

Somatics -Thomas Hanna

I know this to be true, because I have seen it occur thousands of times. Clients I have worked with during the past 12 years evince changes that are real and lasting. Years later they happily confirm the fact. I confess that 20 years ago I would not have believed possible what I see taking place in my office every day. Even though clients—most of them 30 and older—have heard good things about my work, they first come to me with the same mix of hope and skepticism that I once had. But once we finish working together, they typically tell me, "I had no idea that this was really possible. Having had this problem for years, with nothing to help it, I decided I had to learn to live with it." Then they often add an intriguing remark: "You know, even though I didn't think this was possible, somehow I always thought that it *should* be possible." A similar thought was expressed by a group of physicians, osteopaths, chiropractors, and physical therapists from Australia to whom I had taught some of these procedures: "You have shown us what we thought we should learn during our training but never did. It is the missing link in health care." One of the physicians attending my class was a distinguished cardiologist, practicing in Sydney. In an article he later wrote about his reactions to the class, he said that what he had learned "has as much potential for understanding the mind-body relationship as Einstein's theory of relativity had for physics." For 12 years now I have been hearing such statements of confirmation, and I am convinced that everyone can avoid the loss of bodily function which is the curse of growing older. We all know, and probably envy, some people who in their later years seem to have avoided the aging process. There is no reason for our bodies to suffer when most of our life is still before us. Many people in every generation continue to function actively right up until they die. This is a phenomenon gerontologists have finally recognized. They call it "successful aging."³ We all know of examples. Some of the most famous people in every epoch have lived to an extended age, still working, thinking, and creating right up to the end. Even Sophocles, who gave us the riddle of the Sphinx, wrote his last play when he was 90. The fact is that, during the course of our lives, our sensory-motor systems continually respond to daily stresses and traumas with specific muscular reflexes. These reflexes, repeatedly triggered, create habitual muscular contractions, which we cannot—voluntarily—relax. These muscular contractions have become so deeply involuntary and unconscious that, eventually, we no longer remember how to move about freely. The result is stiffness, soreness, and a restricted range of movement. This habituated state of forgetfulness is called *sensory-motor amnesia* (SMA). It is a memory loss of how certain muscle groups feel and how to control them. And, because this occurs within the central nervous system, we are not aware of it, yet it affects us to our very core. Our image of who we are, what we can experience, and what we can do is profoundly diminished by sensory-motor amnesia. And it is primarily this event, and its secondary effects, that we falsely think of as "growing older." But sensory-motor amnesia has nothing whatsoever to do with age. It can, and does, occur anytime—from childhood onward. Children who grow up in disturbed family situations, or in other fearful environments such as war, show symptoms of sensory-motor amnesia: sunken chests, permanently raised shoulders, hyper-curved necks. Traumatic accidents or serious surgery in young people can cause the same chronic muscular contractions which in older adults are falsely attributed to aging: for example, scoliotic tilting of the trunk, a slight limp, or chronic undiagnosable pain that never disappears during the remainder of one's life. The reflexes that cause sensory-motor amnesia are very specific. There are three, and I have named them the *Red Light reflex*, the *Green Light reflex*, and the *Trauma reflex*. They are a crucial part of SMA and round out the enormously important discoveries of Hans Selye and Moshe Feldenkrais. Before discussing the three reflexes, however, it is important that I point out the following facts: (1) The effects of sensory-motor amnesia can begin at any age, but usually become apparent in our thirties and forties; (2) SMA is an adaptive response of the nervous system; and (3) *because SMA is a learned adaptive response, it can be unlearned*. This is my good news: Sensory-motor amnesia can be avoided, and it can be reversed. You can escape it by making direct and practical use of two abilities that are the unique properties of the human sensory-motor system: to unlearn what has been learned; and to remember what has been forgotten. In Part 3 you will find eight *Somatic Exercises*. These provide a direct and effective way to re-program the sensory-motor system. These exercises are a major discovery. First of all, they erase the primary effects of what is falsely attributed to growing older. Moreover, they are particularly important for people in their thirties, who begin to experience the accumulated effects of the Red Light reflex, the Green Light reflex, and the Trauma reflex. In older people, they actually reverse the process, which has caused so many people to feel stiff and aching. I am arguing that sensory-motor amnesia describes a category of health problems that has not been recognized until now. Even so, this category probably accounts for more than half of all human ailments. SMA is a pathology that is neither medical nor surgical, and it cannot be diagnosed or treated within these traditions. It is a somatic pathology, requiring not treatment but education. With case histories and research evidence, this book serves as a practical introduction to the new field of Somatics, which holds that first-person human experience must be considered of equal scientific and medical importance as outside, third-person observation. *Somatics* provides us with a way to live under the stressful demands of an urban-industrial environment and still remain healthy—physically and mentally. It helps us understand the tendency—of life in general and of technological societies in particular—to wear down our well-being. There is no need to give in to this blindly as the unavoidable effect of aging; rather, we will meet it with open eyes and overcome it. The sensory-

