Mind In Motion: A Look Into How and Why "The Right Thing Does Itself"

by Meg Jolley

What complexities lie within F.M. Alexander's brilliantly simple and apocryphal assertion that when we stop doing the wrong thing, *the right thing does itself*![1] What constitutes *wrong*—and just what is the *right thing*? Is it balance and coordination? Is it using muscle effort appropriate to the task or experiencing vitality, ease, and efficiency? Is it what Alexander refers to as "good use?"

Meg Jolley

Before coming to the Alexander Technique, my understanding of "coordination" was greatly informed by the work of Bonnie Bainbridge Cohen[2] and other teachers in the field of Body-Mind Centering® (BMC™). According to Cohen, the structure and movement patterns of the human infant as it develops from conception through crawling mirror the evolutionary patterns of certain animal species. These same sensory-motor patterns eventually propel the infant "forward and up" into walking. The intent of this paper is to integrate ideas drawn from the BMC evolutionary movement tradition with our own Alexander Technique teachings regarding balance, poise, and primary control. We will look at both models as they relate to the organization provided by the development of human movement reflexes.

During the first year of life coordinating patterns develop out of the basic sequence of *Primitive Movement Reflexes* and *Postural Movement Reflexes*, common to us all. A *Movement Reflex* is defined as a specific movement response to a specific sensory stimulus—one movement only—that will follow a particular sensory cue.

Primitive Movement Reflexes develop in utero, ensuring the fetus's ability to survive after birth. They are vital during the first months of life for breathing, sucking, swallowing, and a wide range of muscle responses to tactile, visual, aural, and olfactory cues. The Primitive Reflexes typically recede after the first few months of life and give way to a wider range of voluntary movement behavior. For example, when the Asymmetrical Tonic Neck Reflex (See Table 1, page 29) is active, every time the baby's head rolls to one side, the limbs on that side automatically extend, and the opposite limbs flex. After this primitive reflex has receded and integrated, the limbs do not automatically react by presenting this pattern in response to head position, and the infant can begin to exercise more choice in movement response.

> "Here is the source of what F.M. Alexander refers to as Primary Control: the interplay between the balancing poise of our head-neck-back relationship in gravity and the enlivening pull of our senses."

The *Postural Reflexes* develop after birth and remain active throughout our lifetime, providing underlying support for balance, spatial awareness, and focused attention. Together, these two sets of early reflexes lay the neuro-muscular groundwork for all later development, both physical and cognitive. They are the necessary precursors for the delicate balance and sensory-motor feedback that make possible good use, natural coordination, even, perhaps, the *right thing*.

The processes of sensory awareness and movement (in other words, both mind and motion, attention and intention) are always intertwined. One develops in direct relation to the other. The type of sensory awareness associated with our earliest, most basic movement patterns is primarily in relationship to gravity. In BMC our essential sensory-motor relationship with gravity is referred to as *positive yield in gravity*. Implicit in this term is the notion that gravity, the medium in which we live, is as necessary to our survival on this planet as oxygen and water. Before the other senses fully develop, and before we have the muscular strength or organized motor patterning for self-propulsion, gravity pulls us into relationship with our surroundings. From moment to moment, gravity informs our senses and stimulates our movement responses. Awareness of gravity, underlying all our innate and learned movement, gives us our sense of *down* and *up*, as polar coordinates, or opposing forces, teaching us balance and presence in this world. I believe that this dynamic essential stimulus of gravity and the "primordial positive yielding" referred to in BMC is truly at the heart of the Alexander Technique, inherent in our guiding principles of awareness, inhibition, and direction.

Early Fetal Development

The vestibular nerves of our Central Nervous System—the nerves for the gravity-reading circuitry and our kinesthetic sense—are the first of the cranial nerves to myelinate, or insulate. The insulation of fatty tissue along the length of the nerve fibers protects them and serves to facilitate a quicker transfer of information along the neural pathways. This means that the speedy passage of information along the vestibular pathways underlies and informs all subsequent awareness. Where is *down*? Where is *up*? Our kinesthetic sense gives us the essential awareness of where we are in space.

At the same time, the touch senses begin to receive information. Skin develops from the same stem cell tissues as

the nervous system and is loaded with touch-sensitive proprioceptive cells. The term *proprioceptive* means *self-receiving*, pointing to the fact that our "self" is not an intact entity living inside our skin, but is quite literally formed and informed through awareness, via the sensory channels that connect our inner world with the outer world around us. Skin serves as both a container for all that develops within, and as an interface with the stimuli of the surrounding environment. As the developing fetus yields to the force of gravity, her skin comes into contact with other surfaces around it, perhaps the amniotic sac bumping up against the uterine wall, or the birth canal, and after birth, the arms of the mother/father, and even the surface of the earth. Through awareness and response, tactile stimulation feeds the growing organism constant messages, thus shaping our emerging sense of self in the world.

"*Up, Life-force, Chi, Buoyancy* —these are all terms that address the moving, inherent lightness or energy that distinguishes animate from inanimate forms."

Primitive Movement Reflexes

At first, in utero, our movements are governed almost entirely by the movements of our mothers' bodies. Gradually, as sensory awareness awakens in the developing fetus, so do responsive movement reflexes; the developing organism begins to move itself through a simple array of Primitive Movement Reflexes (see Table 1, page 29). The *Primitive Reflexes* ensure that the muscles necessary for breathing, mouthing, sucking, and swallowing are ready to keep us alive when at birth we separate from our mothers and cross over into light, air, gravity, and the unfolding stimuli of this dramatically new environment.

