

The Sacred in Science

Session 3 – Motion

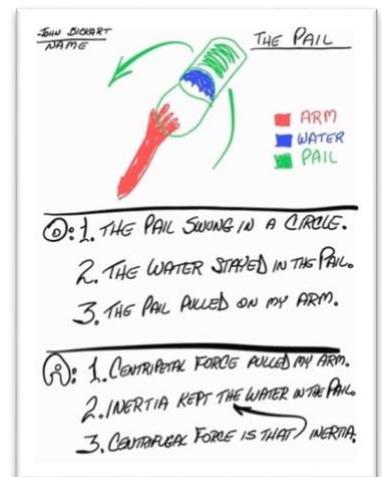
<http://www.bickart.org/>

1. Teaching

“Tell me, and I will forget. Show me, and I may remember. Involve me, and I will understand.”

(Chinese Proverb)

- *Tell* what is coming by setting the mood, not explaining concepts, yet.
- *Show* so that students can mindfully attend the experience, without too much explanation.
- *Repeat* the experience in your mind, still not analyzing and naming. Just re-create it with your imagination, like a movie.
- *Reflect* on what happened. Perhaps within the lesson, or perhaps later – even the next day. If the students took it in mindfully, perhaps in the last night’s sleep, they may have had depth added to their perspective. These reflections can include descriptions of what happened physically, why it happened, how we can use or control it, or even how to make money from it. But these reflections might also transcend the mechanical explanation to honor the *wonder* and *awe* in an event.
- **Take Away Mindfulness Demonstration & O/A: “The Pail”**
 - **Making an “O/A” (Observation/Analysis)**



2. Naming vs Observing

“He who knows the Tao does not speak about it; he who is ever ready to speak about it does not know it.” (Tzu, 2012/circa 500 BC, Verse 56)

“For out of the overflow of his heart his mouth speaks.” (Christ)

- We have named it “Gravity”!
 - We often give something a name because we do NOT know what it is?
 - What do we know of these named entities: “relationship”, “love”, “health”, “success”?
- Perhaps gravity is simply a mass in the way of motion.
- Growing up, we identify with *Names*; but what have we *Done* ... “We are what we repeatedly do.” - (Aristotle, 1984/circa 350 BC)
 - Initiation [8 – 14 years old] (SomÈ, 1994): Is humankind crossing the threshold? Is it a teenager?
 - The Wholeness of Nature suggests that we pay attention to our beginnings.
 - Your Day (morning)
 - > Your Life (childhood)
 - > Humankind’s Life (our ancestors)
 - > Evolution on Earth (animals, plants, rocks)
 - > Evolution of the All

- “The Milk Maiden” - inspired by a story from *The Heart of the Hunter* (Van der Post, 1961)

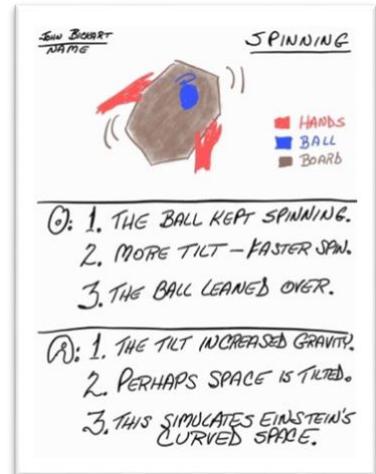
3. *Falling*

“Words that are strictly true seem to be paradoxical.” (Tzu, 2012/circa 500 BC, Verse 78)

- Is not **Falling** one of the things we do best?
- Walking is **Falling**
- We **Fall** in love
- Planets are **Falling** in their orbits
- We **Fall** for a joke
- Why are so many human records of physical accomplishments **Falling** so fast and so far?

- **Take Away Mindfulness Demonstrations:**

- Do an O/A on: “Spinning”
- The Octagon Board: Falling Planets
- Einstein’s Vortex
- Heels against a wall; try to bend
- Margaret
- YES
- Synchronicity - the 2 finger lift
- Gyroscopes



4. *Separating: Time & Space & Measurement*

“Donaldson tells a story ‘of the Indian who said that he could not translate ‘The white man shot six bears today’ because no white could do so’ (1989, pp. 57-58). Whorf (1964) writes of miscommunications with the Hopi because the interviewer required a subject and predicate to sentence structure in order to translate meaning – but the Hopi do not always separate whole concepts into parts. To the predominantly analytical mind, this could make the Hopi seem less capable than the Eurocentric thinker. Nevertheless, Whorf describes how the Hopi are quite intelligent. Like the children in the intuitive stage, the Hopi use a non-linear set of epistemic beliefs to learn and communicate in a way that speaks in wholes that are outside of the temporal use of verb tenses, and outside of the spatial separation of a subject and predicate ...” (Bickart, 2013, p. 123)

