

## THEMATIC ESSAY

# Lonergan’s Contribution to Ecological Economics

Terrance Quinn \*

**Abstract:** This paper provides a brief introduction to Bernard Lonergan’s economic model, whose main features will contribute to a “transdisciplinary ecological economics”. Lonergan’s model was developed in the 1940s; however, some significant source documents only became available in the 1980s. It is worth looking at because it sheds light on current issues and may contribute to a needed “paradigm shift”. As in the searchings of contemporary ecological economics, the model calls for a new ethos. This paper touches on a few points for comparison between Lonergan’s model and mainstream and ecological economics.

**Keywords:** Bernard Lonergan; Ecological Economics; Capital Goods; Consumer Goods; Production Chains; Redistribution; Omni-disciplinary.

## 1. INTRODUCTION

Bernard Lonergan (1904–1984) is mostly known for his work in philosophy, foundations of science, and theology. From early on, however, a primary interest of his was economics (Shute 2010b, xxiii), to which he returned throughout his lifetime.<sup>1</sup> Part of his original motivation was to help toward understanding and resolving the crisis now known as the Great Depression (c. 1929–1939). As it happens, Lonergan’s results in economics have largely been overlooked in mainstream, heterodox, and ecological

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\* Professor Emeritus, Mathematical Sciences, Middle Tennessee State University, 1301 E. Main Street, Murfreesboro TN 37132 USA; terrance.quinn@mtsu.edu.

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<sup>1</sup> Volume 21 of the 23 volumes of the *Collected Works of Bernard Lonergan* (University of Toronto Press) contains most of Lonergan’s finished work on economics (Lonergan 1998). Regarding Volume 15, some care is needed as it “is not... an archival record” (Lonergan 1999, xii). See also Shute (2010b).

economics.<sup>2</sup> But Lonergan’s economic model could contribute to what some now consider a needed “paradigm shift” (Spash 2019) in economics, ecology, and society.

Regarding chronology, “we do not know when Lonergan made his key discoveries. [H]e first set them down in 1942, in ‘For a New Political Economy.’ ... [in which] he lays out the fundamental set of dynamically related variables” (Shute 2010b, xxvii). Decades before *ecological economics* became a recognized area (Røpke 2004), Lonergan formulated a model that some would now consider “transdisciplinary” (Costanza 2019). Lonergan’s model incorporates “world process, the physical, the chemical, vegetal, and human potentialities” (Lonergan 1998, 11). It regards “economic process” as part of human living and therefore as being in support of “human welfare”, where *human welfare* is conceptualized as pertaining to multicultural societies, cultures, and (tacitly) ecologies (Lonergan 1998, 20). However, he also said that “not all is economic” (Lonergan 1998, 11), which will be touched on in Section 4. Regarding the structural part of his model, he writes that: “[t]he object of our investigation will be the general rhythm [of economic process] inasmuch as it is foundation and material fabric; or inversely, we are to study the pulsating flow of human activity, except insofar as it is purely cultural” (Lonergan 1998, 12). Later, he writes:

From economic theorists we have to demand, along with as many other types of analysis as they please, a new and specific type that reveals how moral precepts have both a basis in economic process and so an effective application to it. From moral theorists we have to demand, along with their other various forms of wisdom and prudence, specifically economic precepts that arise out of economic process itself and promote its proper functioning. (Lonergan 2017, 103)

Lonergan’s model is to be based on facts and data obtained from observing how small and large businesses actually operate; the situations in villages, cities, and nations; actual banking; domestic and international production and supply chains; local and international finance; and instances of innovation and their real effects. A fundamental criterion to be met is that its conclusions be “a source of practical applications” (Lonergan 1998, 10).

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<sup>2</sup> Some of Lonergan’s early work in economics first became available in the 1980s. For details on the complex provenance of manuscripts, see Shute (2010a, 3–14, 213–216), Shute (2010b, xiii–xxix), Lonergan (1998, xv–xvi), Crowe (1998), and Lonergan (1999, xi–xii). There is a modest amount of literature on Lonergan’s economics, which includes the following (peer-reviewed) publications: Shute (2010a), Shute (2010b) (historical, archival); Burley (1989), Burley and Csapo (1992) (preliminary leads on structure); Liddy *et al.* (2010) (searchings); Anderson (2016), Anderson (2001), Anderson (2002), Anderson (2012), Brown *et al.* (2018), Quinn (2018), Duffy (2018) (searchings and actual contexts).

