these better-paid girls serves as a stimulus or drive. Our individual then gets

an added incentive and soon reaches a higher level. Another period of non-improvement results, and not until some other incentive is added will she improve. Suppose literature has been put in her hands which shows that the touch system of typewriting is more efficient than the method she has been using. Another impetus has been given to her work, a better method is employed, and improvement again results. Suppose now a prize is offered for speed and she enters the contest. Under the emotional excitement improvement will again show up. Finally, world records begin to serve as a stimulus for improvement; and we at last find our individual holding the world's record for speed.

The business world has to a certain extent studied methods by which it can get this added drive. The system of profit sharing so largely utilized by Ford and other manufacturers, the offering of bonuses or dividends, extra pay, etc., introduces emotional factors which almost immediately bring the workers up to much more efficient levels. Unfortunately the schoolroom has neglected this important element. A while ago I referred to the fact that emotional reactions put the organism into such a changed physiological condition that it

can do things which it could not do at other times. Consequently if we could only get some way of arousing emotion at critical places in learning we would have the solution of our problem. I believe that this can be accomplished to some extent in the schoolroom by the selection of teachers who have that very definite gift of attaching to themselves the emotional life of the pupils. Such teachers can and undoubtedly do get the added drive which comes from emotional arousal. You may say that this has been generally recognized in practice. Possibly it has, but the reason for it has not been understood and we have not insisted upon it as a *sine qua non.* Our test of the teacher is his erudition which may or may not go along with the ability to *fix* and to *hold* the love of the child. For this reason I should never put the untried and inexperienced teacher in to teach the youngest children, which is now so often done. If the teachers are chosen with care, such emotional attachments as I now defend are easily controlled and no evil consequences need result. We have begun here, though, to deal in dreams of the future and with speculations, and the experimenter has a long way to go before he can offer information

which will be anything more than vaguely suggestive.

May I sum up in a few words the general drift of my argument? It is this: the behavior laboratories are working daily at problems which lie close to our school systems. Would it not be to the advantage both of the laboratories and of the schools to stay somewhat in touch with each other; cannot the schools of our land be kept flexible in all matters and ready to try out at least the most promising data which come from the laboratories?

MENTAL AND MORAL HEALTH IN A CONSTRUCTIVE SCHOOL PROGRAM

BY

ADOLF MEYER, M.D.

JOHNS HOPKINS UNIVERSITY

MENTAL AND MORAL HEALTH IN A CONSTRUCTIVE SCHOOL PROGRAM

GREAT emergencies create great efforts and bring out great minds. Chicago with its tremendous problems of amalgamation and integration of a huge foreign population, with its complex political and civic machinery, its widely varied neighborhood problems, and with its tremendous tasks of education, has brought to the front its Colonel Parker, its John Dewey, its Mrs. Ella Flagg Young; it has given the occasion for such magnanimous creations and developments as the Francis Parker School, the University School, and that noteworthy institution which aims to go to the root of sad mishaps in the child and in the adolescent, — the institution so generously and wisely made possible by those who gave the opportunities of work to Dr. Healy.

A school system and such affiliated organizations as Chicago has developed strongly draw one to come and learn, and to meet with those vitally interested, even if the occasion demands that he in turn contribute

to the discussion. There is clearly a very potent personal stimulus of my interest in schools in the fact that in all my work I am constantly confronted with the question: What has been the share of nature and of nurture, and of home and school, in the lives of the patients who form the subject of my medical work? My great desire to learn more through closer contact from the many workers whose life interest lies in the shaping of the school problem and my interest in a prospective experiment with a school as a community center account for my yielding readily to Mrs. Dummer's appeal to undertake a humble discussion of what the psychopathologist might have to contribute to a constructive consideration of the relation of the school to mental and moral health.

There are periods when some of our human institutions are blindly accepted by tradition as if they were the revelation of immutable truths; and other periods come when there is debate and a conviction of possibilities of growth.

To be sure, every human institution such as a school system has to have its frame of stable and dependable organization if it is to hold its own among the many other factors making up organized civilization. But, as it

serves as one of the organs of the growing and ever-changing world of mankind, the frame and the structure as a whole will always have to be more than dead bone, a living, adaptable part of the great biological and sociological integrations of human beings into organized communities. And success will always be judged by the great criterion of the mental and moral health of its products.

To study the school as an organ of the community and to study its possible share in the attainment of mental and moral health, is no small contract. Such a program suggests problems which I certainly do not pretend to solve in an hour's talk. I must limit myself to discussing what changes and what growth have occurred in my own field, — that of the study of mind and of mental health problems, — matters that might well be of interest to those who have the fate and shaping of a school policy in their hands.

As such changes I would mention:

1. The reaching out of psychiatry from hospital administration to the study of the individual patient, wherever found; — and the gain in the relation of individual and community and their respective share of responsibility for mental and moral health.

2. A firmer recognition of the intrinsic unity of the problem of *all* health, that of special organs and also that of the entire individual.

3. The development of methods to get useful inventories of the assets and determining factors of the lives of pupils and their problems, and a correspondingly better practical grasp on their management.

4. The advantage accruing from such study as regards the prevention and correction of mental sickness, and the gain, also, of general efficiency and a vision of natural lines of growth and progress through and in the schools.

THE BROADENING OF PSYCHIATRY

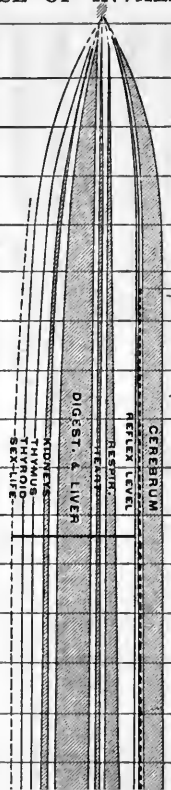
I feel strongly that the educator and the physician have more and more common ground on account of the great progress made both in the school and in the medical spheres. Since the days when I took my first plunge into practical adult life in Chicago and Kankakee, momentous transformations have occurred in the lifework that I then chose. From having their main and almost exclusive field in hospitals largely for committed patients, such as that of Kankakee, the psychiatric interests have broadened until one

of our most inspiring activities is now extra-institutional work in the community and especially at the point where the individual first enters community life — the school. Witness only the work of your Society for Mental Hygiene and of various dispensaries, and the growing amount of work done for child welfare.

In the last twenty years, a transformation has also taken place in the very mode of approach of the psychiatrist and psychopathologist to his immediate task. I have often told of a little experience I had at Kankakee: At the autopsy of a patient who had dropped dead after a hearty meal, I had shown the jury that the man had succumbed to the rupture of his diseased heart muscle. The foreman of the jury, a physician, satisfied with the demonstration of the cause of death, watched me examine the brain and finally asked: "Now, Doctor, show us what you find in the mind." I feel sure that he thought that our knowledge of the brain would give us the safest knowledge of the patient's mental state. I had to refer him for the mental findings to the *history* or life-record of the case, which in those days was very meager, partly owing to the small number of physicians in

proportion to the number of patients, and partly because the physicians had no confidence in the life-record as a scientific fact. Notwithstanding the growth of our knowledge of brains, we have since learned more than ever to express the facts of mind much more definitely in accounts of the personality, and much more in terms of actual life than in fanciful descriptions of brains in terms of what I call neurologizing tautologies. Psychology has learned to make the biography its very frame and starting point, the record of the connected and coherent activity of the individual and the study of the essential *parts* of the *life-record* and its determining factors, *i.e.*, the things and experiences that play a rôle in shaping the life. Psychology is not merely an ultra-erudite and bone-dry laboratory interest or a kind of grab-bag of mysterious forces and tricks beginning with the subconscious and hypnotism, but as Dr. Watson so ably illustrated from his own work-shop, a study of actual observable processes covering the whole range of the individual's activity from sleeping to the fullest waking behavior, such as these processes of learning and acquiring and using experiences — functions with a clearly *biological foundation.*

NAME: **CASE OF INVALIDISM** *May 27, 1885* N.B.



			Yr.
1886			1
7			2
8			3
9			4
1890			5
1		Beginning of headaches.	6
2		Private school.	7
3			8
4			9
1895			10
6	"Typhoid"?		11
7		5th grade repeated.	12
8	Menstruation irregular	Headaches partly menstrual, partly reactive.	13
9			14
1900			15

2			17
3		Marriage	18
4	1st child died 6 mos. old.		19
1905	Complications of sex-life.		20
6			21
7			22
8		Indifference of husband? Pains about the heart - globus; depression; exhaustion.	23
	2nd child [illegible] days.	Growing invalidism. Need of sympathy.	24
1910			25
11	3d child living.		26
12	Operation for fallen stomach. Appendectomy.	Invalidism; mostly in bed. Call for sympathy reinforced by call for operations.	27
13	Removal of ovaries and tubes.	Lavage of stomach [illegible] days rather every 10 years. Exhaustion; pressure in head. Marked fatigability backache, pains about heart, shoulder & limbs;	28
14	Hot flushes.	In hospital from Feb.9 to July 31,1915. Recovery. numbness on left side; [illegible] sensitiveness to noises; poor sleep.	29
1915	"Menstrual" headaches.		30

THE LIFE-CHART

To-day we study mental activity and behavior, *i.e.*, the topic of psychology, as the *function and activity of the unified organism*, just as we view physiology as the science studying the behavior and function of the various organs and *parts*. The study of the *total behavior of the individual and its integration as it hangs together as part of a life-history of a personality in distinction from the life-history of a single organ*, that is our great interest in psychology and psychopathology. No words of mine can give you a more graphic picture of the concreteness of what counts than the *life-chart* — a record, on the one hand, of the condition and of the performance of the various bodily functions and special organs, and of the rôle each of these plays in shaping the biography or life of the person; and, on the other hand, the various experiences expressing the lines of habit-and-resource formation constituting the accumulated mass of habits, memories, and the reactive resources of the individual. The result of this integration is *not an abstract mind* but a living body in action, a unified personality, an individual with capacity for reflexes and instincts and

habits and memories and imaginative reactive resources.

A life can be presented graphically as a record of the special organs (arbitrarily represented in the form of a weight curve of the principal parts), and at the same time as a record of total behavior. The interrelation of the parts and the whole, as I said, constitutes a system of integration. The plan depicts clearly the welding of the parts into an organism, and the interrelation of the organism as a whole with the events and the facts of the outside world, in the form of reactions of the personality or individual, constituting the sum total of the life-history of the parts or special functions as well as of the whole. Thus we can appreciate the fact that the respiration has to serve properly the total need of oxygen and the elimination of carbon dioxid, but the same combination also has to serve the functions of voice and language production as integrated by the nervous system; and this has to blend with even the larger needs and aims of the total organism, since most of our thought is couched in language, forming an important part of those habits and trends which we specify as "the mental and moral life" and its resources. Thus we

see in thought and speech an integration of an organ simultaneously serving simple physiological demands and also serving such a function as the one I am at present engaged in, in a full-fledged observable mental activity.

The great advantage of this simplification, of viewing *mind* primarily as *the adaptive and creative activity of a biological organism in terms of a biography and record*, is that it gives us a practical way of putting forth our facts and problems — whether we try to educate a person or whether we apply mental orthopedics to the correction of behavior, whether it be in connection with any special organ or any special function, or activities involving the whole personality. Moreover, it gives us a valuable sense of proportion between what counts in the life and what is purely incidental; the overt and demonstrable life brought out by overt action and expression, and the mere thoughts; the performance rather than the mere knowledge, the result rather than the mere step to it.

