

# BODILY EXPRESSIONS

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(Translated from the French by Thomas Hanna)

**Our self-image is a body-image, which not only determines what we think of ourselves but also what we do and how we do it.**

The behaviour of human beings is firmly based on the self-image they have made for themselves. Accordingly, if one wishes to change one's behaviour, it will be necessary to change this image.

What is a self-image? I would argue that it is a body image; namely, it is the shape and relationship of the bodily parts, which means the spatial and temporal relationships, as well as the kinaesthetic feelings. Included with this are feelings and emotions and one's thoughts. All of these form an integrated whole.

How does a self-image come about? Everyone feels that his way of walking) speaking, and behaving is uniquely his own and unchangeable. He totally identifies with this behaviour-as if he were born with it. The way he sees objects in space, the way he tracks movements, the way he inclines his head, and the way he looks at things seem to be innate; and he believes it impossible to change any of these things --other than perhaps their rate of speed or intensity or duration.

Despite this belief, everything central to human behaviour is acquired only by a long period of learning: to walk, to speak, to see a photo or painting in three dimensions -one's very movements, attitude, and language are acquired purely according to the accidental circumstances of one's place of birth and environment.

Thus, when we learn to speak a second language, we always speak it with an accent-an earlier learning always stands in the way of a new learning. It is always difficult to sit as the Japanese or Hindus do, because earlier habits stand in the way. Thus, whatever the accident of one's birth, the difficulty we experience when attempting to change mental or physical habits has little to do with heredity and everything to do with the general problem of changing any habit that has already been acquired.

It is obvious that the difficulty is not in the habit per se but with the earlier point in time at which these accidental habits were formed. And so it appears that our self-image is acquired

purely by accident. Hence, the question arises as to whether it might be possible that one can freely choose new habit patterns which are more appropriate and fitting to one's unique person.

Understand that what is in question here is not simply the replacement of one mode of acting with another which would be purely a static change. What I am suggesting is a change in our way of acting which aims at a dynamic change in the whole process of one's action. Before we go any further, it may be worthwhile to engage in a brief experiment that will allow one to feel this possibility rather than merely to understand it.

If you lie down on your stomach and bend the right knee so that the lower leg points up toward the ceiling, you will find that the relation of the foot with respect to the leg is highly variable with different people. Everyone does not hold his foot in the same position. This becomes obvious if we place a book on the sole of the foot: The plane of the book will most likely not be parallel with the ceiling, but it will have a particular slant that varies with each individual. One can see that the muscular contractions of the leg and the foot have a particular relationship with one another. Even if the musculature is not supporting a weight, it still will not be in a neutral pattern. The musculature is following a pattern dictated by one's self-image. This uniquely individual pattern is felt subjectively to be both obvious and inevitable. This is because habitual patterns are imprinted in the nervous system. The nervous system reacts to exterior stimulation with this habitual ready-made pattern, for it has no other available pattern of response. In order to bring about the kind of dynamic change we are suggesting, these compulsive patterns need to be removed from the nervous system, leaving it free to act or react-not according to habit, but according to the given external situation.

To change the dynamics of this foot/leg relationship, one need only make about twenty extremely slow movements, with attention fixed upon both the trajectory of the foot and the

different parts of the foot. For example, flex and extend the foot with your attention on the movement of the heel. Try to follow this movement and, at the same time, be aware of the movements of the big toe-and, one by one, of each of the other toes. This should be done in the gentlest of ways, reducing the intensity of the movement so as to facilitate the change that will gradually occur.

As you focus on each one of the toes moving in space, you will experience very individual differences in the degree of difficulty you will have in perceiving these parts of the foot. The difficulty comes from the fact that these varying degrees of clarity create a discontinuity in the flow of images we have of these bodily parts.

Try another movement pattern with the foot: Move the point of the foot around in a circle while trying to sense the corresponding movement of your heel. If you make a sudden stop, notice how surprisingly difficult it is to know exactly where the heel is in some positions, whereas in other positions it is relatively easy.

Now do the movement of the foot extremely slowly, this time making small arcs rather than a complete circle. Stop at various points of the arc and, again, try to sense the exact position of the point of the foot and the heel in relation to the line of leg lying on the floor. Now try to move the point of the foot directly to the left and right while trying to keep track of the opposite movement of the heel. You will notice that the heel does not follow a horizontal line and that it does something quite different at the extreme right and left of its trajectory.