A basic feature of the model is that it is in some sense an inverse of Newton's discovery. Newton discovered that the apparently different motions of planets and the moon were one type of phenomenon. Loneragan's insight was to work out the implications of what in some respects may at first seem obvious—that capital and consumer production are for distinct ends. That is, there are two types of production. In Loneragan's model, then, the economy is made up of two “sub-economies” (one for capital production and one for consumer production) that are linked and mutually dependent. The details, however, are not obvious. What are the linkages and correlations? A model is obtained that, among other things, does not define economic growth in terms of volume (or GDP). This is crucial because that notion of growth is now known to be problematic—ecologically, economically, culturally, and societally. Among other problems, the GDP “merely measures the size of a nation's economy and doesn't reflect a nation's welfare. ... [or] the distribution of income across society” (Kapoor and Debroy 2019).<sup>3</sup>

Some structural features of Loneragan's model follow from the observation that production occurs along “levels” (Loneragan 1998, 244).<sup>4</sup> There is, then, some overlap with Schumpeter, whose work was well-regarded by Loneragan. For instance, Schumpeter observed that “[i]t is good to classify goods in ‘orders,’ according to their distance from the final act of consumption” (Schumpeter 2012, 16). From archival material, it would seem that Loneragan read Schumpeter's work “from the perspective of his own [already] elaborated view” (Loneragan 1998, xxv, n. 10). As is well known, similar distinctions were made by Kalecki (1990, 23): “We shall subdivide the economy into two sectors providing investment goods and consumer goods, respectively. In each sector, we include the production of materials and fuel will be allocated between the sectors according to the uses that are made of them in production”. Kalecki's work was one of the catalysts for Loneragan's later *Essay in Circulation Analysis* (Loneragan 1999, xli). These comments provide some preliminary historical context. Note that neither Schumpeter nor Kalecki developed a system of defining correlations and dynamics.

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<sup>3</sup> For points of entry into the emerging literature, see also Stiglitz (2020), Coscieme *et al.* (2019), Goldsmith (2019), and *The Economist* (2019).

<sup>4</sup> In this context, “use” is in the sense of “capital goods”, that is, as with tools used (often many times) in the production of other goods rather than intermediate goods in production (Loneragan 1998, 249, 114–116, 246–250) and (Loneragan 1999, 41–43)).

## 2. SOME KEY ASPECTS OF LONERGAN'S ECONOMIC MODEL

The production of *consumer goods* begins with natural resources. Along production chains, *intermediate* goods are moved along production chains toward becoming finished goods, and in that way contribute to *consumer supply*  $S(C)$ , which, in instances meets *consumer demand*  $D(C)$ . A production chain may be concentrated in a single business. For instance, a dairy farmer may do all the work of producing and providing milk directly to consumers. However, production chains are mostly collaborative; they can be local, regional, national, and international and can include various stages of wholesale distribution before the final sale, which removes finished goods from production. Let all payments  $d(C)$  (expenditures) in all consumer production chains be denoted by  $D(C) \xrightarrow{d(C)} S(C)$ . There are also *capital goods*. In the same way, then, let  $S(P)$  denote *capital* supply that meets capital demand  $D(P)$ , and  $d(P)$  stand for all payments (expenditures) along all production chains for capital goods. In this case,  $S(P) \xleftarrow{d(P)} D(P)$ . Let  $m(C)$  and  $m(P)$  represent payments for maintenance and replacement (and more, e.g., innovation) of capital goods used in the production of consumer goods and capital goods, respectively. If an individual contributes to the production of consumer goods, personal income is denoted by  $i(C)$ , and for work that contributes to production of capital goods, it is  $i(P)$ .<sup>5</sup> There is also a zone of economic activity that does not directly contribute to production, which Lonergan called *redistributive*. This includes, for instance, changing the ownership of finished goods;<sup>6</sup> second-hand trade; changing the purpose of production; and banks helping production meet its diverse financial needs. Note that the purpose of production is not a property of materials. The purpose is found in the usage of finished goods<sup>7</sup> and,

