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## Shifting Ontology in an Era of Acceleration and Quantified Humanity

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### Abstract

*The idea that we are swept along in unforeseen consequences of our capitalist ideals of continuous progress stands in stark contrast to Kelly's (1966) consideration of the active role that human activity plays in human evolution. The cumulative change of humanity behaving differently, and divergent behaviour changing humanity, produce acceleration, and for Kelly this acceleration is ontological. In this paper I explore three moments of accelerated change, associated with the ontologies of object, relation and trace. Object ontology encouraged the dehumanised subject, relational ontology a calculated embodied subject and trace ontology the responsible subject. Currently we find ourselves somewhere between the calculated embodied and the responsible subject, cognitively related to others, but not yet prepared to experience the other as me differed and deferred from myself.*

Keywords: ontological acceleration, object ontology, relational ontology, trace ontology

At the beginning of the 21st century the computer scientist and futurist Ray Kurzweil (2004) established the law of accelerating returns by suggesting the exponential change of evolutionary systems. His bold statement that the 100 years of the 21st century will bring the equivalent of twenty thousand years of progress has been at the basis of the belief that we live in an unprecedented era of acceleration. It has been a refrain echoed repeatedly in discussions of rapid developments in technology, especially in the physical, information and biological sciences. The era of acceleration has been likened to a second renaissance with numerous risks and rewards (Goldin & Kutarna, 2016), and there are rumblings of a fourth industrial revolution and a socioeconomic impact we cannot escape. We are warned of negative psychological effects, for example that there may already be “signs of a kind of ‘quasi-mass-neurosis’ because of the link between advanced technology and socialisation”

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(Olivier, 2019, p. 357), and we are recommended remedies such as mindfulness (Kristensen, 2018; Olivier, 2019), to manage the effects of societal acceleration.

A theme opaquely embedded in most papers on the nature and impact of our unprecedented era of acceleration is one of us being victims of processes running amok in an era of late modernity (Rosa, 2015). The idea that we are swept along in unforeseen consequences of our capitalist ideals of continuous progress stands in stark contrast to Kelly's (1966) consideration of the active role that human activity plays in human evolution. Human behaviour has never merged into fixed, stagnated patterns. It has always reflected transition, in constant transformation of itself. Humanity itself changed through human behavioural innovations, something Penrose (2004, pp. 7-8) described as the quest for the forces that shape the world. Thus, in the early times following the dawn of humanity people tapped into personal perceptions of how they themselves would go about controlling their surroundings, and imbued god-figures with their own ideas and emotions. The only way in which they could influence worldly events was to appease the whimsical gods. But gradually they began to notice particular regularities in the world, like seasons in the movements of the moon and the stars. Slowly they realised that these worldly regularities meant that the whimsical gods themselves were subject to mathematical laws, and the earthlings began their own journey into the relationship between heavenly bodies and earthly behaviour, but it took many centuries before the physical realities of the world became disentangled from suppositional and mystical beliefs. People took up their place in the world as bodies amongst objects in a geometry of space and time. The cumulative change of humanity behaving differently, and divergent behaviour changing humanity, produced acceleration, and for Kelly this acceleration was ontological.

We are not unsolicited bystanders in the era of unprecedented acceleration. Neither is the era. We are embedded in an ontological framework of acceleration, and the era in which we find ourselves is a reflection of our ontological embeddedness. In this paper my interest is to explore the ontological frames of reference that foster our accelerated change. We have to call briefly on three different ontologies (object, relational and trace) to get a sense of how we shift ontology in maintaining the ontological acceleration that after all is the very foundation of our sustained evolution.

## Object ontology

It started with a fly, or so the anecdotal story goes. The French philosopher and mathematician Rene Descartes lying on his bed was watching a fly moving across the ceiling when he realised that the fly's movements could be traced accurately by using numbers. All he had to do was to divide the ceiling up into smaller squares, to number the squares and to note how the fly moved across them. Then he had a second stroke of genius. He realised that it was not necessary to put a number in each of the squares. If he numbered the first line of squares along the breadth of the ceiling and he does the same along the length of the ceiling he could pinpoint each square on the ceiling in terms of its breadth number and its length number. Hence Descartes' fly could be found in a square at breadth number X and length number Y. The cartesian coordinate system was born and the fly became an object caught up in this system.

Descartes knew, from the writings of the Greek mathematician Euclid from Alexandria, nearly two thousand years earlier, that he could treat the squares on his ceiling as geometric objects. He also knew that he could change the size of the squares on his ceiling arbitrarily.