Try another movement pattern: Turn the point of the foot to the inside, which moves the heel outward to the right; then turn the point of the foot back to the outside, but do so by making a small semicircle, sometimes arcing above and sometimes arcing below. Do this movement with extreme slowness until you can turn it into a complete circle of the heel, all the while being aware of the corresponding movement of the point of the foot. Make your tracking of the point of the foot even more precise by thinking, in turn, of the big toe, the second toe, the third toe, the fourth toe, and the little toe. From time to time, reverse the circle and continue until the spatial patterns become easy, simple, and clear-this is to say, until the spatial patterns become just like the usual movements which are a part of our self image and have the same simplicity, clarity, and easiness.

Do these movements without any extra effort or any attempt to make them difficult. If you become confused, simply stop and start all over

again. One thing you will notice is that each time you find a difficult spot to track there will be a simultaneous change in your breathing. At any moment of confusion, stop and wait until your breathing gradually becomes normal again. After a while, you will notice that the more your breathing remains continuous, the more you will find that the flow of spatial images of heel and toe becomes easier. And you will be surprised how quickly the time then begins to pass.

If you now stretch out the right leg, you will notice that it seems longer. You will experience a change in the kinaesthetic sensations not only of the muscles and joints of the right foot but also of the entire right side of your body:

The right eye will seem more open-and it actually is. All of the right side of the face will actually be longer and the muscles more relaxed.

If you stand up, you will also notice definite changes in the movement of the right foot and the way it feels against the floor. In fact, there will be various changes noticeable in all of the right side of the body. For example, the head will turn more easily to the right than to the left, and it will go farther to the right. If you lift the right arm slowly upward above your head, bring it back down, and then do the same with the left arm, it is likely you will feel that the right arm is lighter.

Using the same procedure, you can do the same exercise series with the head instead of the heel: Tilt the head, then bring it back up while paying attention to the spatial orientation of the head to different segments of the left side of the body, for example, with the shoulder, the collar bone, the spine, and so forth. You will notice a similar change - a change in the muscular tonus of the entire left side right down to your toes.

In light of all this, certain important conclusions suggest themselves:

(1) Even though both sides of the body participated equally in the movements of tilting and righting the head, it was the side subjected to conscious scrutiny that showed changes in muscular tonus, ease of movement, and a greater feeling of well-being. This means that movement, by itself, is of small significance beyond certain improvements in circulation and other minor bodily benefits. Hence, the change occurring in two identically moving sides came from paying conscious attention to one side and becoming clear about its spatial orientation. It is significant that the change takes place only in the side on which one has focused - a fact which indicates that the change has occurred

through extrapyramidal pathways of the nervous system.

(2) Accordingly, we must conclude that the change took place in the central nervous system itself, inasmuch as the change affected the entire side upon which we had focused.

(3) Finally, this change will not immediately pass away but may last from several hours to several days. It depends directly on the amount of time spent in doing the exercise and upon the clarity with which the spatial relations were envisioned.

The significance of what this technique causes to happen in the central nervous system is underlined by the fact that one can obtain the same changes on the opposite side of the body by purely mental effort: namely, by directing one's attention methodically back and forth to the kinaesthetic sensations of one side then another-without any movement whatsoever. Whereas more than half an hour was required to achieve the initial changes on the first side, the other side will show these same changes within a few minutes merely by means of a systematic, point-by-point, conscious survey of the differences between the two sides from top to bottom.

After such a procedure, perhaps the most important thing to emphasise is how satisfying it is so to change one's habitual ways of using the head or feet. This change makes one realise how far one's usual habits of self-control are from what they could be-from what they were truly intended to be. This is something we shall attempt to make clear in what follows.

It is evident that there are certain areas of the self-image upon which this exercise in conscious attention has special effectiveness. This is to say that there is a system of priorities which can make such exercises easier and more methodical.

In support of this, an initial observation to be made is that a neonatal human's first relationship with the exterior world is established by means of the mouth. From the beginning, the use of the mouth requires special ways of orienting the head in space. Little by little, the development of our teleceptive senses (hearing, seeing, smelling) requires special movements of the head.

The teleceptive senses, being in pairs that are evenly separated from one another, can correctly judge direction and distance of objects only by head movements. The senses of hearing, seeing, and smelling have a complex neurological function that necessitates head

rotation so that the balanced stimulation of the twin sense organs can point the face directly at the source of this stimulation. The head serves as a kind of periscope of the central nervous system in order to bring sensory information into the brain.

