

## Lonergan and the Philosophy of the Lower Sciences

By lower sciences I mean the fields of inquiry associated with the main areas, physics and chemistry.<sup>1</sup> The middle sciences of botany and zoology require their own Website. Mathematics is, of course, included here: its relational structures, its implicit acknowledgment of the fundamental distinction between primary relations and secondary determinations, and its central place in the verifiable geometries of physics give it a central place. Obviously, all this is relevant to the higher sciences: but it is best to work within the distinction of natural and human science if we are to make serious progress in advancing either. Nonetheless, it would seem important, in maintaining a full metaphysical stance, to occasionally advert to the relevance of the lower and middle sciences to higher structures: the “study of the organism” is a common calling of the flower in the crannied wall and of the flowering of the organic body of Christ.<sup>2</sup>

A Website on the methodology of physics (and chemistry) should separate clearly different task, even if the full activity of functional specialization is not immediately implementable.<sup>3</sup> So,

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<sup>1</sup>The Website interest is in physics, and the focus here will be on physics, but it should be quite evident, from Quantum Mechanics, that the overlap with chemistry is significant. Moreover, a serious struggle with the operative notion of chemical things (year-long even, in my own experience, if you have had no previous grappling with that topic) is obviously relevant to coming to grips with the things of physics.

<sup>2</sup>The primary reference here is to the page is to p.464[489] of *Insight*. Were I to summarize Lonergan’s methodological challenge I would do so in terms of two terrifying pages: this page of *Insight* and p.250 of *Method in Theology*. There is of course the terrifying paragraph of the middle of p. 278 of *Method in Theology*, with its “one can go on” that recalls the terrifying page of *Insight*. There is also here a relevant reference to the symbolic poem of Tennyson quoted in the note on p. 31 of *For a New Political Economy*. On the more complex issue of organic systematics, see the Appendix, below.

<sup>3</sup>The hodic division of labour will eventually be present in all disciplines. It is worth bearing in mind that this Website, and the process of collaboration to be associated with it, are interim strategies in the midst of a cultural decay. The drive is to get beyond the axial

at least two distinct interests must be distinguished and, I would suggest, one other attractive interest excluded.

The two distinct interests are in (a) the struggle to shift Lonergan's doctrinal presentation of the challenge into a personal achievement, (b) the effort to implement generalized empirical method in the fields of science. The interest, (c), that, I would hope, would not be included, is an interest to do comparative doctrinal work: Lonergan and Whitehead, Lonergan and Heisenberg, Lonergan and Kuhn, Lonergan and Lakatos, whatever.

First, why the exclusion of (c)? A few scattered reasons may help towards an answer. The most general reason is that attempts at (c) without the backing of a serious development of both (a) and (b) would tend to be both doctrinaire and isolationist. It is important to pause over the meaning of this general perspective. There is, at present, little or no respect for Lonergan's work in the philosophy of science outside the school associated with his name. A reason for that absence of respect is the absence of informed dialogue with the ongoing problematic genesis of science and its methods.<sup>4</sup> That dialogue in its first instance is inner: that is the entire significance of generalized empirical method as precisely described by Lonergan.<sup>5</sup> We have, at the turn of the millennium, little sense of the profound cultural change hidden in this description. It calls for a

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fragmentation in a manner which I have regularly described as analogous to the Irish strike against the Empire in 1916. In the post-axial period creative philosophy of physics will be the work of physicists.

<sup>4</sup>It should be noted, however, that uninformed efforts at dialogue with science and its methods characterize a great deal of present philosophy of science. This, of course, is another reason for not getting tangled up in debates about science that good serious scientists find tedious and irrelevant.

<sup>5</sup>"Generalized empirical method operates on a combination of both the data of sense and the data of consciousness: it does not treat of objects without taking into account the corresponding operations of the subject; it does not treat of the subject's operations without taking account the corresponding objects". *A Third Collection*, Paulist Press, 1985, p.141.

massive shift in education, from well before pre-school to long after post-doctorate. It calls for the mutual mediation of the efforts involved in (a) and (b).

