Lecture 6, Part I: Non-Systematic Processes & Co-Incidental Manifolds & Statistical Methods; Ch. 3 §§1-5: Canons of Empirical Method

[0:00]
Introductory remarks.

[1:00]
• The Objective of Statistical Methods.
• Lonergan's seeming conflation of two different objects: coincidental aggregates (populations) and nonsystematic processes. What is the relation between these two?
• Members of a coincidental aggregate happen to be together in space and time while not being ordered by a single intelligible principle.
• *A kind* of unity (spatio-temporal), but not an *intelligible* unity.
• Example of a crowd in a park.
• Compare to a systematic process: ordered by a single principle.
• Compare to a *non-systematic process*: a *process*, a series of events in time. that *exhibits* coincidental aggregates.

[5:05]
• *Both* systematic and nonsystematic processes can be constructed using only classical laws (without statistics).
• Certain additional, concrete insights are assumed in creating such models.
• Rule for Constructing a Non-Systematic Process: begin with a situation in which specified conditions of intelligibility are not fulfilled.
• Randomness for Lonergan is a *relative* term (i.e. random in relation to a certain kind of intelligible pattern or order).
• The proper meaning of [*relative*] randomness in neo-Darwinian evolution.

[11:00]
• Example coincidental aggregates & nonsystematic processes: Gas Molecules.
  – In the static state, the coincidental aggregate of molecules is all in one spatial region (unified by space) but lacks a corresponding intelligible unity. Set in motion, a non-systematic process is a series of events unfolding in the same region of space and time.
  – The motion of *each* molecule is in accord with the same set of classical correlations (i.e., the "laws" of conservation of momentum and energy) as every other molecule, but the spatio-temporal series of *all* the events lacks a corresponding intelligible unity.

• Student question about the apparent patterns evident in the slower and faster molecules.
  – Discussion of the probability at work (Maxwell-Boltzmann distribution and temperature/speed correlation). The *kind* of pattern is the intelligibility of *probability*, not the intelligibility of a systematic process. Also of the ideal frequency versus the nonsystematic variations with respect to the curve.

[17:30]
• Example of nonsystematic process from biology: predator and prey model.

[19:40]
• Student question: Although Lonergan is arguing against a *hard* determinism, there still seems to be an element of determinism insofar as classical laws of one level set the parameters for the next level, and exclude what is impossible.
  - Classical laws by themselves tell us what is can happen, but not what does happen. Classical laws remarkably open to variations.
  - That each individual event in a population is subject to classical correlations does not imply that the whole aggregate of events conforms to a *systematic* unity.
  - Discussion of higher emergences and higher integrations, including human freedom, which arise from nonsystematic processes.

[26:38]
• Student question: How does Lonergan define a process? How to know when can tell whether or not an observed process is systematic or not?
  - Definitions of process, systematic process, and nonsystematic process, and the statistical parameters that are uses to identify systematic vs. random influences.

[30:33]
• Example of coincidental manifold and systematic process drawn from computer animation: Battle scene from *Lord of the Rings*.

[32:38]
• Relevance of nonsystematic processes to Lonergan's overall metaphysics; implications of restoring the open-ended character of science. "Hope depends on probabilities, not necessities."

[34:20]
• Student question about whether a systematic process can coordinate several nonsystematic ones.
  – Discussion of the emergence of higher integrations, and how the processes it supervenes upon must be nonsystematic.

[35:48]
• Mendel's Statistics of Peas.
• Intelligibility of nonsystematic processes expressed in probabilities
• Nonsystematic Divergences: Nonsystematic deviations from the ideal frequency.
• Example from astronomy: Hubble's Law galactic expansion in the universe.
• Example from meteorology: variation of actual temperatures from the average.
• Classical laws powerless to predict nonsystematic variations from the ideal.

[46:03]
• Scissors metaphor used to describe the methods of seeking probability insights.
• Need for upper-blade theoretical knowledge of kinds of distribution patterns.

[49:51]
• Introduction to Chapter 3.
• The Six Canons of Empirical Method

• §1. The Canon of Selection – the canon of making science empirical.
• Demonstration using an optical illusion.
• We *structure* experience. Images shift.
• How insight even influences sensible data.

[56:30]
• Student question about verifying insights immediately, and conversely, over time.
– What confirms an insight is not empirical contact, as the positivists would claim, but the asking and answering process.
• Additional example demonstrating the effect of prior insights upon our subsequent ways of seeing.

[1:00:45]
• Student question about certain types of anticipation interfering with observation.
– Discussion of the impossibility of pure ("empty headed") observation, and the resulting need for a sophisticated and tutored (i.e., informed by insight) form of observation.

[1:05:32]
•Intellectual Patterning of Observation. *"Selective Alertness"*.
•Example of recognizing rings around Saturn.

[1:07:40]
• Student question about a hypothetical person unable to see a given pattern.
– Discussion of how various observation skills are influenced by one's context and community of inquiry.

[1:10:25]
• Lonergan complexifies what it means to do *empirical* science.
• However complicated and mediated the data, there remains empirical givenness.
• Lonergan as rigorously empirical, more so than the empiricism itself.
• Data of Sensation and Data of Consciousness.

[1: 15:36]
• §2. Second Canon: Canon of Operations
• What is the point to experimentation?
• Not only verification of hypotheses, but moreso the objective of experimentation is the growth of understanding – insight added to insight.
• Exemplifies the self-correcting aspect of the scientific method.
• Experiments lead to transformed experience that leads to new questions.

[1:16:25]
• §§3&4. Canons of Parsimony & Relevance
• Stresses the immanent intelligibility of sense data, relations of things to each other.
• Science not about efficient or material causes. About a formal causes in a new, sophisticated sense. Explanatory, not experiential, conjugates.

- §5. Canon of Complete Explanation:
  No exemptions for space and time,
  No primary vs. secondary qualities,
  No independent variables.

End of Part I.