

Ontogeny Recapitulates Phylogeny

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Is it more valuable to know many facts and information about life, or is it more important to know *The Way of Life* as Lao Tzu wrote in the Tao Te Ching (Tzu, 2012/circa 500 BC)? In other words, is it necessary to take 50 cars apart to diagnose the engine trouble with your car? Now ask the opposite question. Instead of a deluge of information, can an in-depth observation of one individual speak to the nature of the whole group? Can you watch the way one child lives, and gain insights about most children? The subject of this lesson is that a teacher can teach about the whole world by studying a grain of sand. It can be said many ways: as above, so below - the whole is in the part - or if put into pedagogical terms, *ontogeny recapitulates phylogeny*. As William Blake put it,

To see a World in a Grain of Sand
And a Heaven in a Wild Flower
Hold Infinity in the palm of your hand
And Eternity in an hour
A Robin Red breast in a Cage
Puts all Heaven in a Rage
...
God Appears & God is Light
To those poor Souls who dwell in Night
But does a Human Form Display
To those who Dwell in Realms of day

What does **Ontogeny Recapitulates Phylogeny** mean in this context? The phrase originated in a biological context in the late nineteenth century from the biologist Haeckel who attempted to merge ideas on evolution of Lamarck and Goethe with some of Darwin's notions. He conjectured

that the human fetus goes through stages that mimic the evolution of all species. Ontogeny is the evolving of the one organism; phylogeny is the evolving of a group or all species or organisms. Recapitulation means going back through. So, applied to education, one pedagogical meaning of ontogeny recapitulates phylogeny is that each child grows through the stages of humankind. In other words, when you are young, you are like ancient humans. The fun of this comes when you consider that this might mean that little children are acting out ancient history, then at a certain age, we act out present history, and in our older years we are seeing a glimpse of our future. Another exciting consequence of this conjecture is that if the whole is truly in every part, then ontogeny recapitulates phylogeny might pertain to each *day* in your life. So, in the morning you are a baby again - or an ancient. By sometime in the day you are a modern human, but as the day wanes, you are humankind's future self. What then is our sleeping time? Does this map to very early humankind on the evolutionary scale and does it map to the time we were in the womb on the one life scale? And what of the other species? Can we stretch this analogy to all species, in case we have evolved through lives that were formerly animals? If so, could we somehow access what it is like to be another animal by observing ourselves at very early parts of sleep?

Ontogeny is the life of one. You. Ontogeny is your life. Phylogeny is the life of the many - specifically the life of the whole of species. Recapitulates means 'relives' or 're-does'. So, this lesson is about how your individual life relives the life of the all. An example of this would be that sometimes you are reliving the heart of the lion, sometimes the quickness of thought of a bird, and sometimes the strong will of the oxen.

Epigenetics

As Above, So Below ... If *as above* means as in the larger context, and *so below* means as in the minute details, then we can borrow the idea of ontogeny recapitulates phylogeny and extend it, where above goes with phylogeny and below goes with ontogeny. In other words, as things happen with the whole phylogenesis above, so do things happen with the progression of ontogenesis of the detailed parts of any one of us, down here below.

Bruce Lipton (2005, 2006; 2009) has performed extensive epigenetic cell research and noticed that the principle of as above, so below can be applied to the cells in our body. In his book, *The Wisdom of Your Cells* he outlines some new rules for what he calls a new biology, namely:

- we are not victims of our genes, but creators through our thoughts

Through stem cell research Lipton saw that a gene's fate is determined by its environment. Your body is a community of 50 trillion individual, sentient cells. That means that your cells have feelings, they have some form of consciousness, and they decide on their own whether or not to go along with the community of cells you call your body.

- you are a collective consciousness

In every cell exists all the functions of the larger human body. Together, the community of cells are like one being - your body - but at the same time, they exist as separate, autonomous entities.

- therefore, we are made in the image of the cell

The current medical model is not the same as Lipton's model. *Currently, much of the medical profession believes that the human body is a biological machine comprised of chemicals, controlled by genes.*

The medical model does not go with the latest epigenetic research. *Epi* means outside or above, so epigenetics studies that which takes place outside the gene. Epigenetic research specifically studies how genes are controlled by the context of the environment. The current, prevailing medical model of how the body operates is that it takes instructions from the gene. Lipton agrees that the gene is a set of instructions. His new idea is that the cells can *decide* whether or not to obey the gene's instructions. He claims that factors outside the gene often influence the cell to purposely adapt to environmental change and then decide to go with or ignore the gene's instruction set. And what are these environmental changes you say? Well basically there are two. One is chemical - as when you just took a chemical drug into your body. This can cause the cells to behave quite differently than they were before the drug hit the body's system. The other

environmental change is that of an electromagnetic field - as when you send out thoughts from your consciousness. Thoughts you say? Yes. If you think certain ideas, the cells can pick up changes in the electromagnetic fields of your thoughts and respond with the decision to use or ignore the genetic instructions. And here is the kicker. According to Lipton, electromagnetic fields are 98% effective in causing a cellular response as compared with a 2% effectiveness from chemical substances. He is clearly recommending that we enhance the ability to modify our thinking instead of enhancing our access to drugs.

