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ACCOUNTING FOR SUSTAINABILITY: EPISTEME CHANGE AND ONTOLOGICAL PLURALITY

Recent research reveals accounting for sustainable development to be both problematic and essential. This paper considers that the problems arising may be intrinsic to the concepts and structures of Modern accounting and that their resolution lies ultimately in the development of the consequences of a new possibility of knowledge or episteme. After a brief presentation of the nature and historic impacts of episteme change, this paper explores the epistemic origins of Modern accounting. Evidence for a new, other than Modern, episteme is then presented and its consequences for accounting for sustainable accounting are explored. Significant evidence in this regard is the work of Bruno Latour from Actor-Network Theory to the plurality of ontologies. Refs 93.

Keywords: sustainability accounting, episteme, ontology, modernity.

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СИСТЕМА УЧЕТА УСТОЙЧИВОГО РАЗВИТИЯ: СМЕНА ЭПИСТЕМЫ И ОНТОЛОГИЧЕСКАЯ МНОЖЕСТВЕННОСТЬ

В настоящем исследовании выявляется важность и проблематика системы учета устойчивого развития. По мнению авторов, возникающие проблемы свойственны понятиям и структуре современной системы и их решение лежит в самой возможности дальнейшего развития знания или эпистемы. После краткого рассмотрения природы и исторических последствий смены эпистемы в статье исследуются гносеологические истоки современной системы учета. Обосновывается необходимость новой, а не просто современной, эпистемы и ее важность для

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системы учета устойчивого развития. Существенную роль в этом сыграла работа Бруно Латура, заложившая основы акторно-сетевой теории и онтологической множественности. Библиогр. 93 назв.

Ключевые слова: система учета устойчивого развития, эпистема, онтология, современность.

Introduction

Accounting could occupy a more central position in a movement of evolutionary significance for humanity, and for the rest of the planet. Cho et al. [2015, p. 78] recognise a key driver of this movement: “The expansion of human societies and economic activities is exceeding the ecological boundaries of our planet.” Some important aspects of this movement have become known by the term “sustainability” and this is concerned specifically with humanity having a future — or not.

Modern sustainability accounting relates to (i) disclosures of non-financial information about a firm’s performance to external parties to represent the firm’s activities that have a direct impact on society, environment, ecological and economic performance of an organisation; and (ii) the provision and analysis of information for internal decision-making and policy-making that incorporates the firm’s performance in environmental, ecological, social and economic aspects [Lamberton, 2005]. Some widely used sustainability accounting tools include the Global Reporting Initiative [GRI, 2016] and the Triple Bottom Line [Elkington, 1997] accounting. However, many sustainability accounting researchers identify serious flaws with these approaches as identified below.

Gray [2010, p. 47] for example has questioned the meaning of the term “sustainability”: “What may be required is a more nuanced understanding of what ‘sustainability’ actually is and how, if at all, it can have any empirical meaning at the level of the organisation.” Gray [2010, p. 47] elaborates his concerns as follows: “Accounting, certainly conventional accounting, must be thought of as the very essence of modernity” and “much of the realist and procedural baggage associated with conventional accounting is no longer apposite when seeking to account for sustainability.” These concerns are the seeds of an accounting revolution. Cho et al. [2015, p. 84] have related concerns: “Also widely accepted are discussions that capitalism and the market pressures associated with it limit potential organizational actions that might improve sustainability.” Whilst Tregidga et al. [2014, p. 491] draw on Campbell [2007] as well as Gray [2010] to raise more doubts about organizational sustainability: “The representations of ‘sustainable organizations’ found here might lead some, including powerful institutional actors like governments, to assume all is well, raise doubts that organizations are, or at least are becoming, reformed ‘sustainable’ actors, when the change they posit may be largely rhetorical”.

The arguments of this paper provide a different way of thinking about these concerns in order to sketch opportunities that lead to new kinds of solutions. It achieves this by considering the potential for a new “possibility of knowledge” or “episteme” [Foucault, 1970; Birkin and Polesie, 2011]. Such a level of change amounts to a new era or civilisation. Elgin [2014] describes this level of change in terms of humanity growing-up from its present condition as short-term, pleasure-seeking teenagers who try to prove their superiority and independence at the expense of other species and future generations. Kallis [2011] is not so scathing but argues for a similar level of change with a different zero-growth system not dominated by economic rationality and goals.

This paper proceeds by first proposing a new category for this level of change within Unerman and Chapman 2014's review of accounting and sustainability research in a brief section with the title "Sustainability in Accounting Research". Then an epistemic analysis of Modern accounting is used to detail the starting point for the change in "An Epistemic Analysis of Modern Accounting and Sustainability". After that, evidence for the emerging epistemic change is provided and implications for accounting are discussed in the section with the title "The Emerging Episteme and the Opportunity for Accounting". It is this latter section that includes consideration of Latour's recognition of ontological plurality as a major transformation for social sciences that has been created and developed *wholly within* the emerging episteme. Concluding remarks are provided.

Throughout this paper, a balance is sought between an understanding based on a changed possibility of knowledge and the need for specific guidance regarding accounting goals, frameworks and institutions. This addresses a recognised need: "The diversity of approaches found in this study is reflective of organisations realising a growing need to engage with sustainability issues, but without some common point of reference in terms of issues to be managed or a common development framework" [Adams and Frost, 2008, p. 300]. But the guidance provided in this paper is neither prescriptive nor determinative since in the theory of the emerging episteme the details, in a very important sense, are always waiting to be derived from practice.

