

A View on a Conceptual Understanding of Anatomy for Facilitating a Constructive Kinesthetic Behavior (Use of the Self)^{1, 2, 3}

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The classical method of teaching anatomy and the subjective experiential kinesthetic “knowledge” are, by far, akin to oil and water at their inter-repellant interface junction.

One could master a constructive use of the self while having minimal academic knowledge of anatomy.

One could master the knowledge of anatomy while being inept in the actual constructive use of the self.

SUMMARY: There is a wide range of opinions among teachers of the Alexander Technique (AT) on the importance of knowing anatomy for actualizing a constructive kinesthetic behavior (use of the self)³ for oneself and/or for teaching. Some claim that the knowledge of anatomy is not needed, and in contrast, others insist that knowing anatomy is crucial to the practice and strongly advocate that its teaching is incorporated in teachers training programs. Since the use of the self is an experiential “knowledge”, one can master it while having little knowledge of anatomy; conversely, and more commonly, competence in the knowledge of anatomy is not necessarily incorporated (complemented) with a good use; in fact, detailed mental knowledge of- and focus on anatomy may interfere with the attentiveness associated with a constructive kinesthetic behavior. *In this paper, the presentation of anatomy is proposed as a supplementary adjunct, directed toward a conceptual understanding of the dynamic bio⁴-structural nature of the body that is congruent with a constructive kinesthetic behavior. This conceptual understanding may be beneficial to teachers, students or pupils of the AT, especially those who conceptualize better while seeing. The understanding is directed toward a conceptual dynamics of connectivity-flow and aliveness of the body, its organs, tissues and cells- in movement⁵. The teaching approach is based on the actual bio-structural construct of the body, a knowledge that is available via the sciences of anatomy and biology, yet the presentation uses minimal academic-medical details. Further, the approach considers the bio-mechanical factors (including those related to Fuller-Snelson’s tensegrity) with which the mind interacts to achieve connectivity-flow and body aliveness as a whole, in movement. This approach is proposed concurrent with the realization that the knowledge and understanding of academic-medical anatomy, though may be helpful, is not mandatory for actualizing a constructive use of the self and/or teaching the AT.*

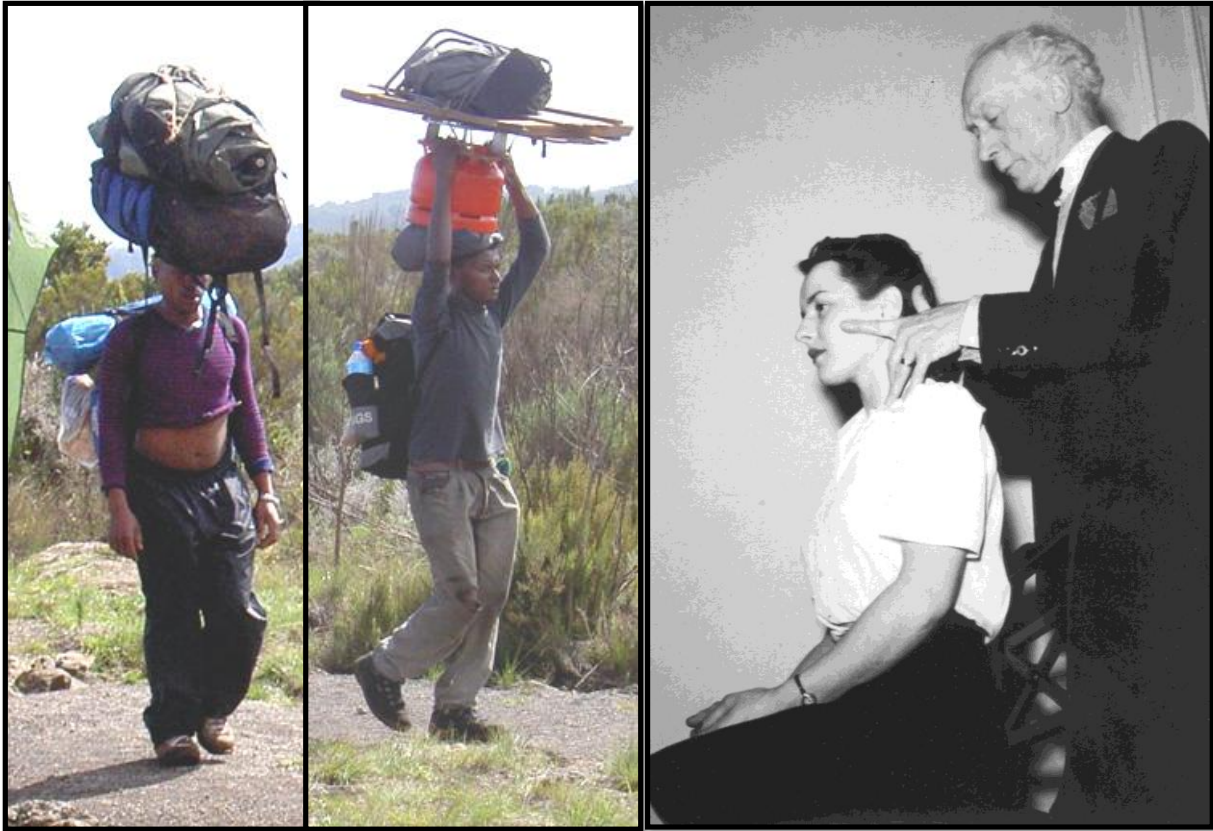


Figure1. Left, composite 2 photos: porters carrying load on head and back in a climb up to Mount Kilimanjaro; it is highly likely that they did not study anatomy; note their use, particularly their uprightness concurrent with equilibrating, with the “on head/back to back” loads [parceled and arranged from a photo “*Carrying Loads on Mt Kilimanjaro*” <http://commons.wikimedia.org> (source attribution: Chris 73/Wikimedia Commons)]. Right: F M Alexander transmitting experiential “knowledge” of the constructive use of the self [“he did not teach anatomy---he knew anatomy!”], ref 46 (photo generously provided by Robert Britton)].

The constructive use of the self (kinesthetic behavior)³ is an experiential experience as a whole, subjective; its actualized “knowledge”, the lived experience, is the “it” in living (“raw”/“a-mediated”). Words, language, symbols, analogies, metaphors, images, concepts, pictures, descriptions, illustrations, explanations, models, etc., by their very nature, and concurrent with their crucial value for communication and understanding, are off-limit the realm of the lived experience; at best, they would marginally and tangentially approximate the “it”, the *subject*, the experience itself (as it is being experienced); and still, at their best, they are *about* the experience, pointing to it as their *objective* (by analogy: by their nature, the score is not the music being heard; or, the gourmet recipe is not the being tasted food).