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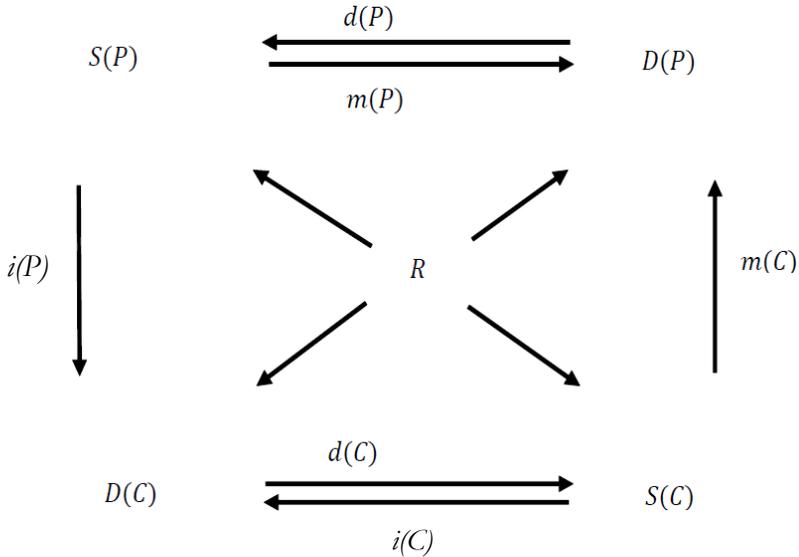
<sup>5</sup> For example, if a painter earns wages for painting a home, their income is  $i(C)$ , while for painting a commercial property, their income is  $i(P)$ . See also note 7.

<sup>6</sup> When a cow is purchased (or indeed, stocks or a multi-national corporation), banks and other lenders provide credit, with repayment plans. The world's stock markets are second-hand trade within the redistributive zone and are not part of the production process.

<sup>7</sup> If needed, milk originally intended to be food can be directed to non-food products (such as insecticides [Audic, Chaufer, & Daufin 2003]) and vice versa. Whether or not production is consumer or capital is always eventually determinate, but only (often long) after production and final sale. Iron ore may go on to become parts of a home (consumer good), an oven in a bakery (capital good used for the production of consumer goods) or a truck

therefore, the classification of production as *capital* or *consumer* cuts across sectors. Assembling these elements leads to the following diagram:

**Figure 1:** Monetary Relations: Capital and Consumer Supply and Demand and Redistributive Relations



**Note:** In this article, Lonergan’s wording “monetary *function*” has been substituted with “monetary *relation*”. This is to avoid confusion with other common meanings of the word function (such as “work” or “operate”)

Payments  $i(P)$  and  $m(C)$  are called “cross-over payments”. The arrows do not mean that money necessarily changes hands. The emphasis is, rather, on intended purpose. For example, a farmer allocates an amount of money for the purchase of milk for consumption by their family. That money is poised to contribute to  $d(C)$ . If, however, a tractor needs maintenance then, prior to being spent, a portion of that money could be redirected to help cover the tractor’s maintenance costs. The purpose of that money is forthwith directed to  $d(P)$ . In some cases, over several production periods, often there is an approximate equality,  $d(P) \approx m(P) + m(C)$ . An example can illustrate the point. If a tractor is used to transport hay for dairy cows, that usage contributes to consumer production. If, on a different occasion, that

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used in a mine (capital good used for both capital and consumer production, depending on production chains, final sales, and usage). This reveals the need for statistical method.

same tractor is used to carry supplies needed to repair a barn, it is used in capital production. But there is only one tractor. Hence, maintenance costs can be partitioned as  $m(P) + m(C)$ . In general, the proportions  $m(P) : m(C)$  are determined by usage. Some capital goods are used for both capital and consumer production, some exclusively for capital production, while others exclusively for consumer production. For the economy as a whole, one needs to look at the actual combinations of maintenance, replacements, and purchases of new capital goods. It should be noted, however, that according to the model, approximate equality is not a mathematical identity.

