

The First Principles of Natural Philosophy

(Advance Notice)

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How do we move? How do animals move? Aristotle said that living motion is produced by the action of the shortening of muscles, and he classified living motion as Natural Motion. Today, much more is known about the intricate structure of muscles and their complex interaction with the elaborate nervous system. But, the nagging questions remain. How do we really move? How does the simplest organism induce its own motion from within? What is the Primary Cause of natural motion? Is it Aristotle's *Soul*, or Anaxagoras' *Mind*, or Newton's *certain most subtle Spirit*, or Leibniz's *vis viva*, or Kepler's *Anima Motrix*? Will the cause of natural motion remain *hidden* forever as Gassindi, Newton, Locke, Berkley, Hume, and other great thinkers believed? Or will the cause be transparent to us as Aristotle, Descartes, Huygens and Leibniz claimed, but without proof? Will we know the Ultimate Reality of Motion only in mathematical terms, as suggested by Galileo, Newton, Fourier, Maxwell, Eddington, Einstein, and twentieth century scientists? And in Plato's Allegory of the Cave, will science be forever content with abstract equations describing forms and sequences of shadows on the wall of the cave and never see the ultimate reality in the bright light of the Sun outside of the cave? Under the above title, I will describe thousands of experiments and extensive analyses which led me to answer these questions. For now, I will give a brief description.

The majesty of natural motion can be greatly appreciated on seeing mechanical models, or lifeless bodies, move on their own. I have had the delight to construct, watch and feel many such models. The motion I produced is the not by Newton's *push* or *pull*, Descartes' and Huygens' *impact*, nor by Aristotle's *push*, *pull*, *twirl* or *carry*. I have produced pure natural motion; by this I mean momentum, or motion, induced in all the parts of the models, very much like living motion. Such motion I produced mechanically: Like in Nature, without wheels, gears, levers, pulleys, springs or other common mechanical devices used heretofore.

Initially, I managed to move many models, but only when touched or held with the hands. That was not different from the sensational demonstrations of mentalists and magicians. In the 1950's, I myself amazed others with many automatic writing devices. By the 1980's, my models had grown in complexity. I tried to cajole or coerce the lifeless models to move alone, with different forces, torques, gyroscopic moments, etc. There was limited success. With the help of my son, we moved a refrigerator with forces applied contrary to the direction of the induced motion. We used a weight scale to measure the force required to move a heavy tool box horizontally on the floor. Incredibly, we moved the tool box vertically upward on walls and cabinets with exactly the same force! Apparently, my gravitation theory, which was scoffed at in 1993, is closer to the truth than the theory of universal gravitation or the theory of general relativity. Anyway, my lifeless models were too obstinate to move alone. There was no clue as to how to induce self-movement in the works of Aristotle, Galileo, Descartes, Newton, Einstein or any other ancient or modern scientist.

Eventually, some models moved on their own, but only in circles like the disoriented fish in a spaceship or like a dog chasing its tail. I then managed to make some models move forward, but the process was frustrating. Some days, the models moved; on other days, the same models were bullheaded and refused to advance alone. I kept close watch on the weather,

just in case the lifeless models had a preference there. I turned them north, south, east and west. I tried different times of the day and night. I moved electric wires around. Also, I continued to analyze the conditions affecting the mysterious motion of the models – which I made from aluminum, steel, glass, styrofoam, cardboard, milk cartons, coffee cans, plastic containers and bizarre looking items from the \$1 stores or hardware and toy stores.

Finally, I produced controlled motion in the lifeless models: First forward, then forward and backward, then in any desired direction, then up on inclined surfaces, and at different *gaites* and speeds. It felt exactly like when I taught my children to walk or to ride a bicycle on their own; always ready to lend a stabilizing hand. An overwhelming feeling was inevitable: I was not teaching the models how to move, I was making them move.

In addition, I tried the concept on my body. I placed some models against my humerus, scapula, torso or other bones, and in some cases I felt momentum (motion) imparted to my body: Without command from Mind, Soul, Spirit, or any other incorporeal agent.

From Descartes' and Galileo's laws of inertia, Newton formulated his law of inertia, "Every body continues in its state of rest, or of uniform motion in a right line, unless it is compelled to change that state by *forces impressed upon it*." Two hundred years later, Poincaré noted that the law was never tested and it can never be tested. Einstein concurred. But the law of inertia has greater difficulties. I consider my body. It can be at rest. My body can be moved if someone pushed, or pulled, me. But equally, I can initiate motion of my body without *forces impressed upon it*! Or, I can move at a uniform speed and bring my body to rest without external *forces impressed upon it*! Newton's laws of motion are limited. They apply to inanimate bodies. The laws apply to the stone, cart, or rock, but not to the horse, man, or child, in the examples used by Newton, Einstein and Galileo, respectively.

Aristotle defined motion as the *actualization of potentiality*, a definition later ridiculed as unintelligible in any language. He said the study of motion, including natural living motion, is the most important task in physics. The motion of living bodies was mainly studied by philosophers; Aristotle, Augustine, Aquinas, Locke, Hume, Kant, Spinoza, Hegel. Now, the motion of humans and animals is studied by biologists, psychologists, and some engineers. My findings show the correctness of the Aristotelian definition and that living motion is primary to physics; to the study of motion of man, horse, bird, fish, electron, photon, etc.

I took thousands of video shots to show most of the stages described above. Natural motion depends on the geometry of bodies, and these can be infinite. Natural motion depends on the materials of construction, and these can also be infinite. The full development and full understanding of the motion that I have produced will undoubtedly be a major occupation in physics, chemistry, biology, physiology, psychology, sociology, philosophy, engineering, robotics, athletics, and many other fields of knowledge throughout the Third Millennium.

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