

# THE OBESITY CRISIS AND SEMIOTIC CORRUPTION: TOWARDS A UNIFYING BIOSEMIOTIC UNDERSTANDING OF OBESITY

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**ABSTRACT:** Is there an obesity crisis? Postmodernists like Michael Gard argue that there is not while epidemiologists argue that there is and it is growing. In this paper, I argue that such polarized positions are not a sign of healthy dialectic, but a sign of an increasingly fragmented and reductionist obesity research field. As a further example, I draw on long term seemingly unresolvable disputes within nutrition research brought about by reductionist approaches. I argue that there is an obesity crisis, that it is linked to other major global crises and that to meaningfully address it will require greater unity within the obesity research field. To do so I put forward the post-reductionist general concept of semiotic corruption developed by process philosopher, Arran Gare, drawn from the emerging post-reductionist field of biosemiotics, as a potential unifying concept for the field. In doing this I explore the history and nature of biosemiotics and its links to other holistic traditions which all seek to mend the gross philosophical errors committed by those such as Descartes who ruptured the relationship between living and non-living processes. I then discuss some implications of this holistic approach for better understanding obesity as semiotic corruption, particularly focusing on the concepts of embodied, anticipatory systems and the need for a new ethics of health which understands and augments the real complexity and irreducibility of life.

**KEYWORDS:** Obesity; Semiotics; Biosemiotics; Complexity; Process Philosophy; Embodiment

## INTRODUCTION

According to Physical Educationalist, Michael Gard, there has never been an obesity crisis and even if there was one, it ended in 2010. From a Foucauldian perspective, Gard argues that what is totalized as a global health crisis is more a complicated assortment of localized power games played by various ideologues. In his two books

and various papers on the subject, Gard does a good job of revealing the prejudices and biases underlying various interpretations of scientific data.<sup>1</sup> Whether you are an alarmist, using his terms, one of the mainstream of science arguing that obesity represents an immanent global health catastrophe, or an empirical skeptic, a scientist who interprets the data as benign, or what he calls an ideological skeptic, one who favours a sociological or political reading, it is more a case of the data fitting the ideology than the other way around. But while Gard's own self-admitted postmodern skepticism provides an important deconstruction of the obesity crisis, it provides little help in understanding or addressing, more broadly, what is evidently a heavily researched and documented global phenomenon involving not a few, but millions of people. Gard is quick to assert that obesity, at whatever scale, is a human social construct, but then, as I will further explain, renders us powerless as humans to act.

Epidemiological research, much of which Gard is critical of, suggests an obesity crisis, or epidemic, does exist and is now well into its fourth decade. While the OECD Obesity Update 2012, for example, shows stabilization in obesity growth in some developed nations with growth rates not meeting projections, a reason for Gard suggesting it has ended, the overall global trend is still up with no sign of retrenchment, particularly now in developing and even under-developed nations.<sup>2</sup> According to the Harvard School of Public Health, what was once largely a problem for the rich in Western nations is now a disease of the poor transmitted by the West through globalization.<sup>3</sup> So it seems we have a crisis that both does not exist and is growing. It is contradictions such as this which are a major concern of this paper. I argue that there is an obesity crisis, that it is intimately linked to other major crises in the world today and that the contradiction I have just identified reveals problems in how it is being addressed. These contradictions emerge due to the fragmented nature of the obesity research field. I do not mean here that there are not advances being made in particular fields or that there are not some who are seeking unity. Rather, I mean that overall there is no sense of wholeness being created by those addressing it; no sense of a big picture emerging of what needs to be done and that this is retarding efforts to reverse the trend. Such lack of unity also allows governments to continue doing nothing which might upset the economic status quo. Instead, as Gard also argues, arguments over its causes and possible solutions have either become more numerous and have fragmented and been reduced into various seemingly

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<sup>1</sup> The two books are Gard M. and Wright J., *The Obesity Epidemic: Science, Morality and Ideology*, (Routledge, Oxon, 2005) and Gard M., *The End of the Obesity Epidemic*, (Routledge, Oxon, 2011).

<sup>2</sup> OECD Obesity Update 2012 at <http://www.oecd.org/health/49716427.pdf>, (accessed 29/1/14).

<sup>3</sup> The Harvard School of Public Health, *The Obesity Prevention Source, Adult Obesity: A Global Look at Rising Obesity Rates* at <http://www.hsph.harvard.edu/obesity-prevention-source/obesity-trends/obesity-rates-worldwide/>, (accessed 29/1/14).

incommensurable defenses of the particular disciplines involved, or have been obfuscated by those who most profit from obesity.

For example, biomedicine continues to reduce it to a disease with genetic or molecular origins which can be addressed ultimately through medical interventions such as medication or even surgical procedures.<sup>4</sup> The World Health Organization treats obesity as one of four risk factors, along with tobacco and alcohol consumption and high blood pressure, implicated in the global rise of what they call Non-Communicable Diseases (NCD's) (as I will explain later in relation to biosemiotics, there is fundamentally no such thing as an NCD).<sup>5</sup> Psychologists continue to attempt to reduce obesity to individual mental disorders treatable by psychological interventions<sup>6</sup> and sociologists assert their own perspectives by reducing it to a social problem.<sup>7</sup> All seek to have their own area of research either prioritized or at least included within narrow multi-disciplinary approaches to the problem and many are compromised through funding arrangements and power relations. While these internal academic battles go on, commercial food industry peak bodies such as the Australian Food and Grocery Council, which represents among others, multi-national food processors in Australia, successfully use their power to block or anticipate government food regulation and ensure self-regulation.<sup>8</sup>

<sup>4</sup> Examples of how biomedicine is approaching obesity through drug development and therapy is in Jun Goo Kang, and Cheol-Young Park, 'Anti-Obesity Drugs: A Review About their Effects and Safety', *Diabetes and Metabolism Journal*, Vol. 36 (1), February 2012, at <http://synapse.koreamed.org/DOIx.php?id=10.4093/dmj.2012.36.1.13>, (accessed 9/8/2014).

<sup>5</sup> The most recent report on NCD's from The World health Organization reveals that their goals for reducing deaths from NCD's, such as obesity, are not being met by participating nations. This report can be found at, [http://apps.who.int/iris/bitstream/10665/128038/1/9789241507509\\_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/128038/1/9789241507509_eng.pdf?ua=1), (accessed 9/8/2014).

<sup>6</sup> A good example of this is in a 2011 British Obesity Working Group Report by the British Psychological Society, titled, 'Obesity in the UK: A Psychological Perspective', which stresses the importance of individual psychological support, at [http://www.bps.org.uk/sites/default/files/images/pat\\_rep95\\_obesity\\_web.pdf](http://www.bps.org.uk/sites/default/files/images/pat_rep95_obesity_web.pdf), (accessed 9/8/2014).

<sup>7</sup> An example here is in a review article by Andrea E. Bombak, 'The Contribution of Applied Social Sciences to Obesity Stigma-Related Public Health Approaches', *Journal Of Obesity*, 2014, at <http://www.hindawi.com/journals/job/2014/267286/>, (accessed 9/8/2014).

<sup>8</sup> This subversion of public policy is discussed in Mayes C. and Kaldor J., 'Big Food with a Regional Flavour: How Australia's Food Lobby Works', *The Conversation* (11/9/2014) at [https://theconversation.com/big-food-with-a-regional-flavour-how-australias-food-lobby-works-28213?utm\\_medium=email&utm\\_campaign=The+Weekend+Conversation+-+1913&utm\\_content=The+Weekend+Conversation+-+1913+CID\\_747f97a720904368e7fd620229206296&utm\\_source=campaign\\_monitor&utm\\_term=Big%20Food%20with%20a%20regional%20flavour%20how%20Australias%20food%20lobby%20works](https://theconversation.com/big-food-with-a-regional-flavour-how-australias-food-lobby-works-28213?utm_medium=email&utm_campaign=The+Weekend+Conversation+-+1913&utm_content=The+Weekend+Conversation+-+1913+CID_747f97a720904368e7fd620229206296&utm_source=campaign_monitor&utm_term=Big%20Food%20with%20a%20regional%20flavour%20how%20Australias%20food%20lobby%20works). (Accessed 15/9/2014).

The common thread here in science and industry, is the problem of reductionism which Richard Lewontin and Richard Levins describe as the assumption that ‘...the smallest parts of a problem are more fundamental than the whole, and if we know the parts well we can understand the whole.’ As they further argue:

It is an approach which works well in engineering where the parts are built by design and can be tested in the laboratory. In the biological and social sciences it is a useful research tactic but as a philosophy it creates a pattern of knowledge and ignorance that in the long run is harmful and makes us more vulnerable to surprises.<sup>9</sup>

As anthropologist, Alexandra Brewis argues in relation to the surprise of the obesity crisis:

...obesity interventions do not work because most address obesity in a narrow, reductionist way. Obesity is a complex, multi-faceted, deep-rooted part of the contemporary human condition that resists simple, singular, quick, or easy fixes. Because it has stemmed from fundamental social, economic, and ecological changes our species has faced over the last few decades, only sustained and fundamental examination of those conditions is likely to do much about it. If powerful and broad global processes shape obesity, global solutions may ultimately be needed.<sup>10</sup>

The radical skeptical responses to reductionism of those such as Gard, however, only serve to generate further chaos, fragmentation and confusion and like the silos of academia, serve to hamper efforts to create global solutions. As Gard concludes:

In fact, like all globally pervasive shifts in the way people think and behave, perhaps a comprehensive understanding of what the obesity epidemic is and how it happened is beyond any of us and a smorgasbord of interpretations is the best we can hope for.<sup>11</sup>

Surely we can hope for more than such passive and meaningless pluralism. Reductionism in the obesity research field needs to be opposed and transcended by post-reductionist approaches. This can be achieved by first, acknowledging that there is a serious challenge, the likes and scale of which humanity has not faced before and second, taking, as Brewis suggests, a more global approach. Gard’s postmodernism and reductionist science form a dialectical relationship, one which requires a new synthesis. Creating this will require participation within dialectical and trans-

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<sup>9</sup> Lewontin R. and Levins R., *Biology Under the Influence: Dialectical Essays on Ecology, Agriculture, and Health*, (Monthly Review Press, New York, 2007), p.183.

<sup>10</sup> Brewis Alexandra A., *Obesity: Cultural and Biocultural Perspectives*, (Rutgers University Press, New Brunswick, 2011), Kindle DX Version, Chapter 7.

<sup>11</sup> Gard M., op. cit., 2011, pp.338-339.

disciplinary processes in which participants meaningfully and respectfully engage in dialogue to create new and greater coherent wholes, rather than the degeneration into a clash of dogmas we are seeing or the serving of powerful vested interests. Creating such wholes will require synoptic and dialectical approaches which attempt to create higher level synthetic general concepts to unite the arguing parties. Such a synthesis is required to adequately address obesity and related problems and increase pressure for meaningful change. One thing Gard does conclude more generally is that for him, understanding and addressing the obesity crisis requires, ‘...a clearer explanation of what it means to be rational.’<sup>12</sup> Among other questions, the broad question of what it means to be rational has been and is a question primarily for philosophy. Therefore, I will argue that the obesity crisis should be addressed primarily as a philosophical problem. But this requires much more than just addressing rationality; obesity is fundamentally a problem of meaning and what constitutes a good human life.

