

An Analysis of Present Methods of Research in Curiosity

INTRODUCTION

This brief review of some methodological issues in social science research will raise some points that researchers might consider in their attempts to understand human curiosity. This review results from a recent reading of three articles written over the past 3 decades in which the authors have attempted to understand; 1) the nature of curiosity and 2) the psychology that contextualizes curiosity. The three articles are “The Psychology of Curiosity: A Review and Interpretation” (1994) by George Loewenstein,¹ “Curiosity and the pleasures of learning: Wanting and liking new information” (2005) by Jordan Litman² and “Curiosity, Information Gaps, and the Utility of Knowledge” (2013) by Russell Golman and George Loewenstein.³ These three articles reveal common features and questions concerning methodological premises and presuppositions. First, do their experiments actually focus on the experience/data of curiosity or something else? Secondly, the authors hold with the notion that objectivity is a subdivision of ‘the already out there now’⁴ and thirdly, there is an inconsistency in their own ability as scientists to understand the data of their experiments and their ability to understand their own experience of curiosity. These observations and questions raise the issue of objectivity in scientific knowing and human knowing. This brief essay will attempt to offer brief accounts of objectivity and evolution that can assist in overcoming these difficulties of scientific procedure.

WHAT IS THE DATA OF CURIOSITY?

The first issue is that of data.⁵ What is the data of curiosity? Researchers in this area set up experiments to provide data for further analysis in an attempt to understand; the origins of

curiosity, the function of curiosity, the measuring of curiosity⁶ and the psychology contextualizing curiosity.⁷ A first question; are the statements made by test subjects, data on curiosity? They are verbal statements expressed by the test subjects attempting to describe particular experiences or responses to questions. Are these descriptions of experiences, that the test subjects provide, experiences of human curiosity? How adequate are test subjects in description? How can a researcher determine the adequacy of a test subject's ability to describe?⁸ These are just some of the questions that raise issues about the objective reliability of statements made by test subjects.

Loewenstein's 1994 article provides a brief history of the various research projects that have been carried out on curiosity since the 1950s up to the date of his own article. An example from one of the research experiments will serve as a beginning of providing an answer to the first statement in the Introduction regarding the data of curiosity. Loewenstein (Loewenstein, 1994, 78) describes an experiment carried out with 300 secondary school students in Australia (Boyle 1989). Boyle carried out a factor analysis of two curiosity scales, the Melbourne Curiosity Inventory (MCI) and the State Epistemic Curiosity Scales (SECS) and he concluded that negatively worded items tend to load together in a common factor that is independent of positively worded items. Forty items were offered to the students of which half were negatively worded and half were positively worded. A range of answers were provided to choose from; *I feel absorbed in things I do to I am not interested in what I am doing*. Loewenstein concludes that the negatively worded items express boredom, which is largely independent of curiosity. Furthermore, Loewenstein states of Boyle's and Day's work (Day,1971)⁹ that behaviours have been included under the heading of curiosity when in fact the statements point more to psychological states of the students and relate more to stimulus seeking rather than the actual

experience of curiosity. Interestingly, the researchers are aware that the results do not provide insights into what curiosity is but fail to go further and advert to the question; if these statements are not an experience of curiosity, what would constitute an experience of curiosity?

It is not to be concluded by the above analysis, that the psychological context of curiosity should not be studied. Can we understand the psychological context of curiosity if we do not yet understand curiosity itself? There is a need to distinguish between what is curiosity and what is psychological, in order to adequately understand what curiosity's psychological context is. If researchers do not understand what curiosity is, how can it be related to its psychological context or vice versa? The experiments that have been carried out over the past half a century tend to focus on the psychological side but in some cases purport to be attempting to understand curiosity. Science is the procedure of determining the functions and relations between two things, two experiences or two processes. If we have not adverted to the actual datum of one of those things, how can research determine the functions and relations when the data on curiosity and the understanding of curiosity is lacking? We shall return to this discussion after some comments on animal experiments.