He could draw a square just large enough to fit the fly, and then use the square to represent the fly. The fly became a geometric object, called XY, but even more importantly the fly assumed the features of this square. The calculated surface of the square became the surface of the fly, and the fly became an object constituted by any number of features assigned to it by the cartesian frame of reference. The era of objectification and quantification began.

From a Cartesian point of view objectification and quantification worked well, but the fly had a different perspective. For the fly objectification was alienation. Descartes' well-known attempt at conquering doubt in 'I think therefore I am', came at the cost of an ontological divide cutting right through the being of the fly. Hence part of the fly, the part that landed on the ceiling, would be *res extensa* and the other half, the part caught up in the Cartesian grid, *res cogitans*. For nearly three hundred years the fly's ontological acceleration was to live this ontological alienation. With historical hindsight we know now that living ontological alienation meant dehumanisation through self-objectification under a Cartesian gaze. This is a mouthful, and a statement that needs to be unpacked carefully.

Descartes lying on his bed staring at the fly on the ceiling was the primordial example of the Cartesian gaze. He was the distanced, objective observer, with no investment and no interest in the part he played in this observation. From Descartes' point of view the Cartesian grid offered a complete and powerful observation. It was complete and powerful because it linked algebra (the calculation of the world) and geometry (the layout of the world) in a single, encompassing observational system. The Cartesian gaze was the gaze of truth.

For Descartes the fly was a single object composed of two substances, but the fly did not have the luxury of distanced objectivity. It could not step outside itself and view itself from a distance. It had to internalise what it was given in the Cartesian gaze. However, what it was given was much more than the overt image of an object composed of two substances. What the fly had to internalise was that it was an object deeply divided within itself. It had no secure footing. Its *res extensa*, its physical embodiment in the world, could only be known through its *res cogitans*, its mind, but the former was also the condition for the latter. The fly's internalisation of the Cartesian gaze, its moment of ontological acceleration, was not without psychological impact. The dynamics and effects of internalising the gaze of the other and becoming the object presented in the gaze was described in Fredrickson and Roberts's (1979) objectification theory. According to this theory the internalisation of the gaze of the other was accompanied by experiences of anxiety, shame, peak motivational states, and awareness of internal bodily states. The fly's anxiety was existential, and its shame the inability to become an integrated object under the Cartesian gaze. But despite these negative experiences, there were great moments of peak motivational states, like mastering the laws of nature through Newtonian science, harnessing the power of steam, discovering electricity and engaging in explorations of its own mind, creating awareness of internal bodily states through Wundtian experimental psychology and Freudian psychoanalysis.

But self-objectification came at the price of dehumanisation. The self-objectified object was without identity and agency, reduced to its parts (Gervais, Bernard, Klein & Allen, 2013). It was simply *res*, an infinitely differentiable substance, provisionally split into *res extensa* and *res cogitans*. The impassionate Cartesian gaze only allowed for a mechanistic understanding of the self-objectifying object. The self-objectified object existed in a Newtonian world of objects and forces, and its interior was no different. It was an inert, cold, rigid, fungible machine without agency or autonomy (Haslam, 2006), a behaviourally

and psychoanalytically well-reasoned object but not one to be considered compassionately. Humanistic psychology was still to come. Comparative psychology (see Galef, 1987), although less mechanical and less cold was nevertheless no less reasoned and also no less dehumanising. Capturing the self-objectifying object as animal rather than machine in the Cartesian gaze simply meant an animalistic form of dehumanisation (Haslam, 2006) – a form of dehumanisation the fly in the present anecdote did not help us to escape.

## Relational ontology

The dehumanisation of the self-objectified object reduced dissimilarity with the object of the Cartesian gaze. The self-objectified object had to be made more objectlike because an object harbouring an interior process of internalisation was intolerable from a Cartesian perspective. Yet, no level of dehumanisation could completely wipe the interior of the self-objectifying object. Something was amiss with the Cartesian gaze, but it was not until the advent of the theory of special relativity (Einstein, 1905) that we got to know what it was. The Cartesian gaze was not uniquely objective. Somebody walking into Descartes' room would have a different but equally valid perspective of the Cartesian grid on the ceiling while being in motion relative to Descartes. Hence no observer could claim a position of observation that offered the truly objective gaze. However, it was general relativity theory (Einstein, 1916) that really dimmed the cartesian gaze. Instead of being flat the ceiling turned out to be warped. Each observer's Cartesian gaze was narrowed to a small region of the warped ceiling, a region small enough to appear locally flat. In the world of special relativity observers could translate their points of view into each other's and have a sensible conversation about events on the ceiling, but in the world of general relativity they could do no more than relate their versions of local events to those offered by their immediate neighbours. There was no global view of the warped ceiling. Any event on the ceiling was an event stitched together from numerous localised perspectives. The fly on the ceiling was faced with a reality more disturbing than before. If previously its dehumanising project of self-objectification was plagued by the indeterminable ontology of the unfathomable division within itself, the division between *res extensa* and *res cogitans*, it now also became epistemologically indeterminable because unfathomable divisions split the single gaze into many. The fly was a compound object held together by ontological and epistemological stitching. It was in desperate need of ontological acceleration.