Such a synthesis as I present, therefore, will give a central role to philosophy in addressing the obesity crisis for, as Mikhail Epstein suggests, the role of philosophy and the humanities more generally, is to create wisdom and to lead the sciences rather than merely serve them.<sup>13</sup> I will not be promoting any philosophy, however, but holistic process philosophy, based on the metaphysical categories developed by Arran Gare and stemming from the dynamic, dialectical approaches to reality of many philosophers, both Eastern and Western, but most notably Heraclitus, Aristotle, Friedrich Schelling and more recently, Charles Sanders Peirce and Alfred North Whitehead.<sup>14</sup> The reductionism and atomism pervading obesity research is related to the dominance of analytical approaches to philosophy which have sought for several hundred years now, to explain reality as primarily a highly abstract and meaningless collection of unrelated, static and deterministic parts. Alternatively, process philosophy begins with reality as a dynamic, undivided whole from which parts emerge to distinguish themselves. The conditions of unity are therefore ontological for process thinkers. From this holistic perspective, fragmented fields, such as obesity research, can be understood as ones that have lost touch with reality.

<sup>12</sup> Gard M., ‘Truth, belief and the cultural politics of obesity scholarship and public health policy’, *Critical Public Health*, Vol. 24, No.1, (March 2011), p.46.

<sup>13</sup> This argument is made in Epstein M, *The Transformative Humanities: A Manifesto*, Translated by Klyukanov I., (Bloomsbury, London, 2012), Kindle DX Version.

<sup>14</sup> For a comprehensive look at the nature of Process Philosophy and its categories see Gare A., *Nihilism Inc., Environmental Destruction and the Metaphysics of Sustainability*, (Eco-Logical Press, Como, 1996) or McLaren G., ‘Unifying Process Philosophy’, in *Applied Process Thought 1, Initial Explorations in Theory and Research*, (Ontos Verlag, Heusenstamm, 2008), pp.43-118.

I will propose and support, therefore, a unifying post-reductionist concept, semiotic corruption, first put forward by Arran Gare in relation to the problem of climate change.<sup>15</sup> In taking a semiotic approach to climate change, a study of the sign systems involved and their nature, Gare likens semiotic corruption to cancer cells which ‘...not only forget their position in the whole and proliferate uncontrollably, they corrupt the semiosis within the body and through their rhetoric reorganize the body to feed the growing tumours.’<sup>16</sup> Semiotic corruption implies, therefore, that the signs we anticipate for creating and maintaining our integrity as living organisms, signs generated within what Jacob von Uexküll calls our *umwelten*, the subjective worlds of meaning created by organisms, are being distorted or overwhelmed by other signs which compromise our integrity. In putting forward this concept, Gare is strongly influenced by the relatively new field of biosemiotics, which, as Thomas Sebeok argues, is itself a unifying field which bridges the gap between the sciences and the humanities.<sup>17</sup> I will argue that Gare’s application of semiotics to the crisis of global warming applies more generally to the obesity crisis and that the obesity crisis can be understood more generally as primarily a consequence of semiotic corruption. I will begin by discussing several corrupting polarities in current arguments concerned with the obesity crisis, focusing mainly on nutrition, revealing their limitations.

#### CURRENT ARGUMENTS AND THEIR LIMITATIONS

In 2004, I completed my Doctorate on *The Metaphysical Roots of Physical Inactivity and Obesity in Late Capitalism* in which I focused on applying process philosophy to major health problems.<sup>18</sup> My conclusion in relation to the obesity crisis was that it was the product of a defective culture in a decadent phase of its lifecycle. The roots of this defective culture, I argued, go back several thousand years to the dialectic between Plato and Aristotle. This was between the substantial, immutable and ideal reality of Plato, influenced by Parmenides and the Pythagoreans and the flux and tension of Heraclitus and Eastern philosophy and the more dynamic empirical reality of

<sup>15</sup> Gare A., ‘The Semiotics of Global Warming: Combating Semiotic Corruption’, *Theory and Science*, Vol. 9, Issue 2, Spring, 2007 at <http://theoryandscience.icaap.org/content/vol9.2/Gare.html>.

<sup>16</sup> Ibid.

<sup>17</sup> The potential for biosemiotics to bridge the ‘two cultures’, as C.P. Snow called them, is argued for in Sebeok T.A., ‘Signs, Bridges, Origins,’ in *Global Semiotics*, (Indiana University Press, Bloomington, 2001), Ch. 5, pp. 59-73.

<sup>18</sup> McLaren G., *The Metaphysical Roots of Physical Inactivity and Obesity in Late Capitalism: Towards a Better Understanding of Major Health Problems through the Application of Process Philosophy*, Ph.D. Dissertation, 2004, at [http://www.researchbank.swinburne.edu.au/vital/access/manager/Repository/swin:28790?queryType=vitalDismax&query=arran+gare&fo=sm\\_creator%3A%22McLaren%2C+Glenn%22&ty=16&x=14](http://www.researchbank.swinburne.edu.au/vital/access/manager/Repository/swin:28790?queryType=vitalDismax&query=arran+gare&fo=sm_creator%3A%22McLaren%2C+Glenn%22&ty=16&x=14).

Aristotle. This was the root of the dialectic between two metaphysical traditions; mechanistic materialism, which sees reality as primarily constituted by static, unrelated parts and process metaphysics, which sees reality as primarily a dynamic whole. Perhaps the most crucial manifestation of this dialectic was the mechanistic and materialist metaphysical view associated with the scientific revolution in the 17<sup>th</sup> and 18<sup>th</sup> Centuries associated with the Moderate Enlightenment, which emerged to oppose the Radical Enlightenment, which promoted more concrete, process understandings of reality (this is a dialectic I will revisit later in the paper). Through its seeming ability to simplify and control reality, the mechanistic materialist view has generally prevailed and has led to belief in the primacy of increasingly remote metaphysical abstractions. These abstractions have themselves generated disembodiment; alienation of humans from the conditions for healthy life, which has in turn generated nihilism. Obesity is a more recent manifestation of this disembodiment which sees humans losing their sense of reality through being coerced into inhabiting the increasingly abstract and ultimately meaningless, Platonic virtual worlds generated by modern capitalism which seeks through Neoliberalism to reduce all relationships to abstract, market mediated ones. My recommendations were to replace this defective and decadent mechanistic materialist culture with one based in process metaphysics. This is a view which better reveals the dynamic, multi-level, irreducible relational conditions for good health and by conceiving of living organisms as complex processes of becoming, understands them as generators of meaning in the universe.

Part of my dissertation looked at what I believed to be the most significant arguments taking place within the academic fields deemed legitimate to address the obesity crisis and how reductionism and the lack of dialectic led to these fields becoming part of the problem. In exercise science I looked at the debates around the frequency and intensity of exercise; how much exercise must be done to achieve and maintain a healthy body weight, what type of exercise and how hard should it be done. In nutrition I looked at debates over what the composition of a healthy diet should be as well as when and how it should be eaten. Finally, I looked at the relationship between psychology and sociology and their debates over whether obesity was primarily an individual problem, some form of mental illness or lack of will, or a social problem associated with, for example, the development of 'obesogenic environments'. These arguments, I argued, generated false dichotomies and were all set against the background of late capitalism and the commodification, fragmentation and alienation associated with it.

More than Ten years later it is interesting to find that the debates have not progressed far. There are still arguments in exercise science over long duration, low intensity endurance activity versus short, high intensity activity. There is a heated

debate happening in nutrition over whether the Healthy Eating Food Pyramids promoted by government health authorities which advocate high carbohydrate intake and low fat intake should be replaced with one's advocating the opposite. Psychologists and sociologists are still, unfortunately, engaged in a turf war to establish their legitimacy as independent 'hard sciences'. This has been against the background of the rapid transition in Tertiary Education to the business-model university aimed solely at providing vocational training while rejecting the value of a more general Liberal Arts education. While speaking the language of disciplinary cooperation, these Neoliberal institutions are in reality actively attacking holistic trans-disciplinary approaches and favouring narrow specialization.<sup>19</sup>

Nutrition is probably the most contentious area in obesity research and arguments in relation to nutrition perhaps best exemplify the impasse that has developed. A glance at the Australian Dietary Guidelines of 2013 developed by the National Health and Medical Research Council, and therefore supported by an orthodox scientific consensus, reveals what has been a consistent message from health and nutrition authorities since the late 1970's; that is, that ideal body weight is the result of a simple linear relationship balancing calories in and calories out where all calories are considered equal and ideally, the bulk of our diet should consist of complex carbohydrate, followed by vegetables and fruits, relatively small amounts of lean meat and predominately low fat dairy products.<sup>20</sup> On the face of it the latest guidelines seem very reasonable with warnings against too many refined sugar products, particularly in the form of soft drinks and so-called energy drinks and a greater focus on drinking water and eating a variety of vegetables. In line with the calorie-in calorie-out equation, minimum levels of exercise are also recommended. For some, however, these guidelines are far too simplistic and reductionist and do not account for the real complexity of human nutrition.

Zoë Harcombe and Michael Pollan, for example, represent a dissident group of researchers and scientists who argue that the current nutritional guidelines have little basis in scientific evidence and are in fact the cause of obesity. Harcombe sees a correlation between changes in government supported nutrition guidelines in the late

<sup>19</sup> There is an increasing body of work examining the phenomenon of the business-model university and the threat it poses to the Liberal Arts and Democracy. Examples are Nussbaum M. C., *Not For Profit: Why Democracy Needs the Humanities*, (Princeton University Press, 2012) and Roth Michael S., *Beyond the University: Why Liberal Education Matters*, (Yale University Press, 2015).

<sup>20</sup> A comprehensive summary of these guidelines are at, *Eat for Health, Australian Dietary Guidelines 2013*, Australian Government, National Health and Medical Research Council, Department of Health and Ageing, at [https://www.nhmrc.gov.au/files/nhmrc/publications/attachments/n55a\\_australian\\_dietary\\_guidelines\\_summary\\_131014.pdf](https://www.nhmrc.gov.au/files/nhmrc/publications/attachments/n55a_australian_dietary_guidelines_summary_131014.pdf), (Accessed 21/7/2014).



