Adsensory Financialisation

Adsensory Financialisation

By

Pamela Odih

Cambridge
Scholars
Publishing

Adsensory Financialisation

By Pamela Odih

This book first published 2016

Cambridge Scholars Publishing

Lady Stephenson Library, Newcastle upon Tyne, NE6 2PA, UK

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN (10): 1-4438-9531-8
ISBN (13): 978-1-4438-9531-6

Dedicated to Professor Barbara Adam.
Barbara's extraordinary intellectual excellence inspires
my feminism of time.

A share of royalties will be donated to the charity United Nations Children's Fund (UNICEF). Established in 1946, UNICEF is dedicated to furthering the rights, wellbeing, prosperity and creative potential of children.

CONTENTS

List of Illustrations ix

Preface xi

Acknowledgements xvi

Prologue xix
Adsensory Capitalism; "The Soul and Sensation" (Epicurus)

Introduction 1
Adsensory Capital Accumulation

Part One: Introjecting the Principle of Performance, Adsensory Technology

Chapter One 18
Introjecting Haptic-Sensory Capitalism

Chapter Two 43
Introjecting the (Ele)ments of the "Performance Principle" (Herbert Marcuse)

Part Two: Adsensory Capitalist Accumulation

Chapter Three 66
Adsensory Accumulation as "[re]capitalized … landed property" (Karl Marx)

Part Three: Dissimulating the Body and Simulating the Soul of Biocapitalism

Chapter Four 106
Dissimulating Advertising

Chapter Five 134
Haptic-Sensory Cognition as the Simulatory Soul of Biocapitalism

Part Four: Adsensory Technologies in Synoptic Times

Chapter Six 166
International Biopolitics and the Political Economy of Wearable Technology

Chapter Seven 187
Adsensory Insurantial Technology in Synoptic Times

Chapter Eight 228
#Health as the Financialisation of Social Capital Translations

Chapter Nine 253
Digital Advertising as Asynchronic Cultural Economies of Financialised Times

Conclusion 294
Adsensory Financialisation as "The Mental Diaspora of the Networks" (Jean Baudrillard)

References 312

Index 329

LIST OF ILLUSTRATIONS

Book Front Cover: Market Just or Just Market?

Figure Pro.1. “And would the future tempt the ardent … Did not completion live within the past?” (Ann Yearsley, *Familiar Epistle to a Friend*, 1787).

Figure I.1. “Lend me thy dark veil. Science darts her strong ray; In the orb of bright learning she sits. Haste! Haste! Cloth’d by thee, I can yet keep my way, Still secure from her critics, or Wits” (Ann Yearsley, *Addressed to Ignorance*, 1787).

Figure P.1. “Indifference come! Thy torpid juices shed On my keen sense: plunge deep my wounded heart” (Ann Yearsley, *To indifference*, 1787).

Figure 1.1 “Tis come! See how it reve’ls in the flood” (Ann Yearsley, *On Jephthah’s Vow. Taken in a Literal Sense*, 1787).

Figure 2.1. “Then come, gentle Goddess, sit full in my looks; Let my accents be founded by thee: While Crito in pomp, bears his burden of books, On the plains of wild Nature I’m free” (Ann Yearsley, *Addressed to Ignorance*, 1787).

Figure P.2. “Protected thus from ev’ry barbed dart, Which oft from soul-corroding passion flies, I own the transport of a blameless heart, While on the air the pow’rless fury dies” (Ann Yearsley, *Written On A Visit*, 1787).

Figure 3.1. “Florus, canst thou define that innate spark Which blazes but for glory? Canst thou paint The trembling rapture in its infant dawn, Ere young Ideas spring; to local Thought, Arrange the busy phantoms of the mind, And drag the distant timid shadows forth” (Ann Yearsley, … *on Genius Unimproved*, 1787).

Figure P.3. “As well command the hoary Alps to bear The Amaranth, or Phoebus-loving flow’r! Bid the Behemoth cut the yielding air, Or rob the Godhead of creative pow’r!” (Ann Yearsley, *Written on a Visit*, 1787).

Figure 4.1. “Hail! Steady Friendship, stubborn in thy plea! Most justly so, when Virtue is thy guide: Beneath your mingled ray my soul is free, And native Genius soars with conscious pride” (Ann Yearsley, *Written on a Visit*, 1787).

Figure 5.1. “Shou’dst thou view a weaker spirit, Moving in her sphere confin’d, Be it still thy greatest merit. To forgive, and be resign’d” (Ann Yearsley, *To a Sensible but Passionate Friend*, 1787).

Figure P.4. “Yet, Precept! Shall thy richest store be mine, When soft’ning pleasure would invade my breast; To thee my struggling spirit shall resign; On thy cold bosom will I sink to rest” (Ann Yearsley, *Written on a Visit*, 1787).

Figure 6.1. “The subject was peculiar, and my friend sullenly trembled for his well-earn’d fame; Yet why? – no vict’ry was by *me* pursued, Nor would I, for her trophies, bid *thee* yield” (Ann Yearsley, *Epistle to a Friend*, 1787).

Figure 7.1. “Farewel, ye groves! and when the friendly moon Tempts each fair sister o’er the vernal green, Oh, may each lovely maid reflect how soon Lactilla saw, and sighing left the scene” (Ann Yearsley, *Written on a Visit*, 1787).

Figure 8.1. “Exquisite thy mental pleasure, Common transports are not *thine*; Far surpassing vulgar measure, All *thy* joys are near divine” (Ann Yearsley, *To a Sensible but Passionate Friend*, 1787).

Figure 8.2. @FitbitUK, SmartPoints (Name Network Analysis).