In final analysis, the only part of our being that holds a relationship with the external world is the nervous system the senses and the rest of the body serve only as a means for action and information gathering. It is obvious that the head, bearer of the teleceptive senses, has active participation in all of our relations with external reality. Thus, the way in which the head moves constitutes the essential ingredient in our self image, and the vertebral column lying below it has an equally important role, because it makes rotation possible in the cervical and lumbar spine.

These considerations show the importance of the skeleton's role in our self image. The head, resting on the pelvic structure by means of the vertebral column, is involved in every action - passive, active, or orienting - that relates us to the external world.

The thoracic cavity and its respiratory functions are suspended from the vertebrae and are affected by its movements. In return, its movements cannot help but be affected by the respiratory functions. For this reason, the thoracic cavity must not do anything that disturbs the position of the head; instead, it must cooperate in facilitating its constant orientations. With this in mind, let us look briefly at how this relates to one's self-image.

If, while lying on your back, you do a careful mental survey of your entire body, you will notice that some parts of your body are more easily sensed than others. The parts that are less easily sensed are not part of our conscious actions. Moreover, you will find that during each separate action other bodily areas will be absent from consciousness -indeed, some areas are almost never present in our self-image.

A complete self-image is an ideal rarely attained-namely, an equal awareness of the whole body, every part having the same importance (front, back; and both sides). Everyone has to face the fact that his degree of self-control directly mirrors his self-image. This image is, unfortunately, much more limited than the ideal.

We should recognise as well that the relationship of all sections of our bodies changes in accordance with the different things we do and the different postures we assume. If, for example, you close your eyes and try to hold

your index fingers exactly as wide apart as your mouth, you may be astonished to find that you have either overestimated or underestimated the width by as much as three hundred per cent.

Or, again, close your eyes and, with the hands, try to indicate the thickness of your chest, front to back. Then try to determine the measurement of the vertical dimensions of your chest in the same way. You will be surprised to discover that your judgment changes each time the position of your hand changes. The three attempts to measure the spatiality of your bodily parts will have resulted in three disparate measurements which are grossly disproportionate.

Here is another experiment you might try: Close your eyes and hold your hands comfortably in front of your face, pointing the right finger directly at your left eye and your left finger at your right eye. Now imagine these lines as rigid rays of light crossing somewhere at the midpoint. Fix that midpoint in space and then take your right thumb and index finger to take hold of that midpoint. Open your eyes and see how far you are off-centre -if at all. Then repeat the same thing, this time bringing the left thumb and index finger to the crossover point, and open the eyes again. This is a good way to discover how visual manual errors have a kinaesthetic origin.

If one does a detailed examination of persons in this manner and if there are truly gross differences between their self-image and their objective performances, one can be sure that there will be truly gross defects in their control of those sections of their body. For example, people who habitually hold their chest with an exaggerated tightness, as if they had just exhaled, discover that their self-image of the chest is two to three times deeper than the chest actually is. Inversely, people who habitually have an exaggeratedly expanded, inspiratory chest position will underestimate the depth of their chest. A detailed examination of all the body parts yields many such surprises, particularly in the pelvis and the anal-genital region.

Once we come to see that one's degree of self-control directly mirrors one's self image, we can understand why we find it so difficult to improve our bodily performance by focusing only on the learning of specific actions. Instead, we might well surmise that to improve one's self image so that it more nearly approximates reality will result in a general improvement in one's bodily actions. And the results of such an improvement would be both quicker and more

extensive than the results from any system of exercises that applies only to specific actions.

It is the musculature, both smooth and striated muscles, that gives us meaningful and comprehensive information about events in the nervous system. Without muscular action, neurological events would show themselves as little more than slow chemical reactions and types of electrical impulses that bear no information of human significance.

If we had only these reactions and impulses as information, we would never know if the nervous system is responding to beauty, if it is experiencing green or red, good or bad, pleasant or unpleasant. Only muscular expression can tell us that. The smooth muscles express the impulses of our internal life, and the striated muscles link up the nervous system with the whole process. As far as we presently know, the muscles are the only means for giving humanly meaningful expression to the chemical and electrical processes of the nervous system.