Animal experiments provide observations of an animal's behaviour and one can hypothesize about the animal's motivations. Do animals have motivations beyond the instinct of survival? Behaviourism, when supported by positivism, leads to conjecture, or a hypothesis which has yet to be verified. Obviously, some animals have evolved with different states of consciousness. As some animals play, others do not. Some are trainable and others are not. However, the more basic question is; are these hypothesis based on observed behaviour regarding what researchers call animal curiosity, empirical in terms of the animal's consciousness? In other words, can this form of research verify any of these hypotheses? Therefore, studies by Butler (Butler, 1957) and

Hebb (Hebb 1958) revealed that monkeys locked in a cage tended to go to a particular window that opened to allow the monkey to see outside the cage. An opposite window would not open to permit a view. It was concluded that the monkeys required visual stimulation motivating them to move to the window that opened. Perhaps, but how can one verify that conclusion? Both of the examples cited raise the issue of objectivity and verification in science.¹⁰

There are numerous similar examples of experiments described in Loewenstein's 1994 article in the search to understand curiosity and in his follow up article of 2013 (Loewenstein, 2013). Litman's article focusses on pleasures in learning. All three articles lack an advertence to the conscious cognitive act of curiosity, which, as stated earlier, compromises any statements on the psychology contextualizing curiosity.

A further issue regards the scientist's trust and ability to understand data. Researchers gather statements and observations from others and trust their own scientific ability to understand correctly this data. How is it that researchers do not trust their own ability to understand their own experience of curiosity? So, a researcher in the field of curiosity might reflect on one's own performance and ask; why am I curious about human curiosity? More specifically, what is going on in me when I am curious about curiosity? Adverting to these two questions can provide the motivation-a psychological context perhaps- and the actual data of curiosity. If a researcher trusts their ability to understand the data of sense, such as statements made by test subjects, can the same researcher not also trust their own ability to understand their own experience of curiosity? It is through the process of awareness of the researcher's own experience of curiosity that scientific knowledge is then empirical. Again, this raises the question of objectivity.

OBJECTIVITY

What is objectivity? The following quotation offers a position.

If objectivity is a matter of elementary extroversion, then the objective interpreter has to have more to look at than spatially ordered marks on paper; not only the marks but also the meanings have to be 'out there'; and the difference between an objective interpreter and one that is merely subjective is that the objective interpreter observes simply the meanings that are obviously 'out there,' while the merely subjective interpreter 'reads' his own ideas 'into' statements that obviously possess quite a different meaning. But the plain fact is that there is nothing 'out there' except spatially ordered marks; to appeal to dictionaries and to grammars, to linguistic and stylistic studies, is to appeal to more marks. The proximate source of the whole experiential component in the meaning of both objective and subjective interpreters lies in their own experience; the proximate source of the whole intellectual component lies in their own insights; the proximate source of the whole reflective component lies in their own critical reflection. If the criterion of objectivity is the 'obviously out there,' then there is no objective interpretation whatever; there is only gazing at ordered marks, and the only order is spatial.¹¹

What applies to visual marks applies to all data of sense. In a definition, objectivity is reached in judgment once one has asked and answered all the relevant questions pertaining to a particular problem. In other words, a correctly understood experience, which is achievable by attention to data, raising a question, achieving an insight, formulating that insight into a judgment and verifying that original insight.¹² There are two question types operative in theoretical research; the 'What' question and the 'Is' question. The 'What' question seeks an insight, and in terms of science, an insight that provides an explanatory account of a datum. The 'Is' question seeks verification of that insight. Curiosity focuses attention of consciousness not just on an experience that is unknown but also on an effort to understand. Questions are a formulation of curiosity. Objectivity is the result of authentic subjectivity, asking and answering all the relevant questions. One can correctly understand both the data of sense and the data of consciousness if one asks and answers all the relevant questions pertaining to a particular datum.¹³ Behaviourism and naïve

realism dominate the three articles referred to in this essay blocking the researcher from a full empirical awareness of the data of curiosity.

ORIGINS OF CURIOSITY

What are the causes or origins of curiosity? One can quote Aristotle's statement that "all men desire to know"¹⁴ but this statement is not empirical unless one has first reflected on one's own performance and attempted to understand just what this desire is. In other words, what is its function, how is curiosity related to the other cognitive operations?¹⁵ To understand the origins of curiosity a view of evolution is also required, or what I prefer to call, emergent probability.¹⁶ The universe has been evolving towards more complex chemical, biochemical, botanical, biological, psychological and conscious structures for a few billion years. The emergence of more complex schemes of recurrence is intelligible only to an intellect that has the potential through the cognitional acts to discover what those intelligibilities are. Curiosity is not only intelligible, but also intelligent. Therefore, we have, through evolution, the emergence of an act of intelligence we have named curiosity, that initiates a potential capacity and a heuristic structure that has the ability to discover and understand the intelligibilities in any data.¹⁷

