

OUR STRAINS AND TENSIONS

MABEL ELLSWORTH TODD



HERE ARE many things which can upset us in our everyday lives. We may be anxious about our friends, or worried over what we are to do if we lose our job; we may, in fact, *fear* the consequence of this greatly if we have home obligations to meet. The attitudes of the people with whom we have to work in the school system, the uncertainty as to whether we are pleasing those for whom we work, whether the children under our tuition will make their grades, the subway rush, the general "cussedness" of inanimate things which seem to obstruct our progress, the headache or the indisposition which follows our evening of entertainment—all seem to add their quota, whether we realize it or not, to a state or condition of strain which we feel without being able to overcome. We say, "If I could only relax, how much better I would feel. . . ." We may notice our neighbor and say of her, "I know that girl is working under great tension, I can see it in her face," or So-and-So "is laboring under stress or strain."

We all know that these fears and anxieties may be conscious or unconscious. We have all seen the unfortunate effects, both in the child and in the adult, of these elements buried in the substrata of consciousness. The distressing physiological conditions observed in our friends and felt in ourselves are expressions of psychological aspects of strain and tension. In this connection, the work of Dr. Walter B. Cannon is interesting. After a very careful study to find out just what bodily changes actually did occur in conjunction with major emotions, he found that very definite changes were affected in

"the bodily economy" through emotional stimulus. He describes the "remarkable alterations" which can come about in response to emotions which "move us," and mentions particularly the effects upon circulation and respiration which, of course, have very far-reaching effects upon functioning as a whole.*

CAUSES OF STRAINS AND TENSIONS

One state of strain in human materials is an anticipatory state, a state of preparation for moving, without moving. There is a dynamic or active pressure for a movement which does not take place. The agents of movement have been stimulated without being directed to act. In other words, movement has been frustrated, the natural sequence, which should follow that type of stimulation, has been repressed or *restrained*. This is annoying, for reasons best known or *felt* by ourselves, but the result is that the arrested "pattern of movement" tends to become prolonged, to persist rather than to break up and resolve, as it would had movement taken place. We do not to-day strike, or run, or kick, and scream, when we are angered or afraid or worried or anxious. We know that this would not do under the circumstances; and we have a reason, perhaps a conventional one, but more often a personal reason for acting in a peculiar way, which is contrary to our real feeling.

But the effect upon us of this repression of movement is a condition of strain or static contraction in our muscles which is very fatiguing. We now know enough

*W. B. CANNON. *Bodily Changes In Pain, Hunger, Fear, and Rage.*

about our autonomic and our central systems to realize that this is a very state of affairs. We now know that we are "strained" is because there is a confusion in decisions. It is just as if "Stop" and "Go" signs on the Avenue were flashed on and off irregularly or at the same time. A mix-up in the traffic would certainly result. We all know the effect of a traffic jam, the result of a "block." Unless a well understood order is given, in any case, a damming up of the nervous forces is bound to follow, and with it the consequences in strain, stress, or

A second factor which often leads to a condition of strain is the damming up of the forces of the nervous system. Food has always sustained people who have lived, flourished, and died away, knowing little or nothing of the biochemical processes and balances which their protoplasmic materials eliminate, and reproduce themselves every day, because science has discovered the things of these balances, and we have only to exist but to exist in a way that we have introduced the teaching of hygiene into our educational system. Hygiene is important in the maintenance of health because if we fail to waste products we will suffer the effects of poisons retained in the body. If we have a nutritional unbalancing is affected.

A third factor responsible for strains is the interference of mental balance. This factor has been little and hitherto largely neglected. For reasons, I am placing the main emphasis in this paper upon this particular balance of human forces. In the subject, we will find that much can be saved, which at present

TENSIONS

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about our autonomic and our central nervous systems to realize that this is a very wasteful state of affairs. We now know that the reason we are "strained" is because there is a confusion in decisions. It is just as if the "Stop" and "Go" signs on the Avenue were flashed on and off irregularly or at the same time. A mix-up in the traffic would certainly result. We all know the effects upon traffic of a "block." Unless a clear and well understood order is given, in our own case, a damming up of the neuro-muscular forces is bound to follow, and we suffer the consequences in strain, stress, or tension.

A second factor which often causes a damming up of the forces of the body and leads to a condition of strain is faulty hygiene. Food has always sustained life, yet people have lived, flourished, and passed away, knowing little or nothing about the biochemical processes and balances by which their protoplasmic materials nourish, eliminate, and reproduce themselves. Today, because science has discovered something of these balances, and we want not only to exist but to exist in a better way, we have introduced the teaching of personal hygiene into our educational system. An understanding and observance of personal hygiene is important in the problem of tenseness because if we fail to get rid of waste products we will suffer from the effects of poisons retained in the tissues, and if we have a nutritional unbalance our functioning is affected.

A third factor responsible for our bodily strains is the interference of mechanical balance. This factor has been little understood and hitherto largely neglected. For these reasons, I am placing the major emphasis in this paper upon this particular aspect of the balance of human forces. If we study the subject, we will find that much energy can be saved, which at present is misapplied

or misappropriated to the task of holding weights, instead of merely moving them. It is the bones that support the units of weight, large or small, which are traveling along the shortest route possible to their base. The muscles act upon the bones and thus move the weights in response to our choice of action.