It is, hence, of primal importance that the muscular system be thoroughly studied in regard to its relationship with neurological functions. From the outset, we should be clear on this point: Until it reaches the peripheral musculature, no neurological event can be perceived either as a sensation or a feeling, or as a mood or action. And by "periphery," we mean to include the mucous orifices of mouth and anus, as well as the musculature of the capillaries and the entire circulatory system.

In itself, the brain appears to be insensible of the majority of excitations which, in the periphery, can cause such lively reactions. In fact, one can become aware of a harmful event in the brain itself only when it causes an action in the periphery-only then does it become conscious.

X-rays or high frequency waves can burn or destroy bones and internal tissue without being noticed. One becomes conscious of it only when it affects the periphery. Kidney stones and gallstones may form imperceptibly, but they are sharply perceived at the moment they begin dilating the sphincter. We do not feel the destructive process of tooth decay until it begins to affect the capillaries and the gums.

From the beginning to the present, terrestrial life has had to evolve nervous and muscular systems that could adapt with the earthly field of gravitation. Outside of controlling temperature and chemical homeostasis of the body, the nervous and muscular systems are

primarily engaged in survival activities, all of which involve locomotion in the field of gravity.

Even our classification of the animal kingdom is based on the animal's mode of locomotion: Fish swim, birds fly, other animals slither, creep, climb, or walk on four legs, or two legs, and so forth.

There is a central feature of all muscular activity that we must bear in mind; if we attempt consecutively to do an easy movement of the finger, then the hand, then the forearm, then the whole arm, trying judge the relative effort involved in each of these movements, it will be noticed that all of these movements are performed with the same ease. Even so, by simple calculation of work done over gravity, we can determine the foot/pounds of work required for a movement: for example, only so many foot/pounds of work are required for the finger, more foot-pounds for the hand, even more foot-pounds for the forearm, and much, much more work for the entire arm. What this means is that the feeling of muscular effort is not measuring work done, but something else. This "something else" is how the movement is organised: its quality.

The quantity of work done can vary from one foot-pound to a million, while the feeling of effort remains exactly the same. The feeling of increased effort will occur only when there is some type of resistance or disturbance that causes us to mobilise an inappropriately greater effort in order to overcome it. And this feeling of increased effort is obviously not due to an increased amount of work done. Thus, we can conclude, in general, that sensations and feelings tell something about internal organisation and about the quality of the mobilisation, but not about differences measurable or verifiable as objective realities.

Inasmuch as feelings and sensations do not tell us what is actually taking place, we have no recourse but to avail ourselves of mental processes, of judgment, understanding, and knowledge if we wish to be certain that what we feel and sense is really what we want to happen. Without such means being called into service, the errors that might occur could very well be fatal.

Our actions are organised according to a self-image that was formed, as it were, by accident. It is a self-image which is made up of feelings and sensations. This being the case, it is elementary to point out that our actions - when based on areas of our self-image that are less than clear-may result in errors, such as doing the opposite of what one thinks one is doing or doing something that has no clear relation with

what one feels one is doing, And these actions will occur without any perception of their occurrence.

Earlier, while you were doing the experiment of rotating the heel and toes, it is likely you experienced moments when you were doing movements quite different from what you felt you were doing. As soon as you begin to notice such a mistake, it will cause an abrupt interruption in the flow of spatial images. Rarely does anyone so lose track of his heel or toe to the extent that he no longer knows where the toe and heel is in space or what is being done with either one. This is because we rarely make it a matter of conscious attention to see if there is a direct correspondence between our actions and what we intend.

Usually, we do little more than move according to the self-image that was formed in us from birth up to about fourteen years of age. This vague image usually works more or less satisfactorily, for we rarely need to have a more complete image.

Even though in later life we are capable of much more complex actions, we normally continue making use of the image patterns established during our youth. The time that we have for developing this image is much more continuous then, for it is rarely broken up into occasional learning periods, as is the case for the adult. It is worthwhile noting that this adult discontinuity in subjective learning is a hindrance to higher possibilities of human creativity. This is the question: Are there actions that are so much outside of the self-image of any individual that we do the very opposite of what we had intended when we try to do them?