2. Sustainability in Accounting Research

Sustainability is an issue that has already changed aspects of business, society and accounting. Accounting research has participated in these changes and the purpose of this section is to clarify the positioning of the arguments of this paper within the accounting sustainability research field. Unerman and Chapman 2014's review of accounting research's contribution to sustainability identified three strands: (1) relationships between social and environmental performance, economic performance and reporting; (2) radical reforms or overthrow of markets and capitalism; and (3) constructive but critically engagements with businesses and other organizations to change their direction towards less unsustainable operations [Unerman and Chapman, 2014, p. 392]. This paper provides a fourth strand for accounting researchers in this field which is a changed possibility for knowledge and a consequential emphasis on studies of empirical evidence and observations of experience in lieu of extensive theory building.

This fourth strand contributes to each of Unerman's and Chapman's strands as identified above but it cannot be reduced to one or more of them. For example, relations or associations are at the core of the fourth strand to represent the first strand; radical reforms of capitalism are indeed identified by the fourth strand but from a fresh perspective; and critical engagement with organisations so as to direct them to more sustainable pathways is an inevitable consequence, or rather a built-in operational routine, of the fourth stand. Finally the arguments of the fourth strand provide an epistemological and ontological unity for all the others.

The fourth strand is argued in this paper to be a consequence of episteme change [Foucault, 1970]. The consequences of such a change are substantial and far reaching. For example, they include the ultimate loss of hard distinctions between subjects and objects, society and nature, and theory and practice [Birkin and Polesie, 2011; Latour, 2013]. In

turn, these consequences affect the values, attitudes, goals and identities we employ in everyday life to truly merit the epithet “new” with regard to era or civilisation; the task of this paper is to identify what this kind of extensive change means, and what opportunities become available, for sustainability accounting research.

3. An Epistemic Analysis of Modern Accounting and Sustainability

Epistemic analysis may be defined as the identification and clarification of the role of “the possibility of knowledge” [Foucault, 1970] in social science studies. The understanding of the fundamental epistemic position derived from epistemic analysis enables a researcher to explain a wide range of theoretical and practical social phenomena that become more apparent during periods of epistemic change since the old episteme and its consequences may be contrasted with those of new. A full account of Foucault’s epistemic analytical method is not feasible within the limits of this paper hence only a brief introduction has provided by means of the examples of the epistemes that Foucault [1970] identified in the history of European thought. It is after all the use made of epistemic analysis with regard to evidence of an emerging episteme that is the main subject of this study.

The start point for the present epistemic change is the Modern episteme. Modern accounting in this regard is taken as the form that accounting took from the mid nineteenth century onwards. The remainder of this section uses epistemic analysis to classify issues in Modern sustainability accounting and its research since: “Classificatory devices and the associated activities both help to frame the conduct of conduct, and are part of the response to it” [Sargiacomo, 2015, p. 69]. The classes used in this analysis are the same as some of those used by Foucault [1970] to specify the Modern episteme and they include origins, metaphysics, epistemological man, finitude and organic growth. This part of the study is indicative, not exhaustive. Its purpose is to identify the start point but, as in any process of change, that point will be left behind and will subsequently be of far less interest than the end point. Indeed, Latour [2013] effectively argues that we should concern ourselves wholly with the new episteme and not bother to engage with the old. This study however is not so dismissive of the Modern and seeks to incorporate some of its achievements in the emerging episteme; this can be done only by a close, epistemic study of Modern accounting and its research.

4. Origins

Historically in Europe belief in a God-made world was prevalent: metaphysics, ontology and knowledge of the origins of people and things could be explained using religious concepts and descriptions. The world and its representations could then be taken at face value and scrutinized for evidence of God’s intent. Foucault [1970] argues that the Modern age is distinguished by a rejection, or suspension, of explanations grounded in religious abstractions. This had many consequences including a quest for origins and the related need for a new, appropriate metaphysics and ontological understanding.

The work of Immanuel Kant (1724–1804) may be distinguished within Foucault’s historic epistemic “archaeology” to mark the beginning of the Modern episteme. Kant’s work is central to Modernity [Kant and his Influence..., 2005] and it emphasised the speculative use of reason to replace the prevalent theology philosophies of his time [Dickerson,

2004]. Kant refused to take the world at face value and he questioned the origins of its representations. He also referred to a transcendental world beyond reason to justify his arguments. Such questioning of origins and the use of a transcendental explanation is the mark of the Modern episteme [Birkin and Polesie, 2011; Foucault, 1970; Literature and Science..., 2009].

The questioning of origins in the nineteenth century revealed new processes and found answers notably in the fields of geology, evolutionary science and Newtonian physics. During this period, unprecedented industrial growth and the establishment of a middle class of industrialists and professionals created a range of new institutions including Modern accounting [Hoskins and Macve, 1994]. Modern accounting had its origins in a world entranced by science and its technological offshoots. Notably, it was the power of Newtonian mechanics to provide precise mathematical analysis and predictions that attracted Modern economists [Keita, 1992]. The quest for a comparably mechanistic, determinate model of the economic universe using humanity as “elements” of the analysis was finally realized in the 1870s by pioneers such as William Jevons and Léon Walras, both physicists by training. At the close of the nineteenth century, Veblen [1898, p. 373] could claim with confidence that for the purposes of economic analyses “He [the human material] is an isolated definitive human datum”.

Economic explanations, like those of physics, are heavily dependent upon mathematical analysis and abstract modelling which dominate development goals and appraisals to this day. The information generated by accounting serves economic analysis and Wickramasinghe and Alawattage [2007] argue that economics provides the meta-theory of financial and management accounting. However, the critical influence of nineteenth century origins on Modern accounting lies not in the use of the numeric analysis of data rather in its use of theory to derive an abstract, universal and deterministic rational model. Accounting merely succumbed to the overwhelming influences of the nineteenth century during its formative years — it could hardly have done otherwise.