Figure 8.3. @FitbitUK, SmartPoints (Chain Network Analysis).

Figure 8.4. Fitbit UK & Ireland Facebook (Chain Network Analysis).

Figure 9.1. “Vile ravager of Order! who shall hold Thy line of false morality?” (Ann Yearsley, *The Materialist*, 1787).

Figure C.1. “Ah! With too vain – yet ever new, For where resides the equal mind? Ye sons of woe, I ask of you, Where shall the wretch this comfort find?” (Ann Yearsley, *Stanzas on Affliction*, 1787).

PREFACE

DIALOGIC ENGAGEMENT WITH THE OBJECTIVIST VERSUS SUBJECTIVIST MODELLING OF BIOSENSOR

Interviewer: So why did you do the marathon?
Interviewee: I do a lot of running, and the marathon is like the ultimate thing to train for really. Train for the marathon and it makes all your other races improves as well. Once a year it is the thing to train for really.

Interviewer: What does it mean to you? What does it mean to you to do the marathon?
Interviewee: What does it mean to me? Erhm. More dedication, things required. I think London's probably special. The London marathon [compared with] others around the country is special. People are proud to do it. But it is congested. Not a very good marathon to do fast times on. It is so congested, zig, zagging around.

Interviewer: And what about the training; how did the training go?
Interviewee: It started at Christmas. And a long slog. Haven't been injured. Had niggles but nothing to stop me. So it's been quite good really.

Interviewer: And how did you train?
Interviewee: There is this book called the Hansons Plan. The Hansons training plan. Which is an American company, which has this pretty; well a lot of people resort to training plan. So I followed the plan of the book for eighteen weeks.

Interviewer: Hansons? ["Yea Hansons Plan"]. Tell me about that, sounds nice.
Interviewee: It's these two guys in America who invented this training plan. They run a running club team over in America. They have written this book and it. And you run six days a week, do three hard sessions a week and then six days. Pretty intensive. Strange thing about it is, you never run more than sixteen miles in the training. Whereas some training plans you run like a twenty two mile run you know as a training. Hansons

it is designed to be, because you are running every day. You are always running on tired legs. It's designed like that.

Interviewer: How does it work the plan? How is it a plan?
Interviewee: It tells you, what, how many miles to run. What pace to run each day.

Interviewer: Oh and does it tell you how to run?
Interviewee: No it doesn't tell you how to run. It is the speed and the distance really.

Interviewer: Does it tell you to actually log the running in any way?
Interviewee: No. I do log the running though, for err GPS watches.

Interviewer: Oh you got a GPS watch?
Interviewee: [Lifting sleeve and revealing GPS watch]. Yea which everybody needs really to say what you are doing.

Interviewer: How does that work?
Interviewee: Well, it tells you, your pace, per mile that you are running at. So if you are doing seven minute miles, and that's your target, for your final time. So you are doing seven minute miles. So you don't need to, [manually], make sure you're not running too fast or too slowly really.

Interviewer: And how do you log that?
Interviewee: Well you can upload it to your computer, to Garmin or Strava. Just upload it and it just keeps a record of all your runs. It gives you all your splits [split time] and everything like that.

Interviewer: What is a split?
Interviewee: Each mile; the speed of each mile.

Interviewer: Wow
Interviewee: Because in the marathon is always slower as you get to the end really.

Interviewer: So how does it help, actually being able to log your times in terms of the marathon?
Interviewee: It is useful to see. When you are running it is useful to see, that you're not running too slow to keep your pace. Afterwards it's good to

look and see: that's where I went wrong. I went too fast there or I went too slow at that mile. It's good to, logs all the miles you do in a year.

Interviewer: And do you share that?
Interviewee: In the *** [name of running club] It's a group and everybody can share each other's training.

Interviewer: And how does that group atmosphere work? How does it work in terms of helping you? Actually the group on line
Interviewee: In your running club, you sort of know people who are a similar speeds as you. So you sort of can gauge, the training that they do. And [it] also maps out the routes that they do, so if you want to find another six mile route you can follow their route. It's got useful things like that really.

Interviewer: So you are like a community online. Do you talk to each other and help each other?
Interviewee: Yea. And you can also, there is a kudos.

Interviewer: Kudos, points?
Interviewee: Well you know, thumbs up with a like, with Facebook sort of thing. When someone has done a run you can sort of like it.

Interviewer: And does that means something to actually have that?
Interviewee: I think so. Yea I think it does. Yea. It is a bit like with Facebook, if someone "likes" your comment it gives you a bit of a warm feeling.

Interviewer: I have been doing some running, but to actually be able to have the stamina to stick it out. Does it take a lot of sort of focus and concentration?

Interviewee: The training as well is hard. At parts of the training and you're thinking: you don't wanna go out, you don't wanna do this. And then you get to the race. You get to the start line and that's the hard part some times. Getting to the marathon because you get injured through the training. Because it is so intensive training. Then you always usually manage to get to mile twenty and after mile twenty is when the legs really start to hurt. It's a matter of getting through the last six miles.

Interviewer: Do you feel that you are competing with anyone or are you competing with yourself?
Interviewee: I am competing with myself. Just trying to do the best, than what I did last time. We also have, at the club we have these standards depending on what age you are. If you are at a certain time you get gold, silver, bronze standard. Targets to work for.

Interviewer: So the Standards are?
Interviewee: Based on time yeah, motivation.

Interviewer: And you are presented with these medals?
Interviewee: That's quite good

Interviewer: So what are your ambitions then in terms of ["running"] Yeah
Interviewee: I would like to get under three minutes, three hours ten minutes. I think, I didn't stop my watch at the end. I think I was about ten seconds over.