1970's and the obesity crisis. Research which suggested a link between heart disease and cholesterol consumption helped lead to a shift from the promotion of fat and protein rich diets to carbohydrate rich ones. To those such as Harcombe, this interpretation of the science was and still is encouraged by the multi-billion dollar food processing industry which profits from cereal and grain based products. It is the effects of carbohydrate rich products, often highly processed and stripped of other nutrients, on insulin regulation which encourages excessive fat storage. For Harcombe, perhaps more interestingly, a calorie is not just a calorie. It is the quality and nature of the calorie which counts and there is no simple linear effect of calorie intake and expenditure. The effects of fat, protein and carbohydrate consumption are non-linear; that is, there are no purely deterministic paths these nutrients take within different cultures and individuals.<sup>21</sup> More recent research into the effects of macronutrients on longevity would appear to support this more complex view.<sup>22</sup> Pollan's arguments address the problems associated with such studies due to the increasing ability and desire of science to abstract and isolate single nutrients. His critique is similarly aimed against the food processing industries and the emergent health problems associated with their replacement of natural whole foods with manufactured ones.<sup>23</sup>

Continuing this theme is Denise Minger in her recent book, *Death by Food Pyramid: How Shoddy Science, Sketchy Politics and Shady Special Interests Ruined Your Health...and How to Reclaim It!* Minger's particular skill is in identifying the inadequacies in both the conduct and interpretation of scientific studies. She focuses on the rivalry between two key scientific figures in nutrition debates in the 20<sup>th</sup> Century, Ancel Keys and John Yudkin, two men researching the increase in heart disease in the mid-20<sup>th</sup> Century and coming to opposing conclusions. American, Ancel Keys is the best known of the two. As well as being the inventor of the K-ration which helped sustain the US military in WW2, Keys is credited with first popularizing the Diet-Heart Hypothesis, which suggests a link between the ingestion of saturated fat, high blood cholesterol levels and heart disease. Keys's now famous research in the Minnesota Starvation Experiment and later in the 1950's, The Seven Countries Study,

<sup>21</sup> These arguments are in Harcombe Z., *The Obesity Epidemic: What caused it? How we can stop it?*, (Kindle DX Edition), (Columbus Digital Services, UK, 2010).

<sup>22</sup> This research conducted on mice concluded that low protein, high complex carbohydrate diets enhanced longevity so legitimizing the manipulation of macronutrients in health interventions. Solon-Biet S. M. et. al, 'The Ratio of Macronutrients, Not Caloric Intake, Dictates Cardiometabolic Health, Aging, and Longevity in Ad Libitum-Fed Mice', *Cell Metabolism* 19, March 4, 2014, p.p. 418-430 at [http://ac.els-cdn.com/S1550413114000655/1-s2.0-S1550413114000655-main.pdf?\\_tid=0ded35aa-1722-11e5-af5e-00000aacb35f&acdnat=1434787253\\_1dcf7d18d918a48959d823a845c102e1](http://ac.els-cdn.com/S1550413114000655/1-s2.0-S1550413114000655-main.pdf?_tid=0ded35aa-1722-11e5-af5e-00000aacb35f&acdnat=1434787253_1dcf7d18d918a48959d823a845c102e1) (Accessed 20/6/2015).

<sup>23</sup> Pollan M., *In Defense of Food: An Eater's Manifesto*, (Penguin, New York, 2009).

revealed to him a causal link between eating saturated fat and heart disease and led to him developing the Mediterranean Diet. British Physiologist, John Yudkin, on the other hand made his name by opposing Keys's findings and arguing that sugar was the main cause of heart disease. His work is best known from his book, *Pure, White and Deadly*, which is still widely read and was updated in 2012.<sup>24</sup>

For Minger, both Keys and Yudkin are still relevant in that they exemplify not only what went wrong with nutrition research in the 20<sup>th</sup>. Century, but what continues today. Their main problem is that they are reductionists and mistook correlation for cause. This led to them adopting dogmatic views implicating a single nutrient in the development of heart disease; for Keys, saturated fat and for Yudkin, sugar. As Minger reveals, however, it is Keys' and Yudkin's own evidence which suggests a more complex relationship between nutrients and the context in which they are ingested, with the main culprit emerging to be affluence, rather than nutrients. As she suggests in relation to a 1970 Bulletin of the World Health Organization paper by Dr. Roberto Masironi:

The picture painted was a clear one: access to greater levels of food seemed more pertinent on the heart-disease front than did any particular diet constituent – whether as a causative agent or yet another reflection of national affluence.<sup>25</sup>

Further confusing these causative claims of this research are the statistics showing that despite more heart-disease in more affluent nations, their life expectancy is also greater. More recent research Minger draws upon reveals support for the view that it is the context of fat and sugar ingestion which is more important in transforming a vital nutrient such as cholesterol into a pathological condition.<sup>26</sup> Despite these findings of those researchers who are taking more complex approaches, I agree with Minger that it is Keys's reductionist views which still largely prevail, helped by the strength of the grain lobby, and remain the basis for the development of national food guidelines advocating low saturated fat diets while promoting grains and artificially produced polyunsaturated oils.<sup>27</sup>

What Minger reveals in her telling of the story of the development of nutrition guidelines are the contradictions which arise from reductionist approaches to

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<sup>24</sup> Minger D., *Death by Food Pyramid: How Shoddy Science, Sketchy Politics and Shady Special Interests Ruined Your Health...and How to Reclaim It!*, (Kindle DX Edition), (Primal Blueprint Publishing, Malibu, 2013), Ch. 7.

<sup>25</sup> Yudkin himself found that owning a radio or television was highly correlated with heart disease. *Ibid.*, Ch.7.

<sup>26</sup> This is a review in *The Netherlands Journal of Medicine* from 2011 which evaluated a large range of research on saturated fat, carbohydrate and cardiovascular disease suggesting that the behavior of saturated fat changes under different dietary circumstances. *Ibid.*, Ch.7.

<sup>27</sup> *Ibid.*, Ch.9.

knowledge and the ways in which these contradictions then become the basis for dogmatic claims to ultimate truths. As Lewontin and Levins argued earlier, this leaves us more vulnerable to surprises. This is because by reducing complexity to its component parts we are left, not with a clear picture of an ultimate cause, but with a multitude of isolated component parts. This is also where the postmodern skepticism of those such as Gard leaves us. What is required to make sense of these parts is wholeness; the creation of higher level, generic unifying concepts which themselves acknowledge the complexity which they seek to constrain. Minger attempts this by arguing for a grand synthesis of all nutrition research which would identify common patterns, particularly in relation to what nutrition research in general tells us not to do. In relation to the obesity crisis, however, this does not go far enough or deep enough. In what follows I will develop a post-reductionist unifying concept around the concept of semiotic corruption based in a holistic metaphysics of process which not only has the potential to unify all obesity research, but also relate the obesity crisis to even larger crises which challenge humanity in the 21<sup>st</sup> Century. First I will look at the fields of semiotics and biosemiotics more generally, from which this concept is generated.

#### BIOSEMIOTICS: A BRIEF HISTORY AND PHILOSOPHY

For the uninitiated, semiotics is the study of the creation of meaning through the perception and interpretation of signs; the act of semiosis. It is often associated with linguistics and the use of language in the human world, but biosemiotics has extended semiotics into all living systems. Those such as Thomas Sebeok even go further to suggest that it is semiosis which defines life. Biosemiotics is a dynamic, post-reductionist and non-representationalist approach to understanding the nature of life and the universe in which it emerged which privileges function over mechanism. The key questions posed by biosemiotics, to quote one of its key figures, Jesper Hoffmeyer, are; ‘How could natural history become cultural history? Or, to put it another way...How did something become “someone”?’<sup>28</sup> In his *Evolutionary History of Biosemiotics*, Donald Favareau documents the way biosemiotics has served to bridge the gap between the natural and human worlds so damagingly split by those such as Rene Descartes.<sup>29</sup> In its Ancient Greek origins, semiosis was associated with early medicine and the ability of a practitioner to perceive and interpret signs and symptoms of illness. But as St. Augustine of Hippo argued in late Roman times, there was also a sense in which a sign can be “anything *perceived*, which in so doing, causes something other than

<sup>28</sup> Hoffmeyer, Jesper. *Signs Of Meaning In The Universe*. (Indiana University Press, Bloomington, 1996), pviii.

<sup>29</sup> Favareau, D., ‘The Evolutionary History of Biosemiotics’, in M.Barbieri (ed.), *Introduction to Biosemiotics: The New Biological Synthesis*, (Springer, Berlin 2006), pp.1–67.

itself to come into *awareness*.”<sup>30</sup> For Favereau, this indicates a sense of unity among early philosophers that signs were both cultural and natural, both in the mind of human perceivers and in the natural world more generally. Had this state of affairs remained, he argues, the development of biosemiotics may not have been necessary. However, this did not remain the case with a split developing between nature and culture associated with, among other developments, the complete rejection of the history of pre-modern philosophy by Descartes.

According to Favereau, Aristotle was one of the first biosemioticians. If one reads Aristotle’s works on logic, collectively known as the *Organon*, together with his works on nature, such as *De Anima*, there is a sense of a co-dependent relationship between nature and culture. In the words of Favereau:

In perception, as well as in imagination, in other words, “it is not the stone which is present in the soul but its form” (*De Anima viii*). Understood within Aristotle’s overarching conceptual system of hylomorphism, and ... translated for modern ears (especially those conversant with dynamic systems theory), this means that *there exists a structural coupling between the relations constituting organisms and the relations constituting the external world that ensures a veridical alignment between the two* that holds across the *scala naturae*.<sup>31</sup>

Unfortunately, however, for most of the Middle Ages the only works of Aristotle available to scholars were the six books of the *Organon* translated into Latin by Boethius. These works on logic, separated from Aristotle’s other works, left the impression that semiotics was primarily generated by human mental experience. Therefore, states Favereau, an

...ever-widening bifurcation in the scholastic period between the investigations of bio-logic and the investigation of semeio-logic resulted in the assumption that it is what the scholastics called the “mental word” (*verbum interius*) – or what we might designate more precisely today as “linguistically mediated experience” – that was to be the natural starting point and, eventually, the exclusive focus of “sign” study.<sup>32</sup>

It was this focus on the primacy of linguistically mediated experience which would play a role in the development of the ‘counter-Renaissance’, or Moderate Enlightenment, which I referred to earlier in the paper.<sup>33</sup> Drawing on the work of

<sup>30</sup> Here Favereau quotes Augustine from his *De Dialectica* of 387AD. Ibid., p.5.

<sup>31</sup> Ibid., p.9.

<sup>32</sup> Ibid., p.9.

<sup>33</sup> Gare refers to Stephen Toulmin’s characterization of Descartes’ work and influence as the ‘counter Renaissance’ in Gare A., ‘Reviving the Radical Enlightenment: Process Philosophy and the Struggle for Democracy’, *Researching with Whitehead: System and Adventure*. Ed. Franz Riffert and Hans-Joachim Sander, Verlag Karl Alber: Freiburg, p.33.

