Response to Ted Dimon's The Organization of Movement
Part 3. How the Relation of the Head to the Trunk Organizes Movement in Space

Published in the AmSAT Journal, Issue No. 5, Spring 2014, Pages 38-42.

This is my second response to Ted Dimon's valuable series of articles, The Organization of Movement, published in the AmSAT Journal 2013-2014, and also at Ted's website, www. dimoninstitute.org. My first response addressed the first two installments, on the subjects of tensegrity and stretch reflexes. This response addresses the third installment, How the Relation of the Head to the Trunk Organizes Movement in Space. I will try not to repeat too much of what was said in my first response. But some repetition cannot be helped.

Dualing Conceptualizations: Postural Support vs. Uprighting

When others, including Ted, write about such topics as "postural support," primary control, habitual mis-use, faulty sensory appreciation, end-gaining, tonic reflexes vs. learned behavior, there is no recognition that human beings can, and do, interfere with gravity. I believe that this is a major omission that skews any analysis of human movement. We human beings are constantly interfering with gravity's influence, with very negative consequences. Neither my Alexander colleagues nor the scientific community seem to recognize this. At least, not to my knowledge.

I find the expression "postural support," which is commonly used by people talking about human movement, to be a vague abstraction divorced from the real action that is taking place —the transforming of a lump of flesh and bones on the ground into a upright being, with a head atop a vertical spine. I call this species-defining act, "uprighting." It is the act of lifting ourselves into verticality. We are doing this close to 16 hours a day, in all sitting, standing and locomotive activities. Talking of maintaining 'postural support' suggests that we come pre-lifted, with a ready made posture. We don't. We need to create our posture. And we create it by doing more than simply providing 'support.'

By not recognizing that we are doing this lifting/uprighting, we are unable to ask what seems to me to be the most relevant question: what makes for efficient lifting as opposed to inefficient lifting? By not seeking an answer to this question, we have not found one. I believe there is a lot more clarity that can be brought to this subject matter. As Alexander Technique teachers, we owe it to our incredible discipline to gain this clarity, so that we can apply it to our own use and share it with our students.

Just because gravity compels objects down to earth, and we are lifting ourselves up, does not mean that we are doing this against gravity, as Ted and others says. We see what happens to astronauts in a zero-gravity environment. Gravity is essential to uprighting, whether we are lifting efficiently or inefficiently. As Alexander Technique teachers we are interested in promoting efficient — indeed, optimal — lifting. This can't happen when we interfere with gravity's influence. When not interfered with, gravity is our ally.

Routine Sitting Behavior — Evidence of Societal Ignorance

Gravity compels objects straight down to earth. But we human beings can lean in any direction — whether this is done consciously or subconsciously. Leaning (or, as I like to call it, "mis-committing body weight") imposes an other-than-straight-down trajectory on our body mass. This results in our moving away from our balances points, the tali in standing, the sit-bones in sitting — which are located directly underneath us. To my mind, this constitutes clear interference with gravity. It makes the act of uprighting far more strenuous than it need be. When we do this habitually, without awareness, we are in serious trouble. And, of course, we do do this habitually. Starting from a very young age, all of us in modern civilization mis-direct our body mass backwards, leaning back in chair, sofas, car seats — at home, at school, everywhere — with staggering repetition. There is no anatomical support located behind us. All structural support for our sitting is directly underneath us (sit bones) and in front of us (legs and feet). It is utter folly for human beings to be throwing our weight backwards repetitively.

The consequence of doing this are staring us in the face, everywhere we go, wherever people are sitting. It is understandable that this mother-of-all-bad-motor-habits has gone unnoticed. Sitting back is a deeply entrenched habit for everyone of us — with its attendant faulty sensory appreciation and end-gaining. We have been

conditioned since birth to accept sitting-back as normal and acceptable. This has happened subliminally, just by watching all of our elders doing it constantly. Even F.M. Alexander did not notice or write about this as problematic. Indeed, in the Alexander Technique world, we like to say that good use is not about right position but about right direction, and that we can use ourselves well in any position. We simply do not recognize that it is mis-direction that gets us positioned at the back of the chair in the first place.

Innate Reflexes and Gravity

Although Ted does not seem to recognize any of the above (he certainly is not writing about it), I find agreement with what I take to be a basic notion of his that "innate reflexes" are an essential aspect of good use (except for the against gravity part). Ted writes:

"[T]onic reflexes remain a crucial element in explaining upright balance and posture for two reasons. First, while they can be altered by context and learning, reflex pathways are essential for maintaining the automatic postural tone necessary for support against gravity. We see this in young foals and human infants, who instinctively and automatically extend the legs and trunk against the force of gravity as they learn to stand — a response that can only be accounted for on the basis of underlying tonic pathways that are wired into the brain stem and spinal column, whether you use the terminology of reflexes or not."