An opportunity for ontological acceleration arose with quantum theory. Suddenly the relationship between the gaze and the fly became a focus of attention. The unquestioned distinction that separated the fly on the ceiling from the fly given in the gaze, the distinction that enabled self-objectification and permitted the self-objectified fly, this distinction became a matter of relatedness instead of autonomy. We came to realise that the object was not a given independent entity. It was not something already out there to be gazed at. It was an outcome of the internal structure of the gaze. Quantum theory made us realise that the object was a function of the relationship between observer and observed. Objects had no pre-existing properties, only propensities to be realised as properties in relation to an observer (Rovelli, 1996; Dorato, 2016), and even more significantly there was no guarantee that two observers would agree about the fundamental reality of a particular object (Frauchiger & Renner, 2018). The fly had to give up on being a fly not because its ontological and epistemological stitching unravelled but because it had no grounds for being an autonomous fly to begin with. All it had was the propensity to be a fly in relation to an observer, a gazer.

Not only modern theories in physics, but an entire zeitgeist of antihierarchical thinking and experience (Ash, 2020), reveal our movement towards relational ontology. Relational ontology is considered in various disciplines such as philosophy, psychology, political theory, education theory and information science (Wildman, 2010). Yet, we are still unclear about the exact nature of relation. Not having shed the baggage of object ontology we are naturally inclined to consider relation as a connection between two existing entities. We grant ontological priority to substance, the *res* of objects, because we do not know how to think relation in isolation and without substance. But even if we could it would be a mistake, because an isolated relation would simply become another object. Thinking of relations as fundamental to objects is not about the objectification of relation. It is about the fact that things do not exist in isolation and that everything can be defined only in relation to another. To help us solve this difficulty we should begin by thinking of objects as bodies (Rogers, 2018).

A body can be anything, ranging from a subatomic physical object to a person. A body has interiority and exteriority, and processing capacity. Internalisation is the processing of input from the outside world. Externalisation is the presentation of the internalised to the outside world. The externalised is the body's response to input. It is the surface that other bodies take images of and use as input. The surface is always more than the image, and the body always more than its surface. A body relates to other bodies through internalising images of the surfaces of these bodies and externalising the internalised images as its own surface, which then offers images for internalisation by other bodies. Bodies exist in a network of relations and are themselves relational in being the loci of the relations between interiority and exteriority. These relations are asymmetrical. Each relation has a source body offering a surface and a receiver body accepting an image. The source relates interior to exterior and the receiver exterior to interior.

At first glance this does not seem to be much of an ontological shift for the fly. The fly offers a surface, and the gazer accepts an image. However, in object ontology the surface is the given exterior of an existing fly and the image is the objective observation of this exterior. In this ontology the image replaces the fly. But in relational ontology the fly has no pre-given existence. Its surface is the externalisation of the internalised image of a preceding surface and its image is the internalisation of its surface by a following body. The fly shifts ontologically from being a rigid dehumanised object to being a dynamic relational body. Its ontological acceleration of self-objectification is replaced by an ontological acceleration of self-embodiment.

Embodiment blurs the distinction between the concrete and the abstract. In relational ontology physical bodies are abstracted as physical bodies because they have an interpretable meaning to other physical bodies (Rogers, 2018, pp. 2-3). Physical bodies are abstracted as physical bodies as internalised images. Thus, embodiment occurs in relation to another body. It occurs through the second body's imaging of the surface of the first body. In other words, embodiment, the physical manifestation of the body, occurs through surfacing and imaging. The embodied body is not a self-contained singular object. It is the exteriority of a preceding body related to the interiority of the one that follows. It has the complex structure of generality in relatedness and particularity in separateness. The embodied body is the body related to another body but is separated within itself because the image of the other remains irreducibly other. The preceding and the following body share mutually determined aspects in their generality, but they differ in their particularity (Rogers, 2018, p. 3).