5. Metaphysics

Foucault uses a metaphysical argument to reinforce the above Modern origins thesis. A metaphysics is needed to ground knowledge and Modern human science metaphysics are weak [Foucault, 1970] (see also the section on “Epistemological Man” below). Kant’s rejection of empiricism noted above coupled with Descartes’ differentiation of mankind’s essence based on a perceived unique ability to reason [Moore, 2014] and the ubiquity and success of Newtonian mechanical explanations resulted in the Modern episteme adopting a metaphysics based on the formalisation of thought and mathematisation [Foucault, 1970]. This formalised, mathematicised is a substituted for the inadequacies of Modern human sciences, metaphysics. In this way, Modern accounting could become far more than a useful housekeeping tool by insinuating itself quite literally alongside a Modern metaphysical sense of reality: hence any strong emphasis on positivism and quantitative analysis in Modern accounting and accounting research may be explained as a consequence of Modern metaphysics.

Overcoming the sense that formal thought and positive analytical data was the *only* route to social analyses was a task for the twentieth century and such authors as Popper [1979] and Kuhn [1962]. But it was not until the 1970’s and 1980’s that qualitative re-

search began to establish itself academically [Denzin and Lincoln, 2005]. In accounting research, the relation between qualitative and quantitative analyses is still actively debated: “Quality in full cost accounting, therefore, means that uncertain and local data should not ‘be buried in a mass of hyper-precise arithmetical data....’ <...> Rather, a ‘good’ ‘quality’ process in full cost accounting terms would create context in which stakeholders have an opportunity to debate and discuss the construction of an account” [Bebbington and Larriaga, 2014, p. 407]. Similarly within Modern finance, there still remains a need to *consider* qualitative sustainability knowledge [UKSIF, 2015].

At this stage in our analysis, the Modern foundation arguments for accounting include *inter alia* abstract rational modelling and a suggestion that data is selected and interpreted for the convenience of the models. The choice of data for accounting is of prime importance for sustainability accounting that crosses disciplinary boundaries. The following section examines these boundaries.

6. Epistemological Man

The lack of origins and a weak metaphysics within the Modern human sciences is compensated by the invention of Epistemological Man [Foucault, 1970]. In summary, whilst the Modern questioning of origins did reveal origins, or close approximations to origins, in many scientific fields, the Modern human sciences found no such origins. Consequentially the Modern origins of the human sciences, such as sociology, psychology, economics and accounting, gravitated around man or more precisely a form of man invented for this weighty purpose, Epistemological Man. This invention is in effect a surrogate metaphysics for the Modern human sciences and it means that Modern knowledge of man is no more than a self-reflection [Foucault, 1970; Birkin and Polesie, 2011].

Epistemological Man’s influence on Modern human sciences is deep and wide. It is marked by what was omitted from studies rather than included. Modern psychologists for example such as Wundt, Freud and Adler strayed little beyond *humanity* for their core theses. In Sociology, the study of *human* societies was the concern of Comte who influenced the thoughts of Marx, Mill, and Durkheim. Similarly, Keita observed: “Thus, the model for neoclassical economics was that of Newtonian mechanics: initially the graphical analysis of early Newtonian mechanics then the calculus approach of mature mechanics. But the most interesting aspect of this adaptation was the substitution of the idea of an artificial ‘economic man’ for the inanimate Newtonian body in motion” [Keita, 1992, p. 55].

In Modern economics, the human-centred determinants of Epistemological Man are clear in rational choice theory, labour value theory, market value theory and a range of goals and performance appraisal measures of abstract, notably monetary, strictly human kinds of wealth. Modern accounting is similarly constituted by Epistemological Man with regard to the identification of costs, the recognition of value and the boundaries of the discipline.

7. Finitude

Finitude is an aspect of the influence of Epistemological Man so important that it merits its own sub-section. Epistemological Man stressed his own time line that of a living man, a finite time. The Modern emphasis on human-scale finite time creates a time-

shortage, a compulsive short-term urgency that underscores all Modern measures of rates of change, efficiency and returns. Short-termism is an often quoted, prime causes, of unsustainable development [Globescan, 2009; Gray, 2010].

8. Organic Growth

A final but profoundly critical feature of Modern accounting is that it grew organically according to its own laws and regulations [Foucault, 1970]. This is an inevitable consequence of a weak metaphysics, abstract model building and Epistemological Man. Modern human sciences quite simply exclude themselves from the empirical evidence that would have directed other ways of growing. They did in effect recreate themselves according to their own inward-looking rationality and logic [Ellis, 2002].

Modern accounting, like Modern human sciences, did not accrue knowledge using an evidence-based, trial-and-error method applied in an open universe but only with reference to their internally generated laws and regulations. Hence when faced with challenging evidence arising from “outside” sources, the only option for Modern economics, accounting and finance is to marginalise such knowledge and maintain business-as-usual — to do otherwise would be to initiate the collapse and rebirth of the discipline.

It is not surprising then that Milne et al. report: “Based on a wide and contrasting paradigmatic framework of development and environment, we have interpreted and critiqued the NZBCSD’s (New Zealand Business Council for Sustainable Development) original discourse as weak and serving relations consistent with dominant economic ends rather than protecting the environment... We suggest from our perspective that the NZ-BCSD’s discourse may reinforce rather than challenge the status quo” [Milne et al., 2009, p. 1241].

