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As Poetry Recycles Neurons

Winter Quarter: March 5th, 2013

## **Doing Goethean Science**

### **Sensing Boundaries**

Each morning I wake and find myself automatically tuning in to how my body feels. My back arches, arms stretch overhead and the length of my body stretches an extra two or three inches as my legs straighten with toes pointing and flexing to complete my first minutes of the day. This is how my conversation with my body starts; with movement. How connected are we to our own bodies? I began to find out just how well I truly understand myself through movement. Seeing as I was in need of references to guide my study I accumulated various texts that contained structured exercises focusing on directing consciousness inward as well as outward to reveal our true selves as well as writing and developing a relationship with our bodies in the surroundings we put them in.

### **Delicate Empiricism: Science as a Conversation**

All body movements, or holding of a stagnant posture, are made possible by muscles, which are infused by tendons to our bones. My body is my partner in this conversation. By making a separation of something that truly is a part of me I give it the possibility to live as its own entity, furthering our conversation. This recognition of Body as its own identity beings to allow me, even forces me to see it as such and give it the respect that it deserves. This newfound attentive awareness and communication to Body has become paramount to my field study.

A key element in my conversation and relationship with Body has been an attentiveness to its needs. Over this field study I have been able to acutely tune into, feel, and attentively listen to what it has to say by reflecting each night on the movement we have made. Before I dove into this dialogue with my body I

decided to stop smoking cigarettes. This I believe ensured optimum lung strength to carry out all of the exercises fully. As I began my field study I found myself and Body immersed in each moment. We woke up each day with stretches and morning yoga to activate our muscles, readying ourselves for the day ahead. Then the day truly began. I balanced my activities between sedentary actions such as reading and meditation and my daily callisthenic exercises. Each day, save Wednesday and Sunday had ample choices for me to decide how Body and I would move. I set our choices between swimming, rock climbing, ecstatic or modern dance, and acrobatic partner yoga.

Starting my mornings off with yoga was a non-invasive way to activate Body. My main goal was to tune into the sensation of somewhat isolated movements, enabling myself to easily identify which muscles I was using. With breath as my base the fluidity of transitions between poses was exceptionally prevalent. Myself and Body feel most comfortable in this exercise. With a sun salutation that is a sequence of poses starting with a standing body, moving to forward fold, and lunges, which are performed on each side of the body to keep ones spine aligned. Each morning, followed by any other poses or stretches that I felt needed to be added to my practice left me feeling awakened and ready for my day.

### **Engaging the Conversation**

As bi-pedal Homo-sapiens movement has never been a struggle, it is second nature to us. But how exactly does that movement benefit us as living souls? When we become aware of movement we search to understand why and how we are able to fulfill these callisthenic routines. These are the questions that I have asked myself over this four week field study. But are these questions too narrow in their broadness? The spark of interest had already been ignited when I enter into a conversation with my body. For this is me, this is all that I am certain of. Yet, there are still questions that I have about myself that I propose; questions that are in fact qualify-able. How will my body feel in each exercise of movement? Which exercise is my body most comfortable in? What muscles and bones am I activating in each mode of movement? How much rest and recovery time will I need compared to how I've currently treating my

body? How will this movement strengthen my wellbeing? Which exercise will I be drawn to most, why? Which exercise will ignite my creativity the most? What sensations am I filled with in these times of movement?

I am weary of asking too few questions of myself yet, I do not want to bombard my body with redundant questions, simply for it to regurgitate an answer back to me. Instead I want to be engaged in a mutual conversation with my body as I now see and refer to it as Body; its own entity. All the while I stay true to myself and let new questions arise as they may. I welcome bumps in the road, surprises, and new questions that I haven't proposed, feeling and working out tensions and being comfortable once more in the silence within myself.