THE BIOLOGICAL CONCEPTION OF MAN

Besides the practical emphasis, the simplified scheme shows us human life with its

material and spiritual aspects as a consistent whole. We are no longer worried and confused by the apparent chasm between nature and the world of human life and its ambitions, which seems to have staggered even Huxley so that it drove him into the transitory phase of agnosticism and doubt as to the possibility of harmonizing the laws of nature and of life with the great human world of ambitions and of dreams of perfection and ideals, the laws of the mores, or ethics, and religion. As we said before, a complex and yet simple organization of natural and creative forces into actual living individuals is what we have to deal with — an organization starting from lowly origins but reaching as high as its support will carry; the product of a long process of growth and function, an unfolding of instincts and their application and transformation, a readiness for and attraction to many experiences and performances, an evolution through a wealth of reactions and capacities gradually wrought into habits and resources, rising to full-fledged individual and social life with its heights of appreciative and creative attainment. There is but one way to learn to know such an organism and that is through its life-history, the record of past and present

reactions, from which we can foretell the range of capacities of the future.

LANGUAGE AS A GREAT STEP OF PROGRESS AND SOURCE OF SERIOUS EDUCATIONAL PROBLEMS

In comparing the simpler biological organisms and man in respect to growth and education, we are at once struck by a contrast which is very significant and which entails the great preëminence of man in the scale of evolution but also a great risk in the sphere of health. The development of language and its symbols, the development of the silent language, and language memory, and imagination in terms of language, gives man at once the great privilege and the great task of maintaining the proper balance, so much more difficult than where life consists more conspicuously of overt and direct activity, as in animals.

The ability to store knowledge in terms of word-memories and principles, in terms of written and transmitted doctrine, creates the human atmosphere and brings with it the temptation to change the system of education from that of training to one of *teaching* and *instructing*. So great is this temptation that the traditional scheme of education has limited itself almost exclusively to this one

type of human attainment, and indeed there are many who would not like to see the school do anything else; and all this in the face of the fact that our very nature is a product of the growth and nurture of an organism in which impulse, instinct and differential activity and performance make up what counts in the biography or life-record. Activity is the natural setting and very nature of all mental growth. As has been said, "The laws of mental health and of character require the completion of thought or feeling by expression in action." Mere feeling and thought and fancy which are not brought to the test of action, to their fulfilment in action, tend to become one of the danger points of human nature.

Even in the prebiological period of human thought as among the Greeks, the school aimed at the development of the entire organism and the development of all-round fitness for adult life. Later the medieval tendency to treat an abstract mind as an entity by itself, and the sectarian tendency to keep important aspects of life out of the curriculum, tended to focus attention upon but one feature of the personality. When we look at biographies, the schooling clearly

gives the main setting to a long series of years. Even if the ideal of the scheme of education aimed mainly at knowledge and at the acquisition of the arts of reading and writing and arithmetic and a certain amount of historical, linguistic and natural history information, the period of school-life is the time during which the habits acquired in earlier childhood become more definitely shaped. Between home, social environment and school, the young citizen spends six, eight and more years to attain the ideal of education of his or her generation. The traditional school aims at conveying systematized knowledge, the results of centuries of human evolution, — the paper money of experience, a set of capacities which a democracy must be able to expect of its citizens, and which life at large would supply only very unsystematically. For this purpose the school practically takes possession of the child and the adolescent, and it determines the principal features of that period of life. Need we wonder that it is more and more concerning itself with a broader conception of education than that of mere "mental training"?

THE MODERN TESTS OF A SCHOOL SYSTEM

The questions we might ask about a school system are: Can the result be called well rounded, making for preparedness for an efficient and wholesome thirty or forty or more years of adult life? Does the product of such training know what he or she is fit for; what he or she wants and will try to do as his or her share of the work of sustenance and productiveness? Is the school training in harmony with our best knowledge of the integrated human organism and personality: Does it satisfy the principle that life ultimately be judged in terms of a biography of objective achievement and that knowledge is merely an incidental asset and telling only when it shows in effective or expressive activity? Does it succeed in forging the natural assets into power? And finally, what share can any type of school have in favoring or damaging the individual chances for mental and moral health and efficiency?

Paton, in his Psychiatry (pp. 198–199), attributes "the enormous increase of nervous and mental diseases, one of the most serious menaces to the public welfare," to the attempt to educate numbers of individuals

whose central nervous systems are functionally unable to withstand the strain imposed upon them. He would limit the advantages and risks of education in the public schools to those who have sound bodies and sound minds. "To render it possible for an individual who is physically and mentally unfit for the stress associated with the effort to undertake the acquirement of what is termed a liberal education should be regarded as an offense against the public health and morality no less culpable than if one were to deliberately place him in an environment where he is exposed to an infectious disease. What particular form of education is best adapted to the average child? How far should the negro be carried in his schooling? Of what degree of mental activity is woman capable without impairing her physical vigor? These are not questions that can be solved by mere amateurs, but involve problems calling for the earnest consideration of those who are at least familiar with the methods of investigating the difficulties connected with the functional activity of the central nervous system."

Here are questions which we may not expect to answer to-night, unless we should

care to risk becoming classified with the amateurs. But they open our eyes to the necessity of studying the problem as far as facts are available and to some ways of using especially what methods we have acquired through the biological conception of man.

STUDIES IN MENTAL HYGIENE

There are two ways of being interested in health; the common one is that of making a list and plan of all the things that are good and desirable in life and giving the best possible description of utopia and of perfection with recommendations as to how to get there. The way of the worker in modern hygiene is that of making a survey of the actual activities and conditions, and then of taking up definite points of difficulty, tracing them to an understanding in terms of causes and effects and to factors on which fruitful experimental analytical and constructive work can be done. The first type leads mainly to moralizing; the second type leads to conscientious and impartial study and to constructive experimentation. It is one thing to study the problem of mental and moral health in the abstract and another to take up the definite points at which the human being is

apt to fail and to trace them specifically to factors which can receive consideration in experimental creative work and in a constructive school program.

To get help from the field of the abnormalities and difficulties of children and of methods of teaching, naturally requires familiarity with the well-studied overt major and minor mental disorders and the methods of getting at their understanding — and also with the aims and methods of pedagogy. These are quite obviously matters which can be acquired only by practical work and collaboration in the fields concerned. What I can survey here is merely a sketch of some fundamental facts and principles to show possibilities and methods as a basis for recommendations of organization.

THE PSYCHOBIOLOGICAL VIEW OF PROBLEMS MET IN SCHOOL

Let me state as the first requirement that the school-physician should have a clear conception of the school child's nature as an organism to be studied in its parts and also as a psychobiological whole, a personality and individual — a conception which implies training in psychobiology for at least a certain

number of the school physicians. The school physician who has the analytic-constructive biological conception approaches the pupil with due attention to disorders of eye and ear, of the breathing and the possible adenoids, and the state of nutrition; but he also knows that the pupil brings to the school an endowment not merely of special organs but also of habits of total-function; good or bad food-habits expressing themselves in appetites and more or less orderly habits of feeding and of digestion; a more or less adequate equipment of habits of sleep and waking and resting and activity; the kind of life characteristic of the infant or child or adolescent, different from that of the adult or old person; he recognizes individual differences in the scope of endowment and resources; endurance and concentration and interest; or weakness, distractability and indifference; a varying ability to control with foresight the momentary notions, temptations and desires; a capacity of contentment and satisfaction, or of unrest; habits of self-dependence or of dependence upon others and craving for attention; habits for team work or a lack of social instincts; an ability to mix, to respond to others and to make them respond — an

ability to understand and to be understood and to enjoy and be enjoyed. Within this large sphere of resources and activities and qualifications we may further single out features such as varying preparedness to meet the unusual or perhaps the undesirable, such as sickness, and varying amenability to discipline and to guidance, and capacities to assume responsibilities and duties. Here there is a mass of vital facts requiring consideration if the child is to be put into the best balanced situations. Dr. Watson has singled out from the greatly varied life of the infant the emotions of rage and fear and love and joy; and a similar sifting will have to be done, with similar care, for the instinctive factors and the lines of acquisition of training of the older child so that we may get a natural picture of the inheritable dispositions and the lines in which they can be brought out and shaped or, as the Latin word has it, educated, and studied as fundamental units.

Until we shall have our nursery and childhood laboratories, might we not be guided in a helpful manner by the grave school of life, with its exhibits of the blundering of human nature?

HELPS FROM MEDICAL EXPERIENCE

Nine years ago I formulated my experience in a paper on "What do histories of cases of insanity teach us concerning preventive mental hygiene during the years of school-life?" (published in Vol. II of the Psychological Clinic). I shall not attempt to restate my facts and conclusions as fully to-day as I did then, but shall choose a few cases from a somewhat different angle, so as to reinforce our conception of man and also so as to throw some light on how to proceed in the study of the simpler but often equally difficult problems you meet in schools.

An attempt to find in the literature discussions of common difficulties of pupils in schools — the kind of thing that one would expect teachers to try to find help for — left me with a remarkably small return. Apart from the Paedagogische Pathologie oder die Lehre von den Fehlern (faults) der Kinder by Prof. Ludwig Strümpell (Leipzig — 1892), I know of no systematic presentation even in the recent works on the hygiene of the child's mind, of the very problems which the teacher would seem to me to meet almost daily in his or her efforts to attain mental and moral

health in the children. The most noteworthy specific beginning comes from your own midst, in Dr. Healy's recent book on Honesty, which naturally deals with but a limited though widely pervading topic.

I have no doubt that there is in a way a healthy feature to this abstinence from excessive discussion. Most of the efforts at remedy are properly made in the very biological foundations: in better feeding, better rest and the creation of more contentment on the part of the pupils. These efforts are clearly the basic substitute for the effete and long-winded discussions of a merely moralizing type. But there certainly are conditions in which the fundamental helps of food, rest and contentment are insufficient, and where nothing but a thorough personality study will reveal the causes at work. The problems of shyness and fear of recitation and other fears, of carelessness, absentmindedness, of unexpected slumps of performance, of obstinacy and unruliness, of lying, etc. are issues which may call for as careful a study and understanding as those *clearly* morbid conditions which even to-day are brought to the physician, because they attract the attention of the family as well as that of the teacher.

I take the liberty of mentioning a few cases of disorders of this period of life, as we could not take up a full discussion of specially difficult temperaments and specially difficult situations without getting too technical for a brief lecture. We can only pick out a few samples which may broaden our horizon, although they did not come up primarily as school problems.

A little girl of 8 comes to us with nervous restlessness and a twitching of the face which she is said to have acquired two years ago from wet applications used during an attack of tonsillitis. She leads her class, memorizes poetry for pleasure, must be the first in everything; is restless and fidgety. She has slightly enlarged tonsils and perhaps a slightly enlarged thyroid. In the Binet scale she ranks one year *above* normal, especially in the points in which she has been drilled at school, but lower where she had to depend on her own wits and her own imagination.

Now what conditions does she live in? What is her mental background? She is afraid to sleep alone. She sleeps in her mother's bed, with the father in the same room; she talks in her sleep, is restless, and the mother wakes her once a night to avoid bed-wetting, although this has not occurred for a year. The child has her own way about food and everything. She knows how to keep her mother on the rack by telling her of what horrible things the girls talk about at school. The girl asks the mother questions and is told not to ask her again about such matters; and back she goes to where her

curiosity is satisfied. You can judge where her fancy turns from the fact that the patient, who is anxious for a baby brother, was rather delighted when her mother had a headache, as that made her suspect a pregnancy.

Whose tonsils shall we have removed in that family? Almost every point mentioned calls for a modification of the way of living and instruction under the guidance of a trained social worker, and we may be sure that the girl can be saved from many and graver dangers than the bad effects from her tonsils.