To misapply our energy is wasteful and unnecessary, since the principles of mechanics are so well established. We really know these principles and observe them in many ways, but not in as many ways as we might if intelligence is to be applied to the reduction of our bodily strains. Suppose we were obliged to carry two heavy suit-cases; we would certainly know enough about weights, and how to manage them, to carry one suit-case in each hand so as to balance the weight of one with the weight of the other. We would also know that carrying them close to our sides, hanging freely, would be easier than holding them in our hands stretched out horizontally. We would know that it was less fatiguing to keep our backbone erect between the loads than allowing the loads to bend our central support either forward or backward.

Gravity will work for us, and not against us, if we will allow it to. The engineer understands this, and so must we. He had to study to learn how, and so must we. He found that his private opinions of what should or should not be the "correct" position of parts of his structure, or what would be a "good" or "bad" disposition of weight had little to do with the real facts. This was not a situation over which he could moralize. If he failed to understand his materials and the forces which played through and upon them, he was out of luck. And so are we when we fail to understand and to cooperate in this vital matter. To erect the suspension bridge, the fifty-story

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building, and the power plant, he has had to study his media and the conditions under which they work. He has had to understand the laws and principles of mechanics so as to dispose his materials in such a way that they may withstand the various forces against which they must inevitably contend.

Although I have mentioned separately these factors causing strains, it is impossible to consider one without the other, since they are all interrelated. There is much that we need to know about this subject of the reduction of strains, but this we do know: balance is the keynote and the foundation for the conservation of energy in *any* structure. If we desire it, we must seek it; balance implies freedom from strains, absence from stress, a readiness for action, a mobility—the opposite of fixity.

Wherever we find fixity, we find arrested functioning, whether it be in mental, physical, or mechanical processes. It is an important question for each of us to decide how far we can afford to harbor prejudices and fixations in a social order moving at high speed. Our scientists now speak in terms of forces—chemical, electrical, and mechanical. They discuss the fluidity and radio-activity of so-called matter or substance, which we formerly valued as "solid," and of the breaking down of the barriers between materials and forces in a most confusing manner. They now even seek to reduce all forces to one. But whatever we may believe in regard to the origin of our universe, or of the properties of matter, and energy, and of our own flesh and blood, we must at least recognize and acknowledge the orderliness of the principles involved, and the advantage to ourselves of working with them rather than against them.

How then shall we approach this problem of balance and fixations? We can do little until we cultivate a "feel," for materials and

for forces, which would align us with the scientific facts. This involves a radical change in thinking for many of us. We will need to think of our bodily materials as the newer discoveries of science have shown them to be, mostly fluid and of radio-active nature, and with every cell in constant movement to maintain a state of balance or equilibrium. These bodily materials are differentiated into various sorts of tissues composed of different kinds of cells, and acted upon by various expressions of force, such as heat, pressure, electricity, gravity and the like.

OUR "POSTURAL PATTERNS"

When we learn to think of our minutest parts as fluidly and actively adjusting to forces outside and inside, we will understand the significance of "postural patterns" which each of us acquire through our experiences. As soon as we are born, stimuli begin to pour in upon our nervous system, and each one of us reacts in a characteristic way. We continue to form individual muscular patterns from that day forward, which may block free mechanical action, or may allow it to go through its natural pathway. Thus postural patterns tend to be formed by these arrangements of parts in movement, and habits are established which facilitate or handicap the balance of our bodily parts. The frequent use of a scooter by a child forms a certain pattern in movement, producing unbalanced adjustments which tend to persist and often cause postural defects.

These arrangements of our parts into patterns of neuro-muscular origin may be both unconscious and conscious. For example, in strong emotions or even in persistent "floating anxiety," fears, or worries, we may feel tightness in the back and neck, between the shoulders, or at the base of the spine,

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but may still be unaware that the ribs and various other weights of the body are being pulled out of balance by this tense contraction of muscles. These bodily strains felt are due to the disturbance in balance of the various parts. Responses such as these are the definite result of a mental and emotional stress in our reacting materials.

We but add to these involuntary strains when we impose upon our bodies a fixed position of any part which we feel to be the "right," "correct," or "ideal" one. We cannot moralize, any more than can the engineer, over structures subject to mechanical principles, without seriously disturbing the balance of reacting forces. If we have been taught to "hold up" the head, to "chin in," and to "lift up the chest," and if we were inclined to be conscious about it, these notions will have influenced us to our mechanical disadvantage.

It has been the habit in the past to think of the bodily materials as having "a posture," and moral values have been given to different parts of the body with reference to this ideal. Posture was thought of as a fixed position of certain parts of the body, that is, such visible members as the head, shoulders, chin, chest, feet, and so forth. In this way, we have lost sight of balance, the central necessity for orderly adjustment of parts in any flexible, reacting mechanism. It is just as impossible to hold any one or more of the parts of the human body in a fixed position, as is the case in any other finely-adjusted mechanism.