The aforementioned parity inherent in the nature of the subjective experiential experience and the knowledge *about it* is highly compounded within the context of teaching kinesthetic behavior in general, and with the AT in particular; for in the latter, one is called to teach experiential embodiment in living of “Alexandrian”⁶ thinking, non-doing, inhibition, means whereby, in

such a way so that, primary control, dynamic relationships, kinesthetic sensory appreciation in truth (vs. delusion), all together one after another, etc.- cardinal building block terms of teaching and actualizing a constructive use of the self- a kinesthetic self use of the body- a living being made up of structures constructed in such a way that connectivity-flow and aliveness in movement⁵, in oneness with the mind (‘a mind-kinesthetic perception-body’⁷) as a whole, is manifested. Thus, it would be reasonable to say that, in the context of the AT, the organic body is the actual medium within and of the whole, through and in which, a kinesthetic behavior in living is manifested. In fact, at AT lessons, instructions addressing/defining/pointing to the location of the atlanto-occipital joint, knee forward, bending at the hip and other joints, boundaries of the torso and neck, etc., are common. Moreover, Alexander advocated studying nature as it is, and his books are replete with claims that the AT influences the functions of the organism (the human body), its musculoskeletal, cardiovascular and digestive systems, breathing mechanism, vocal apparatus (organs), neurobehavioral coordination; and, that the AT is beneficial to general health and could play a role in modifying disease processes; and, with calls for modifying medical education and practices (including the skills of diagnosis⁸)- all of which directs one to reasonably consider the knowledge of anatomy as an integral facilitating component in the practice and teaching the AT; yet, this scientific discipline could be problematic, as discussed below.

Anatomy (pertains to “cut apart” in Greek), is the study of the parts⁹. Basically, the science (knowledge) of anatomy is founded on cutting-dissecting-parting-isolating the parts, examining and describing them (their location, situation, shape, size, color, composition, weight, etc.), and applying to them recognizable names; and naturally, accurate partitive localization and descriptive skills are highly valued among anatomists. By far, anatomical information is obtained by studying non-living specimen or flat-surfaced photographs and illustrations (where the genuine characteristics of aliveness and movement, including dimensionality, are adulterated). As the science of anatomy has been evolving, an interdisciplinary integration is increasingly evident in correlating the identified body parts with their physiological function and with relevant disciplines in medicine, biology, embryology and postnatal development, evolution, anthropology, psychology and behavioral sciences, etc. Based on the aforementioned, it would not be unreasonable to view (and “resist/dismiss”) anatomy as an enormously voluminous and detailed information, in a language that is abundantly perfused with Greek and Latin word origins, *about* the studied *object*, the body. The 38th edition of Gray’s Anatomy¹⁰(Fig 2), for example, is a tome of over two thousand pages, supported by over two thousand references, prepared by a chief editor, six associate- and additional five section editors, and hundreds of contributors- a skillfully composed masterpiece in the study of nature, and a definitive reference in the academic biomedical literature; yet, extrapolating information from this source to the use of the self, in the context of the AT, is akin to finding a philosopher’s stone by translating a hieroglyphic scroll into a popularly spoken modern language.

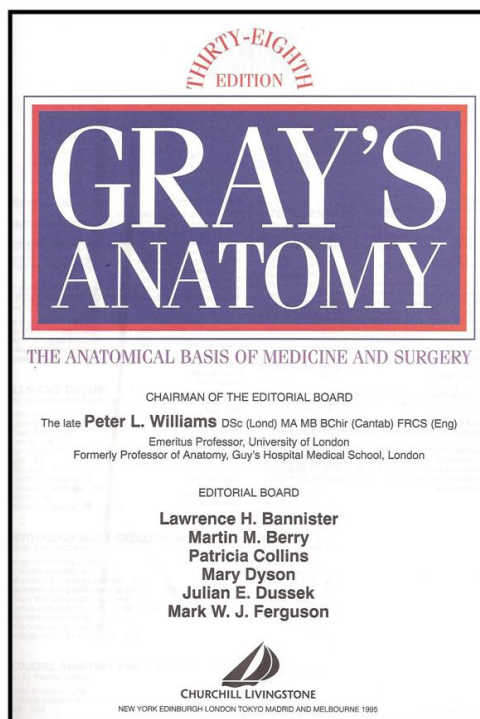


Figure2. The front page of the 38th edition of *Gray's Anatomy* (ref 10); in addition to the chairman and 6 editorial board members, and 5 section editors, hundreds of scientists contributed to this over 2000 page-book; a first class definitive source, containing a voluminous comprehensive information on the bio-structure of the body (including relatedness to animal anatomy, evolution and anthropology) and yet, with little direct reference to the experiential “knowledge” of the use of the self (by permission from Elsevier Limited).

Certainly, a linear mental thinking and intellectual knowledge of anatomy, particularly a focus on minute numerous details, would interfere with- derail one from the attentiveness associated with actualizing a constructive use of the self. And as such, if competence in knowledge of academic anatomy and an experiential “knowledge” of a constructive kinesthetic behavior are, in most cases, akin to oil and water (inter-repellant at their interface junctions, and a “do not mix”), is it possible to find a path toward a dynamic, usefully cultivating emulsion? An emulsion, where the water and oil microdroplets are interfacing with- and reciprocally affecting each other, while concurrently retaining their physico-chemical characteristics (to the point where if letting, with time, the oil and water will re-collect into their separate parted layers). ***In other words, is there information obtained from the knowledge of anatomy that can facilitate and enhance (rather than antagonize and interfere with) the actualization of a constructive kinesthetic behavior?*** Herewith, I wish to propose such a path- that knowledge of anatomy in the context of the AT be a supplementary adjunct in the teaching and practice, directed toward a conceptual understanding of the dynamic bio⁴-structural nature of the body, and its construct, that is congruent with a constructive kinesthetic behavior of the whole, in living. A supplementary adjunct- which may be viewed as a “metaphoric kinesiological anatomy” (Greek: *meta* as “other than” and *phore* as “bearer of, carrier”); that is, the understanding and knowledge of anatomy are incorporated as a supportive facilitator for and with the actualization of a constructive kinesthetic behavior (the lived ‘mind-kinesthetic perception-body’ experience) of the whole, in living.