Another girl of 6 is brought to the dispensary because, since her mother's death three years ago, and especially since her father died, one and a half years ago, she is nervous, stands up in bed, screams, grabs her grandmother with whom she sleeps, is scared, bites her nails, does not play; she is bashful and timid, hides behind the grandmother, but can be interested at once when candy is mentioned; she is curious and rather characteristically so, tears up the toys to see their insides; most of her talk is about her father and mother, with such questions as whether her father gets anything to eat. She does not go out because she has so often been told that she is "the only grandchild." The little patient buys candy incessantly. The nightmares are helped by bromide; but a simple readjustment of the conditions of life with reasonable emancipation from the grandmother has helped her much more generally. The grandmother states that she is like another child, so much less nervous and so much more reasonable.

Let us take an instance from the much larger group where all trouble was tided over until the period of puberty brought a new strain. A boy of $15\frac{1}{2}$ years is brought with choreiform movements of his right arm

and fingers, headache and loss of appetite. The maternal grandmother was nervous; the mother is nervous and has been mentally deranged in connection with two of her childbirths. The father too had a nervous breakdown "due to overwork."

The boy had cried much during the first months of his life. He went to Kindergarten at 4, and entered High School at 12 and now is described as too fond of study for his strength. He is called a "night hawk"; laughed at by his sisters, etc.

After a slight burn in 1908 choreiform twitches of the right arm had developed with jerky movements and some numbness of the hand lasting about six months. Lately the nights have become restless and, during a writing test, the hand began to jerk again. He began to feel the lack of air in school, felt as if he should vomit unless he got out; once he ran away from home. His father suspected self-abuse and as we learned ourselves, justly so; but not knowing how to get near the boy, he charged him in the presence of the family with playing with himself, which only aggravated the boy's discomfiture. To teach the boy to understand himself and the parents to understand him, was the main problem of treatment, and after a hygienic summer, the boy resumed his normal standing in school.

THE NEED OF STUDYING THE INDIVIDUAL CASE

The reason why I should like to give you also a bird's-eye view of the varied troubles of the adult as well is this: there is a widespread notion current among the public,

and possibly also in the medical profession, that what you have to do in these disorders is to get a formal diagnosis as the result of some more or less specific and remarkable test or trick, and that this diagnosis is then used to prescribe a very particular treatment. If you mean by diagnosis a knowledge and understanding of what the moving forces are and how they *work* and how they can be modified, you are on safe ground; if, however, you think you have gained much when you have found a name for the condition, you deceive yourselves. If I may turn once more to the life chart which I brought with me, you find there in brief a record of a patient who was driven into invalidism through many misunderstandings. Call the condition neurasthenia or hysteria; the fact is that you only describe and classify it dogmatically that way. In order to understand it, you have to trace the various factors, and you find from the age of five a habit of headaches, a dependence on others, lack of emancipation, the tendency to appeal for sympathy by her complaints; then after her marriage and the birth of a child and subsequent interference with her normal instinctive life, fear of losing the affection of her husband, more

invalidism; then several unfortunate and mutilating operations, a real evisceration instead of a study of the facts in the case, but finally a readjustment under a treatment reestablishing better habits, a better understanding of the difficulties and an end of making the stomach and the head the scapegoat of failure of adaptation. In this case, as in many similar ones, the school missed an opportunity to trace the situation which tolerated and possibly encouraged the persistence of the habit-headache, the reasons for dependence and lack of emancipation, etc.

THE PROBLEMS OF PHYSICIAN AND TEACHER THE PROBLEMS OF ALL LIFE

Does this recital of concrete medical experience suggest to you the close similarity of the problems of the physician and those of the teacher, those of all life? What you see in this brief sketch of our adult patient is what we must learn to determine even in the minor disturbances and especially also in the disciplinary difficulties of the child; we must not be satisfied with mere descriptions and with distress over the regrettable difficulties and with off-hand efforts to apply traditional measures of correction which may not fit the case or may only smooth over the

trouble. But we must devise methods of getting at the facts in a judicious, helpful and constructive manner, and that means the systematic use of what we physicians and you teachers alike have learnt to recognize as obligatory — *a study of the individual case in the light of his or her development and home and school situation.*

Where nervous and behavior disorders are corrected by attention to special organs as in eye strain, or adenoids, it is of the utmost importance not to neglect, in an optimistic mood, the weak spot in the psychobiological balance which may show again under some other strain or which may persist as evidence of deficit or of sources of irritation.

SCHOOL PROBLEMS

There are problems of the management of life in and out of school and there are ways of getting at the facts and of adjusting them. The school undoubtedly has its share in producing or favoring the disorders of balance at the bottom of the smaller and greater failures of adaptation. It is my impression, however, that the modern school is open in the main to fewer charges of commission than

to charges of omission. Most abnormalities undoubtedly have their foundation laid in the home, by heredity, and by a poor start in habit-formation. In the European schools there is much concern about the Überbürdung, the overtaxing of the school child, a problem which might be considered an exception here, except when a child does not know *how* to work and how to play. The school is more apt to furnish a more or less innocent aggravation of more deeply rooted difficulties, traits which come to the front as much or even more in the extra-scholastic life of the youngster. A more specific school problem is the frequent recurrence of weariness and ennui, with puzzling and meandering in thought mazes. With this goes a tendency to develop false standards, habits of putting up a sham front of performance where the pupil is hardly doing more than serving time; a formal obedience and formal attention without any real interest and performance. This actual training in the intellectual dishonesty of maintaining appearance of interest and work where the interest is plainly wandering, inevitably warps the development of the fundamental instincts of action and its appreciation and incentives.

It stunts the appetites and capacities the child actually has, and it creates pockets for dangerous ruminations, fancies and day-dreams which are not apt to be drawn out into the world of activity, test and correction — the very things that stand out all over the cases I have cited. Even among the best we have to face a pitfall that comes from man's unique development of mere language and thought habits favoring a difficulty of balance of thought and fancy on the one hand and the capacity and output of performance on the other.

It is a striking fact that in the main the more serious and conspicuous disorders are much less frequent and less glaring in children than in the adult. But we see all the more clearly the possible roots from which the smaller and the graver disorders arise. The most frequent disorders, if we disregard for the time the defective growth of the nervous system and the infectious and toxic affections of the nervous system associated with feeblemindedness, epilepsy and kindred defects or retardation of development, are due to defect of balancing resources, unevenness of endowment and of assets, often with tendencies to overreach — with deficit and disap-

pointment reactions — or briefly put, the big problem is that of poorly balanced yearning and desires. The greatest problem is not that of feeblemindedness. There are plenty of good and well-behaved imbeciles. The point that concerns us all is that back of everything lie the yearnings, the "penchant," the leanings of the individual's make-up and the equation of balancing factors of the individual and the social group — the capacity to balance the resources wherever there is a choice or a need of proper adaptation and substitutions.

Disease shows us along what lines human beings are apt to break down and what man is *not* made for. It points inexorably to any existing discrepancies of balance, and errors in the working out of one's economic safety and efficiency. Some diseases are a community disgrace, others a social disgrace, still others must be charged to the stock (poorly guided habits of mating) and to the life of the family, and still others to the individual. Most diseases are chargeable to the unwillingness or inability to face realities of makeup and situation and to shape one's life in keeping with them. And the same holds for the major and the minor difficulties one meets in the schoolroom and playroom; the shy-

ness, the fears, misbehavior, temporary inefficiency, etc.

It is here, in the apparently trifling signals of something being wrong, that the psychopathologist may be able to offer his share of help in the form of methods developed in the study of mental disease. Thereby he serves two purposes: viz., that of helping the pupil, possibly for a lifetime, by aiding him or her to assure harmony between means and ends, and, second, that of fostering inspiration for a broader view of the teachers' working sphere.

But why all this interest in the abnormal? The main problem of the teacher is the healthy child. My contention is that a natural interest in all things human helps us to a more broadly biological and more broadly human and unified understanding of facts and methods.

THE GAIN FROM THE STUDY OF INDIVIDUALS

In the examples of problems of mental health just discussed and even in the serious and full-fledged mental disorders, we have, I hope, made it clear how much more systematically we have learned to inquire into the very human facts of the patients' biog-

raphies. A thorough search into antecedents, into the temporary situation and into the prospects, *i.e.* into the facts constituting the human biography, proves to be the only rational way to deal with most of the difficulties of mind during the school age or any other period, and that not in the sense of a "faute de mieux," an acceptance of commonsense psychobiology "because we do not know enough about the brain" and the like, but in the sense of its being the most dependable and constructively most helpful procedure, considering the actual mode of working and function and evolution of the brain and of the entire individual, the personality.

Even hasty consideration imperatively suggests the desirability of the study of pedagogical difficulties by a properly trained psychopathologist who coöperates with the teacher and who is in a position to review the assets and the situation of the child under consideration in and out of school, and especially with due attention to the full life-history.

PRACTICAL APPLICATION

The plan that suggests itself is that a school physician with training in psychopathology

attend regular conferences at which the management of the problematic pupils is brought up and discussed. The instances calling for special study might then be taken up under the direction of the physician, perhaps by a teacher or in part by a school nurse, but preferably by a teacher detailed for part of her time to make a study of the home situation and of all those facts which the physician needs if he is to make a thorough study of the individual. It should be a specific part of the work of teachers aspiring to promotion to do a certain amount of extrascholastic or field work on specific children and to collect the facts and to establish the relationships between school and home which give that maximum help that should come from the school to individual and community. The teachers to whom such tasks are to be assigned should work under the guidance of and in close coöperation with the psychiatrically trained school physician, so that they may learn to prepare a most useful life-record. Such a document, I am sure, can readily be made a record of the fundamental assets and traits and needs of each child and of fairly specific home problems, supplemented by the record of the assets brought out by a thorough per-

sonal examination by a competent physician, who may be assisted by a psychometrist where the physician favors such a division of labor. Dr. Watson's research into fundamental factors would thus receive a splendid supplement by the continual search for determining factors and individual tendencies of children and for more or less typically recurring home and school situations calling for special study.

HELP IN FINDING ONE'S BEST PLACE

This kind of *individual study* lays the foundations for probably *the greatest function of a public school.* There is no doubt about the school's great opportunity and responsibility to help the child and parents find the best level and direction of ambition adapted to the individual endowment. The school has to accept the children as they are. We may supervise to some extent our children's choice of companions in the neighborhood; but the school must take the children who come practically without choice. What it can and must do, however, is to grade and group them so as to give them an opportunity to develop their many different personalities so as to be true to themselves and also to the wider world. It

can single out extremes at bottom and at top of the scale, and it may make special provisions for individual treatment of different types of working habits, temperament and general behavior. But it must refrain from making the classes too set and rigid, and also from creating false standards of competition.

It is easy to see how the physician's standpoint blends with the standpoint of those representing educational and vocational interests in a union of the two fundamental methods of pedagogical psychology: the test-method and the method of study of the life-history with the analysis.

Binet, interested in the grading of the pupils of the Paris schools, was the first to develop a systematic set of tests serving the purpose of standardizing. So much is written on these tests that I take a knowledge of the scope of this movement for granted. Most of us use the method as one of the most practical helps that has come to us from psychology. Together with other tests, we need as an obligatory help the method specially emphasized in this paper, the life-history furnishing an analysis of the determining factors and special individual tendencies. With these foundations the record of a child must furnish a

most valuable and indispensable means by which the teacher can get an idea of the individual needs and capacities. The art of the teacher has to create a development of types of instruction that will bring satisfaction in activity through using the special individual type of yearnings, and, to do that, we need a record of the pupils' needs and leanings.