### **Exact Sensorial Imagination and Living Understanding**

Each Wednesday I took a modern/interpretive dance class in the community center on campus here at Evergreen. The class itself starts with warming up our bodies by doing across the floor exercises that input the fundamentals of each dance for the day. We usually practice turns and leaps, which activate your whole body. The turns engage pointed toes as arms open and close (imagine you are holding a huge ball, while shoulders are relaxed) to propel your body around in a complete circle to finish the turn. All the while your feet are positioned on opposing each other (heels in). Now, while we leap we make sure to engage both of our legs, continuing to point our toes right after our feet leave the ground. When we leap one wants to me thinking about height vertically, instead of distance horizontally. After having some basic movements covered and practiced a handful of times we are led into an abdominal exercise. In almost any type of dance, but ballet and modern especially your posture at times needs to be precise; sit bone sucked under and abs engaged. A strong core is essential to your execution of movements in dance. After that sequence of sit-ups, leg lifts, planks, and leg isolations are complete the learning begins. In this class we are taught choreography, eight counts at a time to ensure that we retain the moves fully. Having a teacher to work through the movements with you is something that I will never take advantage of. Having a specific movement to reach with body positioning is one of the most challenging yet gratifying

aspects to choreographed dance. Because I have danced before my muscles have a faint familiarity with being confined to exact movements but later in the day on Wednesdays I have come across a completely new style of dance; one in which a can expel energy from every surface of my body.

As I step into this ecstatic dance space a wave of calm and excitement washes over me all at once. Each step forward brings be to like-minded beings, other dancers and people that simply want to express their selves through movement in this space. From 7:30 to about 9:30 each night the dance Co-Op dedicates this space to student individually-collaborative movement. To me this means that we all share this space to dance, stretch, and move. We are all moving together as a whole, yet each one of us moves to our own internal rhythm. Body and I arrive and begin stretching, working out any kinks that have gathered throughout the week. We typically work in some yoga to move at different levels; then the music starts. A slow building ambient track will play as it coaxes all other bodies up. Gradually the intensity of the beat rises as I look to my right and left sweat pours from my peers. I gaze down to my stomach, gawking at the glistening beads of saltiness that adorn me. This is my therapy, where Body and I allow ourselves to be vulnerable, where we scream and bound across the floor one second and find ourselves on the ground in pain the next; I revel in it. I need this space. I crave this energy, this passion. There are moments when I stand amidst undulating bodies and just before the peak of the most intense song I bring my hands together, opposing fingertips touching to shape a sphere over my heart,. Here I harness every ounce of emotion that I have, I let it build here. Happiness, anger, grief, resentment, joy, love, spite, and passion, my solar plexus is radiating by this time. Once I can feel this sphere brimming with light I explode my limbs outward, the sensation that runs through me is unlike anything I have ever felt. Starting at my core and moving out through arms, legs, fingers, toes, and the crown of my head is an immense shooting warmth. Here my movements are unpredictable; I can frolic through the throng of people, tip-toeing as I weave across the floor. Body's extensions are longer here, more drawn out and exaggerated. We often participate in a dizzying dance with one of our peers, we will lock eyes and begin encircling each other, and this feels very primal to me. As we shorten the distance between us we grasp hands and spin until she whisks me up as I twist the back of my spine around her like a snake. I drape my arms and

neck for a few moments in attempt to breathe into my movements. This burst of two hour long energy takes a toll on Body and I. By the end all we can think about is water and rest. While the next day we can feel the stiffness in knees, feet, neck, and lower back. The soreness does not deter us though, each week this is our sanctuary.