As to the presentation itself and at the outset, I believe that it is advantageous, whenever possible, to create an interactive environment and to use specimen, pictures, cinematographic documentation, and hands-on and other experiential practices. In my presentation, I encourage the participants to observe and note outside the class (in-life) how things are structured with emphasis on connectivity-flow and reciprocal support; e.g., “specimen” of meat cuts and fish at food stores, sliced fruit and vegetables, plants, furniture, wrappings or drapes, buildings, animals in movement and at rest, movement of water, effects of the wind, etc. In addition and importantly, whenever possible, I bring forth links and connections of the Greco-Latin and other scientific-medical terms with their analogous common daily spoken language. The intent is to promote a desirable connectivity and congruency among abstracted mental thinking-understanding of anatomical terms with daily functions, and with body sensorial faculties, e.g., touching, seeing-visioning¹¹, phonating-vocalizing, hearing, smelling and moving (and minimize the tendency toward a partitive-dissociated-esoteric knowledge that is deeply embedded in the conventional academic study of anatomy). The following are some examples:

Cardiac (*cor* = heart): at the core or heart of the matter;
Pulmonary (*pulmon* = lung): cardiopulmonary resuscitation (CPR);
Lingual: tongue, language, “lingo”;
Artery: as in traffic;
Posterior: past or back, in location or time;
Respiratory (*spirare* = spirit, soul): expire [die, end of contract], inspire [energize aliveness];
Tuberosity, tubercle, protuberance (*tuber* = swelling, elevation): tuber of a flowering plant;
Pathology (*pathos* = sorrow, suffering): it’s pathetic;
Dia (through): diameter, diagonal.

In private lessons, anatomical subjects would most likely come up on a case-by case and a situation-by-situation basis. The situation is different for presenting anatomy in teachers’ training courses, where the material taught and teaching style are usually chosen by the course director(s). No doubt, informational knowledge of nomenclature, axial planes’ orientation and movement directions, and main general body structure (such as the skeleton and its bones and joints, surface body topology, major muscles, body cavities and the major organs they house, sensory organs, etc.) is elemental. Depending on participants’ background, much of this information may be familiar and would require only a refresher review (I encourage self study in groups and the use of coloring anatomy manuals in addition to the presentations). Additional topics are usually included. Within the scope of this paper and the context of the proposed approach, I wish, for consideration, to introduce an example of topics that I include when presenting anatomy at AT venues including teachers’ training programs.

1. Seeing-visioning the body: The objective is to enhance the skill of being an “observer-witness” of the other as a body in living.

Upon projecting an illustration of a human skeleton (e.g., Albinus’ drawing of the skeleton in a side view¹²) I say to the participants “you are an architect-designer-engineer-builder, and you are to build this structure---- so it is stable and can move”. After a short while, I project a drawing

of the same body posture with muscles¹³, and say “and this structure, having a human mind, is alive and conducting itself in living”.

A sharing discussion follows where I also call to observe that there is hardly a straight line in body structures, and that muscles-fascia are in continuous connectivity, compared to bones whose boundaries are well defined.

2. Conventionally studying anatomy vs. experientially sensing the studied part: The objective is to gain an insight into the difference between a knowledge *about*- compared with an experiential “knowledge” of an anatomical part.

I invite the participants to smile while directing attention to the cheeks, chin, jaws, eyes, etc. Then, while projecting an illustration of the facial modiolus¹⁴, I say “you are a surgeon in training and soon are to conduct a facial surgery; prior to surgery you will be tested on the anatomy of the modiolus and its associated muscles; start studying now”. After a short while, I direct the participants to palpate the modiolus and follow by asking them to smile.

A discussion on the experiential differences follows (where usually the “whispered Ah”, breathing, effects on the head-neck/spine relatedness, etc., come up).

3. Tensegrity in body kinesthetic aliveness: The objective to introduce concepts of body anatomical and bio-mechanical aspects that are congruent with structural tensegrity, connectivity-flow and aliveness as a whole, in movement, as an extension of the physical-mechanical tensegrity principle (view) forwarded by Richard Buckminster Fuller^{15, 16} and Kenneth Snelson¹⁷.

Richard Buckminster Fuller proposed the conceptual principle (view) of tensegrity and sculptor Kenneth Snelson actualized it as a sculpture: a continuously sustained structural stability-mobility that is based on discontinuous compression-continuous tension. This dynamic physical-mechanical conceptual principle (view) was applied primarily to architectural engineering of non-living structures. The structural construct relatedness of the discontinuous compressive with the continuous tensile components in their tensegrity models bears a close similarity to bones [firmer (discontinuous compression) tissue] with the fascia-skeletal muscles-tendons-ligaments-membranes compartment [softer (continuous tension) tissue] in vertebrate animals¹⁸, respectively; or, for cells, the “anchor sites” at the cell membrane with the flexible contractile cytoskeleton, respectively [proposed by Dr. Daniel Ingber as “cellular mechanotransduction”]^{19,20}. It is therefore likely that the physical-mechanical conceptual principle of tensegrity can have applications to the bio-structural nature of the body, its organs, tissues and cells, as related to body aliveness as a whole, in movement- a ‘**Tensegrity in Body Kinesthetic Aliveness**’. I propose²¹ that this ‘Tensegrity in Body Kinesthetic Aliveness’ be viewed as *a dynamically concurrent interactive relatedness among spaciousness, connectivity, elasticity (flexibility) and tonicity (tensile state)- a basic ‘interactive bio-structural unit*

replica' of vectorial equilibration²², within the parts, among the parts, with the whole, forming the whole (e.g., embryo-fetal development²³). Nature-replica models of Fuller's view of tensegrity address physical-mechanical features of non-living structures, whereas those of Mandelbrot's fractal geometry²⁴ address morphologic manifestation of living and non-living structures; the herewith bio-structural view, in comparison, also includes the perpetual dynamic interactivity that involves physiologic processes-anatomical structures of the body, as constituents of aliveness (movement in living). It is further proposed that the aforementioned dynamic interactions have applications for actualizing a constructive kinesthetic behavior of the AT- a poise of a 'mind-kinesthetic perception-body triad', as a whole, in a perpetual renewal of a coordinated kinesthetic equilibration, to achieve what one intends at the moment. Connecting tissue fascia (CTF)^{25,26,27}, by its mechanical support, biological nature, composition, functions, and transmission connectivity with all body parts (including the nervous system), plays a crucial mediating role in the body continuous stability-mobility that is essential to aliveness in movement, as a whole.

The presentation is accompanied with tensegrity models, skeleton and anatomical illustrations, and experiential practices demonstrating flow and connectivity, including 'tensegrity group connectivity-flow in motion'²⁸.

4. Body organization as a suspensory constellational web: the objective is to bring forth examples of body structural constructs that are organized as a suspensory constellational web (that allows, in living, a perpetual dynamic relatedness of a tensegric vectorial equilibration among the parts, within and with the whole).

The situational anatomic "position" of the hyoid (lingual) bone²⁹ is probably a most suitable example (the diaphragm is another good example). This bone is unique among other bones in the body in that its articulation with other bones is not via conventional joints. It is in a suspensory multidirectional connectivity with the root of the tongue, mandibles, chin, skull (at two sites- the styloid and the mastoid processes), laryngeal cartilages, sternum, and shoulder blades. One may imagine this bone, by analogy, as the body of a spider, where in connectivity with the legs, a skillful coordination of up-down/forward-backward/side-side/curvy-spiral-helical movements of the animal are actualized. The hyoid bone suspensory constellational web organization plays a crucial role in head-neck/spine relatedness, breathing (including the whispered Ah), vocalization, seeing, bipedal uprightness, and in one's psycho-sensory interactions with the environment.