Margaret Jacobs, Arran Gare argues that there were two Enlightenments, the Radical and the Moderate which emerged from the Renaissance. According to Gare:

The Renaissance then was not merely a flourishing of culture and a rediscovery and revival of ideas of the Ancient World; it was a revival of the struggle for liberty of the Ancient World, lost when the Greek city states were subjugated by Macedonia and again when Julius Caesar overthrew the Roman Republic.<sup>34</sup>

This struggle for liberty was associated with Civic Humanism and the re-emergence of democracy in the Italian City States from the 11<sup>th</sup>. Century on and the emergence of the Nature Enthusiasts associated with Giordano Bruno in the 16<sup>th</sup>. Century. As Gare argues, the Nature Enthusiasts were opposed to hierarchical power structures and promoted egalitarianism, while the Civic Humanists promoted freedom through participation in self-governance.<sup>35</sup> It was Bruno who developed a philosophy of nature which conceived of matter as dynamic, creative and ‘permeated by soul’, a philosophy which helped to underpin later views of humans as autopoietic processes of becoming. In this, Bruno developed an early form of holistic process philosophy, which as I discussed in the Introduction, is a tradition of philosophy based in a metaphysics of activity and exists to counter static and deterministic views of primary reality. Holistic, process views such as Bruno’s, acted to re-instate the union between bio-logic and semio-logic, nature and culture. The holistic, pantheist, egalitarian views of Bruno and the Nature Enthusiasts and the democratic views of the Civic Humanists, however, created contempt amongst many who feared their radical implications for science, religion and politics, most notably Descartes and his friend, Marin Mersenne, who through their opposition would inspire the development of the Moderate Enlightenment. These views, based on the mechanical and analytical philosophies of Descartes in France and Thomas Hobbes in Britain and later, those such as Locke, Boyle and Newton, split human consciousness again from its natural conditions, rendering nature meaningless and alien and culture deterministic. As well as serving to justify autocratic and oligarchic rule, process philosopher Gare argues: ‘A feature of this counter-Renaissance was the claim to absolute truth through the application of a method, the origin of what later came to be known as “scientism”, while denigrating narratives, metaphors and other literary tropes cherished by Renaissance thinkers.’<sup>36</sup>

It is ‘scientism’, the privileging of reductionist and analytical scientific method over all other ways of knowing and understanding reality, stemming from the Moderate

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<sup>34</sup> Ibid., p.30.

<sup>35</sup> Ibid., p.30

<sup>36</sup> Ibid., p.33.

Enlightenment, which contributes to the fragmentation of the obesity field, discussed earlier. Alternatively, the efforts of biosemioticians to unite nature and consciousness and characterise life as inherently meaningful and dynamic, can be understood as being within the tradition of process philosophy and thus, a development of the Radical Enlightenment. It is important to understand that in this paper I am not denigrating science as a whole, but scientism, at the same time promoting newly emerging post-reductionist areas of science. The idea that obesity research can understand itself more broadly as being part of such historical, philosophical traditions, is one I will return to later.

An example of the different approaches to reality by those representing the Moderate and Radical Enlightenments can be found in the field of semiotics, itself. John Deely discusses the history and philosophy of biosemiotics and semiotics more generally, in relation to the concepts of 'Modern' and 'Postmodern'.<sup>37</sup> Modernity, he argues, can be distinguished by the separation, discussed earlier in relation to Favereau, of human consciousness from nature. Pre-modern thinkers, particularly from the late-Roman and Medieval periods, made a distinction between sensation and perception with sensation understood as embodied constraints on what nature affords an organism and perception involving subjective interpretation of sensations. In this non-representationalist view, therefore, there was a reality underlying human perception which humanity did not make and '...a level within human awareness which did not of itself depend upon subjective interpretive responses expressed in the form of "mental images" or ideas.'<sup>38</sup> It was, however, the level of subjective perception which became the ground for 'Moderns' such as Descartes, Locke and later, Hume, philosophers also associated with the Moderate Enlightenment. Kant, also, according to Deely, by arguing for the unknowable thing-in-itself, proves himself to be thoroughly Modern, rather than one who transcended the problem, by developing an 'idealist bond' with his Modern predecessors, rather than a defence of objective reality.<sup>39</sup> This left Modern Philosophy as a problem for Modern Science, as Modern Philosophy was denying knowledge of reality outside human perception at the same time as Modern Science believed it was revealing it and bringing it '...more and more under the arts of human practical knowledge.'<sup>40</sup>

Between the Father of semiology, Ferdinand de Saussure and the Father of semiotics, Charles Sanders Peirce, it was Peirce, according to Deely, who ushered in a

<sup>37</sup> Deely J., 'The Impact of Semiotics on Philosophy', *First Annual Hommage à Oscar Parland, University of Helsinki, 2000*, at <http://www.helsinki.fi/science/commens/papers/greenbook.pdf>, (Accessed, 7/12/2014).

<sup>38</sup> Ibid., p.5.

<sup>39</sup> Ibid., p.11.

<sup>40</sup> Ibid., p.8.

Postmodern era, defined as the re-unification of nature and culture through semiotics. Saussurian semiology and its structuralist approach, according to Kull, Emmeche and Hoffmeyer, was important in developing semiotic thinking in the 20<sup>th</sup>. Century.<sup>41</sup> In taking a purely analytical and static synchronic approach to the study of signs, however, semiology can be understood to be Modern, or a product of the Moderate Enlightenment. While acknowledging its potential in other domains, semiology for Saussure was confined to human language and the relations between signs themselves abstracted from other cultural or natural relationships. Semiology, therefore, Kull, Emmeche and Hoffmeyer argue, represents only restricted special cases of broader, dynamic semiotic models.<sup>42</sup> Saussure's dyadic, simplistic and atemporal structure of sign and signifier only served to reify the abstractions of the Moderns making his study, according to Deely, '...a variant of modern idealism.'<sup>43</sup> Alternatively, Deely argues, with Peirce's semiotics:

...in recovering from the Latins the general notion of sign, and in advancing that notion both by naming distinctively its third term and by shifting the focus from the being to the action of signs (so that it is well understood that in that spiral of semiosis we call experience representamen, significate, and interpretant are constantly changing places as abductions give way to deductions and deductions to retroductions provenating yet further abductions in a semiosis that *would be* infinite did not death intervene to curtail the process in the individual case), what we were handed was precisely a new set of categories.<sup>44</sup>

Peirce's triadic system of semiotics consisting of the sign, the object and the interpretant, rather than reducing semiosis to a highly abstract, Saussurian static structure, seeks to reveal the dynamic process of sign generation and in a universe of signs, as Peirce speculated, perhaps the generation of the cosmos itself (for Deely, this situates Peirce as a radical semiotician as opposed to the relatively conservative position of biosemiotics). These new categories transcended both the Ancients and the Moderns, according to Deely, because:

...by revealing how mind-independent and mind-dependent being *interweave* in the constitution of experience as a semiotic web of relations whose nodes, reticles, or interstices precisely present to us an objective world both natural and cultural in its provenance and knowability, the new list of categories carries us forward

<sup>41</sup> Kull K., Emmeche C., Hoffmeyer J., 'Why Biosemiotics? An Introduction to Our View on the Biology of Life Itself', in *Towards A Semiotic Biology: Life is the Action of Signs*, Emmeche C., Kull K., Ed., (Imperial College Press, London, 2011), pp. 4-6.

<sup>42</sup> Ibid., p.12.

<sup>43</sup> Ibid., p.2.

<sup>44</sup> Ibid., p.12.

beyond modernity and not simply back to some older viewpoint ("realism") adequately presaged in both ancient Greek and medieval Latin thought.<sup>45</sup>

Where Saussure's dyadic relation between the sign and the signifier focuses on the relationship between syntax and semantics, in the pragmatist field of semiotics Peirce focuses on the sign in its relationship to its users. In this sense, as Deely argues, the object in the triad is different from a thing in that a thing is '...what it is regardless of whether it be known or not', while an object '...requires a relation to a knower, in and through which relation the object as apprehended exists as terminus.'<sup>46</sup> It is this relationship developed by Peirce which was aligned with the concept of the *umwelt* created by Jacob von Uexküll, (characterised by Thomas Sebeok as the 'semiotic web') to form the basis of biosemiotics. The *umwelt*, meaning outer world but often translated as 'lifeworld', is where nature and culture meet; '...a *species-specific objective world*, with elements of the physical environment made part of a larger, "meaningful" whole or "lifeworld" wherein the individual members of a given species live and move and have their being *as* members of *that* species rather than some other.'<sup>47</sup> The *umwelt*, as conceived by von Uexküll, is an invisible bubble in the sense that it is a semiotic field of irreducible relations. Therefore, it '...is not merely the aspects of the environment accessed in sensation. Far more is it the manner in which those aspects are networked together as and to constitute "objects of experience".'<sup>48</sup> Deely also points to the inadequacy of the concept of the *umwelt* in fully understanding the human *lebenswelt* and our ability to not only use signs, but know that we are. This is because as linguistic creatures we are able to model the world through language in a way that is not fully determined by biology, something other creatures are relatively less capable of which I will discuss later in relation to the work of Robert Rosen. This is the condition for Deely to be able to conclude that through semiotics based on Peirce's triadic system and von Uexküll's concept of *umwelt*:

...we arrive at a new definition of the human being, no longer the "rational animal", as in ancient Greek and medieval Latin philosophy, nor even the "thinking thing" of modern philosophy, but rather the "semiotic animal", the animal that not only uses signs but knows that there are signs, because as linguistic the human animal is capable of modeling that fundamental reality of all experience which never appears to the eyes and ears or any other biological channel of sense...<sup>49</sup>

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<sup>45</sup> Ibid., p.12.

<sup>46</sup> Ibid., p.18.

<sup>47</sup> Ibid., p.18.

<sup>48</sup> Ibid., p.16.

<sup>49</sup> Ibid., pp.21-22.



What Favereau and Deely both reveal in their history and philosophy of biosemiotics is a holistic tradition of thought seeking to mend significant philosophical errors, particularly those associated with the separation of perception from direct experience of the physical world associated with the Moderate Enlightenment. They reveal biosemiotics to be a unifying philosophical and scientific tradition acting in a transdisciplinary way to meaningfully explore how ‘something becomes someone’. Notable figures in the field such as Kalevi Kull, Terence Deacon, Jesper Hoffmeyer, Claus Emmeche, Frederick Stjernfelt, Stanley Salthe, Mark Bickhard and Robert Rosen, all represent different disciplines brought together to develop a naturalistic basis for semiotics in general and in so doing, develop the first steps towards ‘...understanding how the humanities and sciences might be integrated into a new grand synthetic theory without having to reduce one to the other.’<sup>50</sup> Therefore, while the field is still in early stages of development, it is the field of biosemiotics, I argue, which has the potential to unite the field of obesity research such that the obese can be understood more fundamentally, both individually and collectively, as ‘semiotic animals’ creating meaning in relation to species specific *umwelten*.

#### BIOSEMIOTICS, EPISTEMOLOGY AND PROCESS METAPHYSICS

Epistemologically, biosemiotics reveals how it is that we know reality prior to our perceptual interpretation of it. In this, biosemiotics can be seen as a further development of the anti-representationalist views which have proliferated at least since Kant’s attack on Cartesian dualism. Continuing this theme, philosopher, Michael Dix, in his paper, *Living and Knowing: How Nature Makes Knowledge Possible*, draws on major thinkers in biosemiotics to provide a detailed account of the likely natural processes involved in the emergence of knowing creatures, from those with simple forms of irritability to highly nuanced sensitivity to semiotic *umwelts*.<sup>51</sup> Such an account, Dix argues, requires that current epistemological concepts:

...be *illuminated* by an integrating framework that draws together insights of evolutionary, biosemiotic, complexity-theoretic, and *umwelt*-theoretic approaches. The integrating principle of this framework is an understanding of the mode of non-linear causation distinctive of biosemiosis, and of how it makes possible a world of emergent, co-evolving, communicating, dynamically self-stabilizing,

<sup>50</sup> Kull K., Deacon T., Emmeche C., Hoffmeyer J., Stjernfelt F., ‘Theses on Biosemiotics: Prolegomena to a Theoretical Biology’, *Biological Theory*, 4(2), 2009, pp.167–173.

