

The Laws of Nature: the ancient origins of a modern scientific puzzle,
and its relationship to Christianity

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- A. I am neither a scientist nor a theologian, but an historian of both the Biblical and the Graeco-Roman roots of our Western intellectual tradition.
- B. In the Homeric poems, the world is governed by the will of Zeus, and by those who can persuade Zeus to their point of view.
1. When Zeus nods, the decision is final.
 2. The Universe was conceptualised as being like a patriarchal clan, ruled by negotiated authority.
- C. But c. 560 B.C., a different view began to emerge. Anaximander and the roots of the Greek philosophical tradition.
1. What he said, and what it might have meant.
 2. The Universe was conceptualised as a self-governing entity, with its own “laws”.
 3. There has been a major shift here, from a mythological world view which explains the world as the result of the choices of anthropomorphic gods, to a social metaphor: laws.
- D. The idea was developed most by Heraclitus of Ephesus.
1. Heraclitus on the nature of change in the world.
 - a. *Panta Rhei*: everything flows.
 - b. “No man can step twice in the same river”
 - c. But if everything changes, how is human knowledge possible?
 - d. The *Logos*, or intrinsic rationality, of the world.
- E. Two forms of “natural law”: ethics and cosmology. The long-term influence of this idea.
- F. What might the “Laws” be?
- G. Development:
1. Empedocles (c. 450 B.C.):
 - a. matter, and forces at work on matter
 - b. Are “the rules” the same everywhere?
 2. Pythagoras and the Pythagoreans (5th and 4th centuries):
 - a. The theorem, Music and Astronomy: the *kosmos* runs on mathematical rules.
 - b. Later Pythagoreans extended this into geometry.
 3. The Atomists (440 B.C.): serious reductionists. By convention there’s the macro-world and all we’re used to; but in reality there are atoms and void.

4. Plato and the geometrical basis of reality.

- a. The sign over the entrance to Plato's Academy read: “Let no-one ignorant of geometry (or: who cannot think geometrically) enter here”. Why not?
- b. Plato’s “geometric atomism”: the “five Platonic solids” and their constituent triangles

5. Later: Stoicism. Pantheism. The world is like an organism, developing under the control of its own mind.

H. Much later:

1. Newton and Deism more generally: the metaphor of clockwork machinery.
2. Marx on the social sciences having the same rigor as the physical sciences: “the iron necessity of a law of nature”
3. The “Gaia hypothesis”: the world is like an organism.
4. Most recently: the Universe as a computer?

I. Stephen Hawking: ch. 12 of “A Brief History of Time”:

“Even if there is only one possible unified theory, it is just a set of rules and equations. What is it that breathes fire into the equations and makes a universe for them to describe? The usual approach of science of constructing a mathematical model cannot answer the questions of why there should be a universe for the model to describe. Why does the universe go to all the bother of existing?”

J. Overall: the role of metaphor in our thinking. “Laws”.

1. Anthropomorphic gods: the world is run like a patriarchal clan.
2. City states: the world is like a well-run society.
3. Mathematics and Geometry.
4. Atomism: the world is like a 3-d billiards table.
5. Stoicism: the world is like a living organism.
6. Deism: the world is like a vast clockwork mechanism.
7. Gaia: back to the world being an organism.
8. Most recently: the universe is a computer.

All of these are forms of analogical thinking.

K. What do we, as Christians, think about the concept of the “Laws of Nature”? Do they proceed from the nature of God? Are they something essentially arbitrary that God has created for the sake of the material universe, but that's all? Are they inherent in matter/energy, or what? How close can we get to them? Does God ever “break” them (miracles)? Or is that a misconception? Is naturalistic science on thin ice without a God to make and enforce its “Laws”?

*This lecture was given by Dr Chris Forbes, as an *ISCAST-**CASE Lecture, at New College, UNSW, at 7.30 pm on the 27th September, 2016.*

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