This provides a natural segue to discuss what Lonergan called *phases*. In early human hunter-gatherer groups, there were regular patterns of production and consumption. There was also innovation. Imagine a group living by water. They have spears, baskets for gathering, and other tools by which they secure necessities for survival and to support their way of life. At some point, for the first time, someone in the group uses a basket to capture several fish. The advantage is evident. Before long, new methods and tools are developed to make “fishing baskets”; then, there is a new abundance of food, techniques for preserving fish are learned, the population grows, other adjustments are made in living routines, there emerge new divisions of labour, and, in some cases, additional leisure time allows for developments in crafts and art. This story is fictional but based on historical sources. Indeed, similar transitions have occurred throughout history. On a larger scale, there was, for instance, the agricultural revolution in Medieval Europe: the invention, production, and use of the “heavy plow stimulated food production and, as a consequence, population growth, specialization of function, urbanization, and the growth of leisure” (Andersen, Jensen, & Skovsgaard 2016, 1). The use of the heavy plough “led to prosperity and literally created a breeding ground for economic growth and cities—especially in Northern Europe” (Lund 2013, 1).<sup>8</sup> Lonergan points to the first and second industrial revolutions to further illustrate his point. Recent examples include what happened following the invention of the automobile, airplane, rocket engine, and digital technology. In each case, there was innovation followed by lags and a buildup of capital production; then there were further lags and finally accelerations in the consequent production of consumer goods and services that eventually became part of the “standard of living”. In ecological economics, there are numerous definitions of *standard of living*. In the present context, Lonergan’s

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<sup>8</sup> This is not to imply that there was not also poverty, disease, social difficulties, and great hardships.

model uses the term to refer to actual rates of production and final sale of consumer goods, for better or for worse (Loneragan 1998, 23). (It is to be noted that rates of production and rates of final sale are distinct quantities.)

By looking to real events, Loneragan's model identifies the possibility of four main *phases* (Loneragan 1998, 23). The phases are: (1) *static* (when aggregate capital and consumer production rates are each more or less constant); (2) *capital production expansion*; (3) *ordinary consumer production expansion*; and (4) *cultural*, when capital and consumer production are mainly for supporting expansion of the "material fabric of culture" (Loneragan 1998, 22). If it occurs, the static phase, as defined by Loneragan, is a matter of fact, neither a conceptual term nor a mathematical limit. It is found, for instance, in a group of hunter-gatherers for whom the making of tools, the use of tools in making other tools ("capital production"), the use of tools for making clothing and shelter and obtaining and preparing food ("consumer production") and so on do not significantly change from one year to the next. In modern times, the dynamics of the static phase are seen in any village, city, or nation, wherein neither production nor population are significantly changing over time.

But for a modern economy, finance is also a factor. Loneragan's model implies that over time, cross-over payments (Figure 1) need to be more or less equal (Loneragan 1998, 46-48; 1999, 50, 69). Otherwise, monies needed to sustain consumer production are drained in support of capital production (or vice versa) (Loneragan 1999, 186) unless monies are added to the economy (Loneragan 1998, 58-62). However, the equality "may be static or dynamic. When it is static, the crossovers are constant; ..., and so there results the [static phase]. ... [W]hen they are increasing or decreasing equally ... there may be an expansion or contraction" (Loneragan 1999, 77).

Neither tractor factories nor tractors are made for their own sake. According to Loneragan's model, capital production is for consumer production, and consumer production provides the material basis for a standard of living. Cultural development can occur at any time. In the cultural phase, both types of production, at least for a period of time, reach a "continuity" (Loneragan 1998, 47-50) which, de facto, supports whatever "development of cultural pursuits" (Loneragan 1998, 27) happen to emerge. It is not automatic. The opportunity can be wasted "just as anything else can be wasted" (Loneragan 1998, 22). The dynamics of the cultural phase are implicit when, for example, resources are directed to the widespread construction of places of worship, schools, universities, and art galleries. It should be noted, however, that in this phase, what is produced need not be so benevolent: "It finds [a] modern exemplar, from the economic viewpoint [Figure 1], in the armament race and the economics of conducting war"