NEW METHODS OF INDIVIDUALIZING

For anything of this kind, we are, of course, in need of an adaptation of the general organization of the schools. It is with the utmost satisfaction that we note the recent *progress towards individualizing education and the cultivation of the child's real assets.* A great step in advancing healthy-mindedness is no doubt being attained by providing more and more individual treatment for each boy and girl. I need not speak of the Gary system. No doubt you also have your own experiments in your midst. Frederick Burk of the California State Normal School at San Francisco has published, not mere pamphlets of propaganda as the titles might suggest: "Lock-step Schooling and a Remedy," 1913; and "Everychild *vs.* Lock-step Schooling, a Suit in Equity," published in 1915; not a

mere appeal, but a record of "data of two years' experience in the operation of a system of individual instruction showing accelerated rates of pupils' progress, elimination of wastes of school time, actual saving in cost of schooling, and adaptability to various schools."

He adds, possibly too categorically: "There are no misfit children. There are misfit schools, misfit texts and studies, misfit dogmas and traditions of pedants and pedantry. There are misfit homes, misfit occupations and diversions. In fact, there are all kinds and conditions of misfit clothing for children, but — in the nature of things there can be no misfit children." We may admit that some children are misfits, but the community will have to recognize the need of special provision.

Another experiment interests me especially because it comes from a center in which I hope to be given an opportunity to help in the realization of the dream of a school as a community center described in its broad outline in the Survey of September 18, 1915.

In a plan of coöperation between the Public School and Children's Playground Association, the Public Park Board and the Paret Memorial (which loaned its gymnasium in inclement weather), "to keep well children

well," Miss Persis K. Miller, of School No. 76 on Locust Point, Baltimore, started, in the fall of 1913, an experiment at liberalization of the school with the knowledge of Assistant Superintendent Hands and the chairman of the Committee on Rules of the Board of Education — with the clear understanding that it was to be a carefully supervised experiment.

She chose one hundred children, or two of the four first grades the first year; the following years two hundred children, or the four first grades.

The following is the plan of the day's work: All the children report at school for morning exercises, attendance roll, etc. The children in each room are divided into three groups. After the morning exercises two of the three groups go to the playground. The group remaining with the classroom teacher, about sixteen in number, has the concentrated attention of the teacher for one hour. Then a fresh group is brought from the playground and the classroom group is taken to the playground. Children are thus spending about one third time in the classroom and two thirds on the playground under supervised play.

The results? The health is noticeably improved. There is less than one half of the absences formerly noted on account of illness. As to progress in school, — the grading of these primary children being based on reading, — the children under this plan have read from three to four times as much as under the old plan.

After the first year the experiment had to be suspended for one month; but the school board finally accepted the demonstration. The first four grades are now using the plan. The playground teacher employs four teachers-in-training from the Baltimore Teachers' Training School.

What all this means is obvious. The child like the grown-up needs action. The child needs a chance *to do in the best way* that which he has to learn to do. If we made sure that one half of the time of our schools was devoted to activity with demonstrable results, and not only to athletic competitions of a few, I feel certain that the college-trained man and woman would less frequently make the statement that they have to learn how to work when they come to the professional school, and would less frequently exhibit a remarkable incapacity to look for facts, to ask ques-

tions, and to assert well-trained curiosity and imagination and a willingness to try things and to harmonize school and life.

Miss Miller, the principal under whose direction the experiment described above was carried out, tells me that one of the greatest perplexities of the parents is that when the children leave school they do not know where to turn and what work to take up. As the remedy, the parents appeal for *vocational training.* Give the pupils some things to do with their hands, including even some duties about the schoolhouse; ask some people in the community to give them an occasional demonstration of what the various trades actually are and how grown-ups live and work; and see to it that each school has its workshop for those who prove capable of work that brings concrete results and a satisfying sense of having achieved something worth while. To have a chance to do work of this character is certainly better than having to earn a penny as a newspaper "middleman."

The child needs less repression and more guiding in activity. Ostwald's "Imperative of Energetics" with its rule, "Waste no free energy; treasure it and make the best use of it," is one of the most important principles

of education. *Direct* children to *use* their free energy by cultivation of habits and by training in the use of initiative. Do not cultivate weariness; do not smooth over weariness by mere overstimulation; but see that the child often enough uses all his energies with a full expression of all his capacity.

If the pupils can be led to develop their opportunities, to shape their ends and aims according to their means, with a really full and wholesome use of what is available, there is the best chance for growth and for stability and a natural development of personal and familial and community problems.

FALSE FEARS

We sometimes hear of a practical doubt as to the application of any standardization and individual guiding of children as conflicting with parental pride and prerogatives. Where a really constructive interest is shown, we need not dread resentment on the part of the parents against the keeping of a record of facts of a personal nature, and against grading the children according to their fitness. When we begin to acknowledge *many standards of normality*, we take away the sting of a "stigma." The parents will feel an ever-

lasting gratitude to him who shows them where their child will succeed. If the standardizing is not done by perfectionists, but is based upon the statement of facts, and if, in any radical demotion, the consensus of the principal teacher and the parent, and, if necessary, some dependable friend of the family and perhaps the physician, is secured, the parents will feel that they receive a help that is worth while and that meets needs very keenly felt at home as well as in school. Democracy stands for equality of opportunity, and also for recognition of individuality.

To collect the data for the right kind of grading has further practical advantages. When I make efforts to get the school history of a patient, I get from schools merely an account of probably rather arbitrary marks — but an account of the principal ambitions, tendencies and assets? What are the teachers expected to work with and to work for? A system with a definite kind of order and routine — but more and more also a knowledge of the individual child, the home, the gang and other factors of the environment. Why should not these facts be so worked out into individual records that they could become available to more than one teacher?

What can a new teacher expect to do when a class of from thirty to fifty little strangers is thrust upon her?

THE PROBLEM OF MORAL HEALTH

I have not, so far, touched specifically upon the *moral health* of the child. It is here that no teacher can do himself or herself justice without individual records.

On this most difficult problem of moral health, and its past and future, the teachers have but little light given them. Yet should not the school have its share in this responsibility?

The French schools, I am told, have made a special effort to introduce moral training into the curriculum, with varying reports as to their success. One of the most interesting efforts in this direction in the United States is that of Milton Fairchild, who has developed several illustrated lectures starting from observations in the street, snapshots of all kinds of situations of actual child and adult life, and accompanied by brief explanatory and advisory talks. The point here, as in so many other points of education, is that we must furnish the help to the teacher, give material enabling him or her to meet *individ-*

ually the many actual situations in the child's life, and also the *questions* and the temporary *interests* concerning the many matters in which no textbook course would hold the attention of the pupil. What is needed is an *occasional* general lesson, but usually more is attained by a concrete personal application or explanation.

The school has to leave the specific recommendations and standards elastic and relatively individual. Is it not the best moral teaching to show the pupil how to be true to one's self, and yet thoughtful of a larger whole than one's self — the religious universe, the social group, and the family — and willing to give thought to special problems and emergencies? The school must train members of different social and religious and intellectual strata of life, and yet bring to them the fundamentals of the nation's standards of behavior and moral principles and the information and habit-training which we must be able to expect from the average citizen. We must keep in mind that the school is a social organization supplementing the home so as to give each child the environment best suited to it, and that not so much with continual concern for the future as for the effec-

tiveness at the time. The school is to bring out the level of general training which fits the growing child for the demands of the give-and-take of a given type of community, with an ultimate ability to make individual decisions. Instead of pondering as to what the moral training and standards should be, we must accept frankly the fact that our standard is the standard of behavior and moral principles and the information and habit-training exemplified by the teachers and the outside environment, the home and companions. Moral training after all is, as Sumner puts it in his "Folkways," the *training of the mores*, of actual social habits, and is, more than any other line of training, a training in fitting together instincts and actual life. To discuss this here and now with regard to such a specific issue as the sex problem would detain you too long. (See note in the appendix.)

No matter how we conceive the problem of mental and moral health, whether as a preventive measure against the various diseases, or, as I would rather conceive of it, as a plan of educational procedure of a more immediately and more broadly constructive nature, as a plan to bring out the assets of our pupils as true to their temporary make-up and

opportunities as possible, — the highest aim of education will always lie in the proper encouragement and training of certain *emotional assets*, the interests, leanings and curiosities, ambitions, likes and dislikes, as well as of purely intellectual assets or knowledge. We know, of course, that as soon as we come to *that*, to the problem of poise, of interests and of the best assets of the personality, helpful guidance can be given only by the one who has himself or herself a reasonable mastery of life and of its mainsprings and forces, and the ability to forge crude emotional material into power.

This means that the *teacher* must be, if not necessarily *of* the people, at least *with* the people whose childhood and growth problems belong to the school. The teachers, like the physicians, have to face many conditions that they like and sympathize with, and others that they can hardly approve of but cannot change and they must be able to help the pupil face the incongruities of life with a great deal of tact and sound sense.

RESPONSIBILITIES TOWARD THE TEACHER

This brings me to my last topic, and the topic, to my mind, most important for real

progress — *our responsibilities toward the teachers.*

Queerly enough, in the face of the great duty and opportunity to render a *leading service to the nation,* our country has done remarkably little to give full recognition to the body of the *workers,* the profession of *teachers,* by making their situation and ambitions such that they would not have to depend on unionism methods to secure their full share of recognition.

If we wish to succeed in any program of mental and moral health work in schools, we have to *give our teachers a chance to develop and to maintain the best in human nature,* and to live in constant and profitable touch with the homes of their pupils and the community at large.

The responsible work of the teacher in a modern individualizing school-system is of a kind that demands the most varied capacities. The teacher must give the pupil an example of an orderly and yet plastic management of a daily program of planned work, with due justice to the many types and temperaments of pupils and with a helpful and sympathetic understanding of the life outside of school. The teacher must be a living

example of poise and good management and square dealing.

We must therefore seriously consider beginning our work of mental and moral hygiene among us teachers. This is the highest task for the school organization.

It is easy to see what this means as regards the *position of the teacher in the community.* I cannot help feeling that I know remarkably little of the teachers in the community in which I live. Wherever I have lived, I have met but few teachers in the circles with which I have most contact. This may be due to the undemocratic prevalence of private schools and their frequent remoteness from the homes and also due to the fact that I have but recently graduated into the personally interested class of parenthood. In my Swiss home environment the teacher had a rather prominent position, close to that of the minister and the physician, although apt to be at a natural disadvantage in respect to compensation, training and outlook. I nevertheless feel that the fact that so many young men become and remain teachers in Switzerland is an evidence that there is something that holds the ambitions and interests, and that inevitably with a de-

cidedly beneficial effect on the schools and pupils.

Stability, proper representation of the teachers in discussions of methods and policies, the right to the freest use of their judgment in the use of the school-hours, and an organized collaboration with parents, will do a great deal towards sanitation of the atmosphere. Cultivation of mutual pedagogical interests among the teachers themselves and among teachers and parents is to my mind the secret of that perennial post-graduate work and post-graduate growth which makes the live teacher.

There is no doubt that clearness on fundamentals and on the minimal standards of demands means greater freedom for the teacher, more personal initiative and less dependence on a rigid form or iron-bound rules. What this means to teacher and pupil, every one of us realizes when we call to mind the teachers who did and those who did not leave lasting impressions upon our development. Those who did were those whom we learned to appreciate as personalities. The question then comes: What are we doing towards shaping personalities in the ranks of the teachers?

This to my mind is one of the vital prob-

lems in the educational system and one that calls most emphatically for the raising of standards of values of our entire civic and political system. We cannot go on taking out of the teacher's life everything that is vital and perhaps somewhat difficult to handle, under the doctrine that we must avoid everything that might touch political and civic and religious and moral principles. We must encourage interest in the matters that mean public leadership. We have to inject the best we have into civics and politics so as to make the field less exclusively tempting to the mere exploiter. We must encourage more citizens and more teachers to take a responsible interest in civics. When shall we be mature for that? Hardly as long as we let politics be what it is in our midst to-day. I believe we shall get nearer the goal when our schools become community centers, with greater freedom for, and more personal confidence in, the teacher, and when the life of the school child and of the educational period of man shall concern itself more even in the early periods of life with a full-fledged interest in a well-rounded existence in school and at large, rather than in the mere hammering in of a set curriculum.