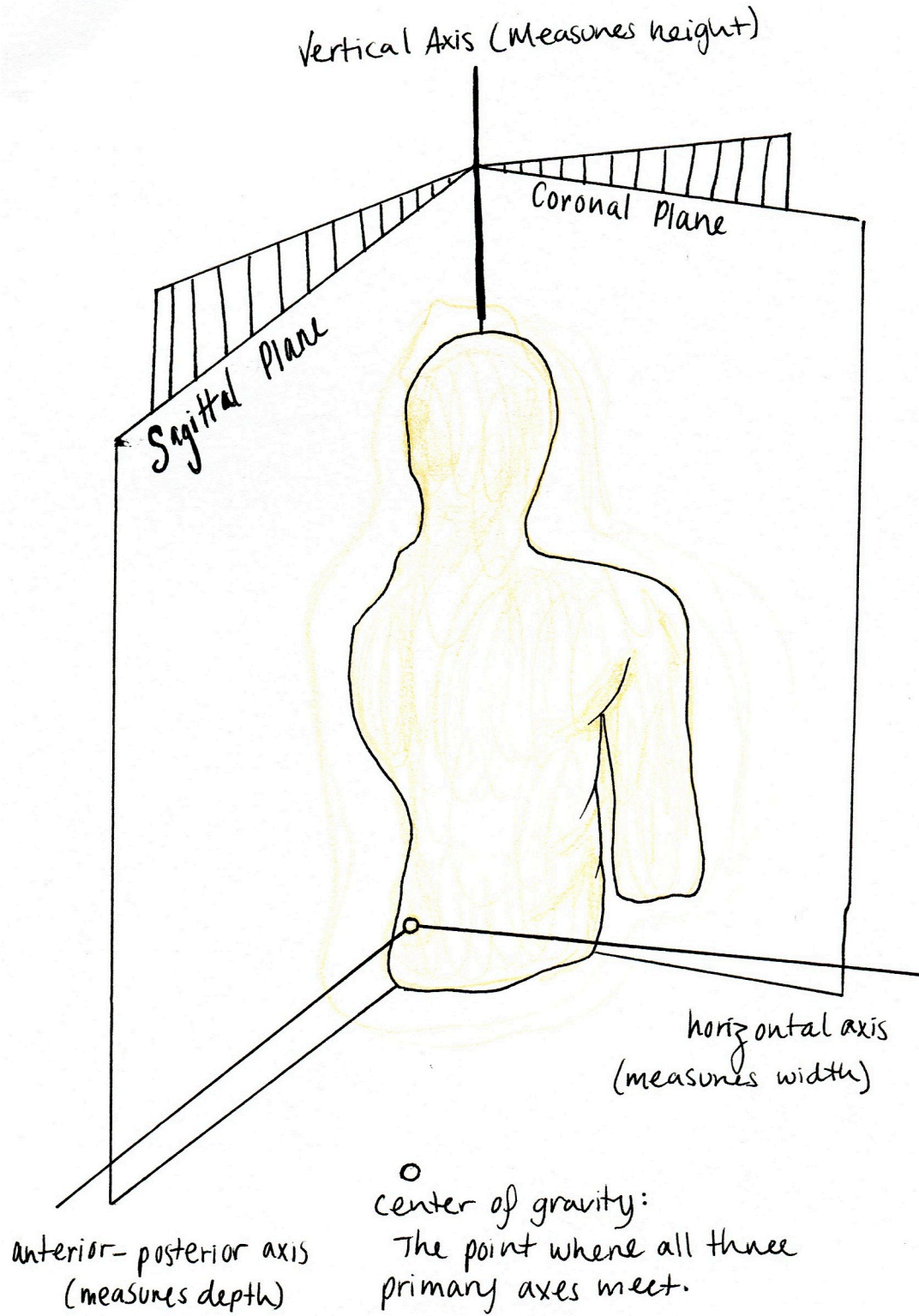
Any day in-between scheduled movement activities I would go to the rock climbing room on campus. The different array of hand and foot holes is daunting at first, but once you pick a color coordinated route it is much easier to decipher. Rock climbing, works each section of my body, I can only spend up to an hour in here at a time. A challenging aspect to these routes is that I am much shorter than your average rock climber, this means that I have to improvise routes, stealing a hand hold from another route; but I make due. The constant reach to a rock engages all arm muscles, as a leg stretching to meet a rock parallel enough to pull yourself towards your hand without falling strengthens calves, skins, and quadriceps. This may seem easy but when you are elevated 15 or 20 feet in the air, the task can be just as difficult mentally as it is on your body. Never the less, the constant growth and inevitable strength gain progress each time I head into the gym to climb. I can stay on the wall for a longer period of time, as well as climb higher, getting used to the intense verticality.