Similarly, Thomson et al. explore accounting-sustainability hybrids’ contribution to sustainability practice in the UK public sector and find that they inhibit rather than advance sustainability: “We have attempted to highlight how accounting-sustainability hybrids could (mis)translate the sustainability programmatic and strip it of its radical vision and potentially relegate it to a footnote of the modern, neo-liberal programmatic” [Thomson et al., 2014, p. 473]. A conclusion similar to Moneva et al.’s [2006] argument that the Global Reporting Initiative camouflages corporate unsustainability.

But perhaps Bebbington and Larrinaga’s 2014 review of social and environmental accounting for sustainability research most clearly identifies the significance and dangers of Modern accounting’s internal organic growth process: “In summary, this section explored the contention that the tendency in the accounting literature to take on board the pre-occupations of its discipline has inhibited the emergence of accounting for sustainable development. It is likely that a focus on documenting (using content analysis) social and environmental related disclosures in Annual Reports or other media of a sub-set of economic entities (primarily for profit listed companies) is not fully in line with the demands that sustainable development places on the academy” [Bebbington and Larrinaga, 2014, p. 409].

The above analysis of the Modern episteme’s impact on accounting provides a starting point for recognising the changes underway to replace the Modern. This is of course not the full story of the Modern episteme. There is for example the important Modern philosophical bifurcation into: (i) a pure reflection capable of providing a foundation which

is typified by the Analytical school of philosophy and a quest for a truth based in things; and (ii) philosophical universality in the domain of empiricity such as in the Continental School of Philosophy and the quest for a truth based in statements [Birkin and Polesie, 2011]. These two schools still remain in opposition within Modernity [Critchley, 2001]. Similarly, the abstract, self-referential knowledge constructs of Modernity have inevitable led to debates relating to the recognition of *reality* in the human sciences. Such debates are on-going and will not be resolved within the Modern episteme for reasons indicated above.

Other consequences are still being revealed. Kelly and Nahser [2014] blame a 'scientific' approach for the tendency of business schools to seek to discover causal determinants of corporate behaviour in patterns and laws [Ghosal, 2005]. Similarly, Von Hayek [1975] identified a 'scientistic' attitude underpinning a propensity for economics to imitate the physical sciences as well as a phenomena called 'physics' envy by Bennis and O'Toole [2005, p. 98].

In summary, Foucault's 1970 analysis of the Modern episteme provides a rich source of insight and understanding with regards to Modern accounting in theory and practice. However, the power and immediacy of an epistemic analysis does not reside in the past. It is about the future, what we are becoming. This is the subject of the next section.

9. The Emerging Episteme and the Opportunity for Accounting

The preceding analysis of the Modern episteme and its relevance to accounting and sustainability could be considered irrelevant except for none but historic purposes. If the Modern episteme changes, a new possibility of knowledge in the human sciences would open new vistas, new opportunities, new demands and constraints to the extent that the knowledge of the prior episteme has to be re-assessed, perhaps re-used, sometimes more or less cast aside. This section takes a different stance to analyse the evidence for an emerging episteme and consider the opportunity for accounting both as a derivative from Modern accounting and as something entirely new.

The emerging episteme relates only to the human sciences. Other sciences have already made sufficient progress in identifying their origins from the nineteenth century onwards that their metaphysics and ontologies are robust enough to stand alone, and to support theorising, without the support of an Epistemological Man. Geology, biology, physics and cosmology have all experienced transformative changes: the realisation of the great age of the Earth and plate tectonics; Darwin's evolutionary theory and genetics; relativity theories and quantum physics; and the Big Bang and Standard Model of cosmology all use — or seek the support of — empirically grounded reality without significant foreclosure around mankind. In addition, several of these changes challenged the once universalised Newtonian mechanistic model and dispensed with it.

Knowledge of how the wider-world works and where it came from has been revolutionised by new scientific evidence. The human sciences can no longer stand apart from the rest of the world in this regard since evidence crosses domain boundaries and informs directly about the origin of man in fields such as evolution, genetics, physiology and anthropology. Since Foucault's death in 1984, our understanding of the complexities, interactions and interdependencies that are to be observed in ourselves and societies has dramatically increased in such as: systems theory [Capra, 1997; 2003], autopoietic behaviour in biology [Maturana and Varela, 1987] and society [Luhmann, 1995; Vallega, 2005], en-

tropy and thermodynamic dissipative systems [Kauffman, 1995; Prigogine and Stengers, 1985], and Chaos mathematics [Gleick, 1987] and Complexity Theory [Navigating Social-Ecological Systems..., 2003; Causality, Meaningful Complexity..., 2010; Mitchell, 2009; Norberg and Cumming, 2008; Olssen, 2008]. This evidence presents a very different view of ourselves and the world we occupy from that prevalent during the formative years of economics and accounting: reflecting a transition from an abstract Newtonian mechanistic world view to one of interactive, interdependent and intrinsically creative relations [Birkin, 1996; Birkin and Polesie, 2011]. The process of epistemic change is well underway.

Douglas July 25 [2015] reports that academicians from diverse fields including economics, anthropology, ecology and evolutionary biology met to discuss how to “overthrow the old regime”. They criticized neo-classical economics for its heavy reliance on mathematical formula at the cost of not attending to the complexities of human beings and their interactions that were identified as the real relations that develop and maintain economies.

