

Lecture 4: *Insight*, Chapter 2. “Heuristic Structures of Empirical Method.” Part II

[0:00]

- §2. Classical Heuristic Structures.

Lonergan returns to origins of modern science to examine it through lens of self-appropriating insight.

- Knowns and unknowns in math and science.
- Seeking the unknown insight that links the data.

[2:56]

- A Radical Retrieval of Origins. Galileo.
 - Various re-interpretations of Galileo; martyr for Reason, etc.
 - Lonergan’s inquiry into the kind of insights Galileo sought.
 - Prior to discovering laws of free fall, Galileo anticipated the fact that they have a definite nature.

[8:18]

- Law *versus* Correlation.
- Class discussion of what a ‘law of nature’ implies.
- Juridical connotations of human law: restriction, universality, imposition, violable.
- A law of nature seems to control and dominate behavior of entities in world.
- Something primary (e.g., force), everything else secondary.
- For Lonergan, laws are insights that grasp correlations, or reciprocal relations.

[13:52]

- Correlation: how things are reciprocally related to one another.
- Removes distinction between primary/secondary (independent/dependent) variables.
- Galileo’s search for correlations, namely, the undetermined function ‘ f ’, to be determined.
- ‘ f ’ as a function which relates other variables.
- ‘ f ’ as standing for any function, analogous to the ‘ x ’ in algebra.
- The continual expansion of kinds of functions, i.e., ways that variables can be correlated. Progression from conic sections to polynomial functions to transcendental functions.

[22:40]

- Examples of correlations taken from physics: e.g., $F - ma = 0$, $E - mc^2 = 0$, etc.
- Lonergan rewrote laws so as to eliminate privileging any variable, stressing their interrelationships instead.

[25:10]

- Galileo’s complaints about lack of intellectual curiosity about projectile motion:
 - He shows that the projectile’s curve is actually a parabola,
 - emphasizes the difference between descriptive and explanatory definitions,
 - intends the method for a new science.

[28:16]

- Film of the trajectory of a basketball.
- How do the different positions and different moments of the ball's path co-relate?
- What single relation, or intelligibility, holds across all the points of data?
- What whole, what function, co-relates all the parts of the ball's path of motion?
- Neither the parabola, nor its formula, are visible in the moving ball.
- Scientific understanding has to add the insight to the visible

[34:25]

- The Significance of Measurement.
 - Difficulties in measuring free-fall and parabolic motions.
 - Numbers alone do not make things objective; they are used to assist in expressing relationships.
 - Measurements correlate different events to each other by relating them all to a single, common standard.

[39:58]

- How the anticipated correlation (or indeterminate function) made determinate.
(By measuring and tabulating, then arriving at the insight and expressing it in a general correlation or function.)

[40:35]

- Scissors Metaphor for the Scientific Method/Classical Heuristic Method
 - Lower blade moving from sense-data upward toward insights
 - Upper blade moving downward from general anticipations toward insights

[45:04]

- §3. Concrete Inferences from Classical Laws [Correlations]
- Early expectations that Newtonian physics could explain *everything*.
- Lonergan claims there are not *two*, but *three* conditions of a concrete scientific inference:
 - Information on a concrete situation
 - Knowledge of laws
 - Insight into the situation.

[47:12]

- Laplace acknowledged only two suppositions.
- Laplace's very influential articulation of modern scientific determinism: given the locations of all the particles in the universe and their motions, one could express in one single formula the movements of every body in the universe.
- Laplace leaves out the factor of insight into the given situation.
- Expecting "a single formula" is unwarranted. One cannot assume a systematic process instead of a non-systematic process.

[53:13]

- The consequences of the oversight of insights.
- Actual application of general correlations to concrete cases has “tremendous implications for what the world is like.”