After birth, bonding is crucial for the survival of the vulnerable neonate—both with the mothers and fathers who raise us and with our mother earth. The newborn infant responds as it has for many months in the womb. Sensing gravity and responding through *positive yield*, rather than through random patterns of muscle firing or resistance, the baby comes into nurturing full-body contact with its mother. Bonnie Bainbridge Cohen suggests that the rich tactile stimulation of being held can create bonds of trust. Our first great lessons in this world are that nurturing warmth and comfort exist in the arms of our parents, and that the ground will not give way under our first efforts to support ourselves. From this basic sense of safety and trust, the infant develops the ability to venture forth into the world. Awareness of gravity and awareness of touch are the essential sensations that inform and give meaning to all further levels of complex development.

Our life-force, or energy, is kept in healthy balance throughout our lives by the interplay of opposing forces: yes/no, push/pull, in/out, up/down. At birth, gravity gives us both downward grounding and the subtle, measurable rebound into "up" that is expressed through all animate beings. *Up, Life-force, Chi, Buoyancy*—these are all terms that address the moving, inherent lightness or energy that distinguishes animate from inanimate forms. As we teach in the Alexander Technique, this up direction happens if we do not interfere with gravity's play within us by doing something to resist. Gravity's interaction with our physical mass plays a part in this up direction, as do other factors such as breath, movement of fluids through us, and the essential upward and outward expansion of our energy through sensory awareness and attention. These other factors will be discussed later in more detail.

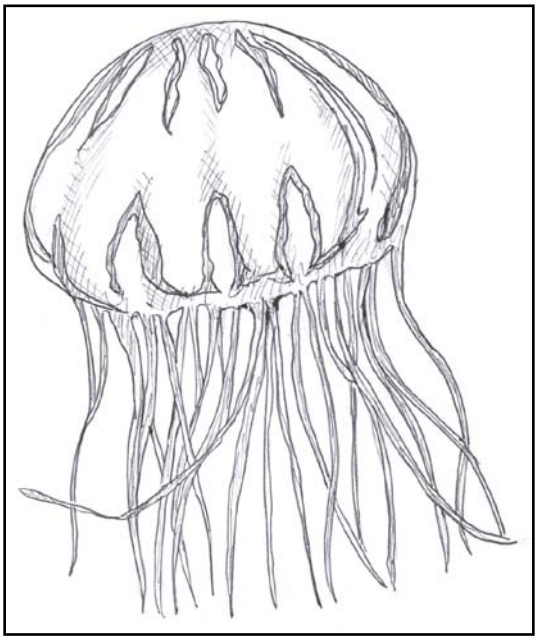
At the transition from life within the womb to life outside it, breathing movements, already practiced in utero, fill the newborn with air. The dynamic interplay between gravity and breathing brings the downward pull of the earth into delicate balance with the buoyancy of breath. Breathing involves the whole torso: on inhalation, the thorax greatly expands as upper ribs are lifted and widened by muscles that assist the musculotendinous diaphragm. The diaphragm, the primary pump of breath, is pulled downward when blood gases signal the body's need for oxygen. The diaphragm operates autonomically, through the deep involuntary sensory-motor systems that regulate the body's vital organs and thereby the baby's very survival. On exhalation, the bones of the lower ribs descend, draping around the narrowed space of the lower torso, and the dome of the diaphragm rises. As we teach in the Alexander Technique, the entire torso widens and lengthens as we breathe, if we don't interfere by stopping this natural free mobility or by resisting gravity.

There are also soft tissue domes—smaller diaphragms—at either end of the spine. Both the mobile structures of the roof of the mouth (or soft palate) and the musculotendinous pelvic floor move in concert with the larger breathing diaphragm: down, or tail-wards, on the inhalation towards the pelvic floor and up, or head-wards, on the exhalation. From birth onward, this dialogue between gravity and breath supports and informs our broader sensory perception and the voluntary movements that we layer upon it. The grounded stability resulting from initial yield to gravity, coupled with the three-dimensional volume of breathing, lends a quality of buoyancy, a greater lightness and inherent mobility to our expanding movement repertoire. Moreover, as the senses of hearing, smell, taste, and vision develop, we are further stimulated by the dynamic outward pull of our sensory awareness. These channels of input between our developing selves and the surrounding world give us the impulse to explore and the intention to move—direct responses to our awakening attention.

When we Alexander teachers ask our students "to inhibit," we encourage them to respond to gravity with the whole of themselves. The most basic, the first *right thing*, lies here in the quiet state of readiness and poise. Neither giving in to the collapse of weight, nor holding tension in resistance, we allow the flow of direction that rides in gravity to move forward and up, buoyed within by our breathing and carried outward by our attention. And is this not at the heart of our work in the Alexander Technique? When we come to quiet, to inhibit, to yield, we let this dialogue between gravity and breath play out through the whole of our systems. We encourage the active support of attention, summoning the elusive quality of *up*, and *directing* awareness three-dimensionally. We teachers listen with our touch, inviting our students into a full body experience of balance and breath in the present moment.