Given the breadth and influence of scientific revolutions in the previous two centuries and the profound ways in which our understanding of our place in the universe has changed, the question may now be asked “Why has accounting not changed to fit in better with the world we now recognise?” After all, even the social construction of knowledge does not close its eyes to “the world out there” [Gergen, 2009]. Furthermore, as noted above, the formation of both Modern economics and accounting drew heavily from the mathematicised, mechanistic Newtonian world-view and to an extent replicated its approach — so why not pay attention now to the latest, radically different scientific world-view? This section considers answers to these questions by drawing on the epistemic analysis of Modern accounting provided above.

10. The Discovery of Origins

The failure to find origins for the Modern human sciences was a major cause of the creation of the Modern episteme [Foucault, 1970]. We have now found these origins. Evolution and genetics explain the origins of our bodies in terms of interactive, interdependent, intrinsically creative processes occurring in over immense amounts of time. Similarly our psychology is now understood to be dependent upon non-human origins in evolutionary [Psychology Today, 2015] and environmental [De Young, 2013] psychology.

In a similar way, “Environmental Economics” deals with economic and environment relations but admittedly only as an extension to neo-classical economic theory. However “Ecological Economics” has taken the far more significant step of seeking its origins in the ecosystem by deriving economics from aspects of natural world behaviour, notably thermodynamics [Costanza, 1991; Georgescu-Roegen, 1971]; a position that reflects a measure of “physics envy”.

In management, a range of initiatives seek to develop new approaches derived from an ecological understanding of interdependence such as Life Cycle Assessments, environmental management, the Triple Bottom Line [Elkington, 1997], the “Triple Top Line” [McDonough, Braungart, 2002], Ecological Footprint Analysis [Wackernagel and Rees, 1998] and “Benefit Corporations” who are changing legislation state by state in the USA so that they may legally work to generate benefits for society and the environment as well as shareholders [Benefit Corporations, 2015].

Hawken [1993, p. viii–ix] calls for a deep transformation in management: “Rather than a management problem, we have a design problem, one that runs through all business. We will need a system of production where each and every act is sustainable and productive.” A call to which the “Phoenix Economy Report” responds with a vision of a new “Phoenix Economy” and an “ecosystem of change” [Volans, 2009, p.28]. Finally, the Natural Step integrates management with new scientific understandings by with a specified set of steps to follow [Natural Step, 2010].

However in accounting, an ecological accounting [Birkin, 1996] has yet to emerge. The related discipline of environmental accounting is indeed established but only to a limited degree [Owen, 2008]. There are significant environmental accounting initiatives such as the System of integrated Environmental and Economic Accounts [SEEA, 2003], Environmental Management Accounting [Orbach and Liedtke, 1998; IFAC, 2005] and the International Standards Organization’s “Material Flow Accounting” system standard ISO 14051. However such initiatives have been developed aside from mainstream accounting which still maintains its Modern form.

11. Metaphysics

A metaphysical answer to the questions posed above has been provided by Ellis [2002]. He argues that the view that nature is *passive* is deeply entrenched in European thought and has been for some time: “The view that things in nature are essentially passive, and obedient to nature’s laws, was widely shared by philosophers of all persuasions in the eighteenth century, as indeed it has been ever since. It was accepted, not only by Descartes, Newton and Hume, but also by Locke and Kant, and therefore by the founding fathers of all the major philosophical traditions of Western Europe” [Ellis, 2002, p. 2]. This passive tradition needs to invoke an external agency such as God, Laws or Forces to direct and drive nature along. With this kind of understanding our attention will be pay close attention to God or similar external laws, forces or structures and not to the *intrinsic* processes of nature. Ellis goes on to argue that neo-classical economics is a logical belief system and as such it is a fantasy that exists only in the mind of the theorist [Ellis, 2002, p. 165]. Most mainstream economics and accounting textbooks do not look to nature for direction, for indicators and motivating drives so in this respect they subscribe to a passive nature understanding.

Birkin and Polesie [2011] express the metaphysics of the new prevalent scientific understanding in terms of “complex, interdependent, indeterminate and creative relations”. Bebbington and Larrinaga [2014] provide an excellent example of the use of these kinds of relations in cost accounting. The way to recognise such complex relations in accounting requires qualitative studies as a first step simply to recognise practical interactions; quantification may follow. Indeed qualitative studies themselves may be cited as further evidence of episteme change, of researchers seeking answers outside the positivistic, mathematized, abstract Modern understanding. Qualitative studies are said to be still emerging [Guba and Lincoln, 2005]. For example, Ittner argues for the use of qualitative methods to enhance understandings of causation in accounting research: “The objective of this essay is to discuss how the incorporation of qualitative methods in positivistic field research can provide a powerful mechanism to enhance a study’s causal inferences” [Ittner, 2014, p. 545].

Within the accounting literature, social and environmental accounting itself is evidence of the discipline reaching out beyond the limits of Modern accounting. Notably in this literature, Bebbington [2009, p.191] used “post-normal science” to introduce to accounting something of the complexity of relations that “instaurate” [Latour, 2013] any particular event: “First, contributory expertise must exist. This is expertise that contributes to understanding the topic in question, including knowledge from those affected by the problem. Contributors may come from all disciplines, including physical science, social science as well as humanities. Second, there is a need for interactional expertise. That is, expertise about how those with contributory expertise may be brought together to investigate the topic under consideration. This type of expertise is needed to allow cross/inter/multi/trans-disciplinarily to be achieved”.