Interviewer: Why didn't you stop your watch?
Interviewee: Because I am going over the line and sort of; you can't hardly stand-up let alone stop the watch. Thirty second latter, I did eventually.

Interviewer: And during the run, do you look actually look at your watch at all?
Interviewee: Yeah

Interviewer: Really, how?
Interviewee: Yeah every five minutes, I reckon, to check you are running at the right speed. Make sure you are not going too fast or too slow.

Interviewer: Is the design really good for marathons then?
Interviewee: Yeah all running really. A lot of people use GPS watches, serious runners yeah. They are essential really.

Interviewer: Why are they essential?
Interviewee: If you're training, if you're, say you are doing speed training, you want to do a mile at a certain pace. If you are running too

fast, you'll only be able to do two of them, whereas if you go to do like six mile repeats, you got to make sure you doing the right time.

Interviewer: And what about the Fitbit? What do you know about; the Fitbit?
Interviewee: Yeah, I haven't got a Fitbit. I don't think they do pacing things, they do more for: how many steps you do in a day?

Interviewer: Pedometer
Interviewee: Yeah. General activity. Garmin do, they are running watches, you see they are designed for running

Interviewer: Does it link to anything else? Does it link to music?
Interviewee: Some of them do. Strava does. I think you can link Strava to your phone. When you have your phone you can link it with your music. You never know, the new one might do. They are bringing one out every year

Interviewer: What do you think would help to link it to; to the watch to help you run?
Interviewee: Music is good. If I am training I use music. You can't do it when you are racing. You need it when you are running on your own. It is really hard to run fast on your own. It is easier in a race, because you're carried along.

Interviewer: Does the watch help you run fast by yourself?
Interviewee: No I think if you keep looking at your watch, you think: I'm behind, I'm behind, I'm behind

Interviewer: When you are running by yourself does it help you run faster?
Interviewee: The watch. It makes you run to your pace. It doesn't make you run faster. It makes you do what you're supposed to do really.

Interviewer: How does it make you?
Interviewee: I am forcing myself. I am behind and I force myself to speed up. If I didn't have a watch I wouldn't know to speed up.

(London Marathon Runner, April 24th 2016)

ACKNOWLEDGEMENTS

I would like to express a heartfelt thank you to Professor David Knights who continues to inspire my academic development. Professor Barbara Adam's prolific contribution to the study of time and society has been inspirational, and I would like to pay tribute to her work.

Genuine appreciation to Camilla Harding (Commissioning Editor), Amanda Millar and Victoria Carruthers (Editorial) at Cambridge Scholars Publishing. My colleagues at Department of Sociology, Goldsmiths University of London have been supportive: Dr. Brian Alleyne, Prof. Vikki Bell, Prof. Vic Seidler and Prof. Bev Skeggs.

Big thank you to my friends Andrea Reay and Ivalee Harris. Special heartfelt thank you to my friend Andy and the enchanting cultural delights of the Edinburgh Festival 2016. Love and best wishes to my family.

Illustrations

All photographic images by Pamela Odih ©

Book Front Cover: Market Just or Just Market? Pamela Odih(c) 2015

Figure Pro.1. "And would the future tempt the ardent … Did not completion live within the past?" (Ann Yearsley, *Familiar Epistle to a Friend*, 1787). Photographic Image, London 2015.

Figure I.1. "Lend me thy dark veil. Science darts her strong ray; In the orb of bright learning she sits. Haste! Haste! Cloth'd by thee, I can yet keep my way, Still secure from her critics, or Wits" (Ann Yearsley, *Addressed to Ignorance*, 1787). Photographic Image, London 2015.

Figure P.1. "Indifference come! Thy torpid juices shed On my keen sense: plunge deep my wounded heart" (Ann Yearsley, *To indifference*, 1787). Photographic Image, London 2015.

Figure 1.1 “Tis come! See how it reve’ls in the flood” (Ann Yearsley, *On Jephthah’s Vow. Taken in a Literal Sense*, 1787). Photographic Image, London 2015.

Figure 2.1. “Then come, gentle Goddess, sit full in my looks; Let my accents be founded by thee: While Crito in pomp, bears his burden of books, On the plains of wild Nature I’m free” (Ann Yearsley, *Addressed to Ignorance*, 1787). Photographic Image, London 2016.

Figure P.2. “Protected thus from ev’ry barbed dart, Which oft from soul-corroding passion flies, I own the transport of a blameless heart, While on the air the pow’rless fury dies” (Ann Yearsley, *Written On A Visit*, 1787). Photographic Image, London 2016.

Figure 3.1. “Florus, canst thou define that innate spark Which blazes but for glory? Canst thou paint The trembling rapture in its infant dawn, Ere young Ideas spring; to local Thought, Arrange the busy phantoms of the mind, And drag the distant timid shadows forth” (Ann Yearsley, … *on Genius Unimproved*, 1787). Photographic Image, London 2016.

Figure P.3. “As well command the hoary Alps to bear The Amaranth, or Phoebus-loving flow’r! Bid the Behemoth cut the yielding air, Or rob the Godhead of creative pow’r!” (Ann Yearsley, *Written on a Visit*, 1787). Photographic Image, London 2016.

Figure 4.1. “Hail! Steady Friendship, stubborn in thy plea! Most justly so, when Virtue is thy guide: Beneath your mingled ray my soul is free, And native Genius soars with conscious pride” (Ann Yearsley, *Written on a Visit*, 1787). Photographic Image, London 2016.

Figure 5.1. “Shou’dst thou view a weaker spirit, Moving in her sphere confin’d, Be it still thy greatest merit. To forgive, and be resign’d” (Ann Yearsley, *To a Sensible but Passionate Friend*, 1787). Photographic Image, London 2016.