<sup>51</sup> Dix M., ‘Living and Knowing: How Nature Makes Knowledge Possible’, *Cosmos and History: The Journal of Natural and Social Philosophy*, vol. 9, no. 1, 2013, at <http://cosmosandhistory.org/index.php/journal/article/viewFile/323/552>, (Accessed 10/12/2014), pp.1-34.

hierarchically structured living systems. It is the emergence in nature of this distinctive mode of causation that makes cognition possible.<sup>52</sup>

Dix, arguing ontologically that nature invented biosemiosis and that the emergence of life is fundamentally a semiotic process, seeks to identify what he calls life's biosemiotic 'causal signature'. Constituting this signature are three characteristic processes. The first requires what he calls, prompts, the '...initial transfer or conversion of very little energy,' such as the light hitting the retina which is not so strong that it burns it but weak enough so that '...the interpreting system not be destabilized by the energy demands of interpretation before the process of interpretation is able to yield an *interpretant*.'<sup>53</sup> The second characteristic is non-linearity, meaning that such low-energy signals can, like a butterfly flapping its wings, cause higher energy signals to emerge in a primarily indeterminate way. The 'cascade' of higher energy processes emerging through this non-linear process constitute Dix's third characteristic, hierarchically ordered communities of signs which are distinct from the simplest systems involving only one sign. This hierarchical organization suggests to Dix that the '...causality of biosemiosis is multi-level and "multi-directional"'.<sup>54</sup>

From "below", it subserves semiotic levels above by providing them with the potential meanings that are their semiotic wherewithal (as, for example, when semantic memory makes meaningful speech possible) or by entraining processes that will do so. Intra-level, biosemiosis constrains (that is, mediates, guides, coordinates, shapes and enables) cooperation and competition. From "above", biosemiosis selectively constrains activity below (through entrained modulation of boundary conditions for the lower level activity). The "higher" the biosemiotic activity, the less frequent is its operation but the more general may be its consequences. Biosemiotic causation is a causality of constraint, not of mechanical necessitation.<sup>55</sup>

Another important 'causal signature' of biosemiosis is anticipation, the ability for creatures to not only react to the past but to anticipate the future by projecting signs forward in the form of predictive models. Dix claims that '...*all* semiosis is anticipatory, inasmuch as the meaning imputed (whether explicitly or implicitly, conceptually or non-conceptually, in reflection or in action) is always, even if only implicitly, in some measure *prospective*.'<sup>56</sup> For example, living creatures interpret signs in

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<sup>52</sup> Ibid., pp.2-3.

<sup>53</sup> Ibid., p.18

<sup>54</sup> Ibid., p.19

<sup>55</sup> Ibid., p.19

<sup>56</sup> Ibid., p.21.

relation to their inherent purpose of creating and maintaining their integrity, (I will not eat that box of donuts today because it may undermine the integrity of my projected future healthy self). This future model is causal in that it acts as a constraint on behaviour in the present. These semiotic anticipatory processes, argues Dix, are also the conditions for the emergence of values, both natural and cultural. The difference between my model of the future having eaten the donuts and the model which did not entails an evaluation. Therefore, according to Dix:

The inherently prospective, anticipatory character of biosemiosis is, *eo ipso*, its valuational character also. This is because the causal character of biosemiosis is the foundation also of its *functional* character – that whereby system production, maintenance and viability are achieved – and functionality is inherently a value-concept as well as a causally descriptive concept.<sup>57</sup>

The claim from biosemiotics that living systems are anticipatory is perhaps its most controversial one in relation to its causal signature, because as A.H. Louie argues in relation to mathematician, Robert Rosen's work on anticipatory systems in general, it suggests teleology, (or what Aristotle called final cause) and a relationship between semiosis and function. Teleology has been excluded from Newtonian based theories of 'objective causation' in science for several centuries now (a legacy of the Moderate Enlightenment). Under the dominant reactive Newtonian paradigm, the future cannot affect the present. 'Physics = system laws + initial conditions. In this context, causality is "past implies present, and present implies future".'<sup>58</sup> Biosemiotic systems however, conform to what Rosen calls, anticipatory systems, defined by him as '...a natural system that contains an internal predictive model of itself and of its environment, which allows it to change state at an instant in accord with the model's predictions pertaining to a later instant.'<sup>59</sup> *Umwelten* contain a multitude of such semiotically based models which involve feedforward as well as feedback processes in which behaviour is preset in accordance with predictive models. As Louie states: 'The essence of a feedforward system, then, is that the present change of state is determined by an anticipated future state, derived in accordance with some internal model of the world.'<sup>60</sup> This does not imply that living systems are accurate fortune tellers. The reality is that in a non-linear, indeterminate universe often our models of the future are wrong, particularly, as I will discuss later, when our models have been corrupted. This is because, I argue, Rosen's models may be better understood more complexly as

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<sup>57</sup> Ibid., p.25.

<sup>58</sup> Louie A. H., 'Robert Rosen's Anticipatory Systems', *Foresight*, Vol. 12, No., 3, 2010, p. 24.

<sup>59</sup> Ibid., p.19.

<sup>60</sup> Ibid., p.21.

intuitive analogies and metaphors rather than representations giving some insight into their fallibility. Also, as I mentioned earlier in relation to Keys and Yudkin, models often necessarily resist change in the face of a changing environment to maintain the system's integrity. For Rosen, anticipatory systems do not imply a replacement of reactive causation but a combination of both. The radical implication for science and epistemology, therefore, is that biosemiotic, anticipatory systems make sense of and open orthodox science up to, the realities of future states as truly causative. This is another way in which biosemiotics becomes a unifying, post-reductionist influence.

Intuitively, it may seem that these predictive models, or any models, or even signs, are representations mediating our experience and at least since Descartes this has been the dominant view. Philosopher and Cognitive Scientist, Anthony Chemero, however, who is influenced by Rosen, provides further arguments against representationalism in his focus on advancing what he calls Radical Embodied Cognitive Science within the cognitive and neuroscientific fields.<sup>61</sup> Chemero is also heavily influenced by Evolutionary Psychologist, J. J. Gibson and his theory of affordances and Francisco Varela and his theory of enactivism. What makes Chemero's view radical is that he rejects what is the central idea underpinning current cognitive science and neuroscience. An internal representation, a process requiring what Chemero calls, 'mental gymnastics' is the condition for enabling us to make complex computations to identify our perceptions and act in relation to them. Chemero makes the argument, however, that representations favoured by reductionists and computationalists and even by many in embodied cognitive science, necessitates a Cartesian split of minds from environments and supports views that consciousness is located in the brain, further justifying the efforts of neuroscience to measure it. For Chemero, however, mind is dispersed and perception is fundamentally direct involving an irreducible, oscillatory coupling of both perceiver and environment. He defines the view of Radical Embodied Cognitive Science in the following:

Animals are active perceivers of and actors in an information-rich environment, and some of the information in the environment, the information to which animals are especially attuned, is about affordances. Unified animal-environment systems are to be modelled using the tools of dynamical systems theory. There is no need to posit representations of the environment inside the animal (or computations thereupon) because animals and environments are taken, both in theory and models, to be coupled.<sup>62</sup>

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<sup>61</sup> Chemero A., *Radical Embodied Cognitive Science*, (The MIT Press, Cambridge, 2009), Kindle DX Edition.

<sup>62</sup> Ibid., Ch.7.

In other words, there is no sense in which a predictive model is purely internal to an organism representing what is on the outside. The model is part of a larger relational whole, a view consistent with biosemiotics. For Chemero, Gibson's concept of affordances is central, the idea that meaningful information exists in the environment which affords possibilities for action. Chemero develops Gibson's idea as relations between abilities and environmental features. In his view, perception is action and is of affordances creating an animal-environment whole. Using Varela's terms, these wholes enact worlds in each moment in relation to a multiplicity of other spatio-temporal domains and there is no foundational representation underpinning the process. While Chemero does not refer to semiotics, in the spirit of biosemiotics his work seeks to unify perception and experience, consciousness and the world. I argue, in agreement with John Pickering, that affordances provide a link between natural and conventional signs and that we can understand animal-environment wholes in biosemiotic terms in that signs are affordances in relationship with interpretants which generate further affordances, some of which do not yet exist; '...that is, to perceive the world as if it were otherwise.'<sup>63</sup> We can also refer to these wholes as *umwelten*. From this, we can understand that 'representation' is an abstract metaphor and that a truly unifying biosemiotics requires an anti-representationalist stance.

As important as this understanding of how we know reality from an epistemological perspective is, it does not go far enough, for as Arran Gare argues, we need to also speculate more generally about the nature of reality and not exclude ontology as classical physics has done. This is the domain of metaphysics. For example, when Dix argues that biosemiotic causation is 'causality of constraint', there is an assumption that these are non-holonomic constraints and that all is in motion, as opposed to a Newtonian view that matter is fundamentally inert and subject to external force. When Chemero makes a case against Idealism in arguing that affordances, as relations, are real, this is a view consistent with a fundamentally relational or non-material view of reality. The metaphysical tradition which supports the concept of a relational universe primarily in motion, as I discussed earlier, is process metaphysics. This tradition does not treat time as a mathematical variable or a fourth dimension, but as intrinsic to the nature and development of the Universe. In process metaphysics, matter is not primarily solid structure but slower-than-speed-of-light trajectories of differing rates. It is these differing rates which produce hierarchies of multiple spacetime domains. Furthermore, as I have argued in a previous paper in agreement with A. N. Whitehead, existence from a process perspective is

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<sup>63</sup> Pickering J., 'Affordances are Signs', in *TripleC*, 5(2), 2007, at <http://www.triple-c.at/index.php/tripleC/article/viewFile/59/61>, pp.72-73.

fundamentally vibratory and perhaps better understood through the metaphor of music and aural analogies, rather than matter and vision.<sup>64</sup> For Gare, one of the most important figures linking the history of biosemiotics to process metaphysics is Friedrich Schelling due to his influence on Peirce.

Based on Peirce's own claims to be a 'Schellingian of some stripe', Gare sees Schelling's influence in Peirce's efforts to similarly overcome the static and mechanical view of the world which emerged with the Moderate Enlightenment, '...while at the same time reacting to the deficiencies in the Idealist reaction against this which privileged consciousness and treated nature as derivative from mind, either individual (in the case of Berkeley and Kant) or collective (in the case of Fichte and Hegel).'<sup>65</sup> As with the history of biosemiotics, therefore, we see Schelling sharing the project of uniting consciousness with nature; a reality prior to cognition which he referred to as 'unprethinkable being'. 'Unprethinkable being' is a dynamic, anti-representational concept of reality and the emergence of order for Schelling, such as the emergence of signs, is a product of the limiting of activity, or constraint, referring back to Dix. Gare therefore argues that from a Schellingian perspective, the object in Peirce's semiotic triad should be thought similarly to be a dynamic object, or process. Gare's work reveals Schelling to be a major figure in the Radical Enlightenment and a biosemiotician of some stripe.<sup>66</sup> As Gare summarizes Schelling's position and his relationship to Peirce:

We are in and part of the world we are striving to comprehend, the product of a whole series of nature's limiting itself and our own self-limiting, and our efforts to comprehend the world are developments within nature. Schelling characterized his own philosophy as "neither materialism nor spiritualism, neither realism nor idealism"; but as containing within itself "the opposition of all earlier systems"... Peirce, in aligning himself with Schelling, was a post-Cartesian, post-Newtonian, post-Kantian, post-Hegelian philosopher grappling with the problems defined by Schelling's project of overcoming the opposition of all earlier systems.<sup>67</sup>

<sup>64</sup> This is in McLaren G., 'Climate Change and Some Other Implications of Vibratory Existence', *Cosmos and History: The Journal of Natural and Social Philosophy*, vol. 5, no. 2, 2009 at <http://cosmosandhistory.org/index.php/journal/article/viewFile/146/251>, pp.134-160.