Postural Movement Reflexes

During the first months of life outside the womb, the *Primitive Reflexes* developed in utero gradually recede, integrate, and modulate into a wider range of possible movement responses. After birth the *Postural Reflexes* develop, and they remain active and supportive throughout our lives. These Postural Reflexes provide us with spatial awareness, eye-hand coordination, balance of the head in relation to both gravity and vision, and the full array of our subconscious balancing responses. As we grow and learn, the brain's cortex (the site of voluntary muscle response and refined movement) becomes more active. Our life experiences, our cultural, social, and familial imprinting, our emotional body responses—indeed all the elements that make up the vast and complex body story unique to each of us—coalesce and are supported by our constant gravity-reading Postural Reflexes. We all share these primitive and Postural Reflexes through our evolutionary heritage as vertebrate mammals: first, in infancy as a-pedal mammals, then as crawling quadrupeds, evolving towards human bipedal mobility.



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Movement Reflexes as Part of Evolutionary Process

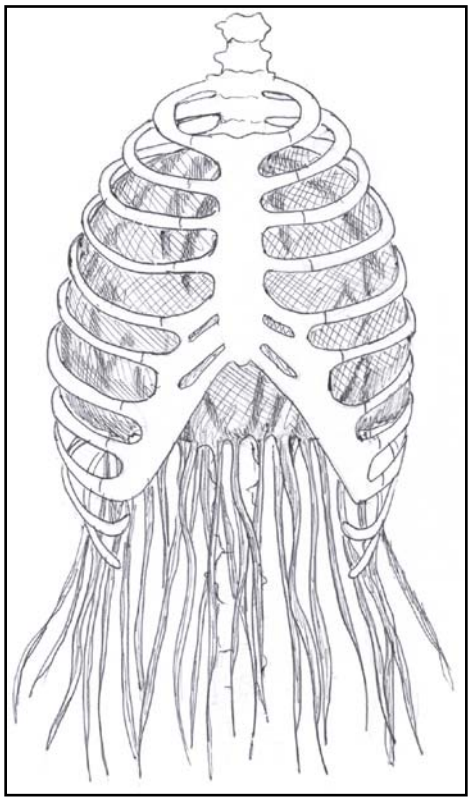
Let us look at these same developmental processes through the lens of the evolutionary process as it is presented in Body-Mind-Centering. Evolution is generally considered a process of growth towards increasing complexity, moving from a lesser to a greater range of choice in response to the environment. Both the sequence of embryonic human development (ontogeny) and the evolutionary development of animal species (phylogeny) exhibit this tendency towards increasing complexity.

Jellyfish

According to evolutionary theory, life in its most simple form began in primordial oceans as a single-celled alga or amoeba. Afloat in its watery home, this type of primitive organism was moved by the surrounding currents, with no part of its structure offering self-propulsion. Its buoyant relationship with gravity was primary.

The jellyfish is a further development of this type of organism, as is the human embryo in its earliest form, afloat in its amniotic sea. Indeed, this most basic pattern is apparent in our every cell and in the shape and movement patterns of many of our internal organs, which pulsate and vibrate with life, exchanging nutrients and oxygen across their boundaries with the surrounding environment.

Imagine the heart, lungs, liver, pancreas, and glandular structures as examples of this kind of amorphous, jellyfish-like physical structure. Though these organs have since developed greater complexity and specificity of function, at first, the beating of the heart, the expansion and release of breath movement, even the micro-pulsation of our every cell in the tiny act of cellular respiration reflect this "jellyfish" movement model.



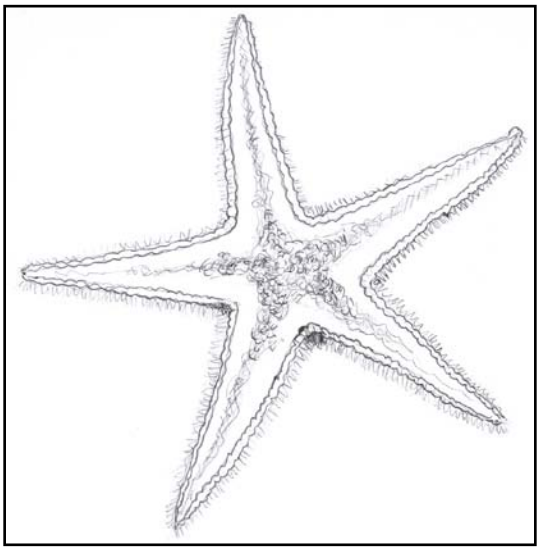
"…the beating of the heart, the expansion and release of breath movement, even the micro-pulsation of…cellular respiration reflect this 'jellyfish' model."

The movement qualities of pulsation, vibration, dilation, and contraction that characterize the jellyfish model occur at the source of our very being, present within each cell. Furthermore, as we look to the evolutionary model, when jellyfish begin to propel themselves, the parachute-like dynamics of their forward motion are like the movement of our respiratory system. The movement of our three soft tissue domes pulling down into width on inhalation and releasing up into length on exhalation evokes the lovely, pulsating motion of moon jellies swimming in their watery world.

Starfish

The next level of complexity in this evolving process is the form of starfish structure, which in BMC is termed "navel radiation." Organisms exhibiting navel radiation develop from a central gut, or mouth. Their limbs radiate out, organizing around a belly-center. In this manner, the fetus in the womb, tethered by the life-giving umbilicus, first develops six limbs around its center—limbs that will later differentiate into head-tail, right shoulder-left hip, right hip-left shoulder. This early starfish structure gives our torso the dynamic coordination of three intersecting axes that interconnect through our center of gravity.