The Wholeness of Nature

Most scientists do not agree that ontogeny recapitulates phylogeny. But this is exactly what Oxford physics professor Dr. Henri Bortoft (1996) describes throughout his book, *The Wholeness of Nature*. While most physicists in the middle of the twentieth century were arguing over whether Einstein's relativity and some new quantum mechanics could really replace Newtonian physics, Henri Bortoft was studying the science of Johan Wolfgang von Goethe. You may know Goethe as a great literary figure - the author of Faust, perhaps the best poet in Germany history; but Bortoft saw Goethe as a revolutionary thinker in science. What Bortoft calls Goethean science is a way of interpreting all scientific phenomena as if every part of nature contains the whole of nature. For instance, Goethean science describes how, as many of us know, a seed has the whole tree in it, and the human ear or nose contains proportions of the whole body. Goethean science takes this to every level of existence. For instance, open the door and go outside. Goethe would say that the scene you see needs every single symbiotic contribution of diverse microorganisms, bugs, plants, and animals around you.

How about a modern example that uses the principle that the whole is in the part that was developed well after Goethe passed away in 1832. Bortoft uses the example of a hologram - you know, like the 3-dimensional images you can project. Let's say that you make a hologram on a glass plate, but then you accidentally drop the glass plate. It breaks into fifty pieces. The amazing thing about holograms is that you can pick up a piece of the glass and you will be able to project the whole 3-D image! This is because somehow the holographic pattern on the glass repeats the whole image in every part. Bortoft says that nature is holographic. He shows how a leaf holds the image of the whole tree in its structure. In fact, sometimes you can regenerate the tree by

sprouting a leaf. Just plant it in water. This is how entire animals have been cloned from a small piece of DNA - there was information about the whole animal in each piece of DNA.

Fractal Geometry

But the principle of ontogeny recapitulates phylogeny goes much, much deeper. Fractal geometry is that geometry which employs the same formula to generate the whole graphic as it generates each new part. One author says that each person is a fractal and contains the essence of all humankind. The Golden Ratio is found in parts of the human body, as well as throughout nature. As Da Vinci used the golden ratio in painting the Mona Lisa, we also see these proportions in the sunflower, the pine cone, the conch, and scores of other natural, as well as, man-made objects. Certain leaves will root if put in water, thus they have rooting abilities up in the leaves. So, a property of the whole tree is in a remote part. The ear belongs only to your body. It has the nature of your whole body in it, although it is only a part of the body. Try pin the ear on the human (like the children's game, pin the tail on the donkey). Would someone else's ears look right on your head? It is said that the whole of the animal kingdom is in each human. Try playing the game, which animal does your body (or just your head - or one specific body part) remind you of? How about books. The whole meaning of a book, without seeing its totality, can sometimes be sensed by reading a small part. Therefore, the whole book is not the sum of its parts - it is *in* each part. You could say that the meaning of text is holographic.

Philosophy & Relativity

Charles Eisenstein (2013a, 2013b) warns that we often project our modern self onto ancients and miss how they truly experienced the connectedness of the parts of their life.

This is not merely an enlightened understanding that no person can be truly healthy if his family, village, or ecosystem is not healthy; it is a broader definition of self that includes family, village, and ecosystem. It is an understanding written into such spiritual teachings as the hermetic principle "As above, so below," the Taoist concept of an internal universe embodying all the relationships that exist externally, and the Buddhist teachings of karma— that anything you do to the world, you do to yourself— and the unreality of the self. (2013a, p. 155)

Geoffrey Chew, a holistic philosopher, has a 'bootstrap' philosophy that says that the properties of any one particle is determined by all other particles. So you could 'bootstrap' or start up the universe (like 'booting up' a computer) from any one particle. This may be similar to cloning a whole animal from a small part of DNA. In Chew's own words, "every particle consists of all particles". Both Mach and Einstein (1920/2010, 1950/2011), in working through philosophical ideas that later became the theory of relativity, say that matter's mass is a reflection of the rest of the universe. These are physics observations that are similar to Chew's philosophical observations.

Infinity & Eternity

According to Bortoft, Time & Space are wholes that can be found in parts. One author says, "see the eternal element in every single thing." This is another case of the whole contained in the part ... whole = eternal ... part = every single thing. Said another way, the timeless is in each moment. This also means that time does not exist without the timeless, since every moment has eternity or the timeless in it. How about space? Just as there is a timeless state that you could say is either outside of time or is all of time ... there is also a formless state. The formless state is either outside of form (or space) or is all of space. And again the whole is in the part. You could say the formless is in each form. Another way to say this is that the immaterial is in the material. And again this means that form does not exist without the formless.

The Starry Sky

This example is amazing when you think about it. Look up at the sky at night. The human eye can see about 6,000 stars if the sky is clear. If you take a photographic image, the camera can see even more. Bortoft points out that as you take the picture, the light rays of every one of those stars are going through a narrow opening such as the iris in a camera, or the iris of our eye. The rays are all on top of each other, or very close together, as they pass through the iris. But now, look at the image of the stars in the camera or the back of the eye. There is a perfect picture of 6,000 separate stars - separated points of light, that were just occupying the space of the iris. How did each star's ray of light exist so closely together while in the iris, yet retain its individuality as it emerged from the other side of the iris? I don't know, but the whole of the starry sky's light was in one, small part of your camera or your eye.

As you walk around outside today, know that the starlight of perhaps sextillions of stars are touching you with every step you take, everywhere you go. At every point in time today and at every place you go, you have the whole of everything there is in you.

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