motor system is a mechanism fundamental to all human experience and behavior. And to understand sensory-motor amnesia is to understand one of the fundamental causes of the malfunctions we have falsely believed to be the effects of aging. I informed Barney that he did not have arthritis, but had a painfully over-worked muscle that was sore from constant contraction. "Why did my physician tell me I had arthritis?" he asked. I told him I did not know. I knew that X rays do not show muscle tissue, painful or not. And I knew that it was common for physicians to tell patients suffering chronic and medically incurable pain that they had arthritis and there was nothing to do for it. The ancient myth of aging is firmly embedded in modern medicine. Now that I knew precisely where Barney's pain was, I asked him to stand directly in front of me with his eyes closed. Barney's entire trunk was leaning almost 15 degrees to the right. Because the bulk of his weight was thus always on his right side, his gluteus medius muscle was always contracted. As Barney stood there, I felt his left gluteus medius muscle. It was soft and uncontracted. Then I felt the same muscle on the right side. It was hard and contracted. When I felt the muscles of his back, they were similar: The left side muscles were relatively soft and relaxed, whereas the right back muscles were tensed—especially those near the spinal column. The muscles on Barney's right side were chronically contracted, pulling him into a scoliotic curve, so that the added weight of his trunk caused his right gluteus medius muscle to contract constantly—thus the chronic pain and fatigue in the muscle. Barney could not voluntarily relax the muscles on the right side of his back. They simply would not respond. I had Barney stand in front of a full-length mirror, so that he could see his 15-degree tilt. He had had no idea that he was tilted. But he did remember his physician telling him that his right leg was shorter than his left. We measured his legs, and they were the same length. I asked Barney to bring himself up to a vertical position and then close his eyes. "How does that feel?," I asked. "Are you balanced?" "No," he said. "I feel tilted to the left." As soon as he relaxed, his trunk immediately tilted back to the right. Then I had him tilt far to the left with his eyes closed and then come back to what he felt was vertical. Without hesitating, he went right back to a 15-degree tilt to the right. "Now I'm vertical," he said. But he looked like the Tower of Pisa. Not only was Barney's perception of his right side muscles defective, but his perception of his body's position in space was defective as well. His sense of balance was distorted. At one time, earlier in his life, Barney had normal motor control of his muscles on both sides. His senses had been aware of what his muscles were doing to change the posture of his body in space. But he had since lost both his motor control and his sensory awareness. What he once did, he could no longer do. What he once sensed, he could no longer sense. That is the typical effect of sensory-motor amnesia. Once Barney was taught how to sense his muscular movements as he once did, and once he relearned ways to control his muscles, three things occurred: (1) He no longer had any pain in the pelvis, despite the "arthritis" of old age; (2) he now stood vertical, with his weight equally balanced on each leg and with his trunk muscles balanced left and right; and (3) his sense of balance was restored, so that he knew when he was vertical and when he was tilted. He no longer had the precarious posture that had caused him to stumble constantly. In brief, Barney no longer had sensory-motor amnesia. And better still, he now possessed the happy knowledge of how to prevent this from ever occurring again. He was now self-maintaining, no longer needing my help, nor the help of any other health professional, to control this problem. When he first came to me, Barney could not properly control the muscles of his trunk and pelvis—which was a motor deficiency—and could not properly sense what these muscles were doing with his body—which was a sensory deficiency. Both problems relate to the central nervous system, that is, the brain and the spinal cord, which is the overall system that controls the body. Everything we sense in the world outside our bodies and everything we sense inside our bodies comes into our brain by way of the sensory nerves. Everything that we do in the world and every movement we make flows out from our brain down the spine by way of the motor nerves. The sensory nerves control our perceptions of the world and of ourselves. The motor nerves control our movements in the world and inside ourselves by means of their attachments to the muscles of the skeleton and the smooth muscles of the viscera. This structural division is functionally integrated within a single neural system: The sensory and motor functions are two sides of the same coin. In the spine we see the division of the two systems, but in the brain we see their integration. The sensory nerves carry to the brain information of what is happening in the world as well as in our bodies. Provided with this information, the brain can compute what to do and how to do it; that is, the brain integrates the incoming sensory information with outgoing commands to the motor system. These integrated functions of the sensory and motor systems are so fundamental and so familiar that, like the fish that does not notice the water, we do not notice their ceaseless operation. We are rarely conscious of these two integrated functions when we do something as simple as turn the pages of a book. When one comes to the end of a page, one's left hand lifts, goes to the right, finds the edge of the next page at the right corner of the book, and turns it to the left. But for the left hand to "find the edge of the next page" demands precise sensory information as to where the hand is and where the book is. When your left hand lifts, it must know where it is going, otherwise it might lift and flop to your side, or hit you in the nose, or go over and touch your right shoulder. Luckily, it doesn't. You know where your hand and book are, because during every instant that you move your hand you are receiving a constant stream of sensory information about the location, direction, contour, trajectory, and speed of the hand movement in relation to the perceived location of the edge of the next page at the right corner of the book. In contemporary neurophysiological science, the ongoing interplay of sensory information and motor guidance is referred to as a "feedback system" operating in "loops": The sensory nerves "feed back" information to the

motor nerves, whose response "loops back" with movement commands along the motor nerves. As movement takes place, the motor nerves "feed back" new information to the sensory nerves about the position of the hand. This feedback loop continues its exchange of information until the hand and fingers touch the page and turn it. Once we reflect on it, it becomes obvious to us that we require a constant stream of sensory information from the outside in order to maintain ongoing control of our muscular movements from the inside out. We could not purposefully do anything in this world if our sensory-motor system did not constantly function. To recognize how obviously fundamental the sensory-motor system is to the way we live makes us aware of something else fundamental: If anything goes wrong with the sensory-motor system, our lives will be fundamentally diminished. If something happens that dims our sensory perception, we will not know how to control our bodies and our actions efficiently. If something happens that dulls our motor control, not only will we become limited and inefficient in our actions but our feedback will become confusing and imprecise as well. Inasmuch as the sensory-motor functions are integrated into one system, anything that goes wrong in one part automatically goes wrong with the other. How we sense our world and feel ourselves to be is affected just as much as how we act in the world and how well our bodies function. Malfunctions of the sensory-motor system are serious matters, and when they occur, they cause a fundamental deterioration in our lives. For thousands of years they have been associated with the disorders of aging and were therefore thought to be unavoidable and irreversible. But, as we shall see, they can be prevented and reversed. Walking with a smooth, even stride is one of the essential human functions. We are bipedal creatures with a way of walking that is different from that of any other bipedal animal: Each arm swings freely to counterbalance the movement of the opposite leg. There is a twist in the middle of our spine, centering between the seventh and eighth rib vertebrae, at which point the upper body is rotating in one direction and the lower body in the other.

Summary: What These Five Case Histories Teach Us

1. *These problems are functional, not structural.* In all five case histories, the problems, which on the surface looked to be irreparable breakdowns of the body, were, instead, malfunctions of the nervous system. Viewed externally, they seem to be about five bodies that are degenerating; but viewed internally, these are five brains that have lost control of their bodily functions. To use my own terms, these are somatic problems—not bodily problems. These are functional problems—not structural problems. These are problems solvable only by the patient—not by the doctor. These are problems reflecting a loss of control from the inside of the human system—not a deterioration of bodily parts at the outside of the human system.

2. *The functional problems are cases of sensory-motor amnesia.* All five of these people were suffering from non-medical problems. They were outside the reach of medical help, whose services they had exhausted. They were not suffering from infectious diseases or physical lesions or biochemical imbalance. They were suffering from a loss of memory: the memory of what it feels like to move certain muscles of their bodies, and the memory of how to go about moving these same muscles. Their memory loss was, to be specific, sensory-motor amnesia (SMA). I know this to be the case, simply because their being shown how certain muscular patterns feel, and how these contractions are accomplished, resulted in an end to their problems. They regained their normal functioning and normal bodily well-being without any need for antibiotics for infection or surgery for lesions or drugs to correct a biochemical imbalance.

3. These SMA problems were caused by the quality of their life span and not by the quantity: It was not the number of years but what happened during those years. Age, in itself, is neutral as far as health is concerned. Age has never harmed anyone, nor has it ever killed a single human being. It is what happens during the aging process that harms and kills human beings. Everything that happens to us during our lives causes a necessary reaction in our central nervous system. Our brain responds to and adapts to the events that occur. If we live a restricted, narrow life, our brain adapts to it. If we suffer years of anxiety, fear, and despair, our brain adapts to it. If we suffer shocks, accidental injury, serious illnesses, or complex surgery, our brain responds and adapts to it. These are the events that bring on sensory-motor amnesia, causing us to believe we are helplessly deteriorating. On the other hand, if we enjoy years of contentment, confidence, and hope, our brain adapts to that. And with very different effects. The brain is an adaptive organ. It responds to the events of our lives in whatever way is necessary in order to survive and keep going. But, because the brain directly or indirectly controls all of our bodily functions, this means that our entire body reflects what has happened to us during our lifetimes. The bodily malfunctions in all five of these case histories clearly reflect an internal, somatic adaptation to specific events that had occurred during the course of these lives. SMA is the unfortunate result of specific adaptations made by the central nervous system in response to what happens to us during our lifetimes. Part 2 is a discussion of these specific adaptations.