Anatomical illustrations, palpation and attentiveness to breathing (including the whispered Ah), head-tongue-jaw-larynx movements and vocalization are helpful in the discussion of this topic.

5. Overlapping inter-connectivity in anatomical body systems and cell types: The objective is to increase awareness of the in-congruency between the conventional partitive classification of body systems in the study of anatomy (crucially important as it is) and the overlapping inter-connectivity that occurs in nature. The nervous systems and muscle are used as examples.

While discussing the various nervous system(s) (central/peripheral, motor/autonomic [parasympathetic/sympathetic/splanchnic]) and differentiating their primary functions, I point out that apparently a complex inter-connectivity network occurs among and within the system(s)³⁰. The nature and functional significance of this inter-connectivity web is under an active scientific exploration, and it is likely that the recent interest in neuroplasticity³¹ and other fields of neurosciences will generate significant advances toward a more comprehensive understanding of the holistic interactive function(s) of the nervous system(s), a view that was pioneered and advocated by Dr. Kurt Goldstein³².

Similarly, while discussing the various muscle types (skeletal, smooth and cardiac) I point out that attributing voluntary control to skeletal muscle and involuntary (automatic) control to smooth and cardiac muscle is restrictive. Examples of normal involuntary (in addition to voluntary) movement of skeletal muscles (e.g., of the eye, diaphragm or tongue) may be used. As to the tongue, I suggest to the participants to look at their tongue in the mirror and notice the constant “mini-rippling”³³ (and the inability to stop it) that occur even when they voluntarily move this skeletal muscle. Voluntary control of smooth muscle (and even of the heart) may be cultivated, although to a greatly lesser extent³⁴. Another “overlapping” example is the potential inter-conversion among fast, slow and intermediate skeletal muscle cell types that could occur depending on exercise/sedentary conditions.

Anatomical illustrations are helpful whereas experiential hands-on work is limited in the presentation of this topic.

6. Spine-ribs articulations, breathing^{35, 36}, spine aliveness and stature length: The objective is to point out features of rib-vertebrae articulations that play a role in breathing, spine aliveness and stature length.

Concurrent spine stability with flexibility is of paramount importance in aliveness, and congruently, the bio-structure of the spine is constructed with a highly complex arrangement of variously structured vertebrae, discs, numerous articulations, ligaments, membranes and muskelo-tendeno-fascial attachments. The thoracic segment of the spine differs from other segments by its intimate connectivity with the ribs. Each of the twelve ribs articulates with its respective thoracic vertebra, e.g., 1st rib with T₁, 2nd rib with T₂,,, down to the 12th rib with T₁₂. The articulation is by two joints at two different facets, one with the head and the other with the tubercle of each rib. In addition, and of a special note, is that each head of the 2nd to the 9th rib articulates also with its higher corresponding vertebra- that is, for example, the head of 2nd rib articulates with T₁ in addition to T₂, or the head of the 3rd rib articulates with T₂ in addition to T₃, etc. Each of these double-joint articulations occurs at the inter-vertebral site adjacent to the edge of the inter-vertebral disc; furthermore, a ligament connects each double-joint articulation with the peripheral tissue of the inter-vertebral disc. *One highly important outcome of the aforementioned complexity is that each breathing movement is accompanied with an inter-vertebral movement (spinal undulation); and correspondingly, a spine aliveness (movement) is accompanied with a free and a more complete breath. This spine-rib breathing movement is also associated with the viability of inter-vertebral aliveness (the movement promotes flow of*

extracellular fluid that bathes the disc periphery, and plays a role in regulating disc volume [the latter is an important factor in stature height]. Clearly, the relationship between the anatomical bio-structural construct of the spine-ribs complex is an important factor in the dynamics of breathing, spine aliveness and stature length.

In addition to using a skeleton and anatomical illustrations, I invite the participants to experientially notice the concurrent mutuality between breathing (including the whispered Ah), their spine and the body as a whole.

7. The coccyx and bipedal uprightiness: The objective is to increase awareness of the crucial role of the coccyx' (tail bone) situational bio-structure in bipedal uprightiness.

Vertebrates' tail is a skin-covered spinal extremity that extends out of the pelvic boundaries. It functions in several roles in locomotion (terrestrial, arboreal or aquatic, including balance), protection of digestive and urogenital tract tissues, behavioral communication, "brushing off" menacing creatures, etc. Humans and non-human apes are tailless; instead, they have a coccyx, also known as the tail bone. This spinal extremity is a skinless small number of vertebrae, where in humans at birth number 3-5 (4 in the vast majority of individuals); extending from the last (lowest) sacral vertebra, they curve down and forward toward the pubis, and through them pass the last pair of the spinal nerves (coccygeal n.) which innervate the perineum (the major body area that "feels" the chair while sitting). The adjectives "rudimentary" or "vestigial" are often unfairly applied to the coccyx, and at least by name, "cranio-sacral therapy" neglects the importance of this spinal segment to spinal aliveness and a constructive bipedal uprightiness. Together with highly strong muscles, tendons, extensive fascial tissue and an expansive network of ligaments, the coccyx attaches to the pubis, sacrum, sit- and other pelvic bones, and is crucial to the strength, stability and flexibility of the pelvic floor (pelvic diaphragm). This diaphragm is the bottom/sides surfaces of the pelvis (basin) that houses intestinal and urogenital organs and their contents (including a gravid uterus), and securely encompass the openings of the digestive and the urogenital tracts. In discussing the evolutionary modification of the pelvis, it was pointed out³⁷ that the view of the pelvis as a basin-container is misleading, in that it neglects its simultaneous role as the supportive foundation for the torso (toward the cranium) and the connective mediator with the legs below. Taking the aforementioned in the context of human bipedal uprightiness and a constructive kinesthetic behavior, the pelvis provides connectivity, strength, stability and flexibility, and the coccyx is an essential contributor in the fulfillment of these requirements.

In addition to using a skeleton and anatomical illustrations, I invite the participants to experientially note the tail bone in breathing (including the whispered Ah) and during various pelvic movements (including 8-shaped rotations, and the many conventional Alexandrian practices).

8. The situational relatedness of the pharyngeal tubercle with the atlanto-occipital (A-O) joint: The objective is to draw attention to the importance of the situational relatedness of the pharyngeal tubercle with the A-O joint, to the head/neck/spine relatedness, bipedal uprightiness and a constructive use the self.