Clearly, human beings come into this world with the ability to upright optimally. This is a highly evolved ability developed over millions of years. As infants and toddlers, we all display this ability. And no one teaches us how to do it. We learn it because it is in our DNA. So I agree with Ted that these "reflex pathways," or whatever you want to call them, certainly exist.

Ted cites physiologist/researcher T.D.M. Roberts as saying that "many aspects of balance are actually learned and cannot be accounted for on the basis of innate reflexes." Nonetheless, Ted believes that "[t]hese reflexes, as is demonstrated in the most current work in neuroscience, continue to operate in adult humans, and are an essential part of how we maintain support in a gravitational field."

It is my view that these 'reflexes' or 'automatic, highly evolved, constructive responses' or 'whatever you want to call them' are triggered only when we allow gravity to operate unimpeded. It is the force of gravity interacting with our neuro-muscular-skeletal organism that enable these automatic, constructive responses. When we allow gravity to take us straight down, our joints flex a tiny bit, creating ground contact at appropriate spots on the foot or sit bones, from where we gain optimal leverage to lift/extend ourselves the tiny amount we have fallen/flexed with minimal effort, using our deepest extensor musculature.

When we interfere with gravity, on the other hand, and effect an other-than-straight-down trajectory, all bets are off. We have deviated from the innate pathway. This is why "neuroscience texts now downplay the role of reflexes in posture." Interference with gravity is ubiquitous. These innate pathways are hardly ever used. But they are still there, ready to perform when activated. That is why it is so important to recognize our deeply ingrained, long-term, sitting-back habit. It has kept us in a state of faulty sensory appreciation in which the kinesthetic connection between how we fall and how we lift has been temporarily severed. It can be restored.

Since living demands that we continue to upright even when we interfere with gravity's influence, we must find different pathways, different muscles to lift us. That neuroscience considers this to be "learning" is, to me, misleading. This "learning" is the adoption of bad motor habits, and happens subconsciously, controlled by our 'base brain' — as a way of protecting ourselves against ourselves. Relying on these survival mechanisms leaves us lifting ourselves inefficiently to one degree or another — with muscular strain and skeletal distortion.

Coordination of the Whole

Throughout this third article, Ted comments on the functioning of organisms less complex than human beings. Contrasting fish from worms, Ted notes that "a worm only contracts particular segments of its body, whereas a fish must be able to coordinate all the segments of its body as a whole." He reiterates this when speaking of land-based animals, whose "muscular system must maintain support of the body as a whole — again, not acting on parts but on the total system." [pg 38] Ted speaks of "tonic reflexes" (named by Sherrington) as "produc[ing] continuous action of the muscles for maintaining posture." [pg 39] These tonic reflexes, Ted tells us, "are long-lasting — that is, they never seem to tire...the small postural muscles responsible for maintaining sitting posture

can work for hours and even days with little sign of fatigue. This is partly because these muscles, when working elastically, perform their work efficiently." I say fine to this. But this just begs the following questions. What conditions enable this efficiency? What conditions disable this efficiency? On this matter, Ted and I see things differently.

In discussing the "righting reflex" that Magnus' found in studying rabbits and cats, Ted writes: "The entire muscular system must be organized as a whole as the animal moves in space; and this total response is organized by the relation of the head to the trunk via sensors in the neck that are connected not just to the neck muscles, but also to pathways affecting the entire body, so that the relation of the head to the trunk determines total body posture. We see this beautifully demonstrated in the cat stalking its prey." [pg 40]

As to human beings, Ted says: "These standing and supporting reflexes take a different form in humans, but work fundamentally on the same principle...because the head is supported from below, it must be delicately counterbalanced forward in order to counteract the pull of the neck extensors; and the spine, meanwhile, has to lengthen directly upward against gravity in order for the whole system to work properly...As in four-footed animals, the head in human upright posture leads the body to lengthen, in this case upward instead of horizontally. The balancing forward of the head on the spine lengthens the neck muscles, which are richly supplied with muscles spindles that activate the anti-gravity response of the muscular system. This is a tonic response that occurs automatically as a basic organizing factor in movement." [pg 41]

I have a problem with this scenario. What organizes our movement in space is the act of lifting ourselves into verticality. How well or how poorly we coordinate ourselves as a whole depends on how efficiently or inefficiently we perform this activity. The simple fact that the head is positioned on top of the spine, does not mean it leads the upward movement. If, indeed, all human activity is an act of the whole of us, then no particular part leads. It all works in concert — for good or for ill. What makes it work well is the straight-down direction of our body mass. Interference with this straight-down, gravity-influenced direction compromises the effectively working of the system as a whole.

Take the example of someone sitting back against a chair support, with the spine bearing the weight that is leaning back, somewhere in the thoracic spine, around T5. Does doing this organize the entire system as a whole? Does this enable the spine to lengthen upward? I say, most definitely not.

