Clarification by Contrasts:

I. Aristotle and Emergent Probability
   1. Key features
      1. Necessary: what always happens – namely the heavens
         1. thinks of classical laws as concrete and not abstract.
      2. Contingent: what usually happens – earth
         1. recognized coincidental interventions of causes that disrupt.
            1. This forms a diverging series of coincidental causes. Thus, there is a coincidental residue (which, if he had broken through to probability, he would have then recognized this residue as a statistical residue).
   2. World View: the regularity of the contingent is caused by the necessity of the heavenly. He argues this from the seasonal variations, which happen for the most part, and are linked to celestial patterns. From this, Aristotle proposes the eternal heavens, the eternal earth, and the eternal cyclical recurrences.
   3. In contrast:
      1. Classical laws: concrete vs. abstract
      2. Eternal cycles vs. emergent probability
         1. regularity is explained by emergent probability, both in heavens and on earth.

II. Galileo and Emergent Probability
   1. Key Features
      1. Primary qualities: what is truly real, the mathematically imagined reality.
         1. Thinks classical laws are concrete, not abstract.
            1. Classical laws completely govern the concrete schemes of recurrence, and thus these concrete situations are necessary, mechanical.
         2. Statistical probabilities are simply used because of ignorance of the classical laws, that if known, would complete explain the concrete situation.
      2. Secondary qualities: what only appears, the descriptive qualities.
   2. World View: Mechanical view of the universe
      1. All imaginable parts are systematically related to all others.
      2. Dominant view up until the 20th century.
   3. In Contrast:
      1. Quantum mechanics has challenged this, but not on the same grounds as Lonergan challenges it.
      2. Classical laws are enriching, but abstract
      3. A systematic unification of all classical laws would still be abstract.
         1. Therefore, a systematic unification would not result in a unified view of this actually existing universe, but only of its possibilities.
         2. Further determinations still would be needed to apply the abstract laws, and these determinations are non-systematically related.
         3. Thus, one there is a place for statistical probability that complements the classical laws.
         4. Regularities are not from laws alone but from the combination of laws with suitable circumstances.
         5. Even machines follow this – they are not necessary.

III. Darwin
   1. Key features
      1. Employs probability but without clarity of its methodological structure.
      2. It explains why species differ, why they are found in spatio-temporal differences, why

the numbers of each species might increase, remain constant, or decrease.
3. It is an intelligibility immanent in data, but it is radically different than the classical type.
4. Chance variation = the chance of a non-systematic event causing a new species to emerge. Hence, this is an instance of the probability of emergence.
5. Natural Selection = The animal or plant is a limit range of a flexible circle of schemes that are related to larger sets of schemes in this universe. It thus can survive within ranges of variations in temperature and pressure, water and air, sunlight and soil, floating populations of other plants or animals (a range of ecosystem parameters). Thus, an chance variation that increases or changes its ability to operate in new sets of parameters is the meaning of natural selection.
2. World View
1. That species arises in accord with successive schedules of probabilities.
2. Quite variable, because it incorporates real change
3. In contrast
1. Lonergan is focusing on schemes of recurrence at this point, not on things. Hence, emergent probability affirms a conditioned series of schemes of recurrent that are realized in accord with successive schedules of probabilities.
2. For Darwin, he is involved in a problem that cannot be resolved here, until Lonergan has dealt with the notion of thing.

IV. Indeterminism
1. Key Features
1. Real – not primary qualities, but microscopic and random
2. Apparent – not secondary qualities, but macroscopic which seem to verify classical laws.
1. Why? Haziness of the data. Classical laws are not verifiable because the data is never precise enough.
2. Classical laws are concrete (hence agrees with Galileo), but are not real, because for them to be real, they would have to precisely match the data.
3. Rids the imaginative synthesis presumed in mechanism and replaces it with symbolic constructs.
2. World View: Chaos
3. In contrast:
1. If classical laws are enriching but abstract, then such laws are verified not by being exact but by convergence. Concepts are determinate, not data.
2. The possibility of divergence points not to verifiability, but revisability. The possibility of new concepts, new techniques for measure results in the data always being hazy.
3. Chaos overlooks possibility of discover of the systematic which emerges from the non-systematic.