What of philosophy of science as currently practiced? Here we move to the second major reason why comparative work is not the key way to go at present. The key way to go is the Hodic way.<sup>6</sup> This is Lonergan's great achievement in methodology, quite beyond his rediscovery of Aristotle's strategy of self-investigation. It meets the emergent crisis of fragmentation in all areas of inquiry.<sup>7</sup> Within that way, comparative work must submit to the strategy described on p.250 of *Method in Theology*. Initiating that strategy will not be easy: but if a thing is worth doing, it is worth doing badly. In so far as it is attempted it will give a lead to, and hopefully merge with, movements out of present fragmentation through what I might call accidental hodic operations or aspirations.

These two reasons link sets of minor reasons for avoiding simple comparative studies, some of which would involve discomfiting recollection (anticipating a slice of the operation of p.250 of *Method in Theology*) of the past thirty years of rambling Lonerganism. There seems little point in entering into that sad tale here. With luck, Lonerganism will fade and the academy and culture will be teased, cajoled, into the hodic way which makes generalized empirical method a more probable emergence in this millennium.

Let us return then to the suggestion that (a) and (b) are the way to go, and to the problem that this poses to the interested Website community.

Obviously, this interested community will include some, perhaps, many, who lack competence in science. I suspect that time, talent and present tasks may exclude the personal

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<sup>6</sup>I have been using the word "hodic", meaning functional specialist, for some time now, with its reference to the linguistic root of "method" and to the hod-carrier Tim Finnegan of the song: "to rise in the world he carried a hod".

<sup>7</sup>This was the point of my Florida (1970) Conference paper, "Metamusic and Self-Meaning", later published as chapter two of *The Shaping of the Foundations* (UPA, 1976).

climb into science for most such: but please do not give up too easily. There is, for example, the challenge of Lonergan's economics. That theoretic achievement promises to blossom slowly into a democratic commonsense. A little theoretic effort on the part of those who take him seriously would help towards modifying that slowness. But also, I would see this Website as promoting a shift of consciousness towards the theoretic in those open to the adventure. This would be an adventuring in sharing: those with some glimpse of generalized empirical method and who have some achievement of the relevant "identification"<sup>8</sup>, could lead willing climbers upwards. I think, for instance of the two fundamental insights of the calculus so evidently excluded in present textbook presentations. In so far as these are identified and shared, with the relevant psychic tonality, large areas of present mathematics and physics open up, even to relative beginners.<sup>9</sup>

But there are the many of us who were educated in philosophy and theology in a literary mode and context who may not be up to sharing such adventure. Then the task becomes an encouragement in the next generation of what Fred Lawrence calls "sufficiently cultured consciousness". Such an encouragement is greatly helped, in ourselves and in the next generation, by a linguistically-manifest aggreformic metaphysics.<sup>10</sup>

So: (a) calls for internetting that relates to a learning in the lower sciences that is toned up to

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<sup>8</sup>See *Insight*, Chapter 17, section 2.5.

<sup>9</sup>A task related to the interest (a) that should be an immediate focus is to bring out, in an undergraduate fashion, the elements regarding physics that are touched on in *Insight*. I think here both of details regarding mathematical abstraction, the significance of invariance, a broader view of energy and *potentia*, a precision regarding motion and *act*, (note 11 of chapter one of Lonergan, *Phenomenology and Logic*, University of Toronto Press, 2001, gives a lengthy unpublished reflection of Lonergan on Aristotle's failure here), etc, and of broader issues like the isomorphism of levels of consciousness with the verification of theories in instances. A further elementary task is to reach for an integral perspective on the two sets of canons of inquiry that would sublimate the work of Kuhn, Lakatos, etc.

<sup>10</sup>Pointers towards this reorientation are given in McShane, *A Brief History of Tongue*, Axial Press, 1998, Chapter four.

identification and generalized empirical method. Are there those “out there” who are interested in the new strategy of teaching? Are there those who are interested in a personal transition to the new theoretic that is meta-luminous?

We can turn now to (b) and immediately note that there is no discontinuity between the effort involved here and the effort involved in (a). Why is this? The answer helps to bring us to a more precise notion of the function of a Website connection.

It is because the project is novel, in spite of the fact that generalized empirical method was the character of Aristotle’s thinking and Aquinas’ theology. It is novel because of the cultural shift that invites hodic selves-control within a linguistic turn that seeks to entwine creatively content, method and expression.<sup>11</sup> The footnoting indicates that this is a large historic task of lifting forward the word “task” and its context on p. 48 of *Method in Theology*.

This task makes us all beginners, repentant<sup>12</sup> beginners, merging (a) and (b).