Each Sunday my partner and I would go downtown to Breathe yoga studio to take an acrobatic yoga class. During this class we learned the fundamentals to this practice and distinguished that I would be the flyer and he the base. The base is the supporter if this two person aerial act, devoting his legs and feet to the flyer to place her pelvis or posterior upon. From here, the possibilities are endless, as long as there is communication and trust between partners. This is the movement where I feel strongest, where I feel most accomplished. With a tight core I am able to let my partner steady my movements as we transition through a pose. The first pose you learn is called bird. Bird consists of the bases feet being placed on the flyer's pelvis; the base then bends their knees and straightens them to lift the flyer straight up in the air. The flyer is now sturdy up here and may shift into another pose, making a sequence. As your body gets used to this counter-balanced buoyancy the intensity of the positions may progress with the strength of the body. I have now reached the candlestick pose which starts in bird, then allows my base to shift his

hands to my shoulder muscles, I then grasp his ankles and coax myself to raise my toes to the sky to get into a completely vertical position. Though I can feel my own weight, being in a suspended pose is unlike anything I've felt before. As spectacular as the movements in acrobatic yoga can be, nothing comes close to the communication you have with Body and your partner when doing so. With each subtle movement you check-in with yourself, constantly trying to find your center of gravity. You can feel each muscle engaging, wavering in its tension. Once you are able to notice Body's reaction to the movements you are able to signal your base if any adjustments need to be made. This balance of deep understanding of self and partner is the ultimate game of trust. As the days have started to warm up my partner and I began to practice outside, this I feel is where the interaction of bodies and nature were meant to meet; through harmony, communication, and trust.

### **Movement – A Portrayal**

To measure ourselves and describe movement we can look at our bodies as sectioned into planes, axes, and our center of gravity to not only measure ourselves but describe movement as well. Planes articulate the dimensions of the body and section it from front to back, side to side, and bottom to top. The primary transverse plane divides the body equally by weight from top to bottom. This particular plane passes horizontally through the center of the body; a secondary plane may pass through the knee horizontally. A primary sagittal plane will intersect the body equally between the left and the right side by weight; while a secondary sagittal plane may pass through a single leg and divide the right side of the leg from that of the left. The primary coronal or frontal plane will divide the body equally from front to back by weight; while a secondary plane may pass through the toes and nose vertically. Thus, an axis is a line formed from the intersection of my two body planes. Now, if a line formed from the intersection of the primary sagittal (dividing left to right) and the primary transverse (dividing top and bottom) planes, we find that this line now measures depth. This is called the anterior-posterior axis.





## **The Whole in the Part**

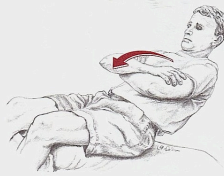
To visualize the three-dimensionality of the planes one can place two sheets of paper beside the body to represent the sagittal and transverse planes. They will form a 90 degree angle where they will intersect. The line created where the two papers meet represents the anterior-posterior axis and measures depth. Using the two pieces of paper one may identify the line formed from the intersection of the primary transverse (top and bottom) with the primary coronal (front and back). This line measures the width of the body and is named the horizontal axis. Finding a secondary axis at your skull one may identify the intersecting lines of the primary sagittal and primary coronal planes. This axis measures the height of the body and is called the vertical axis. The plane not involved in the formation of an axis is called the plane of motion. The body or body part rotates around its axis through this range of motion. A movement around our vertical axis for example would be a spin or a headshake no. A movement around our horizontal axis (measuring depth) would be a side bend from the waist such as a cartwheel. A movement across the body planes such as a spiral, a turn in ballet, or a tennis serve is considered an integrative movement, one where all three planes are being utilized.