Yes, the head may be "counterbalanced forward" and, yes, the deep extensors of the spine may be activated, but only as far down as T5, where the spine is supported by the chair-back. This is certainly not activation of the entire system as a whole. Below the point of contact with the chair support, the muscular-skeletal system, for all practical purposes, is de-activated and non-functional. To generate chair contact at or around T5, we move our torso in a back and down direction. In moving in this fashion — whether we do it with awareness, or without (as we did countless times every day as school children and as adults before we became students of the Alexander Technique) — it is folly to think that the head is leading. When we move backwards to lean against a chair support, T5 is clearly leading this movement. And without question, every time we move backward from the hip joints while maintaining a vertical neck, somewhere in between the sacrum and the base of the neck, the spine is bending. If we move back a little bit, the spine bends a little bit. If we move back a lot, the spine bends a lot. Either way, the back is shortening, not lengthening. This is not from "tensing the neck" or "pulling down." It is an absolutely natural and immediate consequence of committing body weight backwards.

Addendum
Consequences of Repeatedly Sitting Into the Backs of Chairs, Sofas, etc. and Pulling Ourselves Off of Them

In the famous *Evolution of a Technique* chapter in *The Use of the Self*, F.M. Alexander writes of his self-observations as he worked to change his habitual manner of use. He observed a number of physiological manifestations: "tensing the neck", "shortening the stature", "pulling the head back", "narrowing the torso", "lifting the chest." To me, all of these are the inevitable consequences of habitually sitting back.

Moving Toward the Chair-Back

It is important to recognize that as we are moving backwards, we are not moving horizontally. We open up the hip joints, over-extend them. This rocks the pelvis back and down from the sit bones. When the pelvis moves, so does all that is above. We are commanding that we fall backwards. We can do this because we know that a chair-back is waiting to catch us.

The moment we begin to move backwards towards a chair-back, our vestibular system registers the backward tilting of the head. Our 'base brain' recognizes this backwards toppling as problematic, and subconsciously responds by “tensing the neck” to level and stabilize the head.

As we let the pelvis and lower spine roll back and down, we use ilio psoas muscle effort to regulate our backwards fall, so that we don't slam into the chair-back. This strains the lumbar spine and “narrows the torso.” Noticing ilio psoas tension is one of the most important aspects of my teaching. As far as I am concerned, this is the most over-used muscle in the body.

The backwards movement of the pelvis and lower torso generates a forward compensatory flexing of the thoracic and cervical spine, to keep the upper spine relatively vertical (“shortening the stature,” “depressing the larynx”, aka slumping).

When the thoracic and cervical spine are over-flexed (which is a common occurrence since, in habit, we are not aware of what we are doing), additional neck tensing is necessary to tilt the face up so that we keep a relatively level sight-line (“pulling the head back”).

These symptoms manifest every time we fall backwards toward a chair-back. It is just a matter of degree. When we fall way back, the symptoms are extreme. When our sit bones are relatively close to the chair-back so that we fall back only a little, these symptoms manifest to a lessor degree.

Anchored Against the Chair-Back

It is very important here to recognize that the only part of the spine that is going up is the part above contact with the chair-back. Indeed, this is the only active part of us. The rest of us, below contact with the chair-back, is not doing much of anything; basically, just occupying space. Thus, it should be clear that when we sit-back, we are not even using the whole body, let alone the whole self. Yes, it is definitely possible to let the head go forward and up so that the upper spine (above chair contact) is nicely extended. But this does not change the fact that the whole spine is shortened, flexed as it is at the point of contact with the chair-back.

The flexing of the spine is not a noticeable problem when sitting back against a chair-support. Here, there is no need to 'manage' the upper spine. With the bulk our body mass anchored against the chair-back, the upper spine cannot be dislocated from this anchored part. It is 'free to roam.' The upper thoracic and cervical spines remain functional and relatively vertical in this context, even in bad use. People routinely sit back and perform a wide variety of activities. This, however, only masks a problem that is all too apparent when we need to sit forward to eat at a table or to write at desk.

Coming Forwards Off the Chair-Back

When we want to come off the chair-back — to get up off the chair, to eat at a table or write at a desk, or simply to ‘sit up straight’:
We need to employ significant ilio psoas effort to pull the pelvis and lower spine out of their backwards collapse (i.e. “narrowing of the torso,” aka sway back).
We need to employ significant erector spine effort to lift our over-flexed thoracic spine (i.e. “lifting the chest”).
And we need to keep up these efforts for as long as we wish to continue sitting-up-straight. Such strenuous muscle activity, however, cannot be sustained. Thus, people cannot sit up independently for very long. This is why we seek 'support' against the back of a chair, and why doing so seems restful. But it actually is reinforcing a very bad habit.
Committing body weight backwards makes hard work of sitting — something we could do with virtually no effort when we were only 7-months old. Because responsibility for this lies in our consciousness not in the chair,

the problem of mis-committing body weight does not magically disappear when we get up out of a chair. Without our recognition, it spills over into how we stand and move.