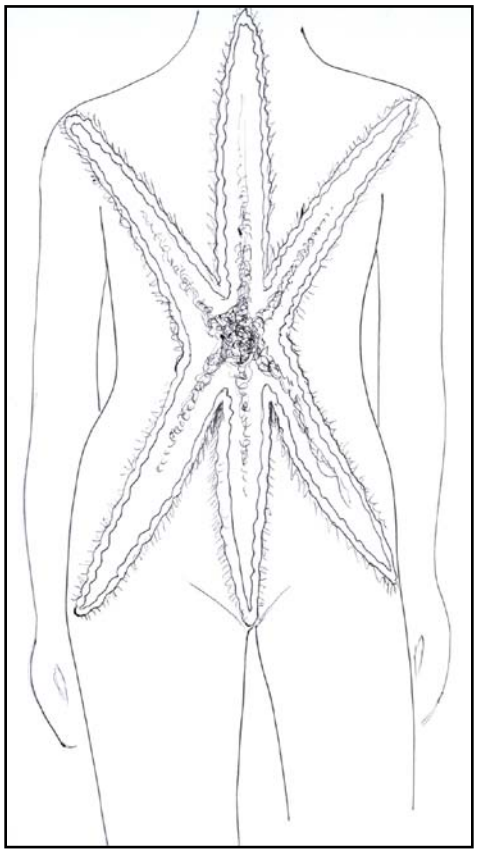
Each of the limbs will later develop into a sensory organ and movement motivator. The head will contain our primary sense organs and open through the mouth to both the digestive and respiratory systems. The tail will contain our organs of elimination and sexual/reproductive systems. The arms and legs will extend the field of sensory awareness through the touch sensitive hands and feet. Sense gathering from the limb-tips and movement initiating in the center are the basic patterns of "starfish" that establish our body's center of gravity and the dynamic relationship between the vertical axis of head/tail and the hip/shoulder diagonals that enliven and balance our core.



"This early starfish structure gives our torso the dynamic coordination of three intersecting axes that interconnect through our center of gravity."

Here is a vital connection between the teachings of BMC and the Alexander Technique: The muscular and energetic opposition of limbs inherent in starfish structure give three-dimensional fullness and form to our developing organism. Awareness in the senses lodged in the head engenders *forward and up* movement, and sensory awareness of weight in the sacrum and tail connects us to the *grounding* force of gravity. If we allow our shoulders and hips to *sense both the internal space and the directional space beyond*, we can come to an expansive sense of our torso lengthening and widening along the contralateral diagonals of opposing limbs. If we think of the whole torso in light of this starfish model, with attention to the dynamic opposition of our six starfish limbs—head to tail and each shoulder to opposite hip—we find clear embodiment of the AT idea of "back, back and up off the legs."

As shown in Table 1 (See page 29), the first two Primitive Movement Reflexes, operating out of this starfish symmetry, are the Moro (startle) Reflex (and the related Palmar and Plantar Grasp), and the Babinski Reflexes. The primary movement pattern associated with this radial architectural structure is termed *physiological flexion and extension*, with the limbs and torso all flexing in towards center or extending away from center. Movement is initiated centrally and sequences outward, away from the navel center. The limb-tips act as sensing extensions, each equipped with a high concentration of sensory receptor cells. These sensing cells become the channels through which we experience the world, and the means whereby we extend the web of our awareness. Thus we bring information from the outside in, so that we may respond to the world around us in order to survive, to grow, and to thrive.



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Vertebrate Patterns

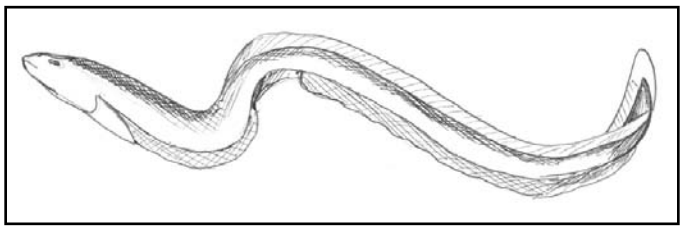
Head/Tail

From the eighth week of gestation, great concentrations of sensory organs emerge in the head of the human fetus, making way for the organizing sensory-motor pattern called *Head/Tail* in BMC and that we characterize in the Alexander Technique as "head leads, body follows." At first, the mouth leads, with the body orienting around the elongated pre-spinal digestive tube and ending in organs of elimination and muscles of propulsion in the tail. The head first turns to receive nourishment and to focus awareness through the mouth and the ears. In these early

TABLE 1		
PRIMITIVE REFLEXES AND THEIR ASSOCIATED SENSORY/MOTOR PATTERNS		
PRIMITIVE REFLEX	**MOTOR PATTERN**	**SENSORY STIMULUS**
MORO REFLEX (STARTLE)	FROM THE NAVEL, THE 6 LIMBS EXTEND OUT, AND THEN FLEX IN. PUPILS DILATE. BABY GASPS.	GRAVITY/VESTIBULAR SENSATION, SOUND, VISION, TOUCH, SMELL,
PALMAR, PLANTAR, BABINSKI REFLEXES	DIGITS FLEX IN, OR EXTEND OUT FROM CENTER	TOUCH, MOTION (SUCKING)
MOUTHING, SUCKING REFLEX	GRASPING WITH THE MOUTH, DRAWING IN AND SWALLOWING. HEAD ROCKS UP AND OVER THE JAW.	TOUCH, TASTE, SMELL
ROOTING REFLEX	LIGHT TOUCH OF THE CHEEK CAUSES BABY TO TURN HEAD TOWARDS THE STIMULUS	TOUCH, TASTE, SMELL
ASYMMETRICAL TONIC NECK REFLEX	WHEN HEAD ROLLS TO ONE SIDE, ARM AND LEG ON THAT SIDE EXTEND, OTHER ARM AND LEG FLEX (FENCER'S POSE)	GRAVITY/VESTIBULAR, SOUND, MOTION, VISION
SPINAL GALANT REFLEX	STIMULATION OF THE DORSAL SPINE RESULTS IN HIP FLEXION AND LATERAL BEND	SOUND, TOUCH
TONIC LABYRINTHINE REFLEX	MOVEMENT OF THE HEAD FORWARD ELICITS FLEXION OF ARMS AND LEGS. MOVEMENT OF THE HEAD BACKWARDS ELICITS EXTENSION.	GRAVITY /VESTIBULAR SENSATION