4. *SMA always affects the entire somatic system and has its roots in the center of the human body.* Any imbalance in the sensory-motor system creates imbalance throughout the entire body. When the muscles in one single limb become spastic or clumsy or too flaccid, this loss of control and efficient coordination within the musculoskeletal system causes an automatic compensation within all the other interconnected bodily parts. The brain brings about these compensations automatically and unconsciously, in an attempt to rebalance the entire system. Obviously, this compensatory rebalancing causes a distortion of the somatic functions internally and the bodily structure externally. The entire somatic system malfunctions and becomes askew. Because it is genetically programmed to preserve the somatic system, the brain rebalances and

compensates for this imbalance, but the whole system has now become inefficient, less supple, slower in response, habitually self-stressed, and operating with a significant loss of energy. These are precisely the symptoms of what we mistake for "old age." But not only does SMA always affect the entire somatic system, it also has its roots in the center of the human body: namely, in the waist, lower back, and abdomen where massive, powerful muscles connect the vertebrae and rib cage to the pelvis. This area is the center of gravity for the human body. And it is precisely the area where symptoms of "old age" first begin. In sum, because any sensory-motor disturbance will affect not only the entire somatic system but also, and particularly, the gravitational center of the human body, two simultaneous, interconnected problems will occur. First of all, malfunctions will occur in the muscles at the center of gravity, which will cause malfunctions in the movements of (1) the spinal-pelvic centrum; (2) the shoulder and hip joints; (3) the elbows and knees; and (4) the distal regions of wrists and hands and ankles and feet. Conversely, the other problem is that injuries and malfunctions in the distal regions of the wrists and hands, ankles and feet, elbows and knees, shoulder and hip joints, and spine will cause malfunctions in the proximal muscles at the spinal-pelvic center of gravity. This phenomenon was clearly present in the five case histories. In all five, the muscles in the center of the body are crucially involved, no matter what the specific problem was in the peripheral parts of the body.

5. Viewed infernally and functionally, SMA is a single somatic problem. Viewed externally and structurally, SMA is a multitude of mysterious medical problems. As I pointed out earlier, age is not the cause of anything, healthy or unhealthy. "Age" is a neutral term, just like "life": To live is to age. Nonetheless, within the medical profession and in medical research, the word age has a mysterious meaning. Even though, by definition, the word has no pathological significance at all, in medical usage, it has strong pathological significance: It is the mysterious unknown cause of all the mysterious symptoms in elderly humans that one cannot effectively diagnose or treat. "Doctor, why can't I be helped?" "Well, you're not getting any younger. After awhile things begin to break down. It's more or less what you should expect at your age." This, of course, is nonsense. Age has nothing to do with the hundreds of problems it is blamed for. "Age" is a cryptopathology. Behind the mystery lies ignorance, which is, by and large, an ignorance of the somatic condition of sensory-motor amnesia. The five case histories are the prototypes of millions of case histories and of typical symptoms that occur all over the globe every day. Over a 12-year period, I made note of some of the complaints my clients had when they first came to see me. All of them had a clear connection with the central muscles of the body, and all were resolved when these muscles no longer constrained the other body areas they affected. In every instance, SMA was the single, somatic problem at the root of the multitude of mysterious symptoms. In addition to painful feet, toes, legs, buttocks, chests, arms, hands, backs, necks, and jaws, my clients reported such symptoms as sciatic pains in the leg, swollen knees, varicose veins, weak ankles that turned too easily, stiff ankles that would not turn, leg cramps, numbness or "pins and needles" in their hands, chronic tension headaches, ringing in the ears, eye aches, shallow breathing, constipation, frequent urination, spasms of the urethra, inflamed joints, and restricted movement of the head. All of their complaints were chronic, all of them unresponsive to medical and paramedical treatments, and all of them resolved once the SMA was cleared up.

For example, when worries trigger this response, the eyes and forehead contract, wrinkling the skin. If we worry long enough, our skin becomes permanently wrinkled. When anxieties cause the neck muscles to flex, the face is projected forward in space, causing the muscles at the base of the neck (around the seventh cervical vertebra) to contract mightily, in order to hold up this forward-hanging burden. The more frequently this happens, the stronger and larger the muscles and fat tissue grow around the seventh cervical vertebra, thus creating what is called a dowager's hump. It is the same with the shoulders, whose posterior surface is connected to the neck by the same trapezius muscles. When distressful events cause us to worry, they cause the reflex of lifting and rounding the shoulder blades forward. One cannot worry without contracting the shoulders. It is impossible to say, "Oi Veh!" without lifting the shoulders. That is why people with chronic worry often have chronically sore shoulders and necks. If serious worries afflict a human early enough in life, the stooped shoulders will occur early. It is a measure of childhood anxiety to what degree a child's shoulders are slumped and neck contracted. During the distressful teenage years, this posture is common. Thus, it is not "age" that causes these bodily changes, it is distress. The more there is of it, and the longer it lasts, the more the Red Light reflex shows its long-term effects. It is not "age" that causes a stooped posture and shallow breathing; it is accumulated response to negative stress. Having a family and taking care of the kids and holding a job and paying the bills and solving the daily problems of life are all causes of looking old and stooped, unable to climb steps without getting breathless and hearing one's heart beat faster. A stooped posture and shallow breathing go together. Both are caused by contraction of the abdominal muscle. The rectus abdominis is a long, powerful sheath of muscles that stretches from its lower attachments at the pubic bone and groin line all the way over the front of the chest and up to the nipple line. When it contracts, the upper part of the rib cage is pulled forward and down, and the pubic bone is pulled forward and up. The trunk is, thereby, pulled into the flexed curve of the fetal posture. Contraction of the abdominal muscle not only depresses the rib cage, it depresses the entire contents of the abdominal cavity, creating pressure on the viscera. This means that when the diaphragm muscle between rib cage and abdomen contracts during inhalation, and begins to come downward toward the abdominal cavity, breathing is abruptly stopped. The