With a development of school districts, and a community organization with the schools as centers, we shall inject vital interests and contacts which will enliven the ideals and the practical meaning of the teacher's work.

To come back to a previous topic: When I ask myself when, in what part of the curriculum, and how should the many features on which health depends be taught, I become impressed over and over again with the fact that the many branches of teaching and learning interweave tremendously. Thus the teaching of the mother tongue is really a part of all branches of elementary and later teaching. Such a feature as clearness and correctness of thinking and expression belongs to the nature study as well as to the lesson in grammar, and the accuracy, or lack of it, that prevails in the pupil's home and social atmosphere, ultimately decides how much grammar and accuracy of language can be expected at school.

The same I feel holds for the grammar of conduct and behavior, the grammar of using one's instinctive capacities and assets and the available opportunities, — the grammar of mental and moral health. When all the

teachers are imbued with interest in the best that is to be had in the fields to be taught, when they know each other's methods and ambitions and when they are in equally live contact with the foundations of the community spirit, they will find those opportunities of *group teaching and individual helps* which are most telling in the problems of hygiene, — and they will help through contact with the parents to create an atmosphere which will help the child instead of being full of bewildering contradictions.

SCHOOL BOARDS

In view of how much depends on the teacher, we must realize that in every community there should be a most carefully chosen body of mediators between the inevitably greatly varied types of indifferent or overzealous, indolent or fault-finding public and the body of teachers who also may have their degrees of indifference or of zeal, their divisions of interests and their griefs and worries. Success will always depend on a wise school board and a wise body of administrators, aiming above all things at a spirit dedicated to the right kind of efficiency, the spirit of practical idealism among the teachers and in the community

whose educational work they have to handle. Here again the problem is to shape the aims according to the means. It may at times be necessary to be conservative and to refrain from radical steps although they may promise a quick attainment of the millennium; but the general direction should be toward such community organization and civic and national service as will make unnecessary the *hysterical* types of clamor for preparedness in the hours of danger and trial that from time to time are bound to come to any community or nation.

REAFFIRMATIONS

It is not startling novelties that an outsider should be expected to bring into this type of discussion. One may be pretty certain that many teachers and pedagogically inclined persons have singly and in various group-movements proposed and probably practiced the bulk of what an outsider might have to suggest in such a survey of the field from the angle of a special science. I offer what I have to say in all modesty as reaffirmations, as emphases suggested by my special experiences, fully realizing that the large mass of experience of the professional educator is what will always be the biggest help for any

constructive program. I hope we understand each other on the principle of a general solidarity of the health of the parts, the health of the individual and the health of the group; on the advantages we may derive from using the experiences of psychopathology and its methods, on the advantages of records which help us standardize pupils and bring teacher and parents closely together, and on the great desideratum of bringing the school into the very center of community organization.

John Dewey has described "The School of Tomorrow"; Abraham Flexner is shaping his "Modern School." There are in many school-systems "schools of to-day" — full of inspiration. There are evidences everywhere of the will to grow, and of the means to grow, and it looks as if we had good cause to wish that we might be "children of to-day" if it were not even more fascinating to be active workers for mental and moral health in our educational and civic world.

THE PERSISTENCE OF PRIMARY-GROUP NORMS IN PRESENT-DAY SOCIETY AND THEIR INFLUENCE IN OUR EDUCATIONAL SYSTEM

BY

WILLIAM I. THOMAS

UNIVERSITY OF CHICAGO

THE PERSISTENCE OF PRIMARY-GROUP NORMS IN PRESENT-DAY SOCIETY AND THEIR INFLUENCE IN OUR EDUCATIONAL SYSTEM

In his treatment of the infantile emotions Professor Watson suggested that we have greatly overstated the number of the original emotional reactions, and he is inclined to reduce them to three types — those connected with fear, those connected with rage and those connected with joy or love.

In a study of a particular immigrant group (the Poles) I have found that human behavior seems to represent four fundamental types of interests or wishes — those connected with the desire for new experience, those connected with the desire for mastery, those connected with the desire for recognition, and those connected with the desire for safety or security, — recognizing of course that all forms of behavior can eventually be reduced to the two fundamental appetites, food-hunger and sex-hunger, the one necessary to preserve the

life of the individual and the other necessary to preserve the life of the species.

It would perhaps be fanciful to assume that all interest could be reduced to terms of organic motion — physiological expansion in rage and joy, physiological contraction in fear, — as the physicists reduce all reality to velocity and changes in velocity, — but actually we find the development of emotional states and of intelligence directly connected with the power of movement in space. Broadly speaking, the vegetable and the animal differ in their organic economy in the fact that the vegetable is stationary and has to rely for the satisfaction of its hunger and reproductive needs on what is present in the soil and what comes to it or falls to it (in the way of pollen or rain), while the animal, through the power of motion, seeks its food and its mate by the exploration of a wide region. It was Professor Mead, I believe, who defined the animal as a mechanism for utilizing a non-nutrient environment as means of reaching a nutrient environment.

If now the experimenter takes an animal as subject, say the rat, brings him to the proper point of hunger and places him before a box containing food, the actions of the

animal become frantic; he pushes, climbs over, burrows under, bites the box until his random movements strike the combination and he solves the problem — perhaps by pulling a string and standing at the same moment on a platform inserted in the floor. Similarly, if the rat is placed before a maze containing food and representing one chance in twenty of going right, he will begin the same frantic and random pursuit, finally locating the food through the elimination of errors. Or if you follow him into the open the dominant activity will be pursuit, varied by flight.

And in this connection I think we must conclude that just as the whole physical mechanism of the animal is adapted largely to motion, to pursuit, so the dominant interest is a pursuit interest, and the mental pattern or schema is essentially a hunting of pursuit pattern. And we must note that the reproductive activities fall into this scheme also, for pairing among animals and human marriage are a process of pursuit and capture.

Turning now abruptly from the rat to the creative man, any one who studies the history of a practical invention or a scientific discovery will be impressed with the resemblance

between the activities of the human being before his problem and those of the rat before his box or maze. For some years, in fact, I have been in the habit of pointing out that scientific pursuit is precisely of the hunting pattern. The intensity interest on the part of the discoverer or experimenter, his random and frenzied movements, his following of every scent, his abandonment of false trails, his elation when he has got his result, remind us of the animal in quest of his prey and after he has made his kill. The whole scientific life of such men as Pasteur, Goodyear, Helmholtz, Mayer, is a pursuit of ideas, either a series of quests or one long quest, ending perhaps with success and exhaustion. Permit me to cite a single illuminating example from the life of Pasteur.

Pasteur's first scientific success was in the study of crystallization, and in this connection he became particularly interested in racemic acid. But this substance, produced first by Kestner in 1820 as an accident in the manufacture of tartaric acid, had in 1852 ceased to appear, in spite of all efforts to obtain it. Pasteur and his friend Mitscherlich suspected that the failure to get it was due to the fact that the present manufacturers of

tartaric acid were using a different tartar. The problem became then to inspect all the factories producing tartaric acid and finally to visit the sources from which the tartars came. This was the quest, and the impatience which Pasteur showed to begin it reminds us of a hound tugging at the leash. He asked Biot and Dumas to obtain for him a commission from the Ministry, or from the Academie, but exasperated by the delay he was on the point of writing directly to the President of the Republic. "It is," he said, "a question that France should make it a point of honor to solve through one of her children." Biot counselled patience and pointed out that it was not necessary to "set the government in motion for this." But Pasteur would not wait. "I shall go to the end of the world," he said. "I *must* discover the source of racemic acid," and started independently. I will excuse you from following the quest in detail, but in a sort of diary prepared for Mme. Pasteur he showed the greatest eagerness to have her share the joy of it. He went to Germany, to Vienna, to Prague, studied Hungarian tartars. "Finally," he said, "I shall go to Trieste, where I shall find tartars of various countries, notably

those of the Levant, and those of the neighborhood of Trieste itself. . . . If I had money enough I would go to Italy. . . . I shall give ten years to it if necessary." And after eight months he sent the following telegram: "I transform tartaric acid into racemic acid. Please inform M. Dumas and Senarmont." [1] He had made his kill.

Without citing further cases, I think it is apparent that the hunting activity, whether of animal or man, and the scientific activity of the creative man are singularly alike. And the point of interest for us is that no activity is interesting unless it follows the pursuit pattern. With reference to pleasurable and displeasurable work, obviously the more nearly the hunting scheme is followed the more vivid the interest. Those forms of work are irksome in which the interest of pursuit is dropped out, either because the constant repetition of the process leaves nothing of the problematical or because, through the division of labor, the problem is destroyed by breaking it into fragments. Society has become so complicated and artificial that it is hard for the individual to preserve a type of occupational activity of the naturalness, spon-

[1] Cf. Vallery-Radot, R., Life of Pasteur, 61 ff.

taneity and interest corresponding to the hunting schema. This is most perfectly preserved in the various games, which are all typical and integral pursuits, and in the favored occupations — scientific research, business enterprise, legal and medical callings — while hard labor represents the residuum after the interesting problems have been abstracted.

Now the pursuit, by both the rat and Pasteur, embodies, in my terminology, the desire for new experience and the desire for mastery. The incipient stage of the pursuit, or the general preparatory condition, is called curiosity. The animal *must* be interested in what is going on about him. If a noise, a movement, an approaching object were ignored, this might involve serious consequence of two kinds: he might miss the chance of pursuit and food, or he might, by failure to be alert, be made the object of pursuit, might be eaten. Consequently the animal is always alert, always getting information with reference to possible action. This expresses itself in the endless exploration of the situation by the child — the general exploration with the hands and eyes, putting things into the mouth, tasting and biting, attentive behavior to novel ob-

jects, cautious approach and retreat, etc. — and in adults in watching one another and gossiping, in the aimless wanderings of the vagabond, and in the useful "curiosity" of the scientific man. It is a fortunate fact that this curiosity becomes a desire for new experience in the abstract, enabling the mind to take an acute interest in any problem — whatever — in scientific pursuits.

What I have called the desire for mastery or the will to power, is one of the by-phenomena of anger or rage. The gloating over the object of successful pursuit, as shown in the playing of the cat with the mouse, and in the tendency of the child to tease, to bully, torment, pounce upon, tear to pieces; in the swagger, the strut, the glare of triumph or defiance; in gestures, yells and actual attacks;[1] later in the desire for ownership, the tendency to control every act of others, dictatorial, censorious and unbearable behavior — exerted by man more actively and woman more passively, by the latter to the degree of having her own way even by simulation of weakness or sickness — and finally in lust for power, tyranny, political despotism, and in "ambition," called by Milton

[1] Cf. Thorndike, E. L., The Original Nature of Man, 92, *et passim*.

"the last infirmity of noble mind" — the one that survives as long as he does.

If the animal or the man, the rat or Pasteur, were not a member of a society, the activities I have been indicating would have no moral quality, would be neither moral nor immoral. For the sake of limiting our problem we will drop the rat at this point, but in fact both animals and men do live in societies, in combinations whose meaning is a common struggle against death, against external enemies and internal disharmonies. The great common desire of a human society is therefore to remain solidary, and it accomplishes this by the formation of a code of behavior. In a society, the same act is good or bad, organizing or disorganizing, according to its meaning for the welfare of the whole group. Thus, the desire for mastery may express itself in furious and sadistic rage and murder and pillage, and is immoral, disorganizing and criminal when directed against the members of one's own society, but becomes courage, patriotism, heroism and virtue when turned against outsiders, in the protection of women and children, of the state.