## **The Unity of the Organism**

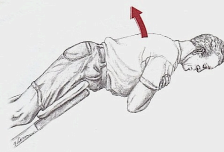
The intersection of all three body planes creates a point. This point is essentially our center of gravity, where all movement is organized for balance and mobility. By further looking at how our body relates to space we may fully understand how we are able to move so freely. Our postural alignment involves the three primary body weights, the skull, the thorax, and the pelvis. Our high center of gravity is delicately placed, balancing over our base of support, our feet. When identifying our postural alignment we see that our vertical line drops from the top of the skull to our feet through our three body weights. Since our body connects to the earth at the feet, we typically begin work on alignment from the ground up. We balance each body part in sequence this way.

As homo-sapiens our breadth of capacity for rotation at the waist and through the horizontal plane gives us the potential for multidimensional activity. We can reach in any direction in space without changing our base; we do so by spiraling around our center. Movements of the body occur at the joints, where bones connect. Although movement affects the placement of bones, the actual terminology of movement always refers to joints. The various descriptions of movement start with the most basic terminology, extension and flexion. Extension is the movement that straightens or opens a joint. When a joint can extend beyond its normal range of motion it is called hyperextension. Flexion is movement that bends a joint or brings the bones closer together. Such as in a fetal position most joints are in a flexed position. Both flexion and extension take place along the sagittal plane (dividing left to right). These next two words only relate to the appendages, adduction and abducting. Adduction of a joint brings a limb medially towards the body's midline. Abduction moves the limb laterally away from the midline. Circumduction is possible only at the shoulder and hip joints. It involves a combination of flexion, extension, adduction, and abduction; together these actions create a cone-shaped movement. Now, supination and pronation specifically relates to the actions of the forearm and feet. Supination occurs when the radius and the ulna lie parallel to one another; while pronation takes place when the radius crosses over the ulna, turning the palm down. Moving downward to the ankle the terms describing movement are referred to as plantar flexion and dorsiflexion. Plantar flexion is performed by moving the ankle to point your foot towards the ground. Dorsiflexion is the opposite movement, such as moving the ankle up, lifting toes to the sky. Each of these terms can and are used to describe our motion as we move throughout space. Knowing exactly how we move has given me a greater appreciation for the fact that I am able to propel myself without assistance.

## Spine and Thorax (vertebral column)



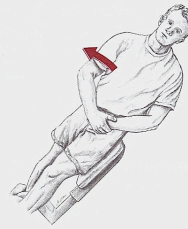
Flexion



Extension

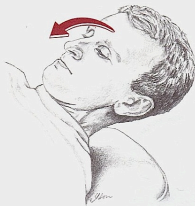


Rotation

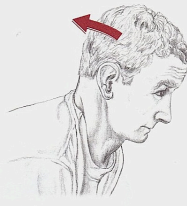


Lateral flexion

## Neck (cervical spine)



Flexion



Extension

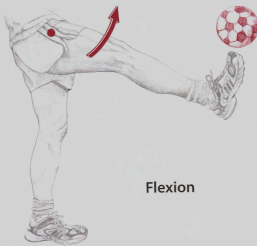


Rotation

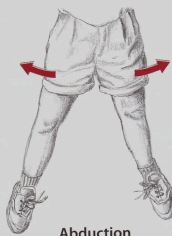


Lateral flexion

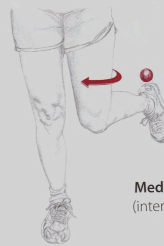
## Hip (coxal joint)



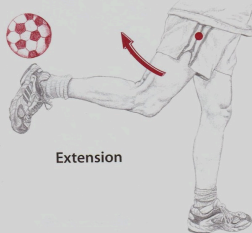
Flexion



Abduction



Medial rotation  
(internal rotation)