<sup>65</sup> Gare A. 'The Semiotics of Global Warming', op. cit.

<sup>66</sup> The influential relationships between Schelling, Peirce and Biosemiotics in general including the work of Robert Rosen are explored and developed by Gare in, Gare A., 'Overcoming the Newtonian paradigm: The unfinished project of theoretical biology from a Schellingian perspective', submitted for publication in: *Journal of Progress in Biophysics and Molecular Biology*, (special theme Issue on 'Integral Biomathics: Can Biology Create a Profoundly New Mathematics and Computation?') 2013.

<sup>67</sup> Ibid.

In this relationship, we see exemplified the unifying potential of traditions of thinkers in the process and biosemiotic traditions who themselves are seeking through a synoptic approach, to unify previous thought in new and better syntheses.

#### PREDICTIVE MODELS, ABSTRACTIONS AND SEMIOTIC CORRUPTION

Having outlined some of the history and potential of biosemiotics and its relationship to process philosophy, I will now endeavour to show how this approach can both enlighten our understanding of the obesity crisis and unify our efforts to address it. In relation to the science of global warming, Gare argues that from a Peircean semiotic perspective:

Science can be construed as a semiotic process of interpreting, producing and reinterpreting signs. It involves hypothesizing to explain unexpected indexes of change, elaborating these hypotheses into models (icons) of these changes to deduce what can be expected in the future, and carrying out investigations to test such changed expectations, then using rhetoric to change the beliefs of others.<sup>68</sup>

My argument is that we can and should approach the obesity crisis in the same way. Let me use the arguments in nutrition I discussed earlier as an example. From Minger's account, we see that both Ancel Keys and John Yudkin were focused on the same dynamic object, heart disease, but were interpreting the signs very differently. This led to competing hypotheses which they both modelled and tested eventually coming to their separate conclusions. These conclusions then led to them reinterpreting their models to frame their anticipations of future reality to conform to and reinforce their conclusions. For Keys, his predictive model is of a heart disease free future where less saturated fat is consumed and for Yudkin, one where less sugar is consumed. Less consumption of fat or sugar can be understood also as emergent values for both. But as we saw, for others different signs came to the foreground and were interpreted in ways which contradicted Keys' and Yudkin's findings. Higher level constraints emerged from these interpretations such as affluence producing higher and more constant levels of food consumption in general, within which both fat and sugar consumption become unified as related components in a larger whole acting to create that whole. However, while the dialectic between Keys and Yudkin led to such syntheses neither Keys nor Yudkin appear to have achieved any. Their reaction in sticking to their reductionist models despite the signs turning against them reveals limitations in our anticipatory systems related to the need for relative stability, or robustness in the face of constant change; similar to what C. H. Waddington referred to as canalization where the same phenotype continually creates itself despite changes

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<sup>68</sup> Ibid.

in environment and genotype.<sup>69</sup> Both Keys and Yudkin were guilty of committing what Alfred North Whitehead calls ‘the fallacy of misplaced concreteness’, in mistaking their relatively simplistic abstractions for reality.<sup>70</sup> This fallacy is regularly committed by those who are victims of semiotic corruption which in this case, retarded their ability to understand the more holistic, complex, hierarchical relationships surrounding food consumption and heart disease.

Through rhetorical processes in which they were able to promote their reductions loudly and often, their reductions became dogmatic truths, particularly Keys’s views. In becoming truths they were influential in transforming the *umwelten* of many others in such a way as to corrupt their models of future reality. Why have they been corrupted? Because these over-simplified, isolated reductions, like cancer cells, using Gare’s analogy, have forgotten their position in the whole, or larger contexts. They can proliferate relatively free of the constraints of larger contexts and divert other systems away from the greater whole to instead feed them. The result is that research communities emerge which are divided between those who isolate saturated fat and those who isolate sugar, because the signs indicating the relationship of both within a greater whole have been corrupted. Thanks to the support of the symbolically and economically powerful meat and dairy and grain and sugar industries, each were able to convince many of the validity of their findings leaving the public in the centre of a contradiction. Such contradictions are not all bad from a philosopher’s perspective (it provokes thought), but the effect of such semiotic corruption in this case is to replace more holistic, intuitive and traditional understandings with misconceived and sometimes harmful over-simplified abstractions (Denise Minger’s own experience of rapidly deteriorating health after cutting out fat and only eating fruit for an extended period serves as a good example).

This brings us to the problem of abstract thought and self-consciousness and how a biosemiotic approach might illuminate our understanding of their role in obesity. Returning to Dix’s discussion of biosemiotic processes, he suggests that there are five levels of anticipation. These range from anticipation at more fundamental levels of beginning, continuance and completion of activity, system continuance and viability and reproduction and viable lineage, to, as he argues, cognitively higher level anticipations,

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<sup>69</sup> Waddington C. H., ‘Canalization of development and the inheritance of acquired characters’, *Nature*, **150** (3811) (1942): 563–565.

<sup>70</sup> Whitehead initially used this concept to critique the idea of simple location of instantaneous material configurations being understood as primary in Classical Physics. Whitehead A. N., *Science and the Modern World*, (The Free Press, New York, 1967), p.51.



...in the manner of a nuanced production-system (an algorithmic or quasi-algorithmic system of “rules” for action, nuanced to differences in sensory input, and in that sense selectively anticipating possibilities); or...in the familiar manner of representational-conceptual modelling of possibilities and their prospective implications.<sup>71</sup>

These levels of anticipation match the hierarchical levels of semiosis identified by Kalevi Kull. Symbolic semiosis associated with thought and language, is associated with the highest levels of anticipation and, as Gare interprets Kull, ‘this is seen to presuppose ‘animal semiosis’, semiosis where the interpretant is action, which in turn presupposes ‘vegetative semiosis’, where the interpretant is growth, which in turn presupposes semiosis within and between cells within the organism, that is, ‘endosemiosis’.<sup>72</sup>

We can understand the implications of this if we relate it to Robert Rosen’s concept of anticipatory systems. Both Kull and Howard Pattee recognise Rosen as a biosemiotician and were influenced by his relational biology even though Rosen did not refer to himself as such.<sup>73</sup> Remember that Rosen defined anticipatory systems as natural ones containing predictive models of themselves and their environments. As A. H. Louie, Rosen’s student interprets him:

Rosen suggests that there must be information about self, about species, and about the evolutionary environment, encoded into the organization of all living systems. He observes that this *information*, as it behaves through time, is capable of acting causally on the organism's present behaviour, based on the relations projected to be applicable in the future.<sup>74</sup>

Fundamental here is Rosen’s metaphorical relational paradigm, the (M,R)-system, where M stands for metabolism and R for repair. Complex living systems are distinguished by the realization of (M,R)-systems and their impredicativity, or what he calls a closed path of efficient causation; self-referential systems in which metabolism, repair and replication interact to generate and maintain themselves.<sup>75</sup> The integrity of living systems, therefore, requires that their models contain the functions of metabolism, repair and replication. Endosemiosis operates at the most fundamental

<sup>71</sup> Dix M., op. cit., p.24.

<sup>72</sup> Gare A., ‘Overcoming the Newtonian paradigm: The unfinished project of theoretical biology from a Schellingian perspective’, op. cit., p. 17.

<sup>73</sup> Rosen was friends with Pattee and worked on semiotic distinctions in hierarchy theory. Pattee H. H. and Kull K., ‘Between Physics and Semiotics’, in *Towards a Semiotic Biology*, op. cit., p.229.

<sup>74</sup> Louie A. H., ‘Anticipation in (M,R)-systems’, *International Journal of General Systems*, 41:1, 2012 at <http://dx.doi.org/10.1080/03081079.2011.622088>, (Accessed 20/1/2015), p.17.

<sup>75</sup> Rosen R., *Anticipatory Systems: Philosophical, Mathematical and Methodological Foundations*, (Pergamon Press, Oxford, 1985), pp.203-207.

levels of living systems. These most fundamental systems generate a predictive model of themselves within their *umwelt* which anticipates their functions of metabolism, repair and replication, but little else. Their non-holonomic constraints only allow very limited degrees of freedom, or anticipation, diminishing their ability to radically transform their *umwelten* as well as their ability to anticipate uncertainty. As Dix suggests, even at the relatively complex vegetative levels of a plant such as the Venus flytrap, it ‘...does not *need* to know how to trap insects, because it cannot *prevent* itself from trapping them.’<sup>76</sup> Although he goes on to say that any ability to modulate this behaviour, transform their model of themselves in relation to modelling errors, would suggest both learning and knowing. Compare this to systems at the highest levels of anticipation and symbolic semiosis. Referring to Deely’s suggestion earlier that linguistic creatures are able to model the world through language in a way that is not fully determined by biology, these are creatures with levels of self-consciousness that through their abilities associated with memory and self-reflection, are able to model themselves through the aid of high level abstractions. Such creatures can imaginatively model themselves in ways that go far beyond fundamental needs for metabolism, repair and replication, but in doing so leave themselves far more prone to error.

According to Rosen, error emerges as bifurcations in systems and the more complex systems are the more prone to error, as well as side-effects, they are. This is because models are necessarily abstract and relatively closed compared to open natural systems which models seek to predict or explain.<sup>77</sup> In other words, the universe is far more than our particular anticipations within our particular *umwelten* can account for or need account for. Complexity, for Rosen, can be understood as a function of a system’s interactive capabilities; the more interaction involved, the more difficult the system is to model or reduce. There are also temporal differences involved in that predictive models emerge at different time scales than the natural processes being modelled (think of planning out your hoped-for 90 year life, for example, in a matter of minutes). In terms of closed paths of efficient causation, fundamental anticipatory (M,R)-systems are constrained in their ability to generate alternate models (have less interactions) and are therefore less prone to error and more inclined to continually realize their anticipations unless being majorly perturbed by an external cause (such as the disintegration of a higher level constraint). This is why, I argue, most cells and plants and even most animal life do not suffer from obesity. Obesity is largely a problem that afflicts highly complex human life (as well as the animals domesticated by

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<sup>76</sup> Dix M., op. cit., p.23.