patterns, the body follows the head, with rotation spiraling down the spine sequentially, or with the tail pushing sagittally (front-back), creating inchworm-like propulsion, or moving laterally (side-side), creating fish-like swimming patterns. These early spinal motor patterns enable the birthing baby to participate dynamically with its mother in the partnered act of childbirth. Eventually, as strength develops in symmetrically-paired limbs, the arms and legs will take over this function of propulsion. However, at this early stage, spinal movement patterns develop and orient around the head and the awakening primary senses.

These cranial senses inform and motivate movement in all three primary spatial planes—front-back, side-side, and rotational. Vision will later lead movement forwards and backwards; hearing will pattern side-to-side movement; and the rooting/sucking reflexes will ensure that the infant's movement coordinates in spiraling rotation.



"head leads…body follows"

When, in the Alexander Technique, we speak of "head leads…body follows," we do not refer to the *position or placement* of the head. Rather, we ask our students to attend to the processes taking place in the head that affect and direct our balance, stimulating us to move. The energy of light, the motion of sound waves, the traveling molecules of scent move from the outer world through channels of sensory reception into our brains. Our sensory awareness leads, and the body follows.

At first, mouthing, sucking, and swallowing patterns create head to tail movement in the front-back, or sagittal, plane. This whole-body movement is readily apparent in a nursing baby. The infant latches on to the mother's breast, stabilizing with her jaw, and, through the sucking action, her head rocks "forward and up," sequencing down the spine all the way to the tail in a lengthening fetal curve. Simultaneously, the baby's hands and feet flex and release in a tiny kneading motion. The precursor movements for this pattern were established in the womb by the Tonic Labyrinthine Reflex: alternating patterns of flexion and extension in response to movements of the head forward and back (Table 1). Later on, the visual senses alone will stimulate movement in this same plane, the eyes becoming prime motivators for movement forward and backward in space.

Auditory stimuli pattern coronal side-to-side movements. The sideways cock of the head in response to listening is a holdover from this early pattern. Around the fourth month of fetal development, the Spinal Galant Reflex (Table 1), first stimulated by sound or touch, triggers alternate side-to-side flexion of the spine. A sudden sound from outside the womb will cause the fetus to flex laterally into the direction from which the sound comes. This motor pattern sets up a fish or snake-like slithering mobility, enabling the tail to push side-to-side, as the mouth leads forward. The ability to move in this manner greatly aids the baby in the birthing process.

Smell and taste stimulate the developing infant to rotate in the horizontal plane. Just after birth, the baby does not have the muscular development to lift her relatively heavy head away from the pull of gravity. Instead, the Rooting Reflex (Table 1) stimulates sequentially spiraling rotational movements. The scent of milk or a gentle stroke of the cheek triggers the infant to turn mouth and head towards the stimulus. Gravity aids the infant's sequential rotation towards her mother's breast. These primitive motor patterns arise in the fluid uterine environment, and later strengthen in response to both birthing and the stronger

pull of gravitational forces outside the womb. Ultimately, they will enable the infant to support and move her own weight in the world.

From birth onwards, balancing the weight of the head on the neck plays a primary role in overall coordination. Here we see the radical shift from movement initiating centrally, as in the starfish pattern, to movement initiating distally in the limb-tips, often led by the head-senses, but always buoyed by the underlying yielding and breathing of the jellyfish patterns, and organized around the dynamic torso diagonals of navel radiation as in the starfish model. Here is the source of what F.M. Alexander refers to as Primary Control: the interplay between the balancing poise of our head-neck-back relationship in gravity and the enlivening pull of our senses. Through the lively engagement of our senses—from full body awareness of gravity to tactile attunement of our skin to the fine-tuned senses of seeing, hearing, smelling and tasting—we direct ourselves upward and outward. Our bodies are infused with a lively quiet, a present relationship with our surroundings. In this state of present attention, we have ready access to the innate coordination of the nervous system, to that *right thing that we evoke in our Alexander teaching. Curiosity* emerges as a coordinating force and *Presence* (with emphasis on *sense*) as the condition that promotes *good use.*

Further Postural Developments

Homologous Movement Top/Bottom Push/Pull

Once the spine has developed, and the tiny limb buds have sprouted arms and legs in paired symmetry, the fetus in utero develops strength through repeated flexion and extension. After birth, once the neonate can breathe, swallow, suckle, and yield to the touch and teaching of her parents, the business of becoming strong enough to move in earth's gravity begins. At first, this involves strengthening the neck and back to support the head. Soon this process includes the conscious aiming of the senses along with coordination of eyes tracking and focusing at close, mid, and far ranges. The delicate, constant interrelationship of eye movement and head balance is aided by the Ocular Head Righting Reflexes (See Table 2 below).