More recently, it is the introduction of sustainability science to social and environmental accounting that provides the clearest evidence of a growing recognition of a metaphysics of complex, interdependent and indeterminate relations: “Sustainability science is a distinctive approach that has developed as a result of a belief that there are problems that are sufficiently different in nature that we need to experiment with new ways of knowing, including new forms of research engagement” [Bebbington and Larrinaga, 2014, p.410]; and “Specifically (and as is apparent from the previous characterisation of sustainability science) it is impossible to say that a problem is ‘solved’ or to say what an ‘ideal’ outcome might be, or even to define in a unique manner the problem to be subject to investigation” [Bebbington and Larrinaga, 2014, p.404–405]. Milne and Gray [2013] use an ecological understanding, based on complex relations, to identify the significant failings of the Triple Bottom Line, the Global Reporting Initiative and Corporate Sustainability Reporting.

12. Epistemological Man

Epistemological Man does not exist in the emerging episteme; he has been washed away like footprints in the sand [Foucault, 1970]. Without the anthropologisation that Epistemological Man engendered, we simply take our place as participants alongside other species within an active nature. Indeed, the existence of a “self” has been challenged and reconceived as a “benign user illusion” [Dennett, 1991]. As part of this process of loss of self-referencing anthropologisation, we are beginning to regard other species as more human [Rugemer, 2008, p.4].

However the legacy of Epistemological Man lingers. Anthropocentrism is a critical issue when dealing with Climate Change and in other sustainability debates such as in Motesharrei et al.’s [2014] partially-NASA-funded, well-publicised [Guardian, 2014] study of the collapse of civilisation due to individual greed. In accounting, the development of social accounting does shift emphasis away from the individual but a logical consequence of the demise of Epistemological Man would ultimately be a form of accounting appropriate to the new metaphysics of complex, interdependent relations with society *and* nature.

13. Organic Growth

It is within the internalised, organic growth of the Modern Human Science disciplines that the most telling answer may be found to questions about why accounting has not changed to fit in better with the world processes now recognised by science. Modern

accounting has had two centuries of growth and adaption in accordance with its own internal rules and regulations without need to subject its actions to experimental testing in any reality other than that of its own making; that is until the incursions of sustainable development and the development of social and environmental accounting and accounting for sustainable development. Modern accounting has powerful vested interest among both practitioners and academics who protect core values and understanding using two hundred years of internalised development for support. The struggle to “open” Modern Accounting to the interdependent and interactive world now known to science is ongoing and Jones specifically describes a knowledge structure for accounting that is clearly not Modern: “...based on a more holistic view of accounting, organisations and the environment, seeing them as mutually independent, interconnected and interrelated systems all being mutually dependent” [Jones, 2010, p. 131].

14. Finitude

The removal of Epistemological Man provides the opportunity for accounting to reach well beyond man’s personal time horizon to capture the range of complex human and non-human relations that we now know to constitute reality and hence economic activity. However Man’s meagre measure of finitude is the *raison d’être* that underscores much of Modern accounting’s measures of efficiency and rates-of-return and it is not easy to disabuse the discipline of these short-term impediments.

In the absence of a God-given eternity, we struggle to come to terms with deep time in geology, cosmology, evolution and even anthropology. All of these sciences have finite time-scales but they are singularly non-human. To learn to live within the relatively short-term decades to centuries long time-scales of sustainability is difficult when we have many immediate problems; such long-term thinking is not — cannot be — on the Modern accounting agenda.

But if we are to have a future on this planet, we urgently need to expand our operating time horizons. Globescan’s 2009 survey of CEOs revealed short-termism as a key factor inhibiting their transition to more sustainable ways of doing business. The World Business Council for Sustainable Development [WBCSD. Vision 2025...] recognises the need for new measures of efficiency and long-term sources of finance that permit planning on time-scales that are appropriate to our new understanding of the ways and needs of the world we inhabit. An approach that leads to the WBCSD’s recognition of the need for a new kind of “people-and-planet” person.

15. Bruno Latour

The work of Bruno Latour is given special consideration here as one of the first, eminent social scientists to work wholly within the emerging episteme. Latour has been anticipating a new episteme for some time with, for example, his critique of Modernity [Latour, 1993] as well as Actor-Network Theory (ANT) [Latour, 2007]. His understanding crystallized in the book “An Inquiry into Modes of Existence: an anthropology of the Moderns” [Latour, 2013] in which his new episteme credentials are clearly expressed. His new-episteme stance has much of significance for accounting: “This pre-eminence of closure within accounting is the result of a ‘small mistake’, an ‘epistemological mistake’”; “the

‘small epistemological mistake’ indeed leads to a ‘form of intellectual leprosy’ that has had such a ‘fatal destiny’ that it can actually be called a ‘mistake in civilization’ — the one that made the Economy an ‘ill-formed institution’ [MoE Team, 2015].

It is however incorrect to regard Latour’s Modes of Existence (MoE) merely as a critique of Modernity since it is an explication of a method of social science inquiry that exists within the new episteme and references to Modernity are passing and dismissive if scathing. In this way Latour is comparable to Descartes who, once he had drafted the “new possibility of knowledge” in the then-emerging Classical episteme called the preceding Renaissance episteme “naïve” and Kant who in turn cast aside Descartes’s face-value acceptance of knowledge by questioning origins. The point is that from within a given episteme, other epistemes may be in some ways knowable — but they do not make good sense — or even any sense at all!

The evidence that MoEs belong to a new episteme is extensive in Latour’s 2013 book; indeed it is too extensive to address but a fraction of it in this study. This book may be taken as a significant waymark — perhaps even as *the* analytical approach for the end point — in the progress of the changing episteme. A key feature of Latour’s position is derived from the acceptance of a metaphysics of complex, interdependent and indeterminate relations. Once this has been grasped, Latour’s work may be fully appreciated as belonging to a new episteme; his propositions such as the removal of distinctions between objects and subject, and nature and society, will be more acceptable. The rest of this section reviews Latour’s position and relates it to accounting literature.