The code therefore represents the judgment of society on the activities of its mem-

bers, it dictates the limits within which the desires may find expression, and it is developed by a method which we may call "the definition of the situation." This defining of the situation is begun by the parents in the form of ordering and forbidding and information, is continued in the community by means of gossip, with its praise and blame, and is formally represented by the school, the law, the church. Of course morality and immorality, organization and disorganization, are relative terms; what would be considered disorganization in one society would not be considered so in another — it is perfectly good organization to kill your parents in Africa because they wish to reach the next world while still young enough to enjoy it — and so the code will differ widely in different communal, national and racial groups, but will usually define truthfulness, honesty, obedience, cleanliness, unselfishness, kindliness, industry, economy, politeness, courage, chastity, the ten commandments, the golden rule, "women and children first," respect to the aged, etc., in terms of positive appreciation.

Moreover, when the code has been defined, no matter what its content, its violation provokes an emotional protest from society

designed to be painfully felt by the offender, and it is so felt, owing to the dependence of the member on society for safety and recognition. The epithets, "coward," "traitor," "thief," "bastard," "heretic," "scab," etc., are brief definitions designed to be felt as painful. And the effect of these definitions is deeper than we suspect. Many of our profound disgusts, for example, those connected with cannibalism and incest, are so developed — that is, they are highly emotionalized institutional products. And all codified acts, even those of no intrinsic importance, become eventually saturated with emotion. It is a matter of no intrinsic importance whether you carry food to the mouth with the knife or the fork, but the situation has been defined in favor of the fork, with grave emotional and social consequences — disgust and social ostracism. In short, any definition, however arbitrary, that is embodied in the habits of the people is regarded as right. It was, for instance, a custom to burn women in India on the death of their husbands, and to strangle them in the Fiji islands, and any widow would demand this privilege although she did not wish it. The contrary behavior would mean social death.

According to Mr. Pearce, there were in Bengal alone about 1200 suttees annually, and when (in 1832) Lord William Bentinck passed an act forbidding them, a petition was sent to the Privy Council signed by 18,000 people, many of them representing the best families in Calcutta, asking that this practice might be allowed to continue. In Vaitupu, of the Ellice Archipelago, "infanticide was ordered by law," and only two children were allowed to a family. In the Solomon Islands it was the practice to kill all (or nearly all) the children and buy others from neighboring islands, the idea being the same as in the case of the farmer among ourselves who sells his young calves to the butcher and buys yearlings. The Skposy sect of Russia sexually mutilates all its members, and since they have no children they also recruit from the neighbors, by missionary efforts. Another sect, the "Child-killers," devotes itself to strangling new-born before they are contaminated by this world. From Tarnopol there was reported in 1882 a sort of communal death. Twenty-two persons, men, women and children, were immured and suffocated by their own arrangement in order to escape the census, which they conceived as a device

of Antichrist to get their names on his list and damn their souls. In Japan, under Iyeyasu, a death penalty was attached to "other-than-expected behavior." Not smiling when reproved by a superior, and smiling too broadly when addressing a superior were forms of other-than-expected behavior. The smile had to be carefully regulated; to expose the molars was fatal.

And we are not to regard these examples as merely curious or disgusting — slavery, duelling, burning of witches are examples of practices coming within the definition of moral acts in our own past — but as evidence of the power which the communal definitions have to control behavior. Our immigration problem and our criminal problem are not mainly questions of inherent mental and moral worth, but questions of the attitudes and norms of behavior established by definitions of the situation.

We are in the habit of calling "primary groups" those societies which through kinship, isolation, voluntary adhesion to certain systems of definitions, secure an emotional unanimity among their members. By virtue of their unanimity the mob and the jury are also momentary primary groups.

Clear examples of the primary group are the South Slavonian *zadruga* and the Russian *mir*. When there arises in these communities the necessity of defining a new situation, it is not even sufficient to reach a unanimous decision; each member must voice his opinion and agreement, make it explicit. Cases are recorded where in a conflict between the traditional communal definition (say of poverty) and that of the great state, a member has appeared before the communal assembly, sustained by the confidence in a new and authoritative definition, only to wither and collapse before the white scorn of a solidary group. If a member is stubborn his family members and close friends weep, embrace, implore — beg him not to disgrace them and his community by showing the neighbors that they cannot agree. It has been remarked by students of the *mir* that boys six or eight years of age speak and act like grown men. They repeat the standard definitions of "our community," "our people."

The savage tribe is another example of the primary group. It was once imagined and is still popularly believed that the savage is the freest person in the world, but ethnologists know that savage life is regulated by an

almost incredibly minute and rigoristic code. The native Australian boy is permitted to speak to certain persons (mother-in-law, older sister, younger sister, etc.) only at certain specified distances — a hundred yards, thirty yards, ten yards. During a period lasting from ten to twenty or even thirty years, he is taken by the old men through a series of intermittent ceremonies, some single periods lasting as long as four months, with dramatic ceremonies — as many as five or six in a single day and night — and oral drill, defining all possible situations of tribal life, and with a result which I can only indicate by saying that, as to marriage, he is related to a girl (among the Arunta) by a ceremony called *tualcha mura* for which we have no parallel, but which means not that he marries the girl but that he eventually marries the daughter of the girl when the latter has married another man and has a marriageable daughter, and that, as to food, he will not only not eat certain foods but believes that if he does this he will die, and in some cases actually does die.

The Polish peasant uses a word, *okolica*, "the neighborhood round about," "as far as the report of a man reaches," and this may

be taken as the natural external limit of the size of the primary group — as far as the report of a member reaches, — so long as men have only primary means of communication. But with militancy, conquest and the formation of the great state we have a systematic attempt to preserve in the whole population the solidarity of feeling characterizing the primary group. The great state cannot preserve this solidarity in all respects — there is the formation of series of primary groups within the state — but it develops authoritative definitions of "patriotism," "treason," etc., and the appropriate emotional attitudes in this respect, so that in time of crisis, of war, where there is a fight of the whole nation against death, we witness, as at this moment. the temporary reconstitution of the attitudes of the primary group.

Similarly, in the great religious systems such as Christianity and Mohammedanism, we have a systematic attempt to make the whole world a primary group, to win men away from the merely communal, human and worldly definitions (or to reaffirm these) by a system of definitions having a higher value through their divine derivation. God is the best definer of situations because he possesses more

knowledge and more prestige than any man or any set of men and his definitions tend to have finality, absoluteness and arbitrariness and to convey the maximum of prepossession.

How rigid and particularistic these definitions became at one time in the western world it would be superfluous to point out, especially if you are acquainted with the Westminster Catechism, but perhaps you did not know that Dr. Lightfoot, vice-chancellor of Cambridge University, announced at one time that "man was created by the Trinity on the 23rd of October, 4004 B.C., at 9 o'clock in the morning," stating that the height of Adam was 123 feet 9 inches, that of Eve 118 feet and 9 inches.

In the Mohammedan world, as in the Puritan world, there was an effort to define *every* present situation in terms of the past. "There are," says Lane, "some Muslims who will not do anything that the Prophet is not recorded to have done, and who particularly abstain from eating anything that he did not eat, though its lawfulness is undoubted. The Imam Ahmad Ibn-Hambal would not even eat watermelons, because, although he knew that the prophet ate them, he could not learn whether he ate them with or without the

rind, or whether he broke, bit, or cut them. And he forbade a woman, who questioned him as to the propriety of the act, to spin by the light of the torches passing in the street by night, which were not her own property, because the Prophet had not mentioned whether it was lawful to do so, and was not known ever to have availed himself of a light belonging to another person without that person's leave."

But I do not wish to leave the impression that definitions are dependent for their validity on their authoritative source. All usual and habitual practices are emotionalized, become behavior norms, and tend to resist change. The iron plow-share, invented late in the 18th century, was strongly condemned on the ground that it was an insult to God, therefore poisoned the ground and caused the weeds to grow; and until recently the old farmer laughed at the soil-analysis of the city chemist. The man who first built a water-driven saw-mill in England was mobbed; the English war department informed the inventor of the first practical telegraphic device that it had no use for that contrivance; in the last generation there was a persistent opposition to the introduction of stoves and organs

into churches, and if we omit recent years, and in recent years only the scientific and practical fields, it would be difficult to find a single innovation that has not encountered opposition and ridicule.

The whole problem of culture hinges on the relation of the individual to society. Each is an indispensable value to the other. The whole fund of instrumental values through which the individual realizes his desires and achieves his creative activities is provided by society, while the type of social organization, the variety of the cultural content, the rapidity of social change, the creation of particular values, depend on the individual. But the nature of the individual, demanding a maximum of new experience, is in fundamental conflict with the nature of society, demanding a maximum of stability, and it would be interesting to analyze the various particular effects of the repressive action of society on the individual — the psychic wounds which confront the psychiatrist, the complete and masochistic resignation expressed in the hymn-books ("Lead, kindly Light, amid the encircling gloom"), the sullen repression of rage during a whole lifetime, represented by Jean Meslier, curate of Epigny, who left at

his death in 1733 a testament in which he declared that he had never believed a word of his teachings and that his ardent wish was that the "last king might be hung with the entrails of the last priest," the meticulous manipulation of scientific data, represented by the Egyptologist Wilkinson who falsified the dates from the monuments to fit the accepted date of the flood, the alternating violation of the definition and confession of error, represented by Galileo and the army of recanters, the straining of the definition to include the desire for new experience, represented by those geologists who at one time reconciled geological time with the Biblical account of creation by assuming six days, indeed, but extremely long ones, or by the plea which I read some years ago (1910) in the Vienna *Neue Freie Presse* for the legal toleration of incineration of the dead, based not upon sanitary grounds or those of individual liberty, but upon the claim that "burial" as used by the church authorities did not mean "depositing the body in the ground," but any disposition of it, etc.

But as general result of this conflict we have the development of three types of individual, dependent on the different temperamental dis-

positions and on the degree and steadiness of the pressure exercised by the given social organization. These we may call the philistine, the bohemian and the creative man. The philistine is the individual who adapts his activities completely to the prevailing definitions and norms; he chooses security at the cost of new experience and individuality. The bohemian is unable to fit into any frame, social or personal, because his life is spent in trying to escape definitions and avoid suppressions instead of building up a positive organization of ends and attitudes; he has avoided philistinism at the cost of character and success, because he had a strong personal tendency to revolt against social pressures or because the pressures were not strong or consistent enough. The philistine and the bohemian are produced by the social effort to impose upon the individual a life-organization and to mold his character without regard to his personal tendencies and the line of his spontaneous development, and both are relative failures.

In contrast with these two types, the philistine tending to accept all the definitions and the bohemian tending to reject all of them, the creative man reconciles his desire for new

experience with the desire of society for stability by redefining situations and creating new norms of a superior social value. He disorganizes the old system momentarily, but provides the elements for a more efficient organization. The creative man and the criminal are equally violators of the norms, disorderly individuals from the standpoint of the primary group, but in the creative man this disorderliness is expressed in the setting and solution of problems, in the creation of new values, while in the criminal it is merely negative — destructive of the existing system. All of these types except the philistine represent individualization in the fact that they reject existing norms, but the individualism of the creative man is an intermediary stage between one system of values and another; his function is to produce changes in the social order corresponding to favorable variations in biology.