Here is a movement which will show what I mean: Place the palm of your right hand over the navel, the fingers pointing to the left. without moving the hand, rotate the elbow around so that it is directly in front of you at a right angle between the forearm and the back of the hand. You may find that you are unable to accomplish this simple movement. If this is the case, place the hand instead on a table and notice how easily you can make a right angle between the back of the hand and the forearm. Then try the earlier movement in a different manner: Keep this right angle between the back of the hand and the forearm and place the palm of the hand on the navel, as you did before. Notice that you can now do it. How is it possible for your hand to do now what it could not do only a moment before? Why was it doing just the opposite of what you wanted it to do? Inasmuch as the hand is the most adroit and frequently used part of our body for making

voluntary movements, how is it possible that it cannot obey us? How can the hand so disobey us that the flexor muscles are activated when we actually wish to contract the extensor muscles?

Learning how to execute this movement correctly and in exactly the way we intended takes only a moment. But, as we remarked earlier, it is not simply a question of replacing one action with another, for we are primarily interested in the more dynamic question of how we control ourselves.

To complete and clarify one's self image by paying attention to the spatial and temporal orientation of one's body can bring about a growth in self-knowledge. The concern to do this is not as unusual as might first be supposed. Creative artists-whether painters, musicians, poets, scientists, or philosophers attempt to enlarge and clarify their self image in the particular area of their specialty. For example, a painter before his canvas attempts to take into account his feelings about the image before him, as well as the position and weight of the hand, in order to direct the brush with exactly the precision he feels is necessary. Often the painter will retouch the surface over and over until he achieves the image that meets his satisfaction.

A poet measures not only the meaning of his words but also their length, sounds, and interrelations until their grouping precisely translates his feelings and thoughts. He is doing with words exactly the same thing we were doing with our heel a moment ago. He, as well, widens and clarifies what he is doing, thus making his self-image more precise and more aware in this particular domain.

In the foregoing examples of the painter, the poet, and the movements of the foot, a simple mechanical repetition would result in no more than a static change; it would not result in any kind of developmental process. This raises the question: What is the essential quality of human practice which makes for a broadening and clarification of one's self image? Obviously, there must somehow or other be a progression in one's self-awareness that brings about either new or better actions, just as the practice with the heel leads to better usage of the entire leg and its component parts. Without conscious attention to what one is feeling during an action and without applying this attention directly to the entire movement resulting from these actions, no development will occur-simple mechanical repetition will never make this come about.

Thus, the postman, despite his daily repeated journeys, will never become a long-distance sprinter until he turns his attention to his movements and becomes conscious of the spatial and temporal orientation of his self-image. Likewise, an athlete who contents himself with mechanical repetition will achieve the most minimal progress.

If there is to be a progressive development of one's self-image, it is necessary to focus on completing the image in all of its dimensions, not simply in those dimensions with which one is most familiar. One does not know how breathing might be improved by an improvement in the functions of our digestion, nor what repercussion these two dimensions might have on our vision or our memory. A mathematician who is also a musician is not like other musicians; nor is the poet-musician like other poets-the added dimensions change the whole. It is when a self-image becomes more or less complete that we have a Leonardo da Vinci or a William Shakespeare.

With these things in mind, let us see if we can gain a better understanding of muscular activity. The first thing to note is that the same muscle can respond to very different stimuli: The muscle of the eyelid can, for example, make a clonic movement during certain states of fatigue or make a reflex contraction when an insect flies into the eye or contract when one has the voluntary intention to close the eye. In each case, the quality of the muscular contraction is different.

All voluntary movements, for instance, have one thing in common: They are reversible; ie., at any time in the trajectory of the movement one can stop and go in the reverse direction, or do something altogether different. In those parts of one's self-image where a complete learning has not yet occurred, this kind of reversibility is not possible. If, for example, one attempts to turn the head to the right while simultaneously trying to turn the eyes to the left, one instantly feels what it is like for a movement to be non reversible. If one attempts to make these two movements twenty times, all the while paying attention to the rhythm of one's breathing-and continues doing this until it becomes as simple as moving the eyes in the same direction - one will discover that there is a change in the muscular tonus at the back of the neck on the side of the head's rotation. If the head is turned to the left and then to the right, one discovers that the right side is freer and that the degree of rotation is clearly greater to the right than to the left. Moreover, the rotation to the right is easier and more fluid. The right side now has the factor of reversibility, as well as a wider angle of turning.

There is a distinct advantage in achieving reversibility: Not only does the movement become more fluid, but it also has a greater range of adaptability. In our everyday lives, we tend to turn our head and eyes together simultaneously, and this becomes habitual. The reverse movement—turning the eyes opposite from the head—is so rare that some persons have never done it.