During the first few months of life, the newborn is busy moving and strengthening her arms and legs in alternating patterns of flexion and extension, developing the strength needed to support weight on forearms, free the belly from the earth's inertia, and hold the head in position to track visual, aural, taste, and smell sensations at will. At this stage, the limbs move in concert, the two arms or two legs together in a top/bottom or *homologous* pattern. Either both arms or both legs push or pull, with the upper and lower torso organizing accordingly. Frogs, rabbits, and kangaroos locomote in a homologous manner, with propulsion accomplished by the coordinated thrust of the bottom two limbs, cushioned by the shock-absorption of the top two limbs.

For the first three or four months, infants move in this fashion, as arms and legs become stronger through alternating patterns of synchronized push and pull. Eventually, the forearms rotate palm-down and push the baby's torso up off the ground with newfound strength for self-support. The baby attempts to pull her torso forward and up into an arc in order to better scan her surroundings. The nervous system coordinates the gentle pull of the arms with the signal to tone and use the extensor muscles of the spine, linking the development of the secondary curve of the cervical spine to both the "pull" of visual attention and the muscular pull of the fore-limbs. Conversely, the push patterns

TABLE 2

POSTURAL REFLEX	MOTOR PATTERN	SENSORY STIMULUS
STRAUSS REFLEX (ADULT STARTLE)	DRAWING IN OF LIMBS, FLEXION OF TRUNK, FLEXION OF NECK, FORWARD ELEVATION OF SHOULDERS, CLASPING OF HANDS, CONTRACTION OF ABDOMINAL MUSCLES, BLINKING OF EYES	GRAVITY, SOUND, VISION, TOUCH, SMELL, MOTION
SYMMETRICAL TONIC NECK REFLEX	IN QUADRUPED, FLEXION OF THE HEAD CAUSES ARMS TO BEND, LEGS TO EXTEND. HEAD EXTENSION CAUSES LEGS TO FLEX, ARMS TO EXTEND	GRAVITY/VESTIBULAR, VISION, MOTION
OCULAR HEAD RIGHTING REFLEX	HEAD MAINTAINS RELATIVELY BALANCED POSITION AS THE EYES FIX ON VISUAL TARGETS	GRAVITY/VESTIBULAR, VISION, MOTION
LABYRINTHINE HEAD RIGHTING REFLEX	COMPENSATORY CONTRACTIONS OF NECK MUSCLES KEEP THE HEAD LEVEL, WHEN BODY TILTS OFF-CENTER	GRAVITY/VESTIBULAR, MOTION
LANDAU REFLEX	EXTENSOR MUSCLE TONE ACTIVATES, WHEN BODY IS LIFTED IN PRONE POSITION	GRAVITY/VESTIBULAR, MOTION
AMPHIBIAN REFLEX	ELEVATION OF PELVIS ELICITS AUTOMATIC FLEXION OF HIP AND KNEE ON SAME SIDE	MOTION
SEGMENTAL ROLLING REFLEX	IF THE HEAD ROLLS, THE BODY WILL FOLLOW SEQUENTIALLY FROM HEAD TO TAIL, OR ROTATION WILL SEQUENCE FROM PELVIS UP THROUGH THE SPINE TO THE HEAD	MOTION
PARACHUTE REFLEX	ON LOSS OF BALANCE OR FALLING, THERE IS AN IMPULSE TO WIDEN THE BASE OF SUPPORT, BY "CATCHING" THE FALL WITH AN ARM OR LEG	MOTION

tend to trigger flexion or rounding of the spine. Constant interplay of pushing and pulling stimulates expressive, responsive mobility in the spine. Throughout our lives, all our complex, well-trained patterns of movement have their source in this relationship between the subtle push-pull of the limbs and enlivened muscle tone through the core.

Now, the baby continues to strengthen her neck as she lifts her head, focuses farther away, and scans the environment with increasing freedom. At this stage, the baby balances her head in gravity with the aid of the Labyrinthine Head Righting and Landau Reflexes (Table 2). These reflexes bring about shifting awareness through changes of head position in relation to gravity, helping the infant develop increasing ability to carry the weight of her head in varying positions. The vital relationship between head balance and vision is further supported by the Ocular Head Righting Reflexes, helping maintain a relatively balanced head position as the eyes focus on visual targets. The baby continues to gain more refined control of eye movements for focus, alertness, and tracking, as well as for eye-hand-mouth coordination, by way of both the precursor Asymmetrical (Table 1) and Symmetrical (Table 2) Tonic Neck Reflexes.

As the baby begins to move toward or away from an object, visual tracking and head balance must adjust to changes in position, distance, and relative motion. All of these patterns, emerging in varying complexity throughout the baby's first year, establish functional pathways through the reticular activating system of the developing infant's brain, laying the groundwork for the vast network of connections to the motor cortex of the cerebrum, linking our basic coordination with higher cognitive functions and more refined voluntary movement response.

After this point, the baby can support herself on her forearms, look around, and shift weight to and fro between arms and legs, aided by the coordination patterns and strength gained through the Labyrinthine and Ocular Head Righting and the Symmetrical Tonic Neck Reflexes. At this stage of motor learning, the previously established patterns inherent in the jellyfish yield and breath buoyancy, the starfish-enlivened torso, and the head-tail primary initiation of the fishes actively underlie and support the newfound mobility that comes about when the baby begins to propel herself forward and back with the limbs. Her horizons broaden, and her personal *kinesphere*, or the space within which she is comfortable moving, expands. Now she can direct both her sensory awareness and her motion out into the wider world. Curiosity, fueled by the pull of the senses, becomes the prime motivator of this newfound mobility, made possible by the pushing and pulling of arms and legs.