For Latour [2013, p.477] strong subject to object distinctions are a root cause of Modernity. He regards them as occupying a transcendent level consisting of an aggregation derived from a “great bifurcation” affecting Primary and Secondary Qualities (after Locke), Nature, Language, Society, Economy, Object and Subject. In the epistemic analysis undertaken in this paper, such binary distinctions are attributed to the weak metaphysics of Modern human sciences, the consequential invention of Epistemological Man and internalising organic growth. Luft and Shields are themselves moving towards reducing the strength of objectivity in causal explanations used in accounting research and they explain its significance: “The accounting research that is sometimes labelled as positivist aims at empirically validating general causal explanations of accounting-related phenomena — that is, causal explanations that apply to many instances of a given phenomenon. This research aims at objectivity, in the sense that empirical results and the inferences drawn from them are meant to be independent of the characteristics of the individual researcher... Paradoxically, the objective development and validation of causal explanations in this literature are often dependent on subjective judgments and decisions. We identify key sources of subjectivity and trace their influence on developing and validating causal explanations” [Luft and Shields, 2014, p.550].

In lieu of the Modern, bifurcated, subject to object ontology, Latour recognises a plurality of ontologies derived from the networks of associations that constitute society. To analyse this society of associations, Actor-Network Theory (ANT) is a suitable approach but without MoE it is incomplete, a mere methodology. ANT has of course already been used by accounting researchers and indeed this kind of use may often be interpreted as the start of an engagement with the processes of episteme change (Justesen and Mouritsen, 2011). For example, Miller derived a network of associations for accountants on Latour’s terms: “The accountants will be there at the head of the queue, complaining that although

you speak of economization, you tell them nothing of the calculative practices by which this takes place. You don't even tell them what these calculations were, how they were performed, who did them, or what their results were. All you provide is a single bar chart which they will find most unsatisfying, believe me. The accountants are not going to like this at all, not (just) because they have become accountants in their very souls, auditors and box-tickers who want the receipts for every item so that the files can be kept in order. They are not going to like it because they are going to want to trace the chains of calculation, the ways in which particular calculative practices are mobilized in different ways and in relation to different objectives according to the incessant stabilising, destabilising, and restabilising of the network" [Miller, 1997, p. 362].

Miller's work clearly illustrates one of the two kinds of networks that Latour uses to construct MoEs. Having first removed the constraint of Modern knowledge domains using an ANT study, MoEs may be discerned from observation and experience in terms of:

- (i) A first network of set-ups, the infrastructure needed from the beginning to make the circulation of the other second network possible for example the constructions around the creation of gas-pipelines, railway-lines, legal and religious practices, the diverse ways and means of knowledge acquisition; and
- (ii) A second network comprising that which flows in the first network that is gas, trains, legal-means, salvation and knowledge respectively.

A moment's reflection reveals that any such networks are not limited to any one domain of knowledge. Constructing a gas pipeline, for example, will require engineering, law, accounting, economics, marketing, town and regional planning and so on. Similarly, to practice in law requires law, accounting, technology, building technology, transport...

In this way, a network is composed in a heterogeneous fashion of unexpected elements based on what is real and is empirically — not theoretically — connected. Such networks, based on leaping across discontinuities and not recognising domain boundaries, are the starting point for the recognition of multiply ontologies [Latour, 2013, p. 29–36].

Incipient MoEs may be argued to have been emerging within the accounting literature for some years. In Ahrens and Chapman [2007, p. 5], with reference to [Miller, 2001], MoEs may be seen emerging as 'structures of intentionality': "Miller's work on the programmatic character of accounting has sought to emphasise the highly specific ways in which structures of intentionality can, through 'temporary assemblages' of people, accountings, ideas, buildings, material flows, etc., come to be contextualised in particular cases".

Similarly, O'Sullivan and O'Dwyer's [2015, p. 35] use of Hoffman's "Issue-Based Fields" clearly points towards MoE's: "Issue-based fields are distinct from common conceptions of organizational fields as they are 'not formed around common technologies or common industries, but around issues that bring together various field constituents with disparate purposes' and interests" [Hoffman, 1999, p. 352]. Issues that become important to the interests and objectives of a specific collective define what the field is, making links that may not have previously been made. Hence, an issue-based field is not merely a collection of influential organizations; it is the centre of common channels of dialogue and discussion where competing interests continually negotiate over issue interpretation, and thus the institutions that will guide organizational behaviour [Hoffman, 1999].

But perhaps Miller's "Multiplying Machine" comes closest in accounting research to representing MoEs: "How might one write the history of an assemblage? How might one describe the swarming multiplicity of actors, agents, practices, tools, instruments, inscriptions and ideas that forms from time to time, and that is defined by the temporarily stabilized networks of relations between its constituent parts, the abstract lines that pass between its components, rather than the contours that surround them? How might one capture the singularity of the process by which this teeming abundance of relations results in the creation of something new, even if it is made up in part of second-hand components that can in turn be re-used, re-connected, re-assembled and linked into a new set of relations, once the assemblage ceases to exist? How can we do this while respecting the fictional nature of projects or programmes, the awkward empirical point that at the outset they do not exist, and only gradually construct themselves as a network of relations forms between persons, things and ideas? How, in short, might we write the history of a multiplying machine..." [Miller, 1997, p.355].