Figure P.4. “Yet, Precept! Shall thy richest store be mine, When soft’ning pleasure would invade my breast; To thee my struggling spirit shall resign; On thy cold bosom will I sink to rest” (Ann Yearsley, *Written on a Visit*, 1787). Photographic Image, London 2016.

Figure 6.1. “The subject was peculiar, and my friend sullenly trembled for his well-earn’d fame; Yet why? – no vict’ry was by *me* pursued, Nor would I, for her trophies, bid *thee* yield” (Ann Yearsley, *Epistle to a Friend*, 1787). Photographic Image, London 2016.

Figure 7.1. “Farewel, ye groves! and when the friendly moon Tempts each fair sister o’er the vernal green, Oh, may each lovely maid reflect how soon Lactilla saw, and sighing left the scene” (Ann Yearsley, *Written on a Visit,* 1787). Photographic Image, London May 2016.

Figure 8.1. “Exquisite thy mental pleasure, Common transports are not *thine*; Far surpassing vulgar measure, All *thy* joys are near divine” (Ann Yearsley, *To a Sensible but Passionate Friend*, 1787). Netlytic Social Data Analysis Image, Fitbit < 14th January 2016.

Figure 8.2. @FitbitUK, SmartPoints (Name Network Analysis), January 2016. Netlytic Analytic Output.

Figure 8.3. @FitbitUK, SmartPoints (Chain Network Analysis), January 2016. Netlytic Analytic Output.

Figure 8.4. Fitbit UK & Ireland Facebook (Chain Network Analysis), February 2016, Netlytic Analytic Output.

Figure 9.1. “Vile ravager of Order! who shall hold Thy line of false morality?” (Ann Yearsley, *The Materialist*, 1787). Photographic Image, London 2015.

Figure C.1. “Ah! With too vain – yet ever new, For where resides the equal mind? Ye sons of woe, I ask of you, Where shall the wretch this comfort find?” (Ann Yearsley, *Stanzas on Affliction*, 1787). Photographic Image, London 2015.

PROLOGUE

ADSENSORY CAPITALISM
"THE SOUL AND SENSATION" (EPICURUS)

Figure Pro.1. "And would the future tempt the ardent … Did not completion live within the past?" (Ann Yearsley, *Familiar Epistle to a Friend*, 1787). Photographic Image, London 2015.

Perfection, be it trifling as the mote
Which reve'ls in the Sun-beam, cannot own
Its essence self-originating. Vain
Are all thy pleas to social rules of Man!
Vain are thy toils in Science! Vain the web
Hoary Philosophy shall ever spin,
If, in thy future views, thou ne'er canst form
Some good to hope for!
(Ann Yearsley *The Materialist*, 1787)

Allegorical metaphors of, "the mote" trifling with *perfection* as it reve'ls in a stream of sunlight, might initially appear as an intemperate sojourn into the esoteric recondite aura of atomist physics. Indeed, eliding economics and atomist physics, in the analysis of biotechnology, might appear, as itself, an indeterminate aleatory encounter. Nevertheless, to elide and encounter physics in the economics of biotechnology has some precedence in the newly emerging field of econophysics (Savoiu 2013, Richmond et. al. 2013, Abergel et al. 2015). Furthermore, Karl Marx's (1841), *Difference Between the Democritean and Epicurean Philosophy of Nature,* provides the archetype exploration of abstract self-sufficiency as contiguous with the biotechnological encounter that is, *clinamen*. As Marx expresses it:

> We now consider the *consequence* that follows directly from the declination of the atom. In it is expressed the atom's negation of all motion and relation by which it is determined as a particular mode of being by another being. This is represented in such a way that the atom abstracts from the opposing being and withdraws itself from it. But what is contained herein, namely, *its negation of all relation to something else*, must be *realised, positively established*. This can only be done if *the being to which it relates itself is none other than itself*, hence equally an atom, and, since it itself is directly determined, *many atoms*. *The repulsion of the many atoms is therefore the necessary realisation of the* lex atomi, [law of the atom] as Lucretius calls the declination. … *But when I relate to myself as to something which is directly another, then my relationship is a material one* … In the repulsion of the atoms, therefore, their materiality, which was posited in the fall in a straight line, and the form-determination, which was established in the declination, are united synthetically. (Marx 1841/2006:116-117)

The picture that emerges from Ann Yearsley's, *The Materialist*, Titus Lucretius Carus' (Lucretius) *De Rerum Natura*, and Karl Marx's Epicurean inspired, *clinamen*, is that, "Repulsion *is the first form of self-consciousness*, it corresponds therefore to that self-consciousness, which