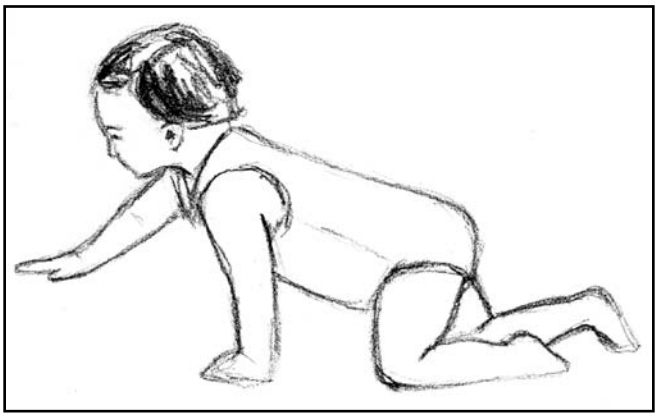
Homolateral Movement

Side/Side Push/Pull

It is important to note that these developmental phases do not unfold in a clear-cut linear sequence. Maturation comes in a series of overlapping waves, with each new development supported by previously developed strength and coordination. One phase does not cleanly give way to the next in either motor or cognitive ability, and there is no fixed or standard age at which these developments "should" occur.

The next level of postural reorganization typically occurs around the sixth or seventh month, as the infant literally yields and falls into the support of *homolateral*, or side-side movement patterns. One day, the baby, propped high up on her arms, tips off balance and catches herself with one sided-support. Homolateral patterns involve a major shift in both weight support (stability) and coordinated use of the limbs (mobility.) At this stage, each side of the body can now operate independently of the other, utilizing push-pull patterns, this time with the arm and leg on one side of the body pushing or pulling in concert. Core support in the torso reorganizes accordingly.

The push-pull coordination of side-side patterns is mediated by the Amphibian Reflex (Table 2), which dictates that as the hip on one side flexes, the knee on that side draws in and under. As the infant leans onto arm and leg on one side of the body, the unencumbered arm and leg are freed for exploration and mobility. They can flex, reach, hold a toy, or push off. Motivated by curiosity, hunger, or an outer stimulus that leads her head-ward or tail-ward, the infant pushes off the flexed arm and leg and pulls with the supporting limbs. The extensor muscles of her back are enlivened and strong enough to balance her torso in this newfound mobility.



"Curiosity, fueled by the pull of the senses, becomes the prime motivator of this newfound mobility, made possible by the pushing and pulling of arms and legs."

Remarkable cognitive and social changes accompany this shift. Freed from top-bottom synchronous motion, the baby can master new movement possibilities, such as rolling over, sitting, and moving along the floor. Both eyes and hands can now cross midline, allowing the infant to see, reach, and roll from side-to-side. A multitude of new neural pathways develop in the brain. Differentiation of right and left hemispheres of the brain can begin. Dominance (first sensory in eye and ear, then later in handedness) will assert itself by the time these side-side pathways are established through the corpus callosum, or right-left bridge of the brain. The infant is now mobile, active, learning, and exploring, growing rapidly in experience, awareness, and cognitive functioning.

Contralateral Patterns and Brachiation

The Emergence of Bipedal Coordination

At one point in the baby's expanding explorations, she will reach with one hand for something beyond her immediate kinesphere and fall off balance towards this object. Aided by the reflexive impulse to widen her base of support via the Parachute Reflex (Table 2), she will catch her fall with her opposite leg—and cross-lateral crawling will begin. This mammalian pattern of *contralateral* support, the opposition of one leg with the other

arm, underlies our uniquely human coordination. From this point on into maturity, contralateral support provides the means whereby we balance our essential "instability" on two legs: with the coordinated counter-swinging mobility of arms and legs. The baby now learns to crawl in a contralateral pattern. Concurrently, the brain is assimilating and integrating new learning, laying down pathways for sensory-motor expression that will last a lifetime. At this stage, the fully mobile, crawling infant begins to pull herself up on furniture, in her crib, or into her parents' arms. The pull of the arms further stimulates the antigravity extensor muscles of the spine, and she begins to pull herself up to standing. As she bears weight on two legs, she supports herself in this brand-new verticality through the thrust of her legs, the counter-balancing of her freely mobile arms, and the enlivening upward and outward pull of sensory awareness.

Of course, not every baby moves smoothly through each of these patterns in a clear-cut predictable way. But, generally speaking, given a healthy nervous system, and absent injury, pathology, or interference, children will find their way to these experiences in their own time.

In upright posture, the head balances more freely on the neck, and the vocal mechanism is freed for more refined mobility. These are the months when the child's vocal repertoire rapidly expands. The ability to speak is certainly not solely due to this new balance of the head up and over the upright human, but also due to cortical development of fine motor control and to the awakening of speech, listening, and language centers evolved in the folds of the human cerebral cortex. These developments are uniquely human: our bipedal structural support, the mobility and dexterity of our vocal mechanism, and the complexity of our brains. This kind of refinement and the related repertoire of possible sounds are more limited in animals that balance on four limbs, where much greater demands for strength and support are placed on the neck.