Professor Watson emphasized the meaning of higher levels of efficiency, and higher levels of social efficiency are reached through the individualization of function represented best by the scientific specialization of our time. Individualization is a relative term — the individual always remains incorporated in some

world of ideas — but practically the creative man secures sufficient individualization to do his work, retains enough recognition to keep him sane, by escaping from the censure of one group into the appreciation of another group. And this escape seems to go on at a rate corresponding with the increased facility of communication. The world has become greatly diversified, containing not only races and nationalities with differing norms and cultural systems, but various worlds of ideas represented by various scientific, religious, artistic circles; and by the fact of reading alone the individual can associate himself with those persons or circles pre-adapted to his ideas, and form with them a solidary group.

It does not follow, therefore, that the creative man is a temperamental rebel. He may even be a philistine at heart. Charles Darwin was not a rebellious person; he was simply engrossed in a pursuit, and was very timorous about it. In common with his naturalist friends he had long realized that something terrible was about to happen to the Old Testament, but when he finally had the proofs that species were not immutable he wrote to his friends that it was "like confess-

ing murder," and in spite of the appreciation of the scientific world he felt deeply to the end of his life the censure of the religious-primary group which accused him of a determination to "hunt God out of the world."

Dr. Meyer pointed out in his lecture that we must learn to appreciate the varying standards of normality. We recognized already that there are varying standards of abnormality, and I assume that if individualization were so complete as to remove its subject from participation in any world of common ideas whatever, this would be a form of insanity. The case of Julius Robert Mayer, discoverer of the law of the conservation of energy, is almost a case of this kind, for he did not succeed in associating himself sympathetically with the set of men preadapted to his idea — Joule indeed tried to plunder him and Helmholtz ridiculed him as a "lucky guesser" — and at the same time he remained in his narrowly provincial Heilbronn, where he was treated as the town fool, accused of the delusion of grandeur, forcibly handled in two insane asylums. Even toward the end of his life, after he had received generous recognition from Tyndall and also from Helmholtz, he regarded himself as insane in his

home town. When Düring wished to visit him he refused to receive him in Heilbronn, but arranged to meet him in the neighboring Wildbad, saying that a visit to his home would excite unfavorable comment. "Since everyone here," he wrote, "regards me as a fool, everyone considers himself justified in exercising a spiritual guardianship over me."

But we are not to regard creative activity and changes in the norms as associated solely with creative individuals or even with design. The work of the Chicago Vice Commission illustrates the contrary fact. This was not a radical body, its "representative" character precluded this. Indeed it explicitly stated its policy of including its activities within the existing norms. We read in the introduction to its report: "[The Commission] has kept constantly in mind that to offer a contribution of any value such an offering must be, first, moral; second, reasonable and practical; third, possible under the constitutional powers of our courts; fourth, that which will square with the public conscience of the American people."

Nevertheless the work of this commission unwittingly resulted in the modification of two norms, namely, "circulation of infor-

mation about sexual matters illegal," and "research into sexual matters taboo." The post office declared the report obscene literature, and the members of the commission were technically liable to penitentiary sentence. The Postmaster General revoked this decision, thus modifying one norm, and the participation of a large body of respectable citizens in a research into sexual questions tended to bring such research under a new norm. But I have speculated on the fate of the individual who might have perpetrated this report single-handed.

But why, we may ask, if a society is orderly and doing very well, is it desirable to disturb the existing norms at all. "Little man, why so hot!" And this question reduces itself ultimately to a basis of idealism. It becomes a question of happiness, of the degree of fulfillment of wishes within the society, and on the other hand of levels of efficiency as between societies in the ultimate struggle against death — as in the present war. The Arunta society is surpassed in orderliness only by the ants and other animal societies, where every act is predefined once and forever in terms of organic structure and external situation. The Chinese society represents a high degree

of stability on a relatively high level of culture. "Amuse them, tire them not, let them not know," is one of the oldest Chinese political maxims.

Now, the superior level of culture reached by the western world is due to a tendency to disturb norms, — introduced first into the material world by the physicists and gradually extending itself in connection with the theory of evolution to the biological world, and just now beginning to touch the human world. And this tendency to disturb norms becomes an end in itself in the form of scientific pursuits whose aim is the redefinition of all possible situations and the establishment eventually of the most general and universal norms, namely scientific laws. And the success of this method from the standpoint of efficiency is shown in the wonderful advance in material technique resulting from research for law in the fields of physics and chemistry, exemplified, for example, in mechanical inventions and modern medicine.

But up to the present we are working in the social world with norms developed either by the method of "ordering-and-forbidding," or by that of empirical, communal "common-sense," and our level of efficiency in this

field remains relatively low. The main purpose of what I have said up to this point was to show that "human behavior norms" are not only very arbitrary, but, precisely because behavior norms, so highly emotionalized that they claim to be absolutely right and final and subject to no change and no investigation. Moreover, every norm claims to be *the* norm, the normal, and any departure from it is abnormal. And eventually every practical custom or habit, every moral, political, religious view claims to be *the* norm — not to recognize, in Dr. Meyer's phrase, the varying standards of normality — and to treat as abnormal whatever does not agree with it. In practice, as I have shown by examples, a social technique based upon a rigid system of norms tends to suppress all the social energies which seem to act in a way contrary to the norm, and to ignore all the social energies not included in the norm. Furthermore, the norms do change, in spite of the emotional prepossessions; traditions and customs, morality, religion, and education undergo an increasingly rapid evolution, and it is evident that a system proceeding on the assumption that a certain norm is valid finds itself absolutely helpless when it

suddenly realizes that the norm has lost all social significance and some other norm has appeared in its place.

The classical example of the decay of old norms in an evolving society and their persistence in doctrine and practice after they are dead is that of "classical studies as learning norm." Granting that these studies placed us at one time in the possession of cultural values superior to those contributed by the stream of Semitic influence, granting, if you please, with Sir Henry Maine that "nothing moves in the modern world that is not Greek in its origin," recognizing also that in a hierarchized society they retained for a time an adventitious meaning in the prestige they gave to their devotees — and prestige has a real value as a tool for the control of the minds of men — these studies did eventually lose their value as universal "learning norms" in an industrial world, but they persist in our curricula, and their retention is justified by a mental process which we may call the rationalization of an emotion. Their advocates wish their survival, and they rationalize the wish in the claim that these studies have an indispensable disciplinary value — a mental process resembling the law of magical causa-

tion whereby the appearance of the desirable and the disappearance of the undesirable effect is decreed, or virtue is transferred from an object of superior value to one of inferior value by contagion.

Similarly in the religious world, while the church has practically if not doctrinally abandoned the norm, "history of the world, unfolding of the will of God," and is doing all kinds of work under the Kantian norm, "history of the world, fulfilling of the will of man," yet a minister was able to say, and recently, that a well-known settlement worker "had done more harm than all the ministers of Chicago could make good" because she was not working under his norms.

As an example from another field I can only refer, without prophecy, to the retreat of "freedom as political norm," and of the whole individualistic system of norms developed in this country during the past two centuries, in the face of the present world crisis.

All that I have said up to this point impresses me, and I hope it will impress you, with the urgency of a more exact and systematic study of human behavior on a scale and with a method comparable with those already provided for the physical and bio-

logical sciences. We have a failure of the "common-sense" method, not only in education and the relation of races and nationalities, but in connection with crime, prostitution, slums, insanity, abnormality, labor problems and all kinds of unhappiness. It is only by following the example of the physical sciences and accumulating the largest possible amount of secure and varied information and establishing general and particular laws which we can draw on to meet any crisis as it arises that we shall be able to secure a control in the social world comparable to that obtained in the natural world, and to determine eventually the kind of world we want to live in. I take it that the only reason we have not followed the path of the natural sciences long ago is the partially unrealized fear of disturbing our behavior norms. For evidently there were laws and consequently practices in the physical world that would never have been discovered by the "common-sense" method, and obviously the same is true of the social world.

What the detailed procedure in such a science would be I am unable even to indicate. You have had examples of it in the preceding papers of this series, and I have referred to

one of the main problems in the earlier part of this paper — the laws of the conversion of one attitude or prepossession into another. But the exact procedure could not be predicted in this field any more than it could have been predicted in the fields of physics and chemistry. The solution of problems gives rise to new problems.

And in another respect a social science must be upon the basis of the physical sciences — it must go on endlessly and without reference to immediate practical applicability. The men who were instrumental in the constitution of the physical sciences pursued their problems as ends in themselves, without any reference to practical applicability. Their work was, to begin with, illegitimate anyway, hedonistic and disorderly, and the society which opposed it had no expectation of practical applicability, but anticipated only harmful disturbance of norms. But it happened that these men adopted the course which in the end yielded the largest number of results of practical applicability precisely because they had unlimited liberty in the setting and solution of problems, and thereby established the greatest variety of laws.

The sciences do reach a point where they

are consciously turned in the direction of practical applicability, that is, they anticipate that by following certain directions certain practical results will appear (and the life of Pasteur is perhaps the best example of this); but the history of the sciences shows that only a *method* quite free from dependence on practice can become practically useful in its applications. We do not know what the future of science will be before it is constituted and what may be the applications of its discoveries before they are applied.

As to education, I have no special competence to speak in this field, but from being associated with educational methods I have some impressions; and if I venture to name some of them, I ask you to receive them as a friendly communication from one universe of discourse to another.

I have the conviction that the prepossessions of all of us are at a given moment deeper than we suspect, that society is in a hypnoidal state with lucid intervals, that these prepossessions are the emotional result of behavior norms of the primary-group type, that educators unconsciously conform the schools to primary-group ideals, that in conformity with primary-group ideals of soli-

darity our curricula strive for uniformity instead of diversity, that there is a consequent disharmony between education and life, because the individual no longer organizes his life on the basis of primary group relations, but the educational system prepares him to do so.

I suspect that we should increase human happiness, efficiency and productivity if we should provide the young person with an adequate technique in connection with a limited body of informational definitions and place him face to face with problems. I was impressed with a casual remark of Mr. Dewey, that if it were necessary he would be willing to have the student forget all the informational data imparted to him during the four years of college life, if he could substitute for this a consuming interest in something.

I have concluded that we are so prepossessed with the idea of giving the child the maximum of informational data that this becomes an end in itself, that the mass of learning norms is so great that the youth actually passes the physiological and psychological age where he is due to erupt along creative lines. I am aware that in our universities we create and find already created an attitude of expectancy with reference to

definitions and systems of definitions, that the student is extremely reluctant to undertake any but approved and supervised lines of interest, that he brings to all problems a too great docility, that he grows old and cautious among the multiplicity of definitions, and that we have in our doctor's dissertation what we deserve.

I am impressed with the fact that great men so frequently did their great work very young. Newton had discovered the law of gravitation, integral calculus, had made discoveries in light, had developed the binomial theory, at the age of 24; Linnæus had his sexual system of plants ready at the same age. Ludwig, Brücke, Helmholtz, du Bois Reymond, were reforming physiology at the average age of 25. Mayer, Joule, Colding, Helmholtz, were all under 28 years of age when they did their work on the conservation of energy. Goethe, Schiller, Byron, Keats, Shelley, Liebig, Sadi-Carnot, are striking examples of creative work at an early age. I have reflected upon how much it seemed to help Shakespeare and O. Henry to be compelled to be in a hurry and abandon the conventional norms and break all the rules.

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I think it is significant that so many creative men were poor in school, and I cannot escape the conclusion that being poor in school was an unconscious protective device for escaping from a multiplicity of learning with no relevance to their aptitude, and that, in view of what was going to happen, they had to be the worst pupils. The chemist Ostwald, in his interesting book, *Grosse Männer*, has pointed out that the precocity of such men as Leibnitz and Sir William Thomson would have done them no good if the schools had been "better" in their time.

A learned man has been at some pains to determine how many men became later productive in literature who did not learn to read in childhood. I believe he did not find any, but it would be of interest to know how many became productive in literary lines who barely learned to read and no more — did not parse or diagram or etymologize or make comparative and historical studies in paragraphing.