Since this is a brief and hopeful manifesto, I cannot enter into all the facets of that beginning. For instance, the conversion<sup>13</sup> to extreme realism that is the central invitation of Lonergan’s

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<sup>11</sup>The primary reference here is *Method in Theology*, p.88, note 34, which points us to a transposition of the sentence “Let us now revert to the relations between language and mental acts”(ibid, p.260). The “now” is an axial period effort to epiphanize the parts of speech buried under Panini’s and Western grammars. On the millennia-long axial period, see chapter one of the reference in the previous footnote.

<sup>12</sup>*Insight*, p.700[722] gives the context.

<sup>13</sup>As I note elsewhere (*Process*, 1990, chapter 4: the book is available on Website ‘McShanepj’ free of charge) I do not like the use of the word “conversion”, and now regularly replace the pair “conversion” and “differentiation” with the pair “displacement” and “transformation”. I cannot enter here into my reasons for the change: but note that (a) “displacement” covers perversion, reversion, etc; (b) it displaces religious overtones.

*Insight* is, as a matter of fact, the achievement of a minority of his followers.<sup>14</sup> We must struggle to be clear, honest, subtle, about this. However, the focus here is on *theoretic displacement*, an orientation that Lonergan didn't fuss about because he took for granted that the message was clear from *Insight*. But, in the full context that we are considering "now" the reach is integrally to the theoretic and the metatheoretic. Proverbially put, in the new context, when you teach children geometry you teach children children; when you learn geometry; you learn you; and thus learning geometry is part of the new cultural context. Of course, Lonergan said this already fifty years ago. I am writing of the "natural bridge over which we may advance"<sup>15</sup>.

To comment further here on this natural bridge would be to venture into complexities that belong in the developed dialogue that this Website seeks to initiate. So I hasten to a conclusion with some few discomfoting comments and some practical suggestions.

Methods<sup>16</sup> of twenty-first century physics will be primarily focused on verified and verifiable geometries and the refined dynamics of consciousness and grammar that bring them forth. In a Boston Workshop of the late seventies on "Theology as Public Discourse" Lonergan - who did not conceive of theology as public discourse - was asked how much physics should theologians know. His reply was "Well, they should be able to read Lindsay and Margenau". This, of course, remains true for both philosophers and theologians. Here the issue is How much physics should you know in order to be seriously in the present ballpark? My reply: you should be able to read the following two books: *The Dawning of Gauge Theory* and *Group Structures of*

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<sup>14</sup>What I call *extreme realism* - which leaves Kant as a half-way house - is vital to the emergence of clear physics-talk. Space-time geometry is not "out there": it is to be contained in a complex verified network of invariants, fractals, etc, within an emergent probability theory.

<sup>15</sup>*Insight*, chapter five, paragraph one.

<sup>16</sup>The plural is vitally significant to progress, but quite beyond a brief essay. Perhaps an analogy would help. Methodology is to methods what botany is to flowers.

*Gauge Theory*.<sup>17</sup> To be able to read these, however, requires serious competence both in physics and in contemporary advances in topology and differential geometry.<sup>18</sup> Had you other expectations? After all, this is the clear message of *Insight*: forms are reached through sciences, and the study of the front-line reaching cannot be a priori. Perhaps you might reply that the reaching is sufficient shared by the semi-popular writings of such experts as Hawking, Penrose, Weinberg? I cannot enter here into a critique of these authors' ventures into the world of pop-culture. Suffice it to say that the post-systematic presentations of modern physics laced with both overreach into larger issues and under-reach in self-understanding do not meet the desperate needs of either symbolic or theoretic integration. O'Raifeiraigh writes professionally and expresses an end-of -the-century sophistication of Lonergan's thesis in chapter five of *Insight*.

The present thesis is "that gauge theory, and thus the theory of strong, weak and electromagnetic interactions, is basically a geometrical theory. This is not only aesthetically

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<sup>17</sup>Both books are by Lochlainn O'Raifeiraigh, the first from Princeton University Press, 1997, the second from Cambridge University Press, 1986. Lonergan students might recognize a fruitful parallel between the two books and Lonergan's two volumes on the Trinity: the *Via Analytica* is followed by a *Via Synthetica*. The parallel should lead to reflection on the full 8-fold hodic development of physics. For example, in that full context O'Raifeiraigh's discussion of the pros and cons of grand unification theory (1986, pp. 125-27) is sublated into the fourth functional specialty, and would mediate the new genetic systematics that will be normative in all disciplines. O'Raifeiraigh's 1997 book calls out for and points towards this type of coherent recollective systematics, which sublates, with corrective reversals when necessary, the systems as they emerge historically. One can speak of physics, or theology, as Joseph Schumpeter writes of economic theory: "It is not simply progressive discovery of an objective reality - as is, for example, discovery in the basin of the Congo. Rather it is an incessant struggle with creations of our own and our predecessors' minds". (*History of Economic Analysis*, Oxford University Press, 1954, p.4). Pointers towards a genetic systematics are given in the Appendix.