In verticality, the arms are released from the demands of weight-bearing and are free for the counterbalancing oppositional swing so essential for our walking gait. This new pattern is a modification of *brachiation*, characteristic of our evolutionary ancestors, the apes, who use rotation at the waist to free the arms for the reach and pull necessary for swinging from vine to vine. This rotation at the waist and coordinated swinging of the arms serves to counterbalance upper and lower torsos in oppositional movement.

During early experiences of walking, the secondary lumbar curve begins to form in response to the need for balancing the weight of the head through a series of mobile spinal curves. Furthermore, the bones of the sacrum, pelvis, and hip sockets begin to harden in response to new demands of weight bearing, creating greater stability at the structural level. The healthy child learns to move in the alternating pattern of fall and recovery that characterizes the human walking gait. In concert with this bipedal gait comes the development of speech, language, family relationships, indeed, all the many complex layers of cortical thinking that give her a sense of self in the world.

Conclusion

From this point in development onward, life experience, emotional imprinting, training, and socialization come more and more into play. Through the years, the baby will construct a "body story," a sense of who she is and how she moves, establishing over time individual habitual patterns of use. However, these later patterns are not necessarily reflexive, or hard-wired, in the nervous systems. They are, as we all know, subject to awareness, inhibition and direction, and the kind of psycho-physical re-education that welcomes us back to our deeper, more innate coordination.

In the Alexander Technique, we can explore each of the essential evolutionary patterns taught in BMC. By encouraging our students to allow themselves to be moved by us during table work, as in the jellyfish model, we help them yield to a deeper experience of gravity and breath, to inhibit in order to open to rich possibilities therein. The freeing of subtle, delicate mobility in the breath work of the whispered "ah" helps our students rediscover the ease, fullness, and underlying support of natural breath movement and its energetic relationship with gravity.

The dynamics inherent in the starfish model unfold progressively as we explore the full volume of the torso—length, width, and depth—with awareness of the span of intersecting diagonals from shoulders to hips and roof of mouth to pelvic floor.

In the head/tail model, by undoing subtle holding patterns that disturb the delicate mobile poise of head on spine, attention enlivens us through heightened awareness of vestibular, aural, and visual senses.

"Through these simple movement forms, we can explore the evolutionary basis of our support and freedom to move…"

Through the Dart procedures and hands-on-back-of-chair, we explore and rediscover the early dialogue between the push of the limbs (feeding the primary curve of the spine) and the gentle pull of the limbs (giving rise to the secondary curves of the cervical and lumbar spine via extensor support). Sitting and standing through folding of the mobile hips, knees, and ankles develops out of coordinated push-pull, via the homologous top/bottom patterns, before the establishment of right or left side dominance. We explore this top/bottom coordination in chair work.

Working with the BMC Developmental Movement Sequences (very much akin to practice of the Dart Procedures in the Alexander Technique) can lead us through experiences of essential coordination in simple patterns of motion. Through these simple movement forms, we can explore the evolutionary basis of our support and freedom to move, and we can experience anew the coordinating patterns learned in infancy that underlie the complexity of adult movement. The Alexander Technique teaches us to clear away, layer by layer, the interference of pre-set habits that may cloud or confuse our natural ease. In this manner, we rediscover the underlying foundational support of our body's architecture—the biomechanical beauty of muscles moving bones in harmony with gravity.

Flexion, extension, lateral bending, or spiraling rotation—whatever the particular movements we intend to do—in the Alexander Technique, we seek to express freely the underlying

breath patterns of jellyfish and the dynamic torso of an enlivened starfish, while the head/tail dance of spinal alignment remains free to balance and move, undisturbed by the functional push-pull locomotor patterns of the limbs. As we undo habitual patterns that have developed in response to a less-than-balanced system, we do not fall into collapse or inertia. On the contrary, we re-establish our innate support and our freedom, the essential interplay of stability and mobility, which is our natural state. It is towards this deep remembering, this return to our essential balance and coordination, that we, as Alexander teachers, hope to lead our students.

Endnotes:

1. "Stop doing what you know to be wrong. The right, aided by my hands, will come about of itself. It is natural to be right, though not habitual, so let Nature do it for you. As you progress you will be able, more and more, to stop doing the wrong thing." F.M. Alexander quoted in Patrick Macdonald, "Notebook Jottings" in *The Alexander Technique As I See It* (Brighton: Rahula Books, 1989), 1.
2. Bonnie Bainbridge Cohen, founding director of the School for Body-Mind Centering® in Amherst, Massachusetts, is a registered Occupational Therapist and a registered Movement Therapist. She is certified in Neurodevelopmental Therapy, Laban Movement Analysis and Kestenberg Movement Profiling. Bonnie teaches an integrated, embodied approach to the study of anatomy, perception, developmental movement, and psycho-physical movement education.

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Meg Jolley, MA, has been on the dance faculty of Pomona College for over 25 years. She is the resident Alexander Technique Teacher for the Departments of Theatre and Dance. She also teaches anatomy, somatics, and ballet for Pomona Dance. Meg has taught Anatomy, Mind in Motion, and Developmental Movement at the Alexander Training Institute of Los Angeles (ATI-LA), where she received her AmSAT certification in 2005.

Illustrations by Julia Cost.

Julia Cost, born and raised on Maui, Hawaii, is the daughter of Hawaiin artist Curtis Cost and granddaughter of California artist James Peter Cost. She graduated from Scripps College in May 2009 with a BA in Studio Art and Dance and is currently a student in the Dance MFA program at UC Irvine.

Photograph of Meg Jolley by Merrie Asimow.