<sup>77</sup> Rosen R., op. cit., pp.307-319.

humans according to an article by Robert Young).<sup>78</sup> The greater complexity of humans and the highly abstract nature of many of our predictive models, lead us to greater errors and side-effects as they bifurcate away from our fundamental models for anticipating metabolism, repair and replication and come to constrain these fundamental conditions for generating and maintaining dynamic stability. Complicating this, however, is the further impredicativity that it is such errors which also generate novelty contributing to greater human cognitive development; the smarter we get the more errors we create, the more errors we create the smarter we get. This, however, also depends on how we respond to our errors and as Rosen suggests, the very future of humanity may depend on our ability to close this infinite regress at a cultural level, such relative closure being the very conditions for life.

#### SOME IMPLICATIONS OF A BIOSEMIOTIC APPROACH

To summarize much of what I have covered in this paper, my approach to obesity begins with process metaphysics which provides a holistic cosmological and ontological basis for reality being primarily active, relational and irreducibly complex in opposition to static, reductionist and mechanical metaphysical positions. This makes sense of the field of biosemiotics which similarly promotes holistic, dynamic approaches to understanding life and opposes reductionist and mechanical views. In turn this makes sense of anticipatory systems and the role of teleology in drawing the future into the present and Radical Embodied Cognitive Science which understands cognition in holistic terms as direct perception of affordances involving active processes of structural coupling between organisms and their worlds and opposes static, reductionist and mechanistic representationalist approaches. All seek to achieve what those associated with the Radical Enlightenment sought; that is, the re-unification of experience and perception, mind and world, semio-logic and bio-logic, split by those associated with the Moderate Enlightenment. What are some of the implications of this for better understanding and addressing the obesity crisis?

At the beginning of this paper I referred to some examples of reductionist and fragmented approaches which typify the obesity research field and associated them with the dialectic between postmodernism and scientism. What typifies these approaches is an abstract view of the obese as either atomistic and mechanistic individuals whose disembodied brains are failing to properly integrate them into alien external environments and are therefore irrational, or in Social Darwinist terms, unfit, or as powerless victims of social, natural and perhaps even supernatural forces beyond

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<sup>78</sup> Young R. J., 'Who You Calling an Elephant? Animals Have Weight Issues Too', *The Conversation*, 6 October, 2014 at <http://theconversation.com/who-you-calling-an-elephant-animals-have-weight-issues-too-32445> (Accessed 22/1/2015).

their control. In the utilitarian view of Neo-classical and Neoliberal economics, which dominates the global economy, they are regarded like the rest of us as autonomous individuals seeking to maximize their pleasure in their rational self-interest. Whichever, the tendency is to reduce them to either this or that. The approach I am arguing for, however, seeks to understand the real complexity involved and, therefore, its fundamental irreducibility. In other words, we are all far more than what we are often conveniently modelled to be in order to fit experimental parameters, for example. In this approach, the obese are understood as semiotic creatures; dynamic processes of becoming, creative agents actively creating their *umwelten* from within dynamic semiospheres filled with meaning in the forms of dynamic objects and signs which are affordances for action. An example of this are studies Chemero refers to into how affordances for walking affect perception revealing that ‘...age, fitness, health, fatigue, and carrying heavy loads, all of which determine to what extent a distance affords walking, affect judgments of geographic slant.’<sup>79</sup> The *umwelten* of the obese, the worlds they both inhabit and co-create, are therefore, ones in which hills are higher and walking distances greater, the implication being that the worlds of the obese are of a different quality to those of the non-obese and need to be understood as such. The coupling between organisms and environments involved here blurs the lines between inner and outer worlds; between psychology and sociology, for example. An implication of this is that obesity is not the exclusive territory of one field of research such as biomedicine. All areas of inquiry are relevant to this problem, whether it be into molecules, fast food, economies or artistic expression through, for example, the stories of obesity in literature. The complexity and multi-level nature of the *umwelten* we create should be reflected in the range of research approaches we take.

Another implication is that predictive modelling and anticipation in organisms, which has emerged and been given scientific legitimacy through the efforts of biosemioticians, should, I argue be a major focus of the obesity research field in general. The obesity crisis, using Rosen’s terms, can be understood more generally as a consequence of predictive modelling errors. Semiotic corruption occurs when the signs indicating our ‘healthy’ models of ourselves, the models we must continually anticipate and realise to create and maintain our integrity as biological systems, such as fundamental (M,R)-systems, are obscured, distorted or overcome by unhealthy constraints. Important here is the relation, Rosen discusses, between global systems and local subsystems which function at different rates, local being faster and global relatively slower. The key to whole living systems is in their ability to constrain the multiplicities of differing predictive models of faster adapting sub-systems such that

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<sup>79</sup> Chemero A. op. cit., Ch.9.

they act in the interests of the whole.<sup>80</sup> Confuse or subvert the global model and you remove these constraints opening up the possibilities for sub-systems to become parasitic on the global system. For example, the food processing industry, which Ancel Keys was an influence on, has become an unhealthy higher level constraint through its success in transforming our complex interactions with food developed over hundreds of thousands of years of human evolution, into more simplistic ones which emphasise isolated, abstracted nutrients. The ‘obesogenic’ environments identified by sociologists and epidemiologists emerge through these efforts to make the distribution of calories simpler, faster and more efficient and ultimately, more profitable.<sup>81</sup> However, the affordances provided by these environments generate highly abstract unhealthy models at the same time obscuring our healthy ones (eating a processed and relatively expensive highly energy concentrated apple fruit bar, for example, instead of an apple). At whole system levels, predictive models will generate future healthy selves unless our ability to anticipate these are subverted leading to a loss of integrity of the whole which removes constraints on sub-systems leading to either parasitic behaviour by sub-systems or their functional failure (an example here is perhaps Alzheimers disease where the predictive model of the self is lost leading to disintegration of the whole).

The fundamental questions all of those in the obesity research field should be asking, therefore, is: What are the predictive models generated by the obese (what is their telos) and do these models augment or corrupt their fundamental ‘healthy’ models of themselves? What biosemioticians such as Rosen reveal is the possibility of overcoming the meaningless pluralism of Gard and the meaningless mechanistic reductionism of ‘scientism’ through identifying naturalistic standards or ideals by which complex organic systems can be evaluated. This is fundamentally a semiotic process. The work of Anthropologists such as Alexandra Brewis becomes central here through her work in identifying the dynamic nature of biocultural perspectives on body size. She finds that Polynesian cultures who see large bodies with high levels of body fat as normal are healthy at these larger sizes while Asian cultures which perceive smaller bodies as normal, are healthier at lower body fat levels. She then records the damaging effects on the health of these cultures when exposed to abstract, idealized images of body size generated by the virtual world of Western commercial media.<sup>82</sup>

<sup>80</sup> Rosen R., *Anticipatory Systems*, op. cit., pp.391-397.

<sup>81</sup> The history of these developments and its links to ‘Taylorist’ scientific management and instrumental rationality is well told by Eric Schlosser in his book, *Fast Food Nation*, (Mariner Books, 2012). Some moral and ecological consequences of these developments are examined by Michael Pollan in *The Omnivore’s Dilemma*, (Penguin, New York, 2006).

<sup>82</sup> Brewis Alexandra A., *Obesity: Cultural and Biocultural Perspectives*, op. cit., Ch.6.

Brewis does not recognise this, but what she is doing is revealing the 'healthy' predictive semiotic models of these cultures which have formed their *umwelten* through their coupling with their environments over generations, as well as identifying the toxic effects of semiotic corruption when abstract, over-simplified models of body size, perverted by the needs of the market, are introduced into these cultures through commercial media, generating modelling errors which did not previously exist. Such errors come as a surprise to cultures rendered vulnerable by the reductionist nature of semiotic corruption.

This raises other questions those in obesity research must ask: What are the predictive models of those who seek to reduce and over-simplify complex processes (what is their telos) and do these models augment or corrupt 'healthy models of humans'? As well as requiring investigation in a range of fields such as economics, business, politics and culture studies, this is where the obesity research field can benefit from situating themselves within the histories of philosophical traditions I have discussed, such as the Moderate and Radical Enlightenments. As discussed earlier, the Moderate Enlightenment was a reaction against the complex, egalitarian, democratic values of the Radical enlightenment, preferring a simplistic Hobbesian view of strict control of the masses by wealthy elites. One of the major problems in dealing effectively with the obesity crisis in a Neoliberal world is that even when a population becomes more informed of better nutrition practices their democratic will to change is subordinated to the needs of wealthy multi-national corporations. The power of multi-national food processing companies to dictate public policy at the expense of a population's health and the health of its democracy can be traced to the influence of the Moderate Enlightenment.<sup>83</sup> As this history also reveals, problems generated by reductions and over-simplifications generate wicked problems, problems with no simple solutions. The obesity crisis is, or is quickly becoming, a wicked problem. This is because we continually seek to solve such problems by applying the cause of the problem; the need to control natural processes by over-simplifying them. Replacing fat with sugar in human diets was one such over-simplification which, according to Harcombe and Minger, signaled the beginning of the obesity crisis and a new experimental relationship between people and food motivated more by simplistic

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<sup>83</sup> As I mentioned earlier, the ability of large food processing multi-national s to stymie government regulation and maintain self-regulation is an example of these anti-democratic influences as well as the Trans-Pacific Partnership free trade agreement now under negotiation by 11 nation states. According to Public Citizen, the '...[Trans-Pacific Partnership \(TPP\)](#) would grant foreign corporations [extraordinary new powers](#) to attack the laws we rely on for a [clean environment](#), [essential services](#), and [healthy communities](#).' The trans-Pacific Partnership: Empowering Corporations to Attack Nations, at <http://www.citizen.org/Page.aspx?pid=5411> (Accessed 9/8/2015).

commercial interests than science. As Rosen shows, such simplistic, reductionist approaches generate more errors in the form of unconstrained bifurcations of component models due to overarching constraining models being compromised. In biosemiotic terms, this breakdown of communication leads to loss of wholeness, which, unless addressed, is the condition for loss of potential; the condition for senescence, and ultimately, death.

This reveals obesity to be analogous with what is happening in the obesity research field. The obese are suffering from a form of reductionism as their range of affordances are increasingly limited through their loss of potential to perceive the world more broadly (think of the affordances lost through restrictions in range of movement and continual sitting, for example).<sup>84</sup> The obese are suffering from premature senescence. Similarly, reductionism in the obesity research field (methodological restrictions in their range of movement, if you like), leads to a narrowing of what is perceivable and therefore, a loss of affordances. Without the ability to perceive more broadly, the field fragments and the consequent loss of wholeness compromises healthy higher level constraints allowing excessive bifurcation in sub-systems destroying communication between levels. This then generates conditions in which holistic approaches atrophy allowing particular disciplines or commercial interests to over-assert themselves at the expense of the field's integrity, rendering it ineffective.<sup>85</sup> Like the obese, therefore, the obesity research field is also suffering from premature senescence. This is just what Brewis was identifying when calling for a global approach, a more holistic approach, one which acknowledges the real complexity involved in understanding the obesity crisis. It is also what post-reductionist process philosophers and biosemioticians call for. For example, biosemiotician Brian Goodwin argues that there needs to be a dynamic balance in our approach to complex processes between control and participation.<sup>86</sup> Reductionism flourishes due to an over-emphasis on controlling natural processes which, as I have argued, then leads to a greater need for control and ultimately, fragmentation. The idea of the need to be able to participate in natural complex processes rather than continually control them, is one that forces the obesity research field (perhaps

<sup>84</sup> This is not just a problem for the obese but for populations who have become more sedentary in general as is argued by Dr. James Levine in his recent book. Levine J. A., *Get Up!: Why Your Chair is Killing You and What You Can About It*, (Palgrave MacMillan, New York, 2014).