The movements of the torso and arms have the same habitual parallelism as the head and eyes. Because of this habit, one does not have the skill of reversibility when one attempts to move the arms in an opposite direction from the head and eyes. As an example, try this: Place the palm of your right hand behind your head and the palm of the left hand on your forehead and try to rotate the head right and left. Instead of rotating the head, many will rotate the head, eyes, arms, and torso right and left like a single block. Their habitual self-image has taken over, and they are quite unaware of what they are actually doing, even when you point it out to them.

Because these habitual movement patterns assert themselves despite our efforts to do otherwise, they can be considered compulsive. The habitual pattern shoves aside the intended movement pattern, but one does not have the least awareness of what is happening.

When the absence of reversibility is this pronounced, very careful retraining is necessary for the person to become conscious of the difference between what he intends to do and what he actually does. When the skill of reversibility is acquired, the learner has the same feeling that one has in solving a puzzling problem. It is the feeling of having arrived at a greater freedom in one's self-control.

Certain esoteric disciplines make full use of the following technique for training reversibility: The learner suddenly has to freeze in whatever position he happens to be at the instant the teacher commands him—and to keep holding this position, no matter how strange or uncomfortable it may be. But by deliberately holding still until the command to relax, the learner becomes conscious of all the typically habituated and inefficient ways in which his body's parts are arranged. When movement is resumed, the learner has an enhanced consciousness that is the first step in learning reversibility. Gurdjieff calls this the "Stop technique" and uses it extensively.

By a careful use of methods of this kind one can overcome the bodily limitations caused by an arrested development in one's self-image. The improvement of this self-image carries with

it an expansion of the range and number of movement patterns at one's disposal. Thus, improving our skill of reversibility goes hand-in-hand with a general improvement of our conscious temporal and spatial orientation.

This orientation is so closely bound up with conscious functions that it seems to permeate all conscious activities. We really do not have control of ourselves unless, for example, our eyes and head have their familiar orientation with space and the vertical dimension established by the gravitational field.

If you ever have the experience of awakening in a bed and room unfamiliar to you, you will feel, at the instant of awakening, that you are neither in command of yourself nor your situation. Even when wide awake, you may experience a rupture in the flow of consciousness when there is a sudden surprise or a sudden change in your spatial orientation. For example, if you are ascending a stairway expecting one more step at the top than there actually is, the abrupt surprise is both a mechanical shock to the body and an experiential shock to the now of consciousness. The same interruption in consciousness also occurs if there is one less step than you expected when descending a stairway.

The return to normal consciousness after such an interruption is accompanied by the question, "Where am I?" Subjectively, the gap in our usual flowing images of spatial orientation is normally experienced as a gap in consciousness.

We can be sure that this relation between consciousness and spatial orientation has important consequences. A methodical and careful application of the concept of reversibility to one's self image has, over time, the following results:

- (1) It makes us conscious of the shapes and interrelationships of the skeleton.
- (2) It both reduces and equalises the prevailing muscular tonus.
- (3) It reduces the amount of effort expended in all we do.
- (4) It simplifies the way in which we mobilise ourselves for any particular action.
- (5) It enhances our sensitivity, allowing us to take notice of even small aberrations from the norm.
- (6) It improves our ability to orient ourselves spatially.

(7) It adds versatility to the way our intelligence functions.

(8) It reduces fatigue, thus increasing our capacity for work and endurance.

(9) It improves posture and breathing, thereby rejuvenating the body.

(10) It improves one's health and capacity for action.

(11) It improves coordination in all that we do.

(12) It makes all learning easier, mental or physical.

(13) It leads to a deeper self-awareness.

When the muscular tonus is reduced while being accompanied by an enhanced skeletal awareness, the skeletal structure is able to fulfil its function of nullifying the vertical component of gravity. This frees the musculature from any weight-bearing function, so that our intentional actions are performed with the least possible effort, ideally with an almost zero effort.

In effect, this means, for example, that if one stands with the legs too far apart, movements from left to right are more effortful than would be the case if the legs were closer together. By the same token, this wide-apart stance means that forward and backward movements are possible only by first aligning the skeleton with the vertical forces of gravity; once the vertical compression of gravity is nullified, one can move forward or backward with minimal effort. Theoretically, the only effort required in moving should be expended in overcoming the resistance factors of air pressure and of friction. A general improvement in the way we use our skeleton allows us to enjoy the full range of movements of the joints and inter-vertebral disks. All too often, the bodily limitations that we believe are due to not being limber are, instead, caused by a habitual contraction and shortening of our muscles of which we are not conscious. Unwittingly, our postures become distorted, and the joints of our bodies suffer unequal pressures.