conceives itself as immediate-being, as abstractly individual" (Marx 1841/2006:117). Inferred in this observation is Marx's concern to differentiate Democritean and Epicurean ancient Greek philosophical conceptions of chance. Democritus (ca.460-370 BC) and Epicurus (ca. 341-271/0 BC) espoused an atomist philosophy predicated on the belief that the universe's constituent elements are atoms and void. While equally committed to atomist physics, the philosophers posited diametrically opposed conceptions of certainty and chance. According to Democritus, continuity and alteration, in the progression of atoms, manifests in accordance with a predetermined order. As Marx expresses it, Democritus was dedicated to discerning, "*the way* in which *the relationship between the atom and the world, which is apparent to the senses is determined*" (1841/2006:97). Democritus asserted that sensuous impression was not an integral feature of the atom: "It is not objective appearance, but *subjective semblance* [*Schein*]" (ibid.). The unswerving principles of the universe are atoms and void, all else is merely subjective opinion pertaining to the nature of semblance (ibid.). The sensation of cold, and that of heat, according to Democritus, exist in the realm of opinion; in empirical reality, exclusively atoms and void exist (ibid.). "Democritus makes sensuous reality into subjective semblance" (ibid. 98). Excluded from, "the world of objects", sensuous reality resides precariously in self-consciousness; individual self-consciousness is, "where the concept of the atom and sensuous perception face each other as enemies" (ibid.). Marx compares Democritus' abjuration of sensuous reality with Epicurus' exhortation of sense perception. For, Epicurus (1993:25) consistently asserted, "whatever image we receive by direct apprehension of our mind or our sense organs, whether of shape or of essential properties, that is the true shape of the solid object, since it is created by the constant repetition of the image or the impression it has left behind". Suffice to say, while Democritus' atomist physics configures sensuous reality as, "*subjective semblance*", conversely, "Epicurus turns it into objective appearance" (Marx 1841/2006:98-99). The former is thus propelled, "into the arms of *positive knowledge*", in the quest for objective determinants of reality, while the latter vehemently challenges the pursuit of necessary cause (ibid. 99). Indeed, Epicurus (1993:67), in a, *Letter to Menoeceus*, ascribes to chance equal relevance, as pertains to necessity, as a determinant of cause: "Some things happen by necessity, others as the result of chance; other things are subject to our control". Referring to the denotation of necessity in Democritean physics, Epicurus remarks, "Because necessity is not accountable to anyone, he sees that chance is unstable, but what lies in our control is subject to no master; it naturally follows, then, that blame or

praise attend our decisions" (ibid.). Epicurus' reference here to a ubiquitous masterly force purposely evokes a religiosity that is too easily ascribed to necessity; conversely, Epicurus is keen to prompt, "Understanding that chance is neither a god … nor an unstable cause of all things" (ibid. 67-68). For, "the wise man does not think that either good or evil is furnished by chance to humankind for the purpose of living a happy life, but that the opportunities for great good or evil are bestowed by it" (ibid. 68). Epicurus appears, here, to infer that Democritean physics needs necessity to be real; this overrides the reality of necessity. As Epicurus indicates, in the following slight remark, "Indeed, it would be better to accept the myths about the gods than to be a slave to the 'destiny' of the physical philosophers. The myths present the hope of appeasing the gods through worship, while the other is full of unappeasable necessity" (ibid. 67). Here, and elsewhere, chance is entangled with human agency, "of living a happy life"; chance is an emergent feature of reflexive prudence; chance has a discernable ethics (ibid. 68). With regard to the latter, it is evident that Epicurus' ethics of chance is integrally bound up with the, *clinamen*.

Epicurus (ca. 341-271/0 BC) formulated a system of philosophy based on the atomist doctrine that, "the universe consists of bodies and void" (Epicurus 1993:21). It is evident that the former exists, as, "perception itself in all men bears witness" (ibid.). No matter how infinitesimal and, "imperceptible", the existence of bodies, we can, "by necessity form a judgement", epistemologically, "through the senses" (ibid.). Logical deduction affirms the existence of, "void and place"; if it, "did not exist, bodies would have no place to be nor anything through which to move, as they are clearly seen to be moving" (ibid. 22). There are distinctions in the ontological existence of bodies: "Some are compounds and others are those from which the compounds have been formed: These latter are indivisible and unchangeable if everything is not about to be reduced to nonexistence" (ibid.). Thus, Epicurus professed that something enduring remains, even when compounds are broken up: "One that is solid by nature and incapable of being dissolved" (ibid.). Consequently, "the first beginnings must be indivisible bodily substances" (ibid.). As Epicurus surmises:

> THE ATOMS … we must consider that atoms exhibit none of the qualities belonging to visible things except shape, mass, and size, and whatever is necessarily related to shape. For every quality changes; but the atoms do not change, since, in the dissolution of compound substances, there must remain something solid and indestructible, which causes changes not into

> the nonexistent, nor from the nonexistent, but as a result of the transpositions of some particles and the approach or departure of others. Therefore, it is necessary that these shifting particles be everlasting and not share in the nature of what is changeable, but rather possess their own mass and configurations. For they must needs remain permanent. Even among things perceptible to us that change their configurations by loss of matter, there is still perceived an inherent shape; the other qualities do not remain in the object as it changes, just as shape survives, but they are removed from the entire body. These properties that are left behind are enough to cause the differences in compound substances, since it is necessary that some at least remain and are not destroyed into the nonexistent. (ibid. 27-28).

Having elucidated the unchanging, solidity and indestructability of the atom, Epicurus sets about describing the constituent parts of the atom. Central to Epicurus' principle of the atom, is that bodies must not be assumed to be constituted by an infinite number of atom particles. For, if we were to presume that infinite particles constitute a limited body, our calculations and analyses would be driven into the realm of nonexistence. As Epicurus expresses it, "Therefore, we must not only reject a cutting into ever smaller parts to infinity, lest we deprive all things of strength and in the composition of aggregate bodies be compelled to consume existing things by reducing them to nonexistence; but we must also not think that in finite bodies a reduction to ever smaller parts to infinity can occur" (ibid. 28). Epicurus' supposition, here, has relevance to analyses of technology; the suggestion that bodies of technology are constituted by atoms is an attractive proposition when situated alongside an analysis of the internal workings of inter-dependent systems, markets etc. An additional feature of, "The Parts of the Atom", of significance, to the analysis of market dynamics, is Epicurus' observation concerning the velocity of the atom. For, it is asserted that, "atoms must possess equal velocity, whenever they move through the void, with nothing coming into collision with them" (ibid. 30). Epicurus defined a progression through the void, which entailed that, "neither will heavy bodies move more swiftly than the small and light, when nothing encounters them; nor do the small bodies move more quickly than the large; since they maintain a uniform course, provided nothing collides with them" (ibid.). The key conceptual issue here is the idea of constancy in the velocity of a phenomenon, which is only disrupted when it encounters and collides with an external force of equal motion. As Epicurus puts it, "For to the extent that either motion is maintained, so long will it keep on a course as swift as thought, until something collides with it, either from outside or from its own weight, which counteracts the force of what struck it" (ibid. 30-31). In this