The recognition of multiple ontologies means that the constraining Modern view of a single bifurcation in a "real-world" constructed around economising and the conversion of diverse values and concepts into a financial language with universal utility is invalid. A plurality of ontologies have replaced multiple representations [Latour, 2013, p. 182] and that profoundly changes the approach to accounting which now has the task of providing fair views of many, equally valid ontologies to assist with their optimisation by means of comprehensive, thoughtful judgement. This new form of accounting is essential to the new episteme. Our institutions and indeed ourselves are given birth by crossings of multiple MoEs, little by little, in diverse ways. Reality and plurality are no longer opposed [Latour, 2013, p. 291].

MoEs require starting over in a new episteme which is as much an opportunity for accounting as discovering the New World was for the global economy. The Modern episteme with its problems and difficult, convoluted consequences has been replaced by something much simpler. There is simplicity and eminent practicality within MoEs but when seen through a Modern lens they will appear nonsensical: they do not ground themselves at all in Modern human sciences. So it may take some time to attain this conclusion but the method of identifying Modes of Existence is straightforward:

1. Choose any of the Domains to which Moderns seem to hold the most;
2. Shift attention from Domains to Networks;
3. Look at the way the first Network expands in order to detect the distinct tonalities of the second Network that we gradually extract by comparing each first Network with the other modes of extension, two at a time;
4. Entrust ourselves exclusively to the often fragile guidance of these discontinuous trajectories abandoning the re-assuring but vacuous help of a transcendent level of subjects/objects and nature/society [Latour, 2013, p. 477].

The transition to MoEs and the new episteme, like the episteme changes of old, brings new opportunities and new freedoms. Latour claims that Moderns have never "...tasted *economic freedom*" and asks of Moderns "Which tyrant do you prefer? The one with the invisible hand of the Markets, or the one with the invisible hand of the State... They have never imagined that there might be no hand at all!" [Latour, 2013, p. 469].

Concluding Remarks

Modern accounting has become essential to society: “Accounting has an ever-increasing significance in contemporary society. Indeed, some argue that its practices are fundamental to the development and functioning of modern capitalist societies... Pioneering work by accounting researchers and social scientists more generally has persuasively demonstrated to a wider social science, professional, management, and policy audience how many aspects of life are indeed constituted, to an important extent, through the calculative practices of accounting” [Accounting, Organizations..., 2009]. It may seem improbable that such an entrenched and extensive institution can be replaced... but historic major epistemic change has occurred and given rise to distinct practical consequences that define eras in thought and development. Epistemic analysis reveals that many properties of Modern accounting are a consequence of a weak, human science metaphysics which has now been replaced. Fundamental changes in the discipline of accounting are anticipated: “We are currently at a critical juncture in the history of accounting...” [Staden et al., 2010, p. 129]. As noted above, economics has already responded to the opportunities that a new episteme presents to derive the new discipline of ecological economics; but this task is far from complete: “The daunting task ahead of us is to rebuild the world economy” [Chang, 2010, p. 252].

The emerging episteme is not *directed* at solving the problems identified by sustainability accounting researchers. Episteme change lies below the level of rationally constructed change (which corresponds to a change of “paradigm” [Kuhn, 1962]. Nonetheless, epistemic analysis provides considerable support for sustainability accounting researchers in two ways: (i) it provides an explanation of the perilous nature of many features of Modern accounting that are supportive of unsustainable development; and (ii) the emerging episteme marks a transition from Modern abstract, logical belief-systems to an empirically-grounded, pragmatism within which the many impacts of our coping institutions and mechanisms are at least recognised with a status that demands equality within our analyses and decision making, planning and evaluative procedures.

Such a profound level of changes individual attitudes and values. New meanings will be sought and ultimately these will have to be incorporated within accounting and accounting institutions will then themselves change: “The empirical findings have illuminated a recursive and progressive multi-step process. In particular, three main processes and related outcomes have been identified: (i) the construction of the common meaning system around the idea of social and environmental responsibility; (ii) practicalisation, whereby rules and routines were adopted and diffused inside the organization; and (iii) reinforcement through the adoption of intra-organizational managerial structures and procedures” [Contrafatto, 2014, p. 428].

The specificities of the changes that the emerging episteme may instigate may not be discerned at this early stage. It is possible to derive distinctive, contrasting characteristics of the new episteme such as the lack of any strong measures of certainty and clearly distinguishable boundaries that are incompatible with the procedures of Modern accounting. But does this mean that Modern accounting as we know it will disappear? Or will it retreat, confined to the representations of one Mode of Existence amongst many? In which case capitalism would become a tool rather than a defining principle of a civilisation. Will the world’s “managers” come to recognise the *lost relevance* of aspects of accounting and fi-

nance and discover — *as management accounting has already done* — and seek the benefits of a more balanced approach to managing the world? We cannot answer these questions but we recommend that researchers seek answers using a pragmatic, empirical approach to reveal the actual associations that constitute our world and, in the first instance, cast off any theoretical determinations however precise, logical and quantifiable they may be.

The other benefits of an understanding of episteme change for accountants include the ability for them to take the initiative, to be proactive and to make the required changes themselves and not in response to external pressures. In this way accountants have a significant role to play in the development of a more sustainable world, i.e. a world with a future. Indeed Latour [2013] argues that new forms of accounting are essential to making the emerging ecological civilisation work; there is an urgent need for more, not less, accounting! To further this transition, accounting and its researchers need to foster minds not foreclosed by the mistakes of Modernism; accountants need to be more *mindful* of what they bring to — and how they manipulate — the world: “Mindfulness is an open-ended inquiry into our experience” [Chödrön, 2001, p.94].

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