<sup>85</sup> For an understanding of the processes by which the autonomy and therefore, integrity of fields can be compromised by other fields, see Pierre Bourdieu, *The Field of Cultural Production*, (Columbia University Press, 1993).

<sup>86</sup> Goodwin B, 'From Control to Participation Via a Science of Qualities', *Schumacher College*, (1999), <http://www.schumachercollege.org.uk/articles/brian/fromcontrolto.html>, (accessed 30/1/2015).

uncomfortably) to question the whole purpose of human technological development and its future impacts on health.

Another implication of a biosemiotic approach which I have mentioned at various times in the paper relates to the efforts of biosemioticians and process philosophers to transcend the divide between the sciences and the humanities. Semiotics itself, I have argued, is a transcendent concept as viewing the world through a Peircean triadic semiotic framework is more fundamental and common to both scientists and those in the humanities. There is another unifying concept which needs mentioning, however, and that is narrative. Arran Gare in his paper titled, *The Primordial Role of Stories in Human Self-Creation*, reveals further damage done by the Moderate Enlightenment, this time on narrative through the exclusion of time and the privileging of synchronic over diachronic approaches to reality (earlier I discussed this to be a problem with Saussure's work, for example).<sup>87</sup> The rise of logical positivism associated with this led to the privileging of de-contextualized atomic facts over stories. From a process perspective, however, narratives are primordial coming before atomic facts, or fragments of knowledge, which are meaningless unless given context by being woven into stories. Because human beings are ontologically temporal creatures, we are primarily story tellers, whether we are physicists or poets. Wholeness and therefore the conditions for health, is created through the creation of stories which produce wholes out of our always partial knowledge and understanding. The ability for living creatures to generate healthy predictive models of themselves is the ability to situate themselves within a continuity between past, present and future. For human beings at the level of symbolic semiosis, this is fundamentally a narrative process generating stories which then become affordances for action within our *umwelten*. Reductionism in the obesity research field as a consequence of semiotic corruption, has led to an obsession with often blindly collecting data where what is perhaps needed more is the creation of coherent narratives to make sense of things as a whole. In relation to the importance of narratives, moral philosopher Alisdair MacIntyre argues:

I can only answer the question 'What am I to do?' if I can answer the prior question 'Of what story or stories do I find myself a part?' We enter human society, that is, with one or more imputed characters - roles into which we have been drafted - and we have to learn what they are in order to be able to understand how others respond to us and how our responses to them are apt to be construed. It is through hearing stories ... that children learn or mislearn what a child and what a parent is, what the caste of characters may be in the drama

<sup>87</sup> Gare A., 'The Primordial Role of Stories in Human Self-Creation', *Cosmos and History: The Journal of Natural and Social Philosophy*, vol. 3, no. 1, 2007 at <http://cosmosandhistory.org/index.php/journal/article/viewFile/56/579>.



into which they have been born and what the ways of the world are. Deprive children of stories and you leave them unscripted, anxious stutterers in their actions and in their words.<sup>88</sup>

Perhaps this is also what the disintegrating obese and reductionists in general have in common; like children deprived of stories, they have become ‘unscripted, anxious stutterers in their actions and in their words’.

I want finally to suggest that an approach based on semiotic corruption reveals the obesity crisis to be primarily an ethical one. It is a question of values and of what we anticipate to be a good life. As I have already revealed, biosemiosis and anticipatory systems are evaluative by nature as the future entails comparison with the present and past. The function of an organism is to create continuity through creating and maintaining its projected integrity. It should, therefore, be able to judge in some way whether or not it has satisfied its anticipations. What distinguishes biosemiosis is that it acknowledges such processes in creatures below levels of symbolic semiosis and abstract reasoning and that this was the pre-condition for higher level reasoning creatures, like us, to emerge at all. It is this idea which unites the Father of modern process philosophy, Alfred North Whitehead and the Father of semiotics, Charles Sanders Peirce. Both argue that feeling precedes logic, turning the dominant view of Western philosophy since Plato, on its head. For Whitehead, the ‘actual occasions’ of the universe are feeling subjects (a controversial view known as pan-experientialism) and for Peirce, feeling and aesthetically conditioned habits form the universe.<sup>89</sup> From a Peircean perspective, the formation of habits, whether healthy or unhealthy ones, presupposes and mediates processes in which initial vague feelings encounter ‘the brute facts of reality’. For example, there are recent trends towards transforming food courts from being providers of unhealthy food to providers of fresher, healthier food.<sup>90</sup> Any ethically positive change of habit this transformation produces will be initially through the pre-reflexive feeling one has in relation to perception of the signs of this altered and unfamiliar physical environment and what it affords aesthetically, with

<sup>88</sup> MacIntyre A., *After Virtue*, (Notre Dame University Press, Notre Dame, 2nd ed. 1984) p. 216.

<sup>89</sup> Whitehead’s pan-experientialist views are famously developed in his major work, *Process and Reality*. Whitehead A. N., *Process and Reality*, Corrected Edition, Griffin D. R. and Sherburne D. W. (eds.), (The Free Press, New York, 1978). The movement of feeling to habit for Peirce relates to his metaphysical categories of Firstness, Secondness and Thirdness as discussed in Peirce, C.S. 1931-58. *The Collected Papers of Charles Sanders Peirce*, C. Hartshorne, P. Weiss (eds.). (Vols. 1-6), (Harvard University Press, Cambridge).

<sup>90</sup> This trend is not only about providing healthier fresh food but also relates to efforts to re-invigorate shopping malls affected financially by economic downturn and internet shopping. It is discussed in Doughty J., ‘The Changing Face of Foodcourts’, at <http://coverpointfood.com/2014/07/10/the-changing-face-of-foodcourts/>, (Posted 10/7/2014), (Accessed 15/7/2015).

logical determinations coming later in the process. This later stage will also involve the questioning and creation of narratives to re-evaluate and overcome disorientation. The fundamental point here is that in ethics, from a process and biosemiotic perspective, feeling and aesthetics are prior to logic.

Based on this view, in my Ph.D. dissertation, I developed and proposed a new process ethics of health combining Aristotelian virtue ethics with 'edge of chaos' theory coming from complexity science. I developed a concept called 'mean intentionality' based on organisms being able to anticipate and continually realize edge of chaos conditions, the conditions of dynamic tension oscillating between order and chaos, (an example being Rosen's (M,R)-systems). The conditions for health in an indeterminate universe, I argued, are those similar to the heart of having a relatively stable higher level oscillation constraining seemingly more chaotic micro level ones which model multiple future scenarios so as to be able to anticipate uncertainty. The heart, therefore, continually creates ordered rhythm without becoming locked in to one order, allowing it to respond to sudden changes in demand for energy. The obese, I argued, were too ordered and so had diminished potential for anticipating uncertainty. Sudden changes in conditions could quickly send them into chaos; a lurching from one extreme to another. Health, I argued, was the conditions for generating potential; the conditions for generating wholeness, the conditions also for generating ethical integrity which is fundamentally about creating a feel for the whole.<sup>91</sup> My aim was to provide a stronger argument for developing healthy, moderate habits; the ability to feel edge of chaos conditions within what I saw was a culture of extremes. I also argued from an Aristotelian perspective that moderating behaviour and developing healthy habits was a heuristic development process towards realizing maturity and that our culture was retarding that process by deliberately obscuring the true complexities of reality behind a veil of simplistic abstractions.

This is still my view. Our Moderate Enlightenment influenced reductionist, mechanistic, utilitarian and Social Darwinist culture, the nature of which is well documented in the process philosophy and biosemiotic fields, generates disembodiment, severing us from our deep inter-connectedness with natural complex processes, including each other. As a consequence of these affordances, too many of us have failed to develop our feel for the whole; the potential to moderate our behaviour, or constrain ourselves for the good of the whole, and have become ignorant of the conditions for health and uncritical of those aspects of our culture which are

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<sup>91</sup> I developed this concept ignorant at the time of the field of biosemiotics so as a follow-up to this paper I intend to develop the concept of a process concept of health informed by biosemiotics. McLaren G., *The Metaphysical Roots of Physical Inactivity and Obesity in Late Capitalism*, op. cit., Ch.4.

retarding our development. The implication here is that addressing this ignorance will require education oriented towards better understanding what it is to be a human being and a living organism more generally from a holistic post-mechanistic, post-reductionist perspective. To understand what it is to be an organism which feels, which ingests and excretes, inhabits and creates it's worlds from within its co-dependent relationships with all other organic and inorganic processes. It will require a process of re-embodiment and education in the ethics of augmenting the conditions for life, not corrupting them.<sup>92</sup>

## CONCLUSION

My purpose in this paper is to unify the obesity research field and counter what I see as growing fragmentation in order to make it more effective in addressing a very real and growing obesity crisis. I began by revealing this fragmentation in dialectics between postmodernism and scientism and in debates within the field of nutrition, dialectics which to date, lack syntheses. Unification of a field comes from synopses and syntheses and from embracing a synthetic general concept which can be applied at all levels generating a coherent narrative which can make sense of the purpose of the field as a whole. The general concept I have put forward is semiotic corruption which itself is dependent on an understanding of the more general fields of biosemiotics and process philosophy. I have endeavoured to introduce the obesity research field to the holistic nature and unifying potential inherent in these relatively new fields which seek to synthesise the most fundamental and important arguments in human history and in doing so meaningfully unite the sciences and the humanities. The concept of semiotic corruption comes from the work of process philosopher, Arran Gare on global warming suggesting that it is a concept that can potentially unify the obesity research field with those addressing other major global problems. If semiotic corruption proves to live up to its potential, then it will afford coordinated action by the obesity research community against semiotic corruption.<sup>93</sup> This will involve transdisciplinary action uniting micro and macro research to identify the complex nature of the *umwelten* the obese exist within including the *umwelten* of those engaged in corrupting healthy

<sup>92</sup> For a discussion of the dis-embodiment effects of our culture see McLaren G. 'The Triumph of Virtual Reality and its Implications for Philosophy and Civilization', *Cosmos and History: The Journal of Natural and Social Philosophy*, vol. 8, no. 1, 2012 at <http://cosmosandhistory.org/index.php/journal/article/viewFile/292/462>, as well as Gare A., 'The Grand Narrative of the Age of Re-Embodiments: Beyond Modernism and Postmodernism', *Cosmos and History: The Journal of Natural and Social Philosophy*, vol. 9, no. 1, 2013, at <http://cosmosandhistory.org/index.php/journal/article/viewFile/345/580>.

<sup>93</sup> Some of this potential could be realized, I believe, through understanding the recently discovered complex role of gut bacteria in creating good health as fundamentally a semiotic process.

models. We must understand what constitutes healthy predictive models, how the predictive models of the obese come to bifurcate from these and how they might reconnect with these healthy models. My hope is that those in the obesity research field will take seriously my thoughts as a process philosopher whose focus is on making sense of the world as a whole and seek through my story the unity the field so desperately needs.

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