pump-like downward movement of the diaphragm is necessary in order to create a vacuum in the thoracic cavity to draw in air. But if the impacted viscera inhibit this downward movement, no vacuum is created, and breathing is insufficient. Aching legs and knees are typical of elderly persons. Careful observation reveals that these old persons have begun to walk with their knees slightly bent, so that the weight-bearing function of a straight knee is lost. If the thigh muscles are constantly engaged in weight support during waking, they will become chronically fatigued and sore. In addition, the areas under the kneecap and behind the knee joint, where the thigh tendons cross over the knee to attach to the lower leg, will become sore and sometimes inflamed. Arthroscopic surgery is not a likely solution. The solution, rather, lies in overcoming the Red Light reflex, in order to walk once again with the full support of a vertical leg. There are many other malfunctions that result when the body is habitually contracted in the withdrawal response. These malfunctions are not typical medical diseases but something else: what Hans Selye termed "diseases of adaptation."³ I agree with Selye. Such diseases would not occur if one had the ability to adapt to these stresses by the intelligent use of Somatic Exercises. The effect is that our muscles become free of the control of lower-brain reflexes and are returned to our voluntary control. Habituation is the simplest form of learning. It occurs through the constant repetition of a response. When the same bodily response occurs over and over again, its pattern is gradually "learned" at an unconscious level. Habituation is a slow, relentless adaptive act, which ingrains itself into the functional patterns of the central nervous system. Impotence is common among persons chronically contracted in the abdominal-perineal area. And these same persons are, predictably, shallow breathers subject to anxiety feelings. The problem would seem to be a traditional psychological one, but it is not. It is more often a reflexive muscular problem in which control has been lost. Sensory-motor amnesia commonly underlies chronic impotence, and it is generally seen in older persons. But it is a habit, not a degeneration of "old age." And habits can be broken. Hyper ventilation is a pattern of respiratory activity characterized by an increased ventilatory response. It is a condition that goes hand in hand with increased incidence of chest pains, heart palpitations, and the arterial narrowing of ischemia. It describes a Type A behavior characteristic seen in persons who are under increased risk of coronary heart disease.¹⁰ It also seems to be directly linked to "essential" hypertension, that is, hypertension of no known cause. Of patients clinically diagnosed as hypertensive, from 80 to 95 percent show no known cause for their disease—such as kidney malfunction.

However, given the evidence, we can surmise that there is indeed a cause, albeit a hidden one, of hyperventilation, one that has been neither particularly noticed nor investigated: the Red Light reflex, whose activation is endemic to industrial societies, and whose habituation causes the shallow thoracic breathing of hyperventilation. Hyperventilation has the following known effects on the heart:

1. increased heart rate

2. increased cardiac output

3. suppression of respiratory sinus arrhythmia and its replacement with a nonvarying heart rate

4. loss of parasympathetic control over cardiac functions and its replacement by sympathetic nervous functions

5. lowering of CO₂, arterial pressure and alteration of Ph, constricting both cerebral and skin blood vessels.

In our society, 80 percent of the adult population suffer back pain. Apparently, the progress of technology is based on progressively deteriorating backs. This is ironic, because, in our contemporary technological society, the reward for escaping from back-breaking manual labor should be freedom from such physical pain. Compounding the irony, twentieth-century medicine has been spectacularly successful in extending our longevity to the limit our genes will allow. At the same time, however, it has been spectacularly unsuccessful in combating — even understanding — the epidemic we now see of chronic pain in the skull, neck, shoulders, back, and buttocks of the entire adult population. As Rene' Caillet, a well-known specialist in medical rehabilitation, observes, "low back pain remains an enigma of modern society and a great dilemma for the medical profession."¹ It is the most common disorder for which people seek medical help. Moreover, it is the most common cause of worker absenteeism in industrial societies.² It is the general disorder for which the largest amount of money is spent on insurance and pharmaceutical and medical services— in the billions. The Landau reaction means that the infant can now do something that is even more thrilling than "swimming." When it arches its back, straightening out its bent knees, it can push against the floor and thrust its head forward: in other words, it can now move itself through space! This is the full discovery of the Green Light reflex. Up until this point the infant more resembled a plant, rooted in one spot. But now the fledgling human being can not only move forward toward a goal but can even choose the goal, busily activating the back muscles and extending the legs in the newfound thrill of locomotion. It is the contraction of the lower back muscles that inaugurates the Landau reaction. When the lumbar muscles connecting the back of the pelvis to the vertebrae contract, the infant has two simultaneous sensations: going up, and going forward. It is a delicious feeling. But this lumbar contraction is accompanied by the synergistic tensing of the muscles of the neck, shoulder, buttocks, and thighs. They, too, are part of the Landau reaction and are essential for the erect carriage of the body in standing and walking. The Green Light reflex is the opposite of the Red Light reflex, as both a muscular activity and an adaptational function. The Red Light reflex contracts the anterior flexor muscles, curling the body forward; the Green Light reflex contracts the posterior extensor muscles,

lifting and arching the back in the opposite direction. The adaptational function of the Red Light reflex is protective; it is a withdrawal from the world. The Green Light reflex is assertive; its function is action, and it too is adaptational. One makes us stop, the other makes us go. Thus, they are in balance, and are both necessary for our survival. They are equally necessary to our sense of well-being. From infancy through childhood and on through adolescence the young human is enormously active. The action response is triggered over and over again as youngsters propel themselves into the world around them. The Green Light reflex, centered in the lower back, unconsciously precedes and prepares her for every positive action. Children are motivated to explore. Their activity is spontaneous and usually joyful. But as they grow, they begin to learn another reason for action: responsibility. They learn that there are some things they "have to do." They have to do their homework. They have to do their chores. They have to take baths, and they have to go to school. They have to perform more and more actions they are not spontaneously motivated to perform. They are learning what it means to become responsible adults. Adults must make a living and be able to take care of themselves—whether they want to or not. The Green Light reflex is still being triggered, but the thrill is fast disappearing. The muscles of the back, now totally mastered, are being activated increasingly toward the responsibilities of life. The more responsible one is, the more often the back muscles are triggered. In our society, most people begin to "get old" early in life. Our technology lets us live a long life, but it also condemns us to live out those years in discomfort and fatigue. An industrial society is fueled by the energy of the Green Light reflex, which is triggered incessantly. This relentless repetition guarantees that the muscular contractions of the reflex will be constant and habitual. The action response is so steady that, eventually, we cease to notice it. It becomes automatic, fading into oblivion. This is sensory-motor amnesia, and once it takes over we can no longer control the Green Light reflex. All we feel is fatigue, soreness, and pain—in the back of our heads, in our necks, our shoulders, upper back, lower back, and buttocks. The senile posture in Figure 19c is the summation of the two opposing reflexes (Figures 19a and 19b). It is a very familiar posture, seen in millions of aged bodies, and it clearly shows how the two reciprocal reflexes habituate into a tense compromise between the two patterns. The powerful contraction of the spinal muscles in the Green Light reflex continues its pulling of the lower back and neck into a curve. But the equally powerful pull of the abdominal and shoulder contractions in the Red Light reflex tilts the entire trunk forward, rounding the back and shoulders and projecting the head forward.