(Lonergan 1998, 25). With all of this in mind, we can get some sense of why, regarding modern general equilibrium theories, Lonergan observed that: “the conception is exact, but it is not complete ... it does not take into account the phases of the productive rhythms” [that occur] (Lonergan 1998, 52).<sup>9</sup>

In Freeman and Louca’s (2002) study, the data provided is suggestive of mutual dependencies among different kinds of production. Lonergan anticipated such results, but with precision. He observed that the four phases are merely “pure cases ... first approximations” (Lonergan 1998, 25; much as a sine wave is a “pure case” in fluid dynamics [Lonergan 1998, 22; 1998, 25–26]) and that different phases can be “simultaneous” (Lonergan 1998, 25). These are important aspects of the model. They reveal Lonergan’s concrete heuristics, as well as the need for future developments.<sup>10</sup> Thus, an agricultural region could be experiencing the effects of a surge in a new tractor technology while another region in the same domestic economy could be experiencing the effects of increased consumer production (consequent, say, to an emerging modernization of the dairy industry). Another example—the development and propagation of cellphone technology—has involved (and continues to involve) sequences of surges at a global scale in both capital and consumer production.

In Lonergan’s model, understanding, supporting, and guiding phase dynamics is a means to an end. The goal of economic activity is not mere production but to have ranges of instances of two types of production that are sufficiently in sync to support local standards of living that, in turn, drive cultural and societal development. Thus, Lonergan draws attention to the benefit of leisure. The economy

[...] must not direct its main effort to the ordinary final product of the standard of living but to the overhead final product of cultural implements. It must not glory ... in adding industry to industry and feeding the soul of man with an abundant demand for labor. It must glory in ... the deepening that adds aggregate leisure, to liberate many entirely and all increasingly to the field of cultural activities. (Lonergan 1998, 20)

Whether by increasing, decreasing, adjusting, or phasing out particular production chains or by introducing innovations, changes will contribute to

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<sup>9</sup> There is some resemblance here to “punctuated equilibrium”, but while punctuated equilibrium is a conceptual model, phase dynamics are concrete and verifiable.

<sup>10</sup> This is touching on future advanced work that will advert to local and global ebbs and flows (Lonergan 1998, 27) and other “micro-, meso- and macro-oscillations” in capital and consumer production. Thus, one may think of “economic series” as *analogous* to Fourier series, with phase dynamics determined by local and global circumstances.

*economic progress* if they (a) contribute to human welfare—societal and cultural (Lonergan 1998, 20) and (b) are (tacitly) ecologically sustainable. Therefore, there is the need for and possibility of providing economic counsel locally, regionally, and globally. The effectiveness of such efforts will depend partly on understanding the fundamental dynamical relations (Figure 1). Also needed will be “widespread collaboration” (Lonergan 1998, 26) among locally and globally informed economists, bankers, financiers, and community members. In particular, the “practical economist [will be] as familiar a professional figure as the doctor, the lawyer, or the engineer” (Lonergan 1998, 37).<sup>11</sup>

### 3. ECOLOGICAL ECONOMICS: TWO EXCERPTS

Looking to the works of Spash (2012, 2019) and Costanza *et al.* (2016) gives some sense of the basic issues. But this is merely to give a preliminary indication of work that needs to be done. A detailed comparison of Lonergan’s model with views in ecological economics would be a major collaborative undertaking.

Spash and Smith (2019, 1) see “economies as emergent ... from and dependent upon ... society and ecology”. They observe that “there are different types of economy ... something typically ignored by economists” (2019, 8). They further point out that “once both the possibility of and need for alternatives are accepted then questions arise as to the varieties of social structure, means of social provisioning and waste disposal, and relationships with nature and biophysical reality” (2019, 9). Lonergan’s (1999, 4) model bears some resemblance in that it regards any economy as “a structure resting on the ecologies of nature and underpinning social and cultural structures”. The model also anticipates diversity, for developments are “according to the current conceptions and needs of the cultural field” (Lonergan 1998, 25); “communities devise their own schemes of recurrence” (Lonergan 1999, 4); and whatever the cultural and societal context, each economy “has its velocities and their changes of velocity [of production and consumption]” (Lonergan 1999, 4). Spash and Smith (2019) speak descriptively of “types of economy” and focus on “social structure” and “biophysical reality”. In contrast, Lonergan’s model partly focuses on answering the question, “How does an economy work, whatever the social structure and biophysical reality?”