The feet, in full touch with the ground, are generally parallel with the ground surface; this is not the case where the skull meets the neck at the A-O joint. A side view of the A-O joint depicts it in a front-up slant, where the front is higher than the back (the front of both the occipital condyles and the atlas are higher than their corresponding back). In fact, the entire skull base is at a similar “front-up” slant (where the eyes-nose meeting area is higher than the occipital ridge at the back of the skull) in relation to the ground surface. Obviously, the range of the up-down curvy glide of the skull at the A-O joint (although slight in comparison to the “yes movement”) is longer at the face than at the back of the neck. No wonder that early attempts to correlate/explain Alexander’s pivotal observations on the head-neck/spine “reflex” relatedness (brought forth recently in relation to the Superficial Back Line of Myer’s *Anatomy Trains*³⁸), placed a great importance to the 3-4 pairs of sub-occipital muscles⁴⁰. Such an emphasis, however, does not address the range of movements (“repertoire of freedom”) of the skull at the A-O joint (though slight, could be distinguished from the movement of the whole head), which also includes rotation (the right to left, akin to the “no movement”) and tilt (akin to the temple to shoulder)³⁹; and to the fact that, in addition to the sub-occipital muscles, some 25 pairs of muscles are attached to the base of the skull⁴⁰, that together with hyoid bone-tongue complex, form the above discussed suspensory constellational connectivity of the skull (cranium-face) with the jaw, throat, pharynx (nasal and oral), sternum, shoulder, and down with the trachea-esophagus-mediastinum-heart to the diaphragm, etc. (Fig. 3 depicts two different approaches by which the AT teacher’s hands connect with the recipient’s head-neck). In my view, ***bringing forth attention to the pharyngeal tubercle and its situational relatedness to with A-O joint (Fig 4) would enhance clarity about the aforementioned amazing complexity, in the context of the head-neck-back relatedness, constructive use of the self and bipedal uprightness.*** This tubercle is a small-down protrusion at the midline base of skull (Fig. 4), at the top of the nasopharynx, in front of and higher than the A-O joint. It is generally accepted that the uprightness postural plumb line representing the center of gravity passes through this tubercle (not through the A-O joint). The most important situational connectivity “feature” is that the pointed-top of the back pharyngeal muscles, which are also an upper continuation from the esophagus, insert at this tubercle; and, an extended connectivity occur with the hyoid-tongue complex, the soft palate, and the auditory tubes [what border the space at the back of the mouth (or, the oro- nasopharyngeal cavity)]. The aforementioned complex relatedness connectivity presents a bio-structural construct congruent with the concurrent vigor, strength, freedom, stability and flexibility that characterizes a constructive kinesthetic behavior of man as a bipedal upright biological being.

In presenting the above described structural complexity, it is essential to use a skeleton and anatomical illustrations, and to differentiate the relatedness of the neck/spine with the skull (cranium-face) from that with the whole head (that includes the jaw). I invite the participants to experientially note the movements of the skull, jaw, tongue, eyes, and those related to swallowing, vocalization and breathing (including the whispered Ah), etc.



Figure3. Two different approaches for transmitting experiential “knowledge” of the use of the self via hand contact with the head-neck; both approaches skillfully address the back of the neck/sub-occipital area; in the approach at the right, compared with the left, the teacher’s transmitting touch also includes the base of the skull, jaw and upper thorax (clavicles); this approach may provide a more “direct/immediate actual awareness” (clarity) of the suspensory constellational participation of the hyoid bone/throat complex in the head-neck-back-whole body relatedness, and of the “forward and up” [right: enlargement from the right photo in Fig 1; left: replacement of the photo that was printed in *The Congress Papers* (the photographer’s name was an error)].

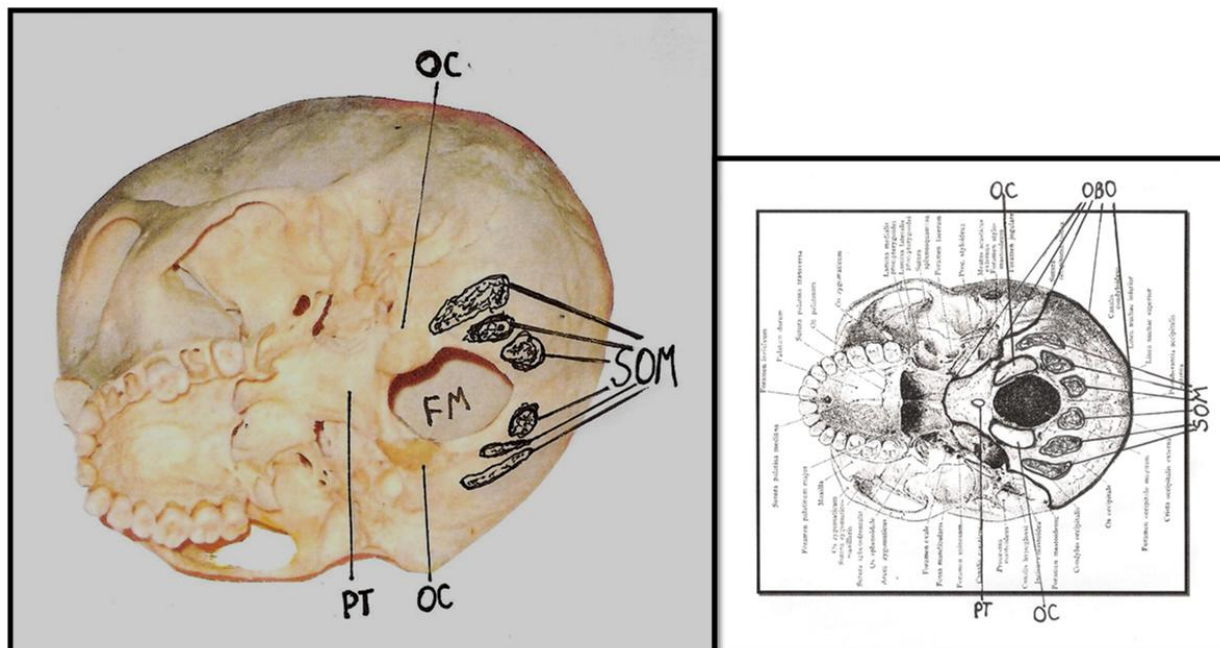


Figure 4: The situational relationship of the pharyngeal tubercle (PT) with the occipital condyles (OC), foramen magnum (FM) and the sub-occipital muscles (SOM) upon the base of the skull/ occipital bone outline (OBO): Left: a photograph of the base of the skull (tilted) - note that the pharyngeal tubercle is in front of and higher than the base of the occipital condyles (which meet the atlas at the AO joint). Right: a drawing of the base of the skull (markings added to a figure from http://etc.usf.edu/clipart/52300/52333/52333_skull_lg.gif).

9. Responsiveness with Gravity⁴²: The objective is to provide a view on the dynamic kinesthetic responsiveness with gravity and the limited appropriateness of the upright postural plumb line gravity center.