statement, Epicurus provides intriguing insights into how atomist physics might be applied to the analysis of time and indeterminate markets. Time, arising from the collision of atoms, is discerned by Epicurus as so instantaneous that it exceeds conceivability. As Epicurus expresses it, "Moreover, the atoms' passage through the void, when it meets no object that collides with them, completes any conceivable distance in an inconceivably brief time. For collision, or the absence of it, assumes the likeness of slowness or speed" (ibid. 31). The passage of time, although imperceptible when conceiving the collision of atoms, is also a context for the alignment of meaning as received through the senses. As Epicurus expresses it, "However, in a passage of time perceptible only to the mind, they move not in one direction, but are constantly colliding with one another until the constancy of their motion comes under scrutiny of the senses" (ibid.). The visual metaphor of motes streaming through a sunbeam of light is an evocative imagery of value here, and one described above as utilised in Ann Yearsley's, *The Materialist*, and Lucretius', *De Rerum Natura.* When viewing motes in a sunbeam, it may appear that these particles are chaotically bouncing around the light; in actuality the motes reve'l; they "draw back", "retract" (Johnson 1837) from collisions with the particles of light. This has particular value for an analysis of technology, in that it suggests a theoretical frame for conceptualising self-determination as an outcome of chance encounter, at the same time as enabling a framing of chance that does not descend into solipsistic chaos theory. Indeed, Epicurus infers processes of self-determination in the following further account of the mental apprehension of the collision between atoms:

> Nor must we suppose that in moments perceptible only to thought the entire moving compound also moves in several directions, for this is inconceivable. If this were so, when it arrived all together in a perceptible period of time from any quarter of the infinite, it would not have set out from the place from which we perceived its motion. This visible motion will be the result of internal collision even if up to the visible level we admit that the speed of its motion meets no resistance from collision. It is useful also to grasp this fundamental principle. (Epicurus 1993:31)

The universe, within which bodies reside, is of infinite scale; possessing, no "outermost edge", it "has no limit" (ibid. 22). Boundless in its calibration, "in the numbers of the bodies", as well as, "the magnitude of the void", the universe is limitless (ibid.). The motion of atoms in space is, "continuously forever", with some extended long distances apart from each other and, "others in turn maintaining their rapid vibration, whenever

they happen to be checked by their interlacing with others or covered by the interlaced atoms" (ibid. 23). Atoms descend downwards through the void, unless they are deflected by a collision with other atoms. The occurrence of atoms colliding, according to Epicurus, is an outcome of, "the nature of the void separating each atom by itself … since it is unable to furnish any resistance", and also, "the hardness belonging to the atoms" (ibid.). The combined effect of these features, "makes them rebound after colliding, to the extent that their interlacing grants them a return to their former position following collision" (ibid.). Axiomatic with the deflection of the atom from the downward descent is timelessness: "Of their motions there is no beginning; the atoms and the void are the cause", and this provides a basis, "for the understanding of existing things" (ibid.). Epicurus', *Letter to Herodotus*, asserts consistently an atomist physicist treatise on the nature of existence, and this philosophy encompasses the essential composition of the soul. In reference to perceptions and emotional feelings, Epicurus (ibid. 32) introduces the idea that one should, "consider that the soul is a body of fine particles dispersed throughout the entire organism and most resembling a wind that contains a certain mixture of heat, in some ways resembling this (the wind) and in others this (the heat)". Additionally, some properties of the soul are interactive with, "the rest of the organism" (ibid.). Epicurus professed that all of these properties of the soul are, "made evident by the powers of the mind, its feelings, its mobility, and those faculties of which we are deprived when we die" (ibid.). The latter assertion infers reciprocity eliding the existence of the soul and the body. Indeed, while it is Epicurus' assertion that the soul is the principal impulse of sensation, "it would not have acquired this faculty, if it were not somehow enclosed by the rest of the body" (ibid.). The body informs the soul about that which precipitates a sensation, but the soul's knowledge of sensation is not entirely drawn from the body. Epicurus deduces that it is, "for this reason, the body has no sensation once the soul departs" (ibid.). By inference, for as long as the soul remains within the body it, "will never cease to feel sensation even when some other part of the body is lost" (ibid. 33). Returning again to the relation of the body to the soul, Epicurus suggests that even where part of the soul is destroyed, as part of the destruction of the encasing body, "if the soul remains at all, it will have sensation" (ibid.). Conversely, the body, even if it endures in entirety or in parts, "will not have sensation when that aggregate of atoms, of whatever size, that goes to produce the nature of soul, is missing" (ibid.). Thus, if the whole body is obliterated, "the soul disperses and no longer possesses the same faculties" (ibid.). Suffice to say, "It is not possible to imagine the soul existing and having sensation

without the body, and experiencing these movements when there no longer exists that which encloses and surrounds the soul, in which it now exists and has these movements". (ibid. 33). This observation leads Epicurus to explore whether the soul is incorporeal. Defining this latter term as applied to that which is perceived "as existing by itself" (ibid.). Such attributes appear directly relevant to the nature of void; "The void can neither act nor be acted upon, but only furnishes to bodies motion through it" (ibid). Conversely, the soul, unlike the incorporeal void, receives from the body elements of sensation and, thus, "the soul would not be able to act or be acted upon", in this manner if it were incorporeal (ibid.).