If we but realize the effect of these inhibitory habits upon the future of the child, we would refrain from holding up ideals of positions which fixate contrary to established mechanical principles. This may be illustrated by a watch. We could not hold a magnet over any one of its parts without disturbing the working of the

whole. These fixities in our own mechanism increased the stresses and strains upon muscles and nerves. If we appreciated these facts, we, as teachers, would want to eliminate these influences before they fasten themselves as habits upon the children in our care. It is important, then, that we bring our thinking in regard to our materials, and the forces playing upon them, in line with modern ideas, and to get away from the ideal of "position" or fixity.

DYNAMIC, NOT STATIC

If we will give more attention to the subject of strains, we will see that the posture of the body should not be a stationary, static mould which we must assume, but a dynamic moving pattern which changes from moment to moment with our thoughts and activities, and that these patterns are the result of movements of muscles. We should bear in mind that all the successive weights of the body either rest or hang upon the vertebral column, which we call the spine, and that the muscles are only wasting energy if they try to hold any part of the structure away from this central support. The purpose of the muscular tissue is mainly to move, and not to support, the various weights of the body. It is the function of the bones to support the weights. With this in mind, our energies would not be spent in an effort to hold the "chin in" and the "chest up" by muscle strain; but we would allow our units of weight to be supported as closely as possible to their central attachments at the spine, thus reducing the strains to a minimum.

It is of practical importance to remember, therefore, that the spine is not a rigid, one-piece bone in our backs, but a succession of twenty-four vertebrae, its parts generously interwoven with flexible tissue. Through

four natural curves, caused by the uneven weights it carries, it produces an axis of support, the length and strength of which are determined by the resistance between the opposing curves.

The different units of weight—the head, shoulders, ribcase, pelvis, and legs—can pull on the spine by means of the muscles attached to them so as to disarrange these curves. If this is done for the sake of some prejudice in favor of some particular position, such as over-emphasis or fixity of any one part, we can work incalculable harm to all the muscles, nerves, and organs of our bodies for the following reasons: *First*, because these muscles, nerves, and organs are all related to the spine in one way or another, and may be, therefore, over-stretched, contracted, or displaced; and *second*, because both the flexibility of the spine and its strength to support the framework of the body are impaired by fixing any of its parts in relation to its central axis.

SOME MEANS OF RELIEF

One of the most important means of relief from bodily strains, both from a psychological and a mechanical standpoint, is to break the focus of attention frequently enough during the day's work to ensure against any habitual fixity in the muscles, such as that produced by the continuance of a set pattern of strain. One way to accomplish this, either at home or at school, is by change of position. One may change from sitting to standing; or one may change the emphasis of one's weight upon the chair.

It is also beneficial to take unusual, and even unconventional positions, in order to break free from the postural habits in which strain has become so customary that it is not noticed until it is acute and hurtful. We

find rest alternating with activity in all the functioning of the body, such as heart rhythm and so on, and we would do well to follow nature's example by interspersing frequent, short periods of rest in the midst of our activities. Rest is the reduction of voluntary control over the mind as well as the body. It will be found most helpful to lie upon the back with the knees bent and the arms folded across the chest. There are several advantages in this; first, it is an unaccustomed position which prevents the domination of habitual fixities; second, it provides a broad base of support instead of the usual narrow one to which the individual is accustomed; and, third, in this position gravity is working through the body from front to back instead of from the head to the feet, and therefore the weights will fall in a different relationship to the spine.

It may be a matter of surprise that I suggest this form of rest for school. But in schools where these suggestions have been followed, their simplicity and efficacy have been amply proved. Children enjoy lying down on mats beside their desks, or in a room provided for the purpose; and when they are given this opportunity several times a day, their growing spines get the real rest which the bones and tissues need for growth and recuperation. This is an excellent remedy for "slumping." Frequent rest periods for the spine reduce the fixity of muscles caused by fatigue; and after the spine is rested, the weights it carries are more easily balanced because of greater flexibility and movement in the restored muscles. Physical forces have once more approximated a balance. In all cases, the frequency with which persistent patterns of fixity are interrupted, the fewer will be the habitual strains.

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PREPARING TEACHERS

GROWING TEACHERS

MABEL



UT AFTER ALL is said and done, your new education chiefly depends on having teachers of unusual personalities. This question, which is often asked, the reply is that it depends on far more than unusual personality alone. For the teacher is the outgrowth of a definite philosophy, and only teachers imbued with thorough understanding of that philosophy and a deep feeling for it can introduce ideals in practice. In the old days where teaching means handing out typed material with no allowance for individual difference among the pupils, it can save school from utter aridity. The colorful personality of the teacher, his enthusiasm for the material carries over to the students. His interest in some subject nourishes that particular student. He is not to be a good salesman, because he is not to sell something that no one wants.

Our new approach makes the process less dependent on teacher personality. Such predetermined curriculum gives place to subject matter which has real interest to the child at the time. Passive learning yields to active work. Attention to subjects studied. The emphasis is shifted from the teacher to the children.

But if my questioners mean that the new education demands a more creative teacher than the old, then the answer is a definite "Yes." Each teacher must in a sense be an artist. Here can be no fac-