- Separation: the first language, the first clocks, and the first measuring sticks.
- The Pendulum
- **Take Away Mindfulness Demonstrations:**
 - The Pendulum in Every Clock
 - The Law of the Pendulum
 - The Bowling Ball Pendulum
 - Touch it to your nose ... friction keeps it from coming back to hit you
 - Race it with a much lighter pendulum of the same length

5. *Additional Motion Topics*

- Looking Through Newton’s Eyes: Seeing the World as Physical Objects Only

- Newton's 1st Law: 'Inertia'
 - Take Away Mindfulness Demonstrations:
 - Basketball & Tennis ball
 - Coin/Card/Cup
 - Pull Tablecloth out from under a Plate
- Linear Motion
- Newton's 2nd Law: ' $F = m a$ '
 - Take Away Mindfulness Demonstrations:
 - Broom Bowling Ball Race
 - Push an actual Car until it Accelerates
- Newton's 3rd Law: 'Action / Reaction'
 - Take Away Mindfulness Demonstrations:
 - Socks vs. Shoes tug of war
 - "1 Woman/1 Ship" Story
- Momentum
 - Take Away Mindfulness Demonstrations:
 - Throw Raw Egg against Sheet
 - Run up a Tree
 - Bounce an Elastic vs Sticky ball
 - Corn Starch
- Energy
 - Take Away Mindfulness Demonstrations:
 - Race Metal Balls on Train Tracks:
 - Momentum Conservation: before/after collisions
 - Energy Conservation: same heights, different tracks
 - Giant Lever: one student picks up several (Law of the Lever: $w_1 * d_1 = w_2 * d_2$)
- Rotational Motion
 - Take Away Mindfulness Demonstrations:
 - Swing Pail of Water Overhead
 - Bicycle Flywheel with studs on axle and a chain for a tube
- Projectile Motion
 - Take Away Mindfulness Demonstration:
 - Parabolas:
 - Shoot a Stream of Water
 - Throw & Bounce Balls
 - Launch Actual Students

For a reference to *current writers on the hoped for, next version of humankind*, go to "Good Reading" on <http://www.bickart.org/>.

References

- Aristotle, B. J. (1984/circa 350 BC). *The complete works of Aristotle: The revised Oxford translation*. Princeton, N.J.: Princeton University Press.
- Bickart, J. (2013). *The possible role of intuition in the child's epistemic beliefs in the Piagetian data set*. (Ph.D. Dissertation), UNCC, Charlotte, NC. DAI/A 74-11(E) database. (3589794)
- Donaldson, M. (1989). *Children's minds*: Fortuna Press.
- SomÈ, M. P. (1994). *Of water and the spirit: Ritual, magic, and initiation in the life of an African shaman*. New York: Putnam.

- Steiner, R. (1996/1923). *The child's changing consciousness: As the basis of pedagogical practice*. Hudson, N.Y.: Anthroposophic Press.
- Tzu, L. (2012/circa 500 BC). *Tao te ching*. Savannah, GA: Green King Press.
- Van der Post, L. (1961). *The Heart of the Hunter ... With drawings by Maurice Wilson*. Pp. 254. Hogarth Press: London.
- Whorf, B. L., & Carroll, J. B. (1964). *Language, thought, and reality: selected writings of Benjamin Lee Whorf*. Cambridge, Mass.: M.I.T. Press.
-
- Aristotle, B. J. (1984/circa 350 BC). *The complete works of Aristotle: The revised Oxford translation*. Princeton, N.J.: Princeton University Press.
- Bickart, J. (2013). *The possible role of intuition in the child's epistemic beliefs in the Piagetian data set*. (Ph.D. Dissertation). UNCC, Charlotte, NC. DAI/A 74-11(E) database. (3589794)
- Donaldson, M. (1989). *Children's minds*: Fortuna Press.
- SomÈ, M. P. (1994). *Of water and the spirit: Ritual, magic, and initiation in the life of an African shaman*. New York: Putnam.
- Tzu, L. (2012/circa 500 BC). *Tao te ching*. Savannah, GA: Green King Press.
- Van der Post, L. (1961). *The Heart of the Hunter ... With drawings by Maurice Wilson*. Pp. 254. Hogarth Press: London.
- Whorf, B. L., & Carroll, J. B. (1964). *Language, thought, and reality: selected writings of Benjamin Lee Whorf*. Cambridge, Mass.: M.I.T. Press.