Why does our knowledge begin with presentations, mount to inquiry, understanding, and formulation, to end with critical reflection and judgment? It is because the proportionate object of our knowing is constituted by combining different types of intelligibility. Insofar as that object is only potentially intelligible, it is to be known by mere experience; insofar as it is formally intelligible, it is to be known inasmuch as we are understanding; insofar as it is actually intelligible, it is to be known inasmuch as we posit the virtually unconditioned.¹⁸

Obviously, different people will experience different experiences contextualizing their curiosity. Some people experience anxiety when unable to understand. Others do not. They keep at it. I use puzzles in my classroom lectures asking the students two questions; 1) what is the solution to the puzzle, and 2) what is going on in you while trying to solve the puzzle. The students experience

different psychological moods when doing so. While the first question is designed to get the student into their puzzling mode, which usually occurs spontaneously, the second question is designed to initiate their own reflection on their own performance while solving the puzzle. I prolong the process and this is when some students experience anxiety.

A puzzle I often use is an alphabet puzzle.

A E F H I K L MN.....
B C D G J O

Why are some letters on top and some on the bottom? Secondly, what is going on in you while attempting to solve this puzzle?

If this puzzle is already known by the reader, a second puzzle follows.

O T T F F S S E

What do the letters signify? Can you extend the series? Secondly, what is going on in you while attempting to answer the first two questions?

The exercises offer an opportunity for the reader to pause and advert, consciously, to their own experience and establish some account of the intellectual operations that occur with specific emphasis on differentiating between the data of sense and the data of consciousness. We might here recall Bernard Lonergan's earlier quotation in this article on objectivity, that these letters in these puzzles are spatially order marks. There is no meaning in the letters. There are patterns that are discoverable by your own human intellectual operations. This is no easy task as our parenting, education, and culture promote unquestioningly nominalism and positivism, neglecting unintentionally our inner performance which solidifies psychologically and intellectually, a common sense notion of reality¹⁹ and objectivity.

Attempts to measure²⁰ curiosity and understand the psychology²¹ contextualizing curiosity without understanding what curiosity is can lead the researcher into the notion that what is presently occurring regarding curiosity is normative.²² Until research is able to provide an explanatory account²³ of curiosity, a view of normativity will be difficult to establish. One can describe one's degree of curiosity about a topic but not in the same manner, that one would measure some object as a datum of sense. There is no color, size, shape, or weight to human curiosity. It is a dynamic expression of the human desire to understand that begins at an early age and too often fades through parenting schemes, education methods and general cultural ignorance of its central role in human growth and development.

A reflection on the child's experience may help here. Children begin to ask what and why questions shortly after learning some language.²⁴ However, their emerging curiosity is expressed earlier in their wanderings and reachings for things, such as cookies, which is often accompanied by a verbal sound. Language emerges through the quested desire to express our inner world and word.²⁵ Parents do not have to send their children off to school to teach them to ask questions nor do they have to introduce the child to this conscious act. Children do it naturally. Curiosity is a manifestation of a new scheme of recurrence that has emerged through emergent probability.²⁶ The desire to understand our sense experience is a natural dynamic that orientates us within our environment. Children are asking questions about everything and anything as a way of relating to their environment. Emergent probability (evolution) brings forth botanical and zoological beings that are solutions to surviving in particular environments. Humans are also equipped to survive in an environment, the difference being that we, by asking questions, can come to some degree of understanding of our environment. The dynamic heuristic of "making sense" of our experiences is normatively, experience, question, insight, judgment and decision.²⁷ That capacity

becomes a responsibility in terms of the fact that we can initiate changes, or as Scranton has stated, leave a footprint that can be progressive or catastrophic,²⁸ depending on our scientific understanding and our motivations.²⁹

Curiosity is also an integral³⁰ act in as much as it draws on former insights in order to aid in the desire for a new insight. Curiosity is also unrestricted.³¹ One can ask a question about anything and children usually do. One's curiosity tends to focus as one ages but the unrestricted range remains so one can shift quickly to living in a particular environment, whether it be the common sense of daily living, meeting biological needs, aesthetic needs or the quested focus of the laboratory to explain phenomena. My conclusions expressed in this essay regarding the nature of curiosity result from my own reflection on my own experience of curiosity when I was engaged in understanding anything and more specifically in this case, in attempting to understand the print of the three essays referred to in this essay.