Extension



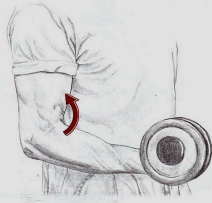
Adduction



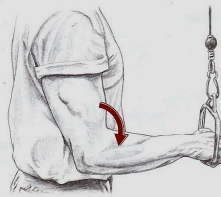
Lateral rotation  
(external rotation)

## Elbow and Forearm

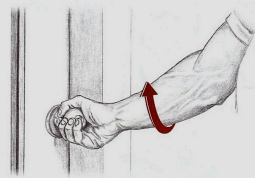
(humeroulnar and humeroradial joints - elbow, proximal and distal radioulnar joints - forearm)



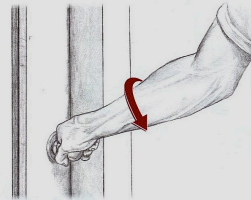
Flexion of the elbow



Extension of the elbow



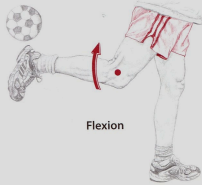
Supination of the forearm



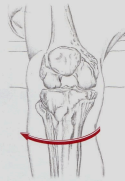
Pronation of the forearm

## Knee

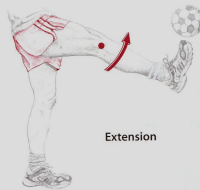
(tibiofemoral joint)



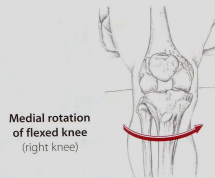
Flexion



Lateral rotation of flexed knee (right knee)



Extension



Medial rotation of flexed knee (right knee)

## Ankle, Foot and Toes

(talocrural, talotarsal, midtarsal, tarsometatarsal, metatarsophalangeal and interphalangeal joints)



Dorsiflexion of ankle

Inversion of foot



Flexion of toes "curling the toes"



Plantar flexion of ankle



Eversion of foot



Extension of toes "straighten the toes"

## **Doing Goethean Science**

I stand vertical holding in the air I've just inhaled,  
here I wait for the exhalation that your touch will bring as  
fingertips brush the backs of my heels.  
Slowly out of the warmth of my hinges the small of my back  
emerges as the ground your feet covet

I sink into you,  
as you into me  
(I am in your hands)

Soon my field of vision flows in a backwards incline,  
neck draping gingerly as I become buoyant atop your two  
sturdy stacked trunks  
I allow myself to breathe, coaxing my spine to sink into the ease of an arch

As hands find the shallows of my collar bone we sink deeper,  
legs seep down with gravity,  
we descend deeper as I allow your ever shifting feet to  
manipulate my petite frame.

This is a permeable game of trust,  
the necessity for comfort-ability in the very real possibility of falling  
Is here  
a loss in grip, in footing, in breath  
yet the counterbalance that is achieved sends me to flight

I am a bird

I feel strong

The wrought iron hinges of me,

bend to your warm milk of a touch

I meld into your depths,

the creases you create as tension eases all else.

### **Practicing Goethean Science**

In the course of any real conversation the partners change and evolve, we are in different places than when we first began. It is true that science had changed our conversation, but the change that has occurred is one to be thankful of. Through this scientific lens I have come to a greater understanding of my body and its inner-workings, that of bones, muscles, and ligaments. As I moved after retaining this knowledge I became hyperaware of each shift I made, each leap, turn, and wrist flick became that much more fantastic. We are interwoven with ourselves, unfortunately most people are held captive by the notion that our bodies are separate from our own selves. People pollute and intentionally harm themselves in their detachment. But the moment we wake up to the fact that our body is a defining part of us, we are free to engage with Body as a separate and equal all at once. This harmony and inability to un-know the information that my mind had retained sends me on my own journey of self and movement. This is just the beginning of the life long conversation I will now have with myself.