1. *Stiff and limited movements.* As the Red Light and Green Light reflexes close in on one another, the human skeleton becomes imprisoned within its own musculature. As noted earlier, it is the muscles around the body's center of gravity that are the central agents of both reflexes. As they simultaneously pull the pelvis and hips up toward the trunk, yet pull the trunk and shoulder girdle down toward the pelvis, all movements become limited. The free rotational movement between the pelvis and the trunk is restricted. This automatically restricts walking. The pelvis doesn't swing, and the arms lose their counter-swing to pelvic rotation. Rather than the right arm coming forward with the left leg (Figure 21a), it begins to come forward with the right leg. The trunk has become rigid, like a single block (Figure 21b), restricts walking. The pelvis doesn't swing, and the arms lose their counter-swing to pelvic rotation. Rather than the right arm coming forward with the left leg (Figure 21a), it begins to come forward with the right leg. The trunk has become rigid, like a single block (Figure 21b). Both the arms above the trunk and the legs below the pelvis are similarly restricted, as is the head. As the senile posture develops, it becomes impossible to turn the head all the way around, for example, to look behind you when you try to park the car. The shoulder girdle is pulled downward, preventing the arms from reaching and rotating. Women have trouble putting on their brassieres, and golfers have trouble following through with a full swing. It becomes difficult to turn the knees in and out in free rotation. Dancing is too much of an effort. It's hard to maintain balance, and a fear of falling develops, which, in turn, causes people to become more cautious and stiff in their movement.

2. *Chronic pain.* The chronically stiff contraction of the body's musculature causes a chronic ache in these same muscles. They become sore, sometimes genuinely painful. Because the early Landau reaction is being constantly triggered in the Green Light reflex, the discomfort in the muscles in the lower back and pelvic region will range from a dim ache to a lively pain, depending upon the degree of stressful activity. Moreover, the restrictions of the shoulder and hip joints will cause varying degrees of discomfort, depending upon the kind of habitual activities engaged in. Typists, for example, will have sore shoulders and necks; postal workers will have sore buttocks and hips. When the senile posture is well advanced, and the central body has become quite rigid, pain will begin in the extremities. It is this pain—for example, in the elbows and hands, or in the knees and feet—that physicians frequently mistake for arthritis, pinched nerves, carpal tunnel syndrome, and so on.

3. *Chronic fatigue.* Inasmuch as the overlapping contractions of two reflexes simultaneously activate all of the body's muscle system, the result is an enormous expenditure of energy. One of the most common complaints of elderly humans is that they are always tired. "Please, can you do something to give me more energy?" is a plea I have heard hundreds of times. But these people do not lack energy. That is not their problem. Their problem is that, involuntarily and unconsciously, they are expending large amounts of energy constantly. These chronic contractions continue unabated when they are lying down, even during sleep. When they get up in the morning, they are dismayed to discover that not only do their muscles ache but they are tired as well. Some become so fatigued that they need to rest within an hour or two after rising.

Sometimes the subjective feeling is not of fatigue but of weakness. Frequently I read medical reports that state that the muscles of an elderly patient have become "weak." This is usually incorrect. If doctors would trouble to feel the affected muscles, they would discover that they are rigidly held in a tonic, involuntary contraction. They are, in fact, not weak, but strong, from their constant contraction. Often they become quite large and powerful from their chronic pulling.

4. *Chronic shallow breathing.* The senile posture, by combining the contractions of the withdrawal and action responses, pulls down the entire rib cage, both front and back, immobilizing the chest. We have seen how this provokes the shallow, rapid breath of hyper ventilation and its unfortunate effects on cardiovascular functions. When oxygen intake becomes extremely low, the result is often depression, listlessness, and loss of mental acuity.

5. *A negative self-image.* When individuals reach a stage in life when (1) they can no longer do what they once did, (2) they are always in pain, (3) they are tired and without energy, and (4) their oxygen supply is restricted, these individuals usually develop a negative self-image. This may happen if, despite all their efforts, they cannot reverse the loss of their youthful functions, and if they constantly are told, "That's the inevitable effect of aging." This state of affairs has its own disastrous consequences, because, according to the somatic law, what you expect is usually what you get. This will be discussed in Chapter 12.

6. *Chronic high blood pressure and the "Dark Vise."* Perhaps the major cause of death from diseases late in life is arteriosclerosis, also called "hardening of the arteries." This condition is at the root of both coronary and cardiovascular diseases, the latter of which include strokes and ruptured aneurysms. The scientific view of gerontology researchers is that high blood pressure, combined with hardening of the arteries which restricts blood flow, is what causes these events, and that this condition is the result of a genetically programmed biological process.¹ In other words, the medical view is that hypertensive arteriosclerosis is "the inevitable effect of aging." But quite possibly it is not, and I say this for two reasons, one of which I have already mentioned in our discussion of the Red Light reflex: When the Red Light reflex restricts breathing and therefore triggers hyper ventilation, it also suppresses the normal variable heart rhythm and pressure of sinus arrhythmia. This means that two things occur: (1) Dominance of the sympathetic nervous system over cardiovascular functions causes the smooth muscle walls of the vascular canals to contract; and (2) the up-and-down variation of blood pressure no longer occurs, so that the vascular walls are not kept supple and therefore adaptable to blood pressure changes.

The other reason for modifying the current viewpoint about the inevitability of hypertensive arteriosclerosis has to do with the known effects of static muscle contraction—also known as isometric contraction. There are two ways in which muscles can work: statically or dynamically. When you squeeze the juice from an orange, the fingers close down around the orange; this movement of the fingers is a dynamic contraction. When you squeeze a baseball, the fingers do not move, even though the muscles are contracting; this is static contraction. This mistaken image of a broken-down back haunts everyone's thinking about this universal problem. "Back-breaking labor" expresses this confusion as does the equally popular complaint, "My back went out." Except with fractures and severe accidents, human backs rarely "break" or "go out." They do, however, become painfully bent into the archer's bow, with the pain usually being in the constantly fatigued muscles of the back, not in the disks or in the nerves, as is commonly believed. If the sensory nerves in the lower back under the fourth and fifth lumbar vertebrae are pinched by excessive contraction, the pain will be felt, not in the back, but in the pelvis and leg on the side of the pinch. These are sciatic pains, which are an aggravated example of the same provisional compression of the disks into an archer's bow. Because the archer's bow curves the lower back inward, it automatically curves the belly outward. "No matter how much I diet, I can't get rid of this protruding stomach!" is a remark of many middle-aged clients. Even though this protrusion is the unavoidable consequence of chronically contracted back muscles, there is a befuddled conviction among some health professionals that the back and belly sway forward because the abdominal muscles have become weak. Having a "tight gut" is an obsession with many males, and they will engage in long sessions of sit-ups and leg-lifts to remedy this situation. But nothing changes, because the abdominal muscles were never weak. Instead, the lower back muscles are excessively contracted—they are "too strong." The typical curve in the middle of the body, then is, due neither to a "weak back" nor to a "weak belly"—nor is it due to a structural breakdown that must be repaired, braced, or trussed up. It is due to a chronic involuntary contraction of the back muscles caused by a constantly triggered Green Light reflex. The problem is in the brain where the reflex is habituated. When this reflex is mastered, the curved back, the protruding belly, the compressed disks all disappear—and the pain ceases. But sensory-motor amnesia causes us to forget what it feels like to have a relaxed, undistorted back. After years of suffering the effects of a curved and shortened spine, one's sense of "straight" is distorted. The trauma reflex is a reaction of the sensory-motor system meant to guard against pain. It is a common protective reflex, as transparently familiar as the breath-holding crouch of the Red Light reflex or the arching back of the¹ Green Light reflex. When we are stung by a bee or pricked by a hypodermic needle, we flinch—that is the trauma reflex. If someone holds a burning cigarette or a sparkler too near to us, we move the threatened body part away from the danger and cringe—that is the trauma reflex. If our body is injured, the muscular cringing is meant to hold a tight protective pattern around the point of injury—that too is the trauma reflex. These kinds of trauma reflexes can occur in any part of the body—top or bottom, front or back, left or right side. They can occur in the front