<sup>18</sup>To get a sense of these advances, and the manner in which they mesh with the study of Lie Groups that are central to present physics, you might find it useful to peruse the final twenty pages of the most recent *Encyclopedia Britannica* on *Geometry*. But the point of entry is, of course, a grounding in group theory.

pleasing but brings the unification of weak, electromagnetic and strong interactions with gravitation a step closer".(O'R, 1986, p.82). More technically, in the *via analytica*, the vector fields - gravitational, electromagnetic, weak, gluon - emerge within a unity-seeking geometric perspective as mathematical *connections*. "For metrical geometry the connections are just the well-known Christoffel symbols and are secondary to the metric tensor from which they are derived, but for more general geometries the connections are the fundamental entities."(O'R, 1997, p.5) Future methodological reflection, of course, should carry the community forward to luminosity regarding the meaning of "entities", to operative distinctions between primary and secondary relational determinations, to the exclusion of hidden assumptions regarding space-time being anything other than the conjugation of beings.<sup>19</sup> More elementarily, it should break forward through clouded terminologies, as illustrated immediately here. "Following a modern fashion, we will use particle, state, and resonance synonymously. By so doing we will neglect the differences between 'state,' which is a general word for an eigenstate with well-defined quantum numbers; 'resonance', which suggests a state decaying by a strong interaction; and 'particle'. This last word suggests the idea of a state with a longer lifetime than that of a resonance, but there is no accepted definition for it"<sup>20</sup>. Can we not push towards a more helpful heuristics of state, resonance, conjugation, coupling, exchange, emission, etc, and more generally towards a critically luminous perspective on the varieties of relevant nouns and significant predicates? This clearly links up with more evident clouded methodological terminology: unhappy phrases such as

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<sup>19</sup>The old "container" image lurks deeply in our consciousness and our languages. We are a long way from a post-axial cosmological imaging of space-time adequate to our origins and destiny such as would ground a rewriting of the final chapter of Thomas' *Contra Gentiles*. The effort should be mediated by the present struggle of physicists to conceive of the geometry and topology of the universe.

<sup>20</sup>David C.Cheng and Gerard K.O'Neill, *Elementary Particle Physics: An Introduction*, Addison-Wesley Publishing Company, London, 1979, p.268.

“clarifying, analyzing, concepts”, “the definition of a concept”, etc. Such cognitional terminology may not warp unduly the serious search of present front-line physics, but it certainly hinders communications, be it on the level of the graduate seminar or on that of high-school texts and teaching.

This brings me to my final point, and a return to the early distinction between (b) and (a), between advanced work and the more elementary struggle. My comments above may have discouraged your (b) aspirations, but the future emergence of a (b) community depends on present (a) efforts, especially in so far as they are directed towards a transformation of classroom behavior. I think, then, that an initial direction of this Website is to determine levels of interest and commitment. There should emerge groups focused on (a), groups focused on (b), and a bridging group mediating cross-fertilization.

While this Website entry may in itself encourage informal collaborations, perhaps it might also lead to explicit webbing? I conclude with two practical suggestion. First, I propose to make physics the center of interest as the 2003 West Dublin Conference, under the title “Functional Specialization: Physics as Elementary Paradigm”. The dates of the conference are August 11- 15, 2003. The second suggestion is that some may wish to set up a more formal structure of communication of interest, background, suggestions re meetings and readings, questions. I cannot see myself handling the coordination involved in this, but there may be some younger physics-person interested in the effort. If all fails, then the second suggestion could be dealt with at the August conference of next year. The conference, of course, would not be just for physicists: its focus would be functional specialist collaboration.

### Appendix: Organic Systematics

The purpose of this short appendix is to invite a flexing of the imagination with regard to future systematic physics. Such inviting is an integral part of the task of the metaphysician.