The plumb line representing the center of gravity, commonly used to illustrate and evaluate one's postural alignment in the upright position, is useful for a view of a moment-in-time position. The kinesthetic behavior, however, is a dynamic responsiveness process of a perpetual self vectorial equilibration in relatedness with gravity- and this dynamic process is not congruent with the straight linearity of the plumb line (where pointed arrow heads are commonly found at its terminal ends). Moreover, the kinesthetic self (as a whole-with the whole) is in a perpetual modulation. Considering, for example, an age factor, and assuming that a person is "normal" and in a constructive use of the self through life- when a plumb line representing the center of gravity is applied to her/his posture, the picture will certainly look quite differently when she/he as a baby in a supine position, a toddler learning to walk, at age three when the spinal curves have not fully formed, or an adult in an upright position (this is while in all the aforementioned stages, the aliveness of the head-neck-back relatedness is optimal and appropriately coordinated in responsiveness with the relevant circumstances). When further integration with the bio-structural complexity of the body and the dynamic nature of 'tensegrity in body kinesthetic aliveness' are considered, it becomes apparent that the dynamic nature of kinesthetic behavior, as a whole, is not congruent with the straight linearity of the plumb line in representing the center of gravity, as useful as the latter is. Assume that the body, at its entire stature and bio-structural

construct, contains an “axial-pivot” through which the responsiveness with gravity of the whole is co-“ordinated”. *This axial-pivot, in my view, is in a dynamic responsiveness, through which, a perpetual oppositional equilibration of any combination of up-down, forward-backward, side to side, spiral/helical curvatures, and/or centrifugal expansion-centripetal attraction- in oneness, takes place.* By a metaphoric analogy, this responsive relatedness with gravity is akin to an orchestral virtuoso jazz ensemble improvising the composition “*a responsive vectorial equilibration with gravity and aliveness*” generously offered as a grace of nature. Further, the aforementioned view is my interpretation of the “fluid and continuous flow” nature of the constructive kinesthetic self envisioned by Alexander (per MacDonald⁴³) and its actualization is a manifestation of man’s endowed (supreme) inheritance⁴⁴. This is congruent (in my view) with what Alexander wrote to Dr. Frank Jones⁴⁵:

“There really isn’t a primary control as such. It becomes something in the sphere of relativity.” “The primary control of the use of ourselves in the activity of living, may be most accurately defined as that relationship of the head to the neck, and the head and neck to the body, at a given time, which makes for the integrated use of the mechanisms of the self as an indivisible whole” (commas added, ZR).

Further, I wish to propose that an aim of the AT practice would be to facilitate the competence of one’s ‘mind-kinesthetic perception-body’, to **embody**, as a whole, an actualization of such a dynamic-responsive vectorial equilibration, in living.

The presentation is accompanied with illustrations of the postural plumb line representing the center of gravity and other commonly used linear/angular stacking models, tensegrity models, slinky, skeleton and anatomical illustrations, and experiential practices demonstrating equilibration and balancing, in movement.

Remarks upon closing

By analogy, assuming the ‘mind-kinesthetic perception-body’ as a palace, the objective of this paper is to suggest an entry to the palace via a conceptual understanding of the body bio-structural construct that is congruent with a constructive kinesthetic behavior. Alexander pointed to the importance of studying nature as it is (in the context of the constructive use of the self); and in my view, this study invites an inquiry into the nature of the kinesiology behavior of the body- a **living** whole, that its use is dependent on and manifested through the nature of its dynamic bio-structural construct. Paraphrasing Elisabeth Walker⁴⁶:

“Mr. Alexander did not teach us anatomy in the training course, he knew anatomy!; he did not focus on the tidbits; possibly, his several doctor friends helped him”.

Binkley, at a lesson with Alexander, asked about the anatomy/function of the trapezius muscle and relates Alexander’s response⁴⁷:

“Your question reminds me of a famous physiologist who said to a friend, while the two of them were watching me demonstrate on a pupil ‘Look at that!

Here we know all about each and every muscle, what each one does and is supposed to do, and look at what Alexander is doing there”.

Further, Alexander, in supporting the AT, referred to Mungo Douglas regarding the study of anatomy⁴⁸:

“...that the interpretation of anatomy must be always subordinate to and merely an adjunct to the study of use and function in living processes”.

Clearly, somehow, in some way, the actual congruency of a constructive use of the self with the nature of the bio-structural construct of the body must prevail as an experiential embodiment, and this prevailing may be facilitated with knowledge of anatomy; in this paper, I suggest a way of presenting anatomy that is directed toward achieving this facilitation.

In as much as the topics presented in this paper provide a mere example, their overarching denominator is pointing toward a conceptual understanding of the bio-structural construct of the body- a living organism- in the context of connectivity and reciprocal flow among the parts, with and within the whole, in movement (aliveness). It is the body, through and with which the mind operates, and where a kinesthetic perception is generated, all of which, an embodiment in a living whole oneness.

With this view, and attempting to bridge the parity between the objective knowledge of anatomy (“about”) with the experiential experience of movement as aliveness (the “it”), I envision the presentation itself as a suspensory constellational web replica, simulating the nature of the dynamic living body--- where the topics (the parts) are in connectivity and flow reciprocity with and within the conceptual understanding of anatomy (the whole). The intent is that the anatomical information (about), as a complementary supplement in the AT teaching and practice, would integrally facilitate the experiential “knowledge” of one’s use (the “it”).

The anatomical information is based on an actual biomedical knowledge which may be largely demonstrated with scientific-biomedical data available at large. This is an important base in that the critical physiological factors of Alexandrian understanding, thinking, seeing, kinesthetic functioning, etc. (that are associated with and affect kinesthetic behavior) are congruent with an actual nature of the body and its operation (what Alexander meant by “truth”, in my opinion). Such a base is essential for guiding further progress and new knowledge which the continuous study of the AT would generate (that Alexander encouraged in his writings). Moreover, this base will encourage and serve as a linking bridge for collaboration between AT practitioners and scientific biomedical researches; and will follow the pioneering inquiry by Dr. Frank Jones⁴⁹ and the recent collaborative investigations^{50, 51}. Further, this link may likely encourage collaborative inquiries into fields addressing the dynamics of the mind-experiential kinesthetic behavior, inquiries that are continuously emerging through the practice of the AT, other kinesthetic practices, and explorations into mind-cognitive sciences and the nature of “self”; for example,

the application of cognitive science to the AT⁵², and the collaboration of Emilie Conrad (founder of Continuum) with Dr. Valerie Hunt^{5,33}.

The proposed approach herewith, as any teaching directed toward a dynamic conceptualization of movement as aliveness, is vulnerable to interpretations and adoptive processes that would lead to dissociation from the “truth” of organic actualization. This may occur either if words and symbols intended toward aliveness become fixated and “fossilized” into unequivocal dogmas, “entrapment” within menacing details, or the aimed conceptualization be diffused and diluted into imaginary non-organic spheres of the mind. Vulnerability is within the nature of intents directed toward dynamic conceptualizations, particularly those intended toward aliveness. Is there a way to change the nature of nature?