Degeneration of the joint surfaces imposes, in its turn, a further restriction of muscular activity so as to avoid pain and discomfort in movement. Thus, a vicious circle is established, which gradually distorts the skeleton, the spine, and the inter-vertebral disks, resulting in an elderly body whose range of movements is reduced long before we have become old. Actually, however, age has little to do with this sad event. On the contrary, it is quite possible

to restore the body's ability to perform every movement of which the skeleton is capable.

Up until sixty years of age, anyone of good health who is not suffering serious illness can attain this optimal ability with little more than an hour of retraining for each year of one's life. It is possible to attain this condition even beyond sixty years--depending on the person's intelligence and will to live.

The central idea behind all we are discussing is the following: The mental and physical components of any action are two different aspects of the same function. The physical and mental components are not two series of phenomena which are somehow linked together; but, rather, they are two aspects of the same thing, like two faces of the same coin. Most likely, the serial, linear nature of language undergirds the serial nature of our thinking and makes the simultaneous expression of these separate aspects possible.

Unless one creates a special vocabulary or a system of notation, such as is used in mathematics, one has little choice other than to keep these two aspects separate-even if one prefers not to do so. Even highly abstract topics, such as number, are not independent of physiological support. The speed of our thinking is closely tied to the speed of our motor cortex functions. The time it takes mentally to count from twenty to thirty is longer than the time it takes to count from one to ten. This is because even nonverbal thinking, such as this, remains caught within the task of articulating numbers which, in the former instance, takes longer than the simpler numbers of one to ten. By the same token, if we think "to the right" or "to the left" it will immediately activate the muscles of the eye.

With training, the human nervous system can learn to eliminate these muscular activities of the larynx and the eye, thereby speeding up the mental process. Even so, our thinking remains limited to the speed at which the motor cortex can function. The simple act of reading this page is limited by the speed of visual perception. But even in this instance, we can accelerate our mental processes by disassociating them from the muscular processes that usually accompany the act of reading.

What is important is that thinking involves a physical function which supports the mental process. No matter how closely we look, it is difficult to find a mental act that can take place without the support of some physical function. Contemporary thinking about the structure of matter indicates that it is only a manifestation



of energy-or something more attenuated, such as thinking itself.

It is our familiarity with certain phenomena that makes it difficult to appreciate them clearly. For us, speed is a very real thing-tangible and measurable. Even so, we can neither touch nor measure speed. It is an abstraction. In order to measure speed, we have to take note of changes in certain physical points in space. But we can go further by measuring an abstraction of the already abstract idea of speed: that is, we can measure acceleration and deceleration, provided we always take note of changes in physical points of space. We can even go to a third level of abstraction and trace out a statistical curve of the variations in acceleration. But in what way is this any different from what happens within us when we are thinking?

Holding to this analogy of three levels of abstraction, note its parallel to mental process: For example, I may read a page absent-mindedly and then ask myself if I understand it. Whereupon I re-read the page, noting whether or not I am comprehending it. Then I read the page a third time, asking myself why I did not understand it the first time.

In a brief essay such as this, it is impossible to treat this subject rigorously. Even so, we can see the similarity of these two analogies, and we can appreciate that a change in speed is possible only with an accompanying change in the physical process supporting it. Any change in the latter means a change in the former. Mental process produces a change in its physical substratum, and a change in the physical substratum of thinking manifests itself as a mental change. In both instances, looking for the origin of the change is futile: Neither a change in speed nor a change in thought is possible without a change in its physical substratum.

The state of wakeful consciousness is made up of four elements: movements, sensations, feelings, and thoughts. If these four activities are absent, one soon falls asleep. It is taken as a matter of fact that movement and sensation are central nervous system functions; but, beyond this, we are proposing that mental process is the same kind of function. And we shall attempt to show that feelings are also functions of the central nervous system.