The fly is embodied in relating to and differentiating from other bodies. It obtains a physical body by generalising and particularising itself in relation to another body. Its self-embodiment is the embodiment of its embodiment, which is the internalisation of its exteriority, the imaging of its surface, the surface of an embodied fly. The embodied fly is externalised as, it has the surface of an externalising body related to but separate from an internalising body. It is a surface internalised and imaged as the fly in general related to the fly in particular. The relationship between the general and the particular constitutes an interplay between similarity and difference, prohibiting stagnation and breeding creativity encouraging the ontological acceleration of the self-embodied body. The self-embodied body claims and maintains ontological acceleration for itself, unlike the self-objectified object that could manage ontological acceleration only through being dehumanised under the Cartesian gaze.

## Trace ontology

Our economic, sociological, and psychological realities reflect acute awareness of the effects of power differentials, anticolonialism, democratisation and governmental transparency. In short, we are heavily invested in antihierarchical thinking. However, hierarchy is something relational ontology does not escape. It allows transcendence to bodies at higher levels that contain and sustain bodies at lower levels (Rogers, 2018). It is also invested in space and time on which it generously relies for conceptualisation. There are obvious examples such as the spatial distinction between the interiority and exteriority of bodies, and the asymmetric flow of time in the relational connection between bodies, but there is also the example of space and time differentiation that cuts through the very fabric of the description of relational ontology. Rogers (2018) identifies some characteristics of relational ontology, such as embodiment and particularity, as temporal, and other characteristics, such as generality and law, as spatial. Although space and time are often considered uncomplicated backdrops in our theorising and conceptualisation, this is an approach that should be followed with care. We know from Einstein's relativity theories (1905, 1916) that space and time are not necessarily innocent bystanders in our theories and concepts. In fact, the connection between relativity and quantum theory is an active arena of research precisely because the spacetime of relativity theory does not square with the space and time of quantum theory encouraging the notion that spacetime is not a pregiven but an emergent property of the world, perhaps woven by something called loop-variables (Penrose, 2004, pp. 940-943). We need a form of relational ontology that does not encourage hierarchical thinking and that does not operate in a presupposed spacetime. The notion of the 'trace' introduced by the French philosopher Jacques Derrida addresses these concerns.

Derrida's trace is a relation:

... this trace being related no less to what is called the future than to what is called the past, and constituting what is called the present by means of this very relation to what it is not: what it absolutely is not, not even a past or a future as a modified present. (Derrida, 1982, p. 13)

Relational ontology acknowledges the rapture between the past (input; the image of the preceding body) and the future (output; the surface of the present body), but it depicts this rupture as a delay and a gap (Rogers, 2018, p. 4) in an existing process. The rupture is explained fully as the time consumed (the delay) and the space occupied (the gap) by the

processes of internalising and externalising. The relation is fully spoken for, fully closed within the body, and as such totally embodied. This relation has no time and no space to relate to what it is not. It contains the unknown, which is the uninterpreted as well as the uninterpretable, within itself. The internalised is never fully externalised (Rogers, 2018). The unknown is rendered at a higher level of abstraction, by a body at a next level containing the present level body. The Derridean trace has no hierarchical ambition. It cannot be abstracted. It cannot be embodied. It is always already open to what it is absolutely not. Also, it is not a delay and a gap in existing spacetime. It is an interplay of delaying and spacing from which spacetime emerges, an interplay that Derrida refers to as *différance* (Derrida, 1982). As such the trace does not contain the uninterpreted and the uninterpretable. It has no pre-given temporal delay and spatial gap in which it can collect, claim and delineate what is unknown, what is uninterpreted and uninterpretable. The trace does not claim the content of the delay and the gap. It claims the delay and the gap itself, and more precisely the interplay between the two. It claims the temporal delay as deferred appropriation, and the spatial gap as indeterminable difference. The trace is the interplay between deferred appropriation and indeterminable difference.

Thus far we saw ontological acceleration associated with the internalisation of the fly as object and as relational body. The third moment of ontological acceleration is associated with the fly's internalisation of itself as trace. Descartes's fly is a leitmotif in these illustrations of ontological acceleration. It continues as leitmotif in the third moment of ontological acceleration but in an unusual way, namely by disappearing from the discussion. It becomes an absence in the discussion, but an absence that is not a frivolous act of omission. In trace ontology the absent fly is neither an object nor a body. It cannot be objectified or embodied. It is an absence into which it disappears so completely that even its name is lost so that we cannot think of this absence as the absence of a fly. This nameless absence is a leitmotif in the remaining discussion.