A wide variety of AT teachers, students or pupils- especially who conceptualize better while seeing- may benefit from the proposed approach of presenting anatomy. The approach has been developed while realizing that the knowledge and understanding of anatomy- though may be helpful- is not mandatory for learning and actualizing a constructive use of the self and/or teaching the AT. In the continued process of my study, I have had influential master teachers who clearly stated to me their dismissal of (and objection to) the importance of the knowledge of anatomy to the practice and teaching the AT. Regardless, I still seek lessons with such teachers for the value they provide toward furthering my experiential use, for me, and through me toward teaching others.

References and Notes

1. Parts of this paper were presented in three workshops at the 9th International Congress of the F.M. Alexander-Technique (Lugano, Switzerland, August 2011). The paper is my personal view which has been evolving in response to my wish to integrate my background in anatomical pathology and biomedical sciences with “understanding” the AT for my own use and teaching (transmitting) it to pupils; this integration has become particularly important for presenting workshops at teachers’ training programs and other AT venues. The experiential nature of the AT “work” offered me cumulative glimpses of “knowledge” that required conceptual insights other than those obtained through my many years as a veterinary anatomical pathologist and a general toxicologist. It became apparent that developing a conceptual understanding of the bio-structural nature of the body construct, that is congruent with a constructive kinesthetic behavior (use of the self) as a whole, would be a useful approach. This developmental process has been continually evolving, concurrent with the cultivation of my actualized embodiment of a constructive use. Interestingly, through this process, I have come to appreciate the conceptual understanding of anatomy in the context of kinesthetic aliveness as a whole, while maintaining the importance of its knowledge as an objective biomedical science. I wish to thank Ann Rodiger, Martha Hansen-Fertman and Pamela Anderson for discussing the manuscript and offering helpful comments.

2. Points that require specific reference citation are provided below; otherwise, the text draws from F M Alexander's four- and many anatomy books, without specific citations. All Internet citations were last visited in August/September 2011.

3. "Kinesthetic behavior"- is interchangeable with "the use of the self"; "kinesthetic": *kinetic* pertains to movement/motion (involves energy) and *esthesia* pertains to sensing, by which to include proprioception which pertains to one's own sensing her/his body at a moment-in-time position (i.e., kinesthetic perception as the perpetual proprioceptions in movement). Note that "behavior" implies the participation of the mind with one's subjective perception in kinesthetic (and proprioceptive) aliveness.

4. "Bio"- to emphasize the association with life and living organism.

5. "Movement"- includes ambulation/mobility, and the "micro-motion" characteristic of organic aliveness that occurs even at stillness. I am thankful to Emilie Conrad-Daud (founder of Continuum) who introduced me to this view of movement [see Conrad, E. 2007. *Life on Land: the story of Continuum*, North Atlantic Books, Berkeley, California (also, www.continuummovement.com)].

6. "Alexandrian"- terms as they are used and implied in the AT "jargon" (compared with "conventional" language).

7. "Mind-kinesthetic perception-body"- akin to *psycho-physical* (or more appropriately *psycho-bio-physical*): the whole, a "oneness of an inter-related triad/a triad in oneness"; [mind- the non-matter (ethereal) sphere of the self with all its processes; kinesthetic perception- one's subjective sensing-interpreting of his/her kinesthetic process, including proprioception; body- one's organic composition such as organs, tissues, cells and their physiological processes]. "Kinesthetic perception" would equate with "somatic" as put forth by Dr. Thomas Hanna: *Somatics*, Da Capo Press, 1988, pp19-21.

8. "Diagnosis" (Greek) - *dia* = through, *gnosis* = knowledge; in medicine, it is the process of examining "through" the case and obtaining a knowledge of the condition (for which, in most cases, knowledge of anatomy is crucial).

9. *Webster's New Universal Unabridged Dictionary*. 2003, Barnes and Noble Publishing/Random House (*anatomy* and *anatomize* entries).

10. *Gray's Anatomy: the anatomical basis of medicine and surgery*. 1995. 38th edition, P L Williams, ed., Churchill Livingstone, New York

11. "Seeing = visioning"- the integrative mind-eye-nervous system process of determining the actual form characteristics of an object (see Huxley, A. *The Art of Seeing*. 1982. Creative Arts Books, Montana Book Publishing, Berkeley, California), as compared to other processes that are more dissociated from the actual object, such as visualizing, imaging, imagining, fantasizing, hallucinating, etc.

12. Hale, R. B. and T. Coyle. *Albinus on Anatomy*. 1979. Dover Publications, Inc., New York; the skeleton, side view, p. 33.
13. *ibid.* The outermost order of muscles, side view, p. 39
14. “Modiolus”- ref. 9, p. 290
15. Kenner, H. 1973. *Bucky: a guided tour of Buckminster Fuller*. William Morrow & Company, Inc. New York
16. Fuller, R. B. 1961. Tensegrity.
<http://www.rwgrayprojects.com/rbfnote/fpapers/tensegrity/tenseg01.html>
17. Snelsen, K. <http://kennethsnelsen.com>
18. Levin, S. M. 1982 Continuous tension, discontinuous compression: a model for biomechanical support of the body. <http://ati.net.com/articles/Levin.php> (also, <http://Biotensegrity.com>)
19. Ingber, D. E. 1998. The architecture of life. *Scientific American*, January
20. Ingber, D. E. 2003. Mechanobiology and diseases of mechanotransduction. *Ann Med* **35**: 1-14. (Dr. Ingber reviews the scientific advancement in the field of mechanobiology- the mechanism by which cells sense and respond to mechanical stimuli, and proposes that abnormal mechanotransduction could lead to diseases of mechanotransduction.)
21. Ruben, Z. 2008. A view, conceived and first presented at the Philadelphia School for the AT; further developed and presented, also at other AT schools, AGM-ATI (2009), The AT International Workshops International-Sweet Briar (2010), and the AT Congress (2011, ref. 1).
22. “Vectorial equilibration”- after Fuller, ref. 14 and 15
23. “Replica”- embryo-fetal development as an example: each of sub-cellular particle of the 1st one embryonic cell (a zygote) is a tensegric biological structure; the particles, together, form a tensegric whole cell; this cell, in tensegrity with its environment, divides to form a tensegric two cell-embryo; the two, in tensegrity with their environment, divide to form a tensegric four cell-embryo; and so fort, forming a tensegric multi-cellular fetus, including differentiated tissue layers and organs, all as a whole, interacting in tensegrity with its environment, .
24. Mandelbrot, B. B. 1983. *The Fractal Geometry of Nature*. Henry Holt and Company, New York (also, <http://classes.yale.edu/fractals/welcome>).
25. Juan, D. 1998. *Job’s Body: a handbook of bodywork*. Station Hill Press, Barrytown, New York; chapter 3 (Connective Tissue) pp 65-90