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<sup>11</sup> In precise terms, this would concretize a metaphor attributed to Keynes (1931): “If economists could manage to get themselves thought of as humble, competent people on a level with dentists, that would be splendid” (Mankiw 2006, 21).

For another point of comparison, we can look to Costanza *et al.* (2016). They aspire to obtain “a comprehensive, non-linear, systems dynamics model that can track both flows and stocks of built, human, social, and natural capital and make projections into the future under different policy scenarios” (2016, 351). They seek a “‘narrative of change’ ... within *existing* socioeconomic and geopolitical circumstances” (Costanza *et al.* 2016, 350) that is based on “*current* knowledge of how ecology, economics, psychology and sociology collectively contribute to establishing and measuring sustainable wellbeing” (2016, 352; emphasis added).

There is an apt analogy: the structural component of Lonergan’s model is to actual economics what the periodic table is to actual chemistry. It does not imply “systems dynamics” which, by definition, are remote to concrete circumstances. An essential component of Lonergan’s model is an understanding of production processes and finance, whatever the community, culture, society, and policy scenarios. Also to be noted is that, as Sections 2 and 4 (below) reveal, the full model calls for *new* narratives of change and *new* knowledge, wherein many aspects of *economic progress* will not be measurable. Lonergan’s hope for a locally, globally, and concretely informed economics is not for a structure that would be imposed. Rather, it is for “a democratic economics that can issue practical imperatives” (Lonergan 1998, 5) that can be communicated widely so that almost everyone can understand.

#### 4. CONCLUSION

Contemporary economic models distinguish between microeconomics and macroeconomics and define them differently. Lonergan’s model includes the fact that in both contexts, choices are made by agents. Economic events are defined by terms and relations, as expressed in Figure 1. The model also looks to aggregates, for which statistical methods (Lonergan 1998, 112, 158–9) will be needed to investigate the actual patterns of local and global production and “concomitant” (Lonergan 1998, 9, 30, 144) monetary flows (Lonergan 1999, 4–5). (The notion of *concomitant* is a key aspect of the model.)

The numerous technical features of Lonergan’s economic model have not been discussed. These technical features will prove critical in contemporary contexts and include adjustments in accounting, normatively distinct types of profit, the roles of the redistributive zone, identification of the world’s stock markets,<sup>12</sup> the structure of international trade, comparison with

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<sup>12</sup> See note 6.

orthodox economics, as well as large-scale models of global natural resources, and the extent to which Lonergan's model allows for a resolution of the problem of booms and slumps (an original motivation for Lonergan). But perhaps enough has been said to generate interest in the challenging and collaborative task of interpreting Lonergan's densely written technically sophisticated texts on economics. Note, however, that because of the concrete referents, Lonergan's model cannot be evaluated by merely comparing with other models. We will need to determine to what extent it bears out (or not) in actual businesses, production, finance, and innovation, locally and globally.

Lonergan's full model (not merely the structural results) and contemporary searchings in ecological economics further reveal that in some respects, the problem is, indeed, "trans-disciplinary" (Costanza 2019). Although, in light of efforts to develop holistic views (Spash 2012b; Spash 2012a; Gerber & Steppacher 2014), and an evident practical bent for global welfare (Costanza 2019), ecological economics is to somehow be "omni-disciplinary".

There are, therefore, fundamental methodological problems that will need to be addressed. As observed by Hagens, "[w]e are desperately in need of a set of guideposts and principles that include not only ecology but also biology, psychology, physics and emergent behaviors" (Hagens 2020, 14). What will ecological economics look like, in a concrete sense, as it matures toward becoming a globally effective "meta-paradigm" (Costanza 2020)? These issues go beyond the scope of this brief review.<sup>13</sup>

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<sup>13</sup> Remarkably, Lonergan's later work on historically emergent structures of global collaboration (Lonergan 1969) may prove useful. The relevance of that work to modern ecology is discussed in Allerton (2016, 218), which also briefly touches on linkages to contemporary economics.

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