My own interest in organic systematics came from work in biology, against the background of *Insight* 15, in the early sixties. Indeed, it was my second option for doctorate work: a sublation of the work of Woodger in axiomatic biology. But its broader significance did not escape me: there were abundant clues in the Epilogue of *Insight* and in Lonergan's Latin works. I recall joking with Lonergan at poolside in Regis in the mid-sixties about Dog-matic theology. Still, it wasn't till the late seventies, when I began following up his leads, especially in *De Intellectu et Methodo*<sup>21</sup>, that the massive cultural shift involved became sufficiently clear to astonish me. Most recently I had the advantage of following up parallel clues from Lonergan's Logic: the pursuit of truth in logic is associated with a sequence (analogically organic) of systems refining that pursuit.

While I have tried to draw attention, in these past decades, to the shift involved, there has been little response.<sup>22</sup> My hope here is to bring it to the attention of those interested in the methodology of physics: it will be both a necessary internal development of future physics and an analogue from a "successful science" for theology. So here I note helpful images

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<sup>21</sup>I would note that this work, the lectures on logic, and the related works on "History and System" all belong to Lonergan's creative surge in the late fifties. There is the need both to sublimate then into his later Hodic context and to enrich his tired expression, *Method in Theology*, of that context.

<sup>22</sup>Robert Doran has brought the topic into focus in theology in recent years (1998-2000) of *Theological Studies*. See also *Method*, 2000.

The primary helpful image is one's own struggle in life towards a present coherence that carries forward, genetically ordered, the potential of ones past.. The four images I touch on here should help give a fullness to that task: images from biology, theology, physics, tennis.

(a) The images from biology, of course, can lead one right up to the remote complexity of *Insight's* treatment of development, but try to struggle with the topic at the level of description. The acorn and the tadpole are both 'working systems', as are the oak and the frog. An elementary text could help you to glimpse the development gap, the need for types of intermediate systems.

(b) More familiar to you, perhaps, are systems in philosophy and theology: though here the development question becomes problematic. However, that very problem helps us along towards thinking of how one gets from story, or history, to system, where now you are thinking, I hope, of system as a system of systems: that is the key jump. And the central point in the problematic is to note that the sequence of real systems - in philosophy, in theology, even in sciences - are not related genetically. To get a genetic sequence you have to envisage "twisting"<sup>23</sup> flawed systems as best you can (the 'you', of course, is a global hodic community). What, for instance, is genuinely progressive about the semi-system of Irenaeus, or Tertullian, or Damascene, or Descartes, or Hegel? (You get a sense here of the massive task of p. 250 of *Method in Theology*?) The image sought here is an image of a genetic systematics, say in theology, of which Thomas Aquinas system is one 'slice', one transition stage.

(c) Can you envisage this in physics? A critically established systematics that would include the best of past struggles that would give the global community the humblest best context for progress? But this envisagement is the centrepiece of our heuristic work on physics: you will need to draw on the work e.g. of O'Rai fertaigh to reach towards it, and help it forward through (d).

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<sup>23</sup>This, of course, is an image of the 'reversing counter positions' of *De Intellectu et Methodo* and of *Method in Theology*.

(d) Finally, there is the pedagogically-challenging image of genetic system in tennis. It is a challenge because, if you pause over the notion, you may well find that you have no image, or perhaps you think of changes in tennis rules and techniques over the past century. But the image I wish you to grapple with - leading back to a fruitful approach to (c) - is the image of a 'growing' tennis player: Martina Navratilova, Martina Hingis, some familiar top-player. I recall Navratilova saying, in an interview after her retirement, that she was a much better player 'now', but her body wasn't up to it. What might she have meant?

An enormous question, of course, bringing to mind for you again the heuristic reaching regarding harmonious development in *Insight* ch.15, but now within the broader collaborative structure of coaching, physiology, etc that is a slim analogue for hodic collaboration. But your initial effort should be directed towards some molecule-minding appreciation of, say, the poise of Hingis before serves in the present(June, 2000) Wimbledon. Has she not struggled, with a range of helpers, to incarnate a revised version of her past returns of serve? This is a lead image for a post-Proustian post-axial Remembrance of Things Past that would be the seventh functional specialty, in physics as in theology, which might better be called Pragmatics.

**Philip McShane, Summer 2001.**