DISCUSSION

Many of the interpretations of curiosity and the psychology contextualizing curiosity resulting from the experiments outlined in the three articles and others could be verified and built upon through a reflection on one's performance of one's interior acts while researching. This procedure would provide the proper data for the study of human curiosity and help in distinguishing between what is curiosity, and what is psychological. It would also assist in understanding animal behaviour if contextualized by an understanding of emergent probability.³² Such a procedure of including the cognitional acts occurring in consciousness as data and as the structure for understanding anything lays the groundwork for a Generalized Empirical Method³³ and a more systematized ordering of content of the particular experiment as it progresses.³⁴ The

implementation of Generalized Empirical Method into the sciences is a task that will require a further division of labour in the scientific endeavour.³⁵ This division is one of functional specialization where the divisions of labour correspond to the mental operations. In doing so, it further orders the content of an entire science in a manner that increases the possibility of cumulative and progressive results.³⁶ Further elaboration is beyond this essay. I refer the reader to Footnote 34 for readings and research on Functional Specialization.

CONCLUSION

The suggestions offered in this brief essay, if self-appropriated as context of the researcher researching, would open up the opportunity to understand curiosity in a way that would find extensive ramifications for psychology, philosophy, parenting and education. An understanding and affirmation of curiosity expressed in a question as not only intelligible, but also intelligent, distinguishing it from sensitive experience, has profound implications for the cultivation of the human subject and pedagogical methods of education.³⁷ Over the past 35 years I have taught courses in philosophy, child education, medical ethics, peace and conflict studies, child studies and more and this approach has been beneficial not only for those students who engaged themselves, but also in my own research in terms of its efficacy.³⁸ I have chosen three articles as examples of the points addressed in this essay and by no means am I implying that they are the only researchers holding such positions.³⁹ The common sense notion of reality and objectivity pervades science in general but that context is much more detrimental to the social than the natural sciences. I would encourage researchers in the social sciences to engage in reflection on their own performance⁴⁰ in overcoming the bias of positivism that we all inherited as children of a Global culture and historical period⁴¹ that mistakes the extroversion of consciousness as the real and looking as knowing.⁴²

Lowenstein's comment about requiring a construct is valid.⁴³ Within his statement there is a question: what would the construct be? I have hinted at such a construct here and elsewhere⁴⁴ in directing the researcher or reader of this essay to reflect on their own performance while attempting to understand data, or puzzles. Once the researcher distinguishes between the data of sense and the data of consciousness and become more at home with the empirical nature of the mental operations, one can begin to work out the relations between the different operations and overcome the common sense notion of sensate realism. This procedure follows explanatory science in its method of understanding the relations between things and eventually one has not only a cognitional theory but will also be able to establish a position on objectivity, knowledge and reality that takes the researcher beyond the common sense realm. Such a development transforms not just the researcher, but the researcher's approach to science. The needed construct is one of reflection on one's inner performance when involved with any scientific procedure.

Knowledge is a composite of operations that occur in consciousness, so only in correctly understanding experiences (data) through these operations are we able to formulate the foundations of an adequate methodical human science. Because there is an unquestioned premise about what 'reality' is, "a subdivision of the already out there now"⁴⁵, the scientist finds it unintelligent to even consider the task.

This article raises many points that were not expanded on due to the restrictions of an essay. If, through the researcher's personal reflection on his or her own performance while researching, a refinement and distinction is recognized and acknowledged between the data of sense and the data of consciousness, one might become 'curious' to follow up on some of the references listed in the footnotes or take up the task of solving the puzzles presented in this essay and discover that the operations of cognition are acts of intelligence and the corresponding intelligibilities are

the content of our conscious operations. It would be very difficult, once such distinctions have been accomplished, to not import such a development in one's own scientific understanding into the research methodology of the contemporary sciences.

ENDNOTES

¹ George Loewenstein, *Psychological Bulletin*, 1994. Volume 116, No. 1, 75-98.

² Jordan Litman, *Psychology Press*, 2005, 19 (6), 793-814.

³ R. Golman & G. Loewenstein, 2013, 1- 27 online at

https://www.cmu.edu/dietrich/sds/docs/golman/golman_loewenstein_curiosity.pdf

⁴ Bernard Lonergan, (1992) *Insight: A Study of Human Understanding*, CWL 3, University of Toronto Press, Chapter 5, Section 3.3 "Absolute Space".

⁵ Bernard Lonergan, *Ibid.* p. 94-97 for a discussion of the nature of data.