of the body, adding to the contracted crouch of the Red Light reflex, as happens sometimes after heart surgery. They can occur in the back of the body, adding to the tight swayback of the Green Light reflex, as sometimes occurs after spinal surgery. But unless the injury is in the center of the body, the cringing contraction of the trauma reflex will be most obviously seen on one side of the body, usually affecting the smoothness of walking and the sense of balance. The trauma reflex can be triggered by surgery: A spastic cringing reaction will occur in the muscles surrounding the site of surgery. Women who have mastectomies may have chronic stiffness and soreness in the shoulder and upper rib cage. Men who have heart surgery may have a tight soreness in the chest. People who have kidney surgery and a catheter insertion will sometimes have uncontrollable muscular spasms in the lower belly and upper thigh where the catheter had been. Examples of this kind are endless. Equally frequent are trauma reflexes on one side of the body after a severe fall on the hip, or following a sprained ankle or a broken leg. The inability to put weight on the injured leg causes an automatic shift of weight to the other leg. This is not a voluntary action; it is a reflex to avoid the pain. One cannot help but "favor" the injured leg. Tailors as well as chiropractors will frequently tell their clients that one of their legs is shorter than the other. Out of hundreds of persons who have been told that, I have never seen one whose leg was actually shorter; in every case, the muscles of the center of the body were chronically contracted, pulling up the hip on the side—like Harley's "retracted landing gear." There are as many varieties of the trauma reflex as there are ways for humans to injure themselves, ranging from the brusky to the subtly violent and from a whiplash twist of the neck to a paralytic disease. Sciatica is caused by disk pressure on the sciatic nerves located just between the fourth and fifth lumbar vertebrae and the fifth lumbar vertebra and the first sacral vertebra, respectively. They are sensory nerves, extending through the pelvis, down the thigh and calf, ending in the foot. The former goes down the side of the leg, ending in the big toe; the latter goes down the back of the leg to the heel, ending in the little toe. Whichever nerve is pinched, the pain will be felt along that route. If the pinch is moderate, the pain is felt only in the pelvis and hip. If the pressure is severe, the pain is like a hot wire going all the way to the foot. It is a nerve pain with a different sensation than muscular pain, and it can be agonizingly debilitating when it is severe. The sexual responsiveness of women reaches its fullness considerably later than that of males, that is, during their late twenties and early thirties. The average frequency of female sexual activity remains fairly constant up until their sixties. Of all women in their fifties sampled in the Consumers Union report, 93 percent were sexually active. When we match this with the 98 percent of sexually active 50-year-old males sampled, we have a picture of human beings at the half-century mark whose sexuality does not subscribe to the myth of aging. The myth about aging and sexuality has its parallel in false assumptions about aging and mental competence. When the Binet intelligence tests were first used in the United States, it was believed that intellectual development, running parallel with sexual development, reached a peak at age 16. During the 1920s, some researchers thought the peak might be even earlier, at perhaps 13 years. After these peaks, no further intellectual development was presumed to take place. (This is when the popular myth probably got its start.) But the Wechsler tests of the 1930s quickly revealed that the findings of the Binet tests were not true. According to the later tests, many adults seemed to get smarter as they got older. And the Wechsler scales turned up an interesting complication: Different types of intellectual function had different times and rates of peaking and declining. This was further complicated by the discovery that some adults did not show any decline at all. Expectation is what carries us from the present into the future. As such, it is like the prow of a vessel nosing its way forward. The direction in which the prow is pointed determines the direction the vessel will go. The prow leads the movement of the vessel. If the prow points up, the vessel will follow in the same direction: upward. If the prow points down, the vessel will go downward. The course of our life follows our expectations in the same way that a vessel follows the direction of its prow. The expression, "a self-fulfilling prophecy," means that what we expect will happen usually turns out to be what actually happens. Expectation is not only a prediction of the future, it also directly contributes to making it happen. This proactive role which expectation plays is crucial to our well-being. Consider the placebo effect. This curious word is Latin. It means "I shall please," and it was taken from the liturgy of the Catholic Church, in which the priest said, "I shall please the lord ..." Later, it came to be applied more generally to any attempt to flatter or please another person. By the nineteenth century it was being used by physicians to refer to any ineffective substance given as "medicine," not to cure, but merely to please, the patient. Soon, however, physicians began to notice an odd thing. These substances, which were not supposed to have any effect, actually succeeded if the physician cajoled the patient into believing it would. If the patient expected that the sugar pill would help, it did. This is the placebo effect. The word "age" means, quite simply, "a period of existence." It is one of the more fascinating words in the English language, because it is significantly more complex than it sounds. First of all, it has a curious etymology. Its Latin root is *aetus*. Its form, *aticus*, meaning "belonging to" or "proper to," was commonly used as a termination to many words: for example, *silvaticus*, "of the wood" (*isilva*), and *viaticus*, "of the way" (*via*). Later, *aticus* evolved into the French suffix, *age*, and *silvaticus* passed into English as "savage" and *viaticus* as "voyage." Age became a common suffix in many English words: language, village, marriage, postage, and so on. Moreover, even though "age" means simply "a period of existence," it refers more broadly to that which characterizes a period of existence. It is particularly interesting when it becomes a verb—to age—for then it means "to grow old." What, we should ask, does it mean "to grow old"? "Old," in its Latin root, *alo*, and in its ancient Germanic form, *alt*, means—quite