Axiomatic to Epicurus', "the soul and sensation" (ibid. 32), is a conception of time as experientially conceived. As Epicurus describes, "We must not search for time as we do for the other things that we look for in an object, referring to the images we have in our minds, but must draw from direct experience, according to which we speak of, 'a long time', or, 'a short time', applying our intuition to this as we do to other things". (ibid. 36). Epicurus countenances against the adoption of novel expressions of time, prioritising instead experientially unstructured epistemologies of time, "already in existence" (ibid.). In order to retreat from a solipsistic relativism, Epicurus asserts against predicating, "of time anything else as having the same existence as this unique property … but take into consideration only that with which we associate time and by which we measure it" (ibid.). Time, therefore, comes to be perceived through our experience; Epicurus associates this form of impermanency with the concept of, "accidents". Whereby, the latter, "are to be regarded as they appear to be: Neither attending permanently nor possessing the status of material substance; rather, they are seen in the manner in which the actual act of perception reveals their proper characteristics" (ibid. 35). Time and temporal consciousness, as features of experience, need not be demonstrated factually, but, rather, experientially as reflections on our association of, "time with days and nights and portions of them, just as we do with feelings and lack of feeling, motion and rest, recognizing time as a certain particular sort of accident of these things, by virtue of which we call it time" (ibid. 36). Suffice to say, time is secular in its ontology, and is epistemologically conceived through experience. Epicurus is, here, also intent to assuage existential anxieties concerning, for example, fearing, "the loss of sensation itself that comes with death as if it were something that affected them directly" (ibid. 41). Such existential anxieties are not based on logical judgement; they are driven by "irrational impulse" (ibid.). Conversely, Epicurus espoused a philosophy of being in time, in which

rational judgement is axiomatic with being, "attentive to the feelings that we have and to sensations both common and particular in accordance with a common or particular concern, as well as to every available perception, according to each of the standards of judgement" (ibid.). To assume that life is to be judged in terms of subjective feelings and sensations is not necessarily to advocate an ethics of hedonistic reverie; indeed, Epicurus adhered to prudence as, "The beginning and the greatest good of all … from it derive all the other virtues" (ibid. 67). In Epicurus' advocacy for the virtue of prudence, can be discerned a pedagogy for us on, "how impossible it is to live pleasantly without living wisely, virtuously, and justly, just as we cannot live wisely, virtuously, and justly without living pleasantly" (ibid.). Thus, it can be discerned that the virtues exist in reciprocal relation with the living of the, "pleasant life" (ibid.).

Because Epicurus denies necessity's accountability, "to anyone", time and chance reside, "in our control", and are, "subject to no master"; praise or admonishment, "attend our decisions" (ibid.). Comprehending, "that chance is neither a god … nor an unstable cause of all things", furnishes the progression in time with an ethics of the aleatory, based on the materiality, "of living a happy life" (ibid. 68). Karl Marx's (1841), *Difference Between the Democritean and Epicurean Philosophy of Nature,* was more favourably inspired by Epicurus' atomist physics on time and chance. Indeed, the comparative methodological technique that Marx utilises, intentionally positions Epicurus against Democritus so they perform one of two distinctly oppositional traditions in ancient Greek's scientific investigation. It is evident that Marx intends that the victor of the dyadic encounter will represent a resolution to, "the function of contradiction and the nature of science" (Fenves 1986:434). Thus, Marx sought to intervene in a tension arising between two contrasting philosophical traditions; in so doing, "Democritus is presented as a physicist who is concerned only with the empirical laws that govern matter. Epicurus, on the other hand, denies necessity, accepts chance when he introduces the atoms' swerve (*clinamen*)" (ibid.). Moreover, the latter's repudiation of scientific truth, as premised on "noncontradiction", provided for Marx further affirmation of Epicurus' rightful casting as an advocate of a science based on indeterminancy (ibid.).

In accordance with Epicurus, Marx countenanced that the atoms' kinetics is threefold: "One motion is the *fall in a straight line*, the second originates in the *deviation* of the atom *from the straight line*, and the third is established through the *repulsion of the many atoms*" (1841/2006:108).

Marx was keen to distinguish Democritus from Epicurus in respect to the second feature of the motion of atoms: "The *declination of the atom* from the straight line differentiates the one from the other" (ibid.). In the writings of Democritus, can be discerned a conception of declination predicated on, "the opposite of freedom", depicted, "with the deterministic and forced meeting of atoms" (ibid. 111). Conversely, Epicurean physics provides for complexity in its conception of time, chance, and identity. As stated previously, Epicurus conceived of a universe constituted by atoms and the void; atoms are in constant motion, "move continuously forever"; atoms inhabit vast distances from each other as they descend vertically through the void; "others in turn maintaining their rapid vibration, whenever they happen to be checked by their interlacing with others or covered by the interlaced atoms"; the void furnishes no resistance to the colliding atoms and thus they rebound; "Of their motions there is no beginning; the atoms and the void are the cause" (Epicurus 1993:23). Epicurus' determined negation of a start point in the atoms' motion is developed further in Marx's account of declination:

> Just as the point is negated [*aufgehoben*] in the line, so is every falling body negated in the straight line it describes. Its specific quality does not matter here at all. A falling apple describes a perpendicular line just as a piece of iron does. Every body, insofar as we are concerned with the motion of falling, is therefore nothing but a moving point, and indeed a point without independence, which in a certain mode of being – the straight line which it describes – surrenders its individuality [*Einzelheit*]. (Marx 1841/2006:111)