⁶ Robert Henman (2016) *Global Collaboration: Neuroscience as Paradigmatic*, Axial Publishing, Vancouver, BC, Canada. See Chapters One and Two. These articles originally published in *Dialogues in Philosophy, Mental and Neuro Sciences* at http://www.crossingdialogues.com/current_issue.htm. See Archives for 2013, 2015 and 2016. At some future stage, through scanning technology neuroscientists may be able to determine from the synaptic correlates to conscious intellectual activity the strength of human curiosity. But, such results would be subject to the variables of biological pain or psychological disturbances that may be known or not. See also my "Functional Research in Neuroscience". Chapter One in *Seeding Global Collaboration*, edited by Patrick Brown and James Duffy, Axial Publishing, (2016) Vancouver, BC.

⁷ See any of the three articles listed in the first paragraph of this essay.

⁸ *Neuroscience for neurologists* (2006) Ed by Patrick F. Chinnery, Imperial College Press, UK. See Chapter 16 "How to spot bias and other potential problems in randomised controlled trials" by S. Lewis & C. Warlow, p. 424. Under **Methods**: Participants: Eligibility criteria for participants. There are some helpful aids in their listing that raise the issue of how test subjects affect RCT. It is to be noted that adherence to such criterion does not solve the problem of establishing the data of curiosity.

⁹ Day, H.I., (1971). "The measurement of specific curiosity" in H. I. Day, D. E. Berlyne, & D. E. Hunt (Eds.), *Intrinsic motivation: A new direction in education*. New York: Holt, Rinehart & Winston. Day's Ontario Test of Intrinsic Motivation (OTIM) consisted of 110 trait-oriented true-false items that were designed to measure areas of interest. Day raised the question of whether diversive curiosity should be classified as curiosity.

¹⁰ Lonergan, *op. cit.*, p. 94-97.

¹¹ *Ibid.* p. 605.

¹² Notice that you can experience the polymorphism of consciousness by adverting to the different cognitive acts.

¹³ Asking and answering all the relevant questions is the task of any science if it is to approach verified conclusions.

¹⁴ Aristotle, *De Anima*, III, 7.

¹⁵ Bernard Lonergan, (1998) "Cognitive Structure" in *Collection*, Vol. 4, University of Toronto Press, p. 206. "Each part (of cognition) is what it is in virtue of its functional relations to other parts..."

¹⁶ Lonergan, *op. cit.*, Chapter IV, Section 2. Also see Philip McShane (1970) *Randomness, Statistics and Emergence*, Gill and MacMillan, Chapter 9; Emergence and Recurrence Schemes.

¹⁷ *Collection*, *op. cit.*, p. 207. "Experience stimulates inquiry, and inquiry is intelligence bringing itself to act..."

¹⁸ Lonergan, *Insight*, p. 525.

¹⁹ Our notion of reality is steeped in a sense of touch and vision. We can "feel" things and "see" things "out there". Therefore, the real and knowing are reduced to the content of the data of our senses. The contributions of the data of consciousness are unintentionally neglected and our schemes of parenting and education never challenge this common sense notion. Any efforts in understanding curiosity are inhibited by these unexplained positions and behaviorism dominates the research.

²⁰ Golman & Loewenstein, *op.cit.*, p. 7 ff.

²¹ Litman, *op. cit.*.