surprisingly—"to nourish" and "to bring up." More generally, *alo* means to strengthen, increase, and advance. It means to become taller and to become deeper. In its root meaning, then, "to age," and to get older, means "to grow up." In view of the etymology of "old," it is fascinating to note that "growing old" has come to mean exactly the opposite of the original meaning of "old": that is, "old" has come to mean worn out, deteriorated, decayed, dilapidated, and no longer useful. Thus, in plumbing the meaning of the simple but curious word, "age," we come upon a fundamental ambiguity: "To age" means either to grow, increase, and become both taller and deeper or to decrease, decay, wear out, and become decrepit and discarded. It is most provocative that a word as basic to human life as "aging" can mean either of two opposite possibilities: growth or degeneration. It suggests that what is characteristic to the period of existence of a human's lifetime is neither programmed nor predictable. It implies that the direction of human life is not fixed but open. This fundamental ambiguity reflects an abiding human insight into the ambiguity of aging: A human life can unfold in the direction of growth and increasing strength, or it can just as well unfold in the direction of decay and steady degeneration. From the layered depths of our language arises the tantalizing suggestion that aging might mean growth rather than decay. This linguistic implication is tightly interlaced with the etymological roots of "aging," almost like the expression of a "collective unconscious" of our race—a collective insight into the authentic possibilities of human life. This insight has for millennia lain glowing within the heart of our language, awaiting full discovery and confirmation. We now know enough about expectation and the way it mobilizes our bodies to realize that it is crucial, when we think of aging as a process, to distinguish between the two opposite meanings of "to age"—that is, to grow, or to decay. If we think of the coming years of our life as a continuing process of advancement and strengthening, it is more than likely we shall experience just that. And it is just as likely that a constant, daily expectation of wearing out and becoming decrepit will be a self-fulfilling prophecy. Expectation is the leading edge of a belief system, and it has the curious feature of being self-justifying. As a leading edge, it predetermines our future. It programs what is to come, so that 60 years later one human smiles and affirms the progress of his life, saying, "This is just what I expected"; but another, who also says, "This is just what I expected," grimaces at his self-predicted decrepitude. Both got what they expected. They could not imagine¹ it happening any other way. Time is the currency spent by life, so we cannot wait for 60 years, wondering indecisively what to expect. Sixty years later will be too late. We see in this situation an extraordinary truth about human life: Whether we will grow or degenerate during the course of our lives is a question not of known fact but of expected possibility. Time, as the currency of life, is always futurity; it is not yet spent. How we expect it to be spent predetermines the plan for its expenditure. Once we realize that the investment we make in our lives is the same as any other investment, we may adopt a very different attitude about what possibilities we expect for our future years. I do not think it improper to say that what we invest in life determines how much we get out of it. It is a question of whether we think that our lives are at least as important an investment as, for example, real estate or stocks. It is my observation that many humans do not value their personal bodily future as highly as they value the future of their material possessions. Undoubtedly, they get their reward, which is "what they expected." To expand slightly a famous comment on the situation: "for what shall it profit a man, if he shall gain the whole world, and lose his own soul—and body?" But life need not unfold in this way. We now know enough about expectation and the way it mobilizes our bodies to willingly choose the expectation that our conjoint souls and bodies—our "somas"—will "increase," "advance," become "deeper and taller"—partly because they are "nourished" and "brought up" with this happy expectation. The human who knows that his or her being is growing is a human who usually has the strength and endurance to prevail over the defeats and stresses and traumas that occur in each and every life. Such a person knows that the inevitable pains and dysfunctions occurring in the body are not "inevitable signs of degeneration," but typical adjustments that all bodies go through in regulating and readapting themselves for the future. A human who knows aging to be a process of ongoing growth is a human who has the ongoing power to overcome ailments, surmount malaise, and triumph over the worst of defeats. Not to countenance defeat, not to accept failure, not to give up, is to drink from the well of life's richest nourishment: the wisdom that, in its depth, life is ever redemptive and rejuvenating.

A Pride in Age

One effect of the myth of aging is that it induces us to despise old age and adulate youth. Worshiping youth is the inverse side of hating advancing age. It is regrettable that this attitude seems to have become steadily more popular, almost directly counter to the recent sudden expansion of our elderly population. Is it that there are more people now who see their advancing years as something ominous and catastrophic? And is it that they hopelessly yearn for a state of youth that can never again be? Is this yearning so desperate that they will do anything to have at least the semblance of youth, masking the shameful signs of age so that, at least externally, they seem to give lie to the inescapable fact of aging skin and hair? Let me say this as emphatically as possible: To despise the fact of aging is not only to despise life but to betray a pitiful ignorance of the nature of life. Youth is not a state to be preserved but a state to be transcended. Youth has strength, but it does not have skill, which, in the long run, is the most potent strength. Youth has speed, but it does not have efficiency, which, in the long run, is the only effective way of attaining goals. Youth is quick, but it is not deliberate, and deliberation is the only way to make correct decisions. Youth has energy and intelligence, but it does not have the judgment necessary to make the best use of that energy and

intelligence. Measured judgment in the end, is the only guarantor of intelligent behavior. Youth has the beauty of genetic endowment, but it does not have the beauty of real achievement. Youth has the glow of promise, but it does not have the radiance of accomplishment. Youth is a time of seeding and cultivation, but it is not a time of fruiting and harvest. Youth is a state of ignorance and innocence, but it is not a state of knowledge and wisdom. Youth is a state of emptiness awaiting fullness, a state of possibility awaiting actualization, a state of beginning awaiting transcendence. In short, youth is a state to be put behind us as we grow taller and deeper and fuller. Unless we understand that life and aging are a process of growth and progress, we will never know the first principles of living. Nor will we understand what youth is all about: an explosive yearning to grow taller and deeper and fuller and to transcend oneself. It is by losing this yearning that we forget the first principles of living and begin to worship a false and superficial image of youthfulness. The human species, possessed with a brain whose genius is unlimited learning and adaptation, is a species that is genetically designed to age by growing. Not to expect to grow is to misunderstand what it means to be human. Not to do so is to fail in the God-given task of living a fully human life. To expect the opposite is, in effect, to sin against life and its biological promise. This is the attitude of youth that we must keep from birth through maturity and till death, for it is an attitude of positive expectation: to expect the best of our lives and to have the basic somatic skills to guarantee this expectation. Such an attitude and such skills can make for a very different elderly population. It is my conviction that the most extraordinary gerontological event will not be the age shift in the population but the shift in attitude and accomplishment of the elderly. To say that aging is an adventure is the same as saying that life is an adventure. Indeed, each individual life is the greatest adventure. Together, they are part of the larger adventure, a life of community evolving on a blue and green planet as it spins its course through a measureless universe. The human race is changing. At the present moment, this change is accelerating, and is charged with the thrill of danger and promise. That's what it feels like when the currents of futurity gather momentum and move us forward headlong into the future. We must make our way through this great time of change, expecting that it will be good, and intending that it will be good. We must make our future the way we want it to be. That is what human freedom is for. And, in the process, we may discover that the myth of aging has been replaced by another, brighter myth. If it is true that, in the deepest reaches of the human heart, we all live according to myths, we may find that, from the ashes of the old myth, a new myth of aging is arising: that life is a continuous process of growth and expansion. I designed these Somatic Exercises specifically to reduce the effects of sensory-motor amnesia that normally occur by middle age. They are based on the ingenious work of Dr. Moshe Feldenkrais, an Israeli scientist. In 1975, I sponsored and directed the first Feldenkrais training course in the United States. Since that time, his revolutionary method of body reeducation has been taught worldwide. This program consists not of physical exercises but of Somatic Exercises; it offers specific procedures for making changes in the sensory-motor areas of the brain in order to maintain internal control of the muscle system. Because you are exercising your brain as well as your body, it is important to practice each movement pattern with your maximum conscious attention.