I recognize the importance of what we call general culture, of contact with various worlds of ideas, but I am convinced that great blocks of our curricula, both those representing norms outworn but persisting through

their emotional rationalization, and those representing real but not universal values, or values disproportionately emphasized in the curriculum, should be transferred to the region of amateur work or sport, and that this can be so arranged as to minister to the emotional needs and contribute at the same time to the efficiency of the individual.

Now, whether these opinions are entirely justified or not, the whole of what I have said makes it impossible for me to wish to disparage our educational system or our educators in comparison with our other social practices. Indeed, if stones are to be thrown, the sociologist is the last man to throw them. It does not solve the problem to attack this or that weak point in our system. If I wanted to run amuck, I think I should not select the educational but the legal field for this purpose; and if the legislator wanted to do the same thing, I think he would select the sociological.

I hesitated to make those remarks about education because I feared you would think I thought they were of fundamental importance. That would be to miss the whole point. The point is that we have not got a method in the social world. The primary group norms

are breaking down, mainly owing to the facilitated communication gained through discoveries in the natural sciences and their practical application. The very disharmony of the social world is largely due to the disproportionate rate of advance in the mechanical world. We live in an entirely new world, unique, without parallel in history. History has not helped us. It cannot help us because we do not understand it; we do not even understand an election. We must first understand the past from the present. We must view the present as behavior. We must establish by scientific procedure the laws of behavior, and then the past will have its meaning and make its contribution. If we learn the laws of human behavior as we have learned the laws of mathematics, physics, and chemistry, if we establish what are the fundamental human attitudes, how they can be converted into other and more socially desirable attitudes, how the world of values is created and modified by the operation of these attitudes, then we can establish any attitudes and values whatever.

And we are not to speak of "ultimate" or "supreme" values. The ultimate value is the value you desire at the given moment.

But if your "ultimate" values mean the abolition of war, of crime, of drink, of abnormality, of slums, of this or that kind of unhappiness, then you can secure these values, and you can secure whatever seem to you "ultimate" values afterwards, but they cannot be secured without a science of behavior, and more than an "ultimate" mechanics or an "ultimate" medicine could or can be secured without the preceding sciences of mathematics, physics, and chemistry.

And, finally, if we recognize that social control is to be reached through the study of behavior, and that its technique is to consist in the creation of attitudes appropriate to desired values, then I suggest that the most essential attitude at the present moment is a public attitude of hospitality toward all forms of research in the social world, such as it has gained toward all forms of research in the physical world. The Chicago Vice Commission could not be called on to do more than face a penitentiary sentence.

APPENDIX TO DR. MEYER'S LECTURE

MODERN CONCEPTIONS OF MENTAL DISEASE

APPENDIX TO DR. MEYER'S LECTURE

MODERN CONCEPTIONS OF MENTAL DISEASE

In a very readable little book of the Home University Library, Councilman has defined disease as a change produced in living beings in consequence of which they are no longer in harmony with their environment, and, we may add, with themselves, *i.e.* their past and their future. Certainly this conception holds also for those disorders which we call mental, because they belong to that large range of functions and activities in which the individual acts as an entity, as a personality, as a stage and link between his own past and future and as an element of society.

The greatest difficulty in life, the greatest source of disharmony, apart from the influences of heredity, infectious disease, and poor feeding, and poor chances for growth, is the discrepancy between impulse, yearning and ambition on the one hand and the actual opportunities and the actual efficiency of

performance on the other. We know of people who try continually to put square pegs into round holes. They are unwilling or unable to learn to know and to accept their own nature and the world as it is, and to shape their aims according to their assets.

In a large percentage of cases in which persons come to grief in their mental and moral health, the trouble is of just that kind. Failing with what is frequently impossible and undesirable anyhow, these persons develop emotional attitudes and habits and tendencies to fumble or to brood or to puzzle or to be apprehensive until what students of the functional diseases of the heart call "a break of compensation" occurs, a break of nature's system of maintaining the balance, with a more or less sudden slump and implication of collateral functions. In our field this is oftenest in the form of a declaration of a simple "minor psychosis" in which the patient maintains his or her general understanding of the situation and of human relations, but develops exhaustibility along with inability to rest, insomnia, various derangements and collisions of functions that should work smoothly, not only of sleep, but also of digestion, of the heart action, of the breathing, of the thyroid function — this is

what we commonly and euphemistically speak of as neurasthenia with its irritable weakness. Or the patient develops obsessions, fear of death or of going insane, doubts, false feelings of obligation, unwarranted fear of dirt and infection leading to habits of washing the hands incessantly, and tendencies to ponder instead of acting, counting, saying things a definite number of times, etc. Or the patient gets into a way of paying attention to various queer feelings and conditions of special parts and organs which really are normal but become the scapegoat for abnormal and blundering conflicts and emotional states. These conflicts and emotional states then are apt to rise to the surface as peculiar dreamy states, fancies, outbreaks of emotions, or even convulsions or various antics of special organs or functions, such as loss of power of a limb or joint, or peculiar attacks of vomiting, of feelings of a lump in the throat and many other really protean disorders. The real relation, however, of these manifestations to the actual difficulties remains concealed from the layman and often actually hidden from the patient, as in states of hysterical amnesia, where the patient may not remember anything of the circumstances and the associative setting of

the disturbance. The condition is like an evasion, not a real disease of the organs but a disorder of balance by evasion or substitution, a disorder of management, adaptation and adjustment.

Or the patient passes into a state of depression or the opposite, a state of elation and overactivity, an occasional swinging of the pendulum into melancholia or into hypomania or mania, often lasting months or even years, without actual damage to the brain, and usually with ultimate recovery or at least periods of normal health. Or the patient may pass into a state of delusion in which the individual asserts his or her own beliefs rather than the judgment of a safe consensus of a group, either as a transitory upheaval lasting a few days or weeks or months, or as the kind that tends to vitiate the attitude for the rest of a life by spinning a web of false interpretations between the patient and reality. Sometimes this disorder leaves the intellectual functions so keen as to deceive the average person as to the very existence of any mental disease, but oftener causes a gradual perversion and deterioration difficult or even impossible to arrest until nature reaches its own resting places of false balances, by no means always a com-

plete perversion, but nevertheless often enough marking a lasting damage.

A large group of these conditions of what we might call fantastic dilapidation constitutes what has been named dementia præcox — by no means always a lasting condition such as the word dementia might indicate. My studies in these cases have convinced me that a nature difficult to understand and shut-in and often somewhat precocious and uneven, habits which tend to day-dreaming and playing with one's own thoughts and feelings, habit conflicts and drifting into mysticism and the like, can be traced in many cases to early childhood and to the school years, where they ought to have been recognized and helped to a safer equilibrium; it is especially striking that these disorders are relatively frequent in apparently very conscientious or actually over-conscientious individuals. Many of these cases are exceedingly instructive in opening one's eyes to conditions which play a rôle in causing minor disturbances of the neurasthenic, psychasthenic and hysterical type and to many problems which merely tend to reduce the efficiency of the person without becoming an actual disease. It is through these conditions that nature may

make cruel experiments; but from them man can learn much for the benefit of a healthier and more developed humanity.

The types thus sketched naturally do not cover all the disorders. There are other conditions disabling our mental life, judgment and behavior brought about either by the habitual use of stimulants and false foods, and by infections, apt to lead to delirium or to various kinds of delusional states; or by damage to the brain by syphilis, which has proved to be the cause of a most distinctive kind of mental disorder usually called paresis; or we may deal with premature changes of the blood vessels or with other damage to the brain. Many of these are states which a mere knowledge of how to steer clear of risk and danger will fail to prevent, unless it becomes an ingrained part of our civilization and individual life. The study of alcoholism, of the venereal diseases and of many infectious diseases makes one realize how deeply rooted most occasions for disease are in the common soil of all the good and bad in human life, in the yearnings and leanings, the penchant, the equation of balancing factors.

In order to avoid any misunderstanding which might suggest a one-sided emphasis

of the so-called mental psychogenic factors, let me emphasize that, between the disorders of mainly functional collisions and maladaptations and those representing more or less direct and palpable brain damage due to palpable outside causes, there are intermediate conditions in which vicious circles damaging various organs or the brain itself are established by emotional conflicts and bungling ways of trying to fit incompatibilities and by disregard of the strain on the various organs which participate in the integrated reactions and in the biological regulations. The studies by Cannon show how internal organs play an essential rôle in emotions; we know that the thyroid gland can be thrown out of balance by emotional strains; we know that the sex glands can be kept under abnormal stimulation. Thus various organs can start special vicious circles and cause intercurrent damage to functions and even to structures, by courting complications and chances for infections.

To this survey you can readily add what we know of heredity and of defective development; the problem of the difficult and poorly fitted individual, — the type on which so much early work is being done in Chicago, — whether delinquent or not delinquent, always

a center of solicitude. Some of these no doubt are the less fortunate types of the innumerable possible varieties of progeny the wealth of which Dr. Jennings has described; some may be clearly the products of poor stock, but many clearly also the victims of a further unwillingness to fit the environment and the training to the case, and the case to the environment it is fit for. From time to time we find an unscrupulous magazine article preaching the gospel of brain operation in these trying cases. Most people know better; only a few of these unfortunate cases present disorders remediable by operation or by any one simple trick. Experience gives no encouragement to the extreme optimist nor is there an excuse for the pessimist who surrenders to the concept of degeneracy and inactivity. Our present-day inquiry is bent on a systematic study of the working of the various determining factors and a search for those factors of adaptation which can be adjusted. This is beyond question the only method with which to reach that far larger matter of concern, that which will bring us, teacher and physician, much more frequently together than do the outspoken cases of mental disease. I refer to the innumerable

minor lapses from the hygiene, the health and the efficient life which give us the human satisfactions of real growth and development.

That an early and sensible understanding of the child's individual problems is a vital gain in shaping more wholesome lives, and that the problem is the same for the teacher and for one interested in mental hygiene, can, I think, readily be gleaned from the above sketch.

THE PROBLEM OF SEX-EDUCATION

No problem is more closely related to the nervous, mental and moral equilibrium and none more closely dependent on the coöperation of home and school than that of what the school shall do with the realities of sex-life. Sex-instruction without a sympathetic and coöperative home training is, to say the least, problematic. Help for the parents with answers to the many childhood questions in harmony with our school instruction, and, in turn, consideration in the school instruction of what the home training offers, would seem to create the only safe road. Naïveté alone cannot be depended upon. There is, however, much to the principle that one should not incite interest in details which are

apt to lead to curiosity and experimentation. Cultivate confidence in the right kind of persons and ease of discussion, with avoidance of curiosity in regard to the parts which react with specific and stimulating sensations; and where desirable, refer the pupil to the best prepared or qualified person for individual discussion, not of generalities, but of specific points that the child may bring up. Efforts in this field are apt to be futile unless one has the coöperation of the parents and a knowledge of their point of view as well as the confidence of the pupil; one should be able to base one's talk on the pupil's own personal experience, and to let one's own larger experience merely form a background from which to encourage spontaneous expression and with which to convey a feeling of safety, with a minimal amount of dogmatic guidance which might overstimulate curiosity. There should be no dogma of exclusive salvation; but a confidence that every individual development can with proper control and guidance lead to a natural and sane capacity to become a father or a mother when the conditions are fulfilled.

Coeducation of boys and girls is a desideratum conditioned by the home situations and

the social fitness of the community, and also by the scope of individualization in the management of the pupils. There should be ample opportunities for individualization, especially if practical work is introduced into the school, and it may even be well to limit the number of coeducational exercises for certain topics and certain groups of pupils, without, however, attracting the attention to the sex-issue as such, but rather to the division of interests.

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