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- ²² Since we do not yet have an explanatory account of curiosity, any dysfunctionality as affecting the function of curiosity is also unknown.
- ²³ There are three distinct horizons possible as developments within human consciousness. The first being common sense, relating things to ourselves, theory, relating things to things and interiority, awareness of the heuristic of cognitional acts and their import in human knowing be it common sense or theory. See Lonergan on the differentiation of consciousness, *Method in Theology*, (1973) Darton, Longman and Todd, London, UK. pp. 273-275.
- ²⁴ Robert Henman, (1984) *The Child as Quest*, University Press of America, Maryland, USA. Chapter 2 see Footnote 16 above.
- ²⁵ Philip McShane, (1998) *A Brief History of Tongue*, Axial Publishing, Vancouver, BC. Chapters One and Two on the origins of language. See also, John Benton (2008) *Shaping the Future of Language Studies*, Axial Publishing, Vancouver, BC. Canada.
- ²⁶ Neuroscience has established through experiment that the hippocampus, mid-brain and nucleus acumen, which are part of the dopaminergic circuit, are activated when consciousness becomes curious. The potentiality of the brain in its earliest occurrence through evolution (emergent probability) forms schemes of recurrence prior to the emergence of consciousness and responds chemically to conscious operations such as curiosity forming chemical patterns enabling memory. These patterns do not carry information. They are specific patterns of electro-biochemicals that form in relationship to the conscious operations.
- ²⁷ For a discussion of the method of understanding the relationships between the individual cognitive elements or operations see Lonergan, *Insight*, op. cit. pp. 522-526. Chapter XVI, Section 3.2 “Cognitional or Ontological Elements?” A central feature of this understanding is the isomorphism of the operations within the process of knowing in the different sciences.
- ²⁸ Roy Scranton, (2015) *Learning to Die in the Anthropocene Age: Reflections on the End of a Civilization*, San Francisco: Cit Lights Books. See also Ian Angus, (2016) *Facing the Anthropocene: Fossil capitalism and the crisis of the earth system*, Monthly Review Press, NY. There is the need to focus on the positive emergence in this epoch which is the ever emerging curiosity of the child and its possibility of maturing into adulthood as alive and well to offset the negative focus of disaster fed by the reductionism and behaviourism of the present social sciences.
- ²⁹ See my ‘An Ethics of Philosophical Work’ at <http://journals.library.mun.ca/ojs/index.php/jmda/issue/view/34> as well as Lonergan, *Insight*. Chapter 18 “The Possibility of Ethics”.
- ³⁰ On the heuristic integral nature of the human intellect see Lonergan, *Insight*, pages 415-421.
- ³¹ Lonergan, *Insight*, p. 33-35.
- ³² Lonergan, op. cit., chapter IV, section 2.
- ³³ B. Lonergan, “Religious Knowledge,” *A Third Collection*, New York, Paulist Press, 1985, p. 141.
“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 subject; it does not treat of the subject’s operations without taking into account the corresponding object.”
- ³⁴ *Global Collaboration*, op. cit., Chapters One and Two.
- ³⁵ Henman (2016) chapter Three on Functional Specialization. Lonergan (1972) *Method in Theology*, Chapter Five on Functional Specialization.
- ³⁶ Lonergan, *Method in Theology*, Chapter Five. Philip McShane (2013) *Futurology Express*, Axial Publishing, Vancouver, BC. Chapters 15 & 16. Henman, *Global Collaboration*, Chapter Three.
- ³⁷ Philip McShane, “Eldorede 1: Re Forming Teachers of Themselves”, http://www.philipmcshane.org/wp-content/themes/philip/online_publications/series/eldorede/eldorede-01.pdf
- ³⁸ Robert Henman, (2010) “Teaching Foundations in Peace Studies” Vol. 5. *Journal of Macrodynamic Analysis*, Memorial University, NL. <http://journals.library.mun.ca/ojs/index.php/jmda/issue/view/10>
- ³⁹ I sent a draft of this essay to George Loewenstein by email. I received the following a few days later from Dr. Loewenstein. “Thank you for sending your thought-provoking piece. I agree that the study of curiosity would be aided by an agreed-upon definition of the construct. Sincerely, George Loewenstein.” Now, what I mean by construct and what Loewenstein may mean by that term would no doubt differ.
- ⁴⁰ Robert Henman (2018) “Contributions to an Adequate Methodology in the Social Sciences” *Dialogues in Philosophy, Mental and Neuro Sciences*, Volume 11, Issue 2 for a discussion of the problems in the method of the social sciences impeding scientific and social progress.
- ⁴¹⁴¹ Alexandra Drage, “Philip McShane’s Axial Period: An Interpretation” *Journal of Macrodynamic Analysis*, Vol. 4, 2004. <http://journals.library.mun.ca/ojs/index.php/jmda/issue/view/9> The Axial Period is the transitional period

from mythic to differentiated consciousness. See Roy Scranton, footnote 28 above. Differentiated consciousness is a remote outcome for human history.

⁴² Lonergan, *Insight*, p. 278. Knowing is a correctly understood experience and we come to know reality through the same procedure. However, saying or reading this statement and discovering that through one's own reflection on one's personal performance are two very different experiences. The former requires the latter experience if it is to be an empirical fact for the scientist.

⁴³ See Footnote 39 above for Lowenstein's response.

⁴⁴ Lonergan's major work, *Insight*, (1992) cited above is the central text in outlining the "construct" of interiority. McShane has also, following Lonergan's work, outlined this construct in various books and articles. See his *Wealth of Self and Wealth of Nations* (1975) Exposition Press, NY for an explicit example. See also Henman, *Global Collaboration*, (2016) op. cit. chapter One and Henman (2018) *Contributions to an Adequate Methodology in the Social Sciences*.

⁴⁵ Lonergan, (1992) op. cit. chapter V, section 3.3 "Absolute space" and Chapter XIII on "Objectivity".

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