26. Myer, T. W. 2001. *Anatomy Trains: myofascial meridians for manual and movement therapists*. Churchill Livingstone. Edinburgh; chapter 1 (The World According to Fascia) pp 9-50
27. Schleip, R. 1998. Adventures in the jungle of neuro-myofascial net. *Rolf Lines*, **26**: 35-37
28. Thompson T. 2011-Copyright-Tommy Thompson: demonstrated (as the leader) at the workshop on Tensegrity (Ref.1). The leader calls two participants to come forth and stand next to each other, where A puts a hand on the shoulder and arm of B; another participant (C) joins and B puts a hand on C; and so forth, C connects with D, up to a larger group. The group can be any number (has been done with as many as 65 AT teachers/trainees). The leader places his/her hands on the back one participant who is standing on the exterior of the circle. The leader then applies a slight pressure, (inducing just enough force) to set a subtle movement in motion, which then the motion spreads connectedly throughout the entire group until the whole group becomes “a unit-wave in motion”. Then, the leader asks one participant anywhere in the group to tighten the elbow, wrist, knee or some other part of his/her body, and initiates a second motion. The flow motion in the group gets interrupted, and for a moment it stops. Then, after a moment, the integrity of the whole absorbs the interruption and the flow motion begins again. Then, the leader asks the participant who contracted to relax the contraction. In a few moments the whole group begins to move in harmony again, swaying as “a unit wave in motion”. The leader never loses contact with the group, always sustaining subtle pressure/directional force to keep the motion flowing. Next, the leader asks the participant who has contracted to reinstate the contraction, however this time he asks the participants to employ “Alexandrian directions” and attention to the dynamic tensional balance of the head's relation to the body. This time, the introduced contraction does not cause as much compromise as before, because of the group’s “thinking and directing”. Repeats and variations on the aforementioned steps may be practiced. (The reality is that there is a harmonious tensegrity equilibration of forces in motion within us, always. And always there are compromising factors, life is interruptive-- but once the forces inducing the compromise to the whole are lifted (as a consequence of “directing-thinking-intending and attending”), flow begins again.
29. Netter, F. H. 2004. *Atlas of Human Anatomy*. Icon Learning Systems, Teterboro, New Jersey; bony framework of head and neck, plate 12
30. Ref. 9, p. 902
31. Doidge, N. 2007. *The Brain that Changes Itself: stories of personal triumph from the frontiers of brain science*. Penguin Books; Penguin Books, New York
32. Goldstein, K. 1995. *The Organism: a holistic approach to biology derived from pathological data in man*. Zone Books, New York
33. Hunt, V. V. 1996. *Infinite Mind: science of the human vibration of consciousness*. Malibu Publishing Co. Malibu, California

34. MacDonald, P. 1989. *The Alexander Technique as I See It*. Rahula Books, Brighton, Great Britain; p. 7: MacDonald writes about Alexander's pupil Dr. Andrew Murdoch, who demonstrated on himself by use of bismuth-X radiography, that intestinal peristalsis is modified by his volitional body coordination. Also, some master yoga practitioners develop the skill of volitional intervention in motility of smooth muscle-organs (e.g. the urinary bladder), and even of the heart.

35. Newton, A. 1997-1998. Perspectives. *Rolf Lines*. Part I: Breathing in the gravity fields (Fall 1997); Part II: New concepts of breathing anatomy and biomechanics is highly informative (Winter 1998); Part III: Posture and gravity (Part Spring 1998); (also <http://alinewton.com/pdf-articles/index.htm>)

36. Stough, C. <http://www.breathingcoordination.com>

37. Ref. 9, p. 613

38. "The sub-occipitals"- ref. 26, p, 81

39. Alexander F. M. 2001. *The Universal Constant in Living*. Mouritz, London. Notes 179-185, pp 309-313 (also, ref. 34, p. 46)

40. Ref. 9, p. 522

41. Ibid. p. 565 (fig. 6.147a)

42. "Responsiveness with gravity"- to imply one's participatory tensegric relatedness with the dynamic stimuli offered by gravity vs. a "mere response" to gravity which implies more at a partitive state of the self in response to gravity; "responsiveness with gravity" is akin to Fuller's design intending that gravity participates with the dynamic stability and mobility of the structure (ref. 16).

43. Ref. 34, p. 53: ".,., (FM) found that the body is a fluid thing, its various parts held in their proper relationship by a continuous flow of impulses; .,.,,these impulses which are analogous to electric currents.,.,.,," [I would not exclude the possibility that MacDaonald's "impulses" are related to the vibratory electromagnetic fields (presumed to involve flow of interstitial fluids) as proposed by Dr. Valerie Hunt (ref. 33) and advocated in Emilie Conrad's Continuum practice (ref. 5), and to the "flow-connectivity-motion" that is sensed subjectively at the AT work, in oneself and between teacher-recipient; to my knowledge, investigations via the scientific methods have yet to elucidate this "bio-connectivity-flow-motion", which apparently is a determinant in aliveness.

44. Alexander, F. M. 1945. *Man's Supreme Inheritance: conscious guidance and control in relation to human evolution and civilization*. Mouritz, London; 6th edition. (I prefer "endowed" instead of the evaluative adjective "supreme")

45. Alexander, F. M. 1945. Letter to Dr. Frank Pierce Jones

46. Walker, E. 2001. Responding to a question from the audience at a plenary session (ref. 1) regarding the apparent negative view of anatomy by Alexander (an impression from his writings)

and whether he taught anatomy in his teachers training course. The audience enthusiastically applauded upon hearing "he knew anatomy!".

47. Binkley, G. 1993. *The Expanded Self: how the Alexander Technique changed my life*. STAT Books, London, Great Britain

48. Ref. 39, Note 185, p. 312

49. Jones, F. P. 2003. *Freedom to Change*. Mouritz, London (formerly, *Body Awareness in Action: a study of the Alexander Technique*. 1979. Schoken Books, New York)

50. Little, P. *et al.*, 2008. Randomized controlled trial of Alexander Technique lessons, exercise, and massage (ATEAT) for chronic and recurrent back. *BMJ*, **337**:a884

51. Reddy, P. P. *et al.*, 2011. The impact of the Alexander Technique in improving posture during minimally invasive surgery. *J Urol*, scheduled for publication, October (also, 2 poster presentations at the American Urological Association, June 2010; and, The American Academy of Pediatrics Conference, October, 2010).

52. Zahn, R. 2005. Francesco Valera and the gesture of awareness: a new direction in cognitive science and its relevance to the Alexander Technique.

<http://alexandertechnique.com/ats/zahn.pdf>

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