The reaction of fear involves a violent contraction of the flexor muscles - especially the abdominals - and breath holding. This is accompanied by a series of vasomotor disturbances: the pulse quickens, perspiration increases, and, in extreme cases, trembling and

defecation may occur. Many a soldier has experienced this at the moment of quitting the trenches for the first bayonet charge. The strong flexor contraction is accompanied by a simultaneous inhibition of its antagonist, the extensor muscles, causing the knees to bend and making it difficult to stand upright.

A neonatal infant has very little sensitivity to external stimuli: it has only a slight reaction to light, sound, odour, or even to moderate pinching. But if that infant feels a sudden drop, a violent contraction takes place in the flexor muscles: breathing stops, crying ensues, the pulse quickens, and vasomotor disturbances occur. There is a striking similarity between a just-born baby's reaction to falling and an adult's reaction to the fear of falling.

Because the reaction to falling is present at birth, it is innate, independent of learned experience. The lowering of the head, the folding inward, the knee flexion, the trembling, and the lack of extensor tonus characteristic of a person in the throes of anxiety or fear-these are all part of the general contraction of the flexor muscles.

A few weeks later, when the baby's hearing is more acute, the same kind of violent reaction happens with a sudden loud noise. In all sections of the nervous system where myelinization is not yet completed, there is a diffusion of excitation to adjacent nerves and branches of nerves. The eighth cranial nerve has two branches, the cochlear and the vestibular, and the semicircular canals are innervated by the latter branch. A sudden loss in support of the neonate causes an intense excitation of the vestibular branch due to the reaction of the semicircular canals to the fall. When the cochlea reacts to a loud noise, the excitation of the cochlear branch diffuses over the vestibular branch, creating the same reaction that occurs during a fall.

The reaction pattern that we have found in anxious or fearful adults is produced by stimulation of the vestibular branch of the eighth cranial nerve. The disturbances that are typical of anxiety-vertigo, vomiting, and other symptoms-are the same as those generally seen when the vestibular functions are disturbed. Thus, we have established what is the underlying pattern in the formation of anxiety complexes, ingrained states of fear, indecisiveness, and chronic self doubt. Additionally, we have pointed out the interdependence of feelings on the one hand and central nervous system functions on the other hand, showing how they affect bodily posture and create typical patterns of muscular tonus. And we have done this by focusing

closely on a few of the many examples of this phenomena.

In summing up, we would like to reiterate how crucial the control of musculature is in the control of self. Careful examination of habitual posture and the patterns of muscular contraction causing it makes it possible to infer which areas of the motor cortex are subject to ongoing, abnormal excitation and which areas are subject to ongoing inhibition.

We should bear in mind that life is a fast-moving flow of successive states of the central nervous system and that each state, no matter how complex, represents a gestalt which is indivisible. It is impossible to think both "yes" and "no" at the same instant. No matter how complex any particular idea, act, or experience may be, it represents a whole action of one's whole being.

And if one's whole state of ongoing excitations and inhibitions is such that every thought and action always activates the same regions, we have a good description of the state of obsession. Such states of the nervous system can be smoothed out to normalcy by drugs which act upon the same regions of excitation and inhibition. When similar results sometimes occur in psychotherapy, they are attended by changes in both posture and general muscular tonus.

Let us say once again that the state of the cortex is directly observable on the body's periphery by these configurations of posture and muscular tonus. A change in the central nervous system always means a change in these configurations. Each, as we have pointed out, is the other side of the same coin.

It is obvious that a technique for reducing muscular tonus and methodically improving one's self-image has a significance that can scarcely be overestimated. Such a technique makes it clear that when self-control is defective, something else is defective: there is arrested self-development. Hence, the correction of these defects should not be experienced as the "treatment of an illness" but, rather, as the rekindling of growth and development of one's self.

This technique, developed over the course of two decades, has been elaborated in two directions: One, working directly with the individual by manipulation; and the other, working in a different fashion with fifty persons, or more.

We should not terminate these remarks without a final observation: Considering the

organisational levels of the central nervous system (the rhinic, which controls the body's internal milieu; the limbic, which controls the outward expression of inner needs; and the supra limbic, which is still evolving and which allows humans not only to act and speak but to know what we are doing and saying), it is obvious that to become conscious of our body's spatial orientation is to come to know ourselves in depth and in clarity. In this way, we take charge again of our personal evolution, moving in the direction already marked out for us by the whole process of evolution.

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**FROM**

*Somatics, Vol. 6, No. 4. pp. 52-59.*

*Somatics, Vol. 7, No. 1. pp. 50-53.*