Marx's depiction of atoms - standing distances afar from each other, descending through spatial void - constitutes the atom's descent as, "the immediate negation of abstract space" (ibid.). The atom negates dissolving into the space of the void, hence, it forms itself as, "a *spatial point*". As Marx expresses it, "The solidity, the intensity, which maintains itself in itself against the incohesion of space, can only be added by virtue of a principle which negates space in its entire domain, a principle such as time is in real nature" (ibid. 111-112). The principle of identity through negation becomes ever more evident in Marx's account of the, "relative existence, which confronts the atom"; "the mode of being, which it has to negate, is the straight line" (ibid. 112). Vertical descent through the spatial void is the self-evident motion of the atom. According to Marx (ibid.), negating the vertical descent - the immediate motion of the atom - can be spatially apprehended as, "the declination from the straight line". In accordance with Epicurean atomist physics, Marx recognised that a

property of the atom, "is that of being pure form, negation of all relativity, of all relation to another mode of being" (ibid.). As wholly self-sufficient bodies, the self-determination of the atom presumes that their progression through the void is, "not in straight, but in oblique lines" (ibid.). Consequences, as Marx observes, "*The motion of falling is the motion of non-self-sufficiency*" (ibid.). Epicurus depicts the materiality of the atom in terms of its vertical descent through the spatial void, and as Marx (ibid.) observes, Epicurus depicts the, "form-determination" of the atom in terms of its, "declination from the straight line"; it is evident that, "these opposed determinations are represented as directly opposed motions" (ibid.). Marx, in homage to Lucretius', *De Rerum Natura,* concedes "Lucretius therefore is correct when he maintains that the declination breaks the *fati foedera* [bonds of fate] and, since he applies this immediately to consciousness, it can be said of the atom that the declination is that something in its breast that can fight back and resist" (Marx 1841/2006:113). Cognizant of the problematics of attributing essentialist properties to the, "form-determination", of the atom, Marx (ibid.) emphasises that Epicurus ventures, "to represent the declination as being as imperceptible as possible to the senses". Indeed, Epicurus (1993:23) evokes the occurrence of the atom's declination, as happening in an infinitesimal small space and, "Of their motions there is no beginning; the atoms and the void are the cause". To assume a point in time, and discernable cause for the atom's swerve away from the straight line, Marx's argument would be to, "throw the declination of the atom back into the domain of determinism, out of which it was precisely to be lifted" (Marx 1841/2006:114). Indeed, to inquire into determined causation is a somewhat paradoxical venture for an Epicurean physicist; this would require inquiring, "after the cause that makes the atom a principle – a clearly meaningless inquiry to anyone for whom the atom is the cause of everything, hence without cause itself". Marx (ibid.) also engages critically with the attempt by previous writers to ascribe to Democritus' deterministic account of declination a, "spiritual principal", as basis for discerning causation. In riposte to a treatise on the, "soul of the atom", Marx reverts back to Epicurus' account of the materiality of the soul and, thus, "the declination", is presented as representing, "the real soul of the atom, the concept of abstract individuality" (ibid.). The latter concept refers to the, "form-determination", of the atom, "the pure being-for-itself" (ibid.). Abstract individuality conceives of the atom as defining itself through gaining, "independence from immediate being", and this requires, "the negation of all relativity", manifested, "only by abstracting from the being that confronts it" (ibid. 114-115). Marx makes evident, here, a paradoxical

feature of the abstract individuality achieved from the declination away from the straight line, "for in order truly to overcome it, abstract individuality had to idealise it, a thing only generality can accomplish" (ibid. 115). By extension, the individuality of Epicurean atomist philosophy is achieved and made manifest when, "the entire Epicurean philosophy swerves away from the restrictive mode of being wherever the concept of abstract individuality, self-sufficiency and negation of all relation to other things must be represented in its existence" (ibid.).

According to Marx (ibid.), meaning and the purposiveness of action can be discerned in the process of the swerve (*clinamen*), the abstraction away from non-self-sufficiency; "swerving away from pain and confusion, in ataraxy". By way of illustration, Marx describes how swerving toward, "good is the flight from evil", and, "pleasure the swerving away from suffering" (ibid.). More significantly, in its declination and abstraction, the atom expresses its, "negation of all motion and relation by which it is determined as a particular mode of being by another being" (ibid. 116). Marx ascribes a virtuosity to the atom's abstract individuality, expressed in the swerve away from the straight line. Axiomatic to this position, is the idea that an integral feature of the swerve is recognition; abstract individuality can only be achieved, "if the being to which it relates itself is none other than itself, hence equally an atom, and since it itself is directly determined, many atoms" (ibid.). By this is meant, that, "atoms are their own sole object and can only be related to themselves" (ibid.). Hence, they are only enabled to interlace, "by virtue of their declination from the straight line" (ibid. 116-117). However, this interlacing with each other is predicted on a recognition and identification, "inasmuch as it relates to something else, which actually is itself – even when the other thing confronts it in the form of immediate existence" (ibid. 117). Referring back to the original objective of a, *Philosophy of Nature*, Marx (ibid.) argues that the human comes to know itself as human only when the other being, to which it relates, is also human. However, this abstract individuality necessitates that the human, "must have crushed within himself his relative being, the power of desire and of mere nature" (ibid.). Consequently, and as Marx (ibid.) expresses it, "Repulsion *is the first form of self-consciousness*, it corresponds therefore to that self-consciousness which conceives itself as immediate-being, as abstractly individual". Furthermore:

> The concept of the atom is therefore realised in repulsion, inasmuch as it is abstract form, but no less also the opposite, inasmuch as it is abstract matter; for that to which it relates itself consists, to be true, of atoms, but