1. *Learn the nature of sensory-motor amnesia, how it occurs in your brain, and where it occurs in your body, by reading and reviewing Part 2, Understanding your brain and body and how they are affected by stress and trauma is essential for the benefits of Somatic Exercises to last.* For most people, the initial effect of these movement patterns "feels like" magic as their bodies relax and regain their suppleness. But the "real" magic comes from learning how to maintain your suppleness and how to continue developing it.
2. *While doing the Somatic Exercises, your primary task is to focus your attention on the internal sensations of movement.* These movement patterns highlight those areas of the body most commonly affected by sensory-motor amnesia. As you perform the exercises, concentrate on developing a careful sensory awareness of the movements in these body areas as a direct way to maintain control over them. To this end, the instructions on performing each individual movement are immediately followed by instructions for sensing each one. In this way, you will know what to look for in the feelings of sensory feedback that these movement patterns evoke.
3. *Ideally, you should do your Somatic Exercises while lying on a rug or mat, wearing loose clothing, and being away from all distractions.* A rug or mat allows comfort while providing a firm support for your body. This allows you to be more precise in performing the movement and more precise in perceiving it. People whose movement or strength is extremely limited may do their Somatic Exercises in bed. The firmer their mattresses, the more effective the exercises will be, and they should move to a rug or mat as soon as possible.
4. *Always move slowly.* Moving slowly, you give your brain the chance to notice all that is happening in your body as you move. Slow-motion films are essential in sports training because they allow athletes to study the details of a movement or play. The same goes for focusing attention on the internal sensations of your own movements: The slower you go, the more you perceive.
5. *Always move gently and with the least possible effort.* This, again, is so that your brain can receive precise and uncluttered sensory feedback from the exercises. When you experience excessive effort and strain—as is usually the case in doing calisthenics—then your brain is cluttered by sensory feedback that is irrelevant to what you are relearning to control. It is better for you to feel that you are doing "too little" than to risk doing too much and undermining the somatic learning process.

6. *Do not force any movement.* Somatic Exercises help you maintain sensitivity and control, but, until your brain learns how to move your muscles, no amount of force and effort will release the involuntary contractions in your body. Pushing against your muscles is from the old tradition of physical training, which always fails to release the hold of sensory-motor amnesia. If you attempt to voluntarily force a muscle that is involuntarily contracted, you will cause an equal and opposite resistance of that muscle. It will contract even tighter, finally to the point of spasm.

7. *Somatic Exercises are not painful.* The movement patterns of these exercises are the normal movements of the musculoskeletal system. If you perform them slowly and gently, they are completely harmless. Hurting yourself while exercising is unnecessary, harmful, and, of course, no fun at all.

8. *Be persistent, patient, and positive.* Somatic Exercises change your body by teaching your brain. Your learning grows steadily and solidly. You must be persistent—determined in your practice of these movement patterns. You must be patient—looking not for a "quick fix" on your body, but for a genuine, lasting change in your comfort, range of movement, posture, and general functioning. Most importantly, you must be positive in your expectations, envisaging & aiming for the improvement you know your somatic system is capable of.

Interlude: The Daily "Cat Stretch"

After you have mastered bodily control, you will arrive at a new stage of your Somatic Exercises: *maintenance of your sensory-motor control.* You must preserve what you have learned as a normal and permanent aspect of your bodily habits without any loss or erosion due to the daily stresses to which you may be subjected. While the learning stage requires patient attention, the maintenance stage requires only a short time each day to reinforce what you have learned. All that is required is a brief repetition of your basic movement patterns, to remind the sensory-motor tracts of your brain how to do them. Therefore, your Daily "Cat Stretch" consists of the most important movements from your Somatic Exercises.

The Daily "Cat Stretch"

Like all Somatic Exercises, these maintenance movements should be done slowly, gently, and with maximum awareness. Do them in an easygoing, catlike manner so that they give you pleasure.

1. Lying on your back, arch and flatten your lower back, inhaling while going up and exhaling while going down. Repeat five times over thirty seconds. *Lesson One: 1.B.*

2. Lying on your back with both hands interlaced behind your head, lift your head while exhaling and flattening your back. Lower your head while inhaling and arching your back. Repeat five times over thirty seconds. *Lesson One: 5.A,*

3. Lying on your stomach with your left cheek on the back of your right hand, lift your head, hand, and right elbow while simultaneously lifting your left leg. Do this two times, then do the same for the other side of your body. Inhale slowly while lifting; exhale slowly while coming down. This will take about thirty seconds. *Lesson One: 2.B and 3.E.*

4. Lying on your back with your left knee held by your left hand, lift your head and right elbow to your left knee while exhaling and flattening your back. As your head comes down, inhale, arching your back up. Repeat three times. Do the same for the other side of your body three times. This will take about sixty seconds. *Lesson Two: 3.A and 4.A.*

5. Lying on your back, roll your arms in opposite directions on the floor, alternately dropping your knees each time to the side of the arm rolling down the floor. Turn your head in the direction opposite your knees to make a full spinal twist. Move slowly and lazily, so as to enjoy the stretch. Repeat six times over thirty seconds. *Lesson Four: 8.A.*

6. Lying on your back, twist your right foot, leg, and hip in and out five times, being sure to lift and arch each side of your back alternately without lifting your shoulders. Do the same with your left side. Move both legs simultaneously in alternating bow-legged/knock-kneed positions five times, then together in skiing motions five times. This will take about sixty seconds. *Lesson Five: 3.A, 6. A, 7.A, and 7.B.*

7. Sitting with your right hand on your left shoulder and with both knees bent and facing left, rotate your trunk to the left three times. Holding your trunk motionless at full left turn, turn your head to the right and back three times. Turn both your head and your trunk in alternate directions three times for the full spinal twist. Still holding your trunk to the left, lift your face to the ceiling while dropping your eyes to the floor and *vice versa* three times. Do the same for the other side of your body. This will take about sixty seconds. *Lesson Six: 1.A and 1.B for both sides; 3.A for both sides; and 4.A and 4.B for both sides.*