The fly's internalisation of itself as trace requires an exploration of the I as trace, particularly the I as the nameless absence in the present, as the relationship between absence and presence. We begin with a Derridean reading of Lacan's mirror stage theory.

In his mirror stage theory Lacan (1966/1977) describes the young child recognising itself in the image in the mirror. The child, still too immature to coordinate its movements, has the internal experience of a disjointed body but sees in the mirror an integrated whole body. The child sees what it will have become. Lacan's purposive use of the future perfect tense illustrates the child's appropriation of itself. It is in this relationship between the body in front of the mirror and the image in the mirror, in the relationship between the internal turmoil of a body in bits and pieces and the external image of a body in one piece, a relationship between an inside and an outside, it is here that I come to be. In a Derridean reading of the mirror stage a presence (the I) is constituted, relating no less to the past (the body) than to the future (the image). However, unlike the Lacanian constitution of a completely present I the Derridean reading reveals an I that is constituted in relation to what it is not, to what it absolutely is not, not even a past or a future as a modified present. A nameless absence inhabits the Derridean I.

Unlike the Lacanian I this I is not the name of the self, but the condition for the self and ontologically prior to the self. The fly's internalisation of the I, its attempt to appropriate itself as an I does not present itself as something, as for example an object or a relational

body. The internalisation of the I is an inscription. The fly inscribes itself as an absence in the present, a radical absence into which it disappears completely, forgetting its own name.

Now the fly is gone and only I remain. We must face this ourselves. We must face ourselves. We are an I, a nameless absence inscribed in the present. The current moment of ontological acceleration is not the fly's. It is not an acceleration associated with an object in object ontology or a relational body in relational ontology. It is an acceleration associated with an I in trace ontology. It is an acceleration induced by tracing rather than objectifying or relating. Like the others, tracing is a complicated induction of ontological acceleration and can be dealt with here only superficially.

Acceleration is induced in a tracing of the trace. Tracing by nature is an attempt to find the original under the assumption of representation. However, the trace can never be the original and as such never fully represent the original. It always contains an unnamed absence that differentiates it from the original and keeps it from fully appropriating the original. This becomes abundantly clear when the original being traced is the trace itself and when the trace is traced as the origin. A tracing that cannot be arrested and brought to rest in a full appropriation of the origin is a slippery ground for unexpected acceleration.

We need to think the I in terms of these considerations. In my experience the present is a given, that I belong to. Yet, it is also a present that exists relative to me, and thus a present that belongs to me. Like zero, on the one hand a number like any other, but on the other hand a nothing from which all numbers extend, I am the 'no-thing', the absence from which everything that is present extends. I know the present affects me and that I affect the present, but it is a novel idea to consider my I as a point of articulation in which an affecting present is related to an affecting me, and even more novel to think of my I as an absence in the present. I know that part of my existential reality seems not to be accommodated in the present, but I am not used to think of this as an absence in the present. I may not know the nature of the part of me that escapes the present, but I have not thought of this as an opaque I, as the part of me that disappears from the present without a name.

Ontological acceleration is induced in the tracing of I. This tracing is an archi-writing which is simultaneously spacing and temporising (Derrida, 1982, p.13). In this archi-writing the traced I is differed and deferred from the original. In being deferred and differed from the original, the traced I never succeeds in appropriating the original. It never comes to rest in the original, but even if it could the original would not offer solid ground for rest because it was already a trace, a present related to a radical absence. There is no solid present that precedes the archi-writing of differing and deferring. The present is written, it comes to be in this primitive writing, this tracing. To see how, we need to look more closely at its processes of transformation, in particular the symmetries and asymmetries of these processes.

The notion of symmetrical transformation is inherently mathematical, but for our current purposes it is sufficient to consider it as follows: Tracing is a process of transformation. Tracing the original I, transforms the original I into the traced I. If tracing the traced I transforms the traced I back into the original I the transformation, that is the tracing, is symmetrical. However, it is important to note that the second transformation, which is the transformation from the traced I to the original I, is a repetition of the first transformation, namely the transformation from the original I to the traced I. The second transformation is not an inverse or a negative that cancels the first transformation. It is a repetition of the first transformation. Tracing is symmetrical if the original I remains unchanged under repeated



tracing. If the original I does not remain unchanged under repeated tracing the tracing is asymmetrical. Asymmetrical tracing may seem like an undesirable outcome, but it is a point of great interest because it is the starting point of an ontological acceleration associated with our shift to trace ontology.

We do not like asymmetrical tracing because it changes the original I. It keeps us from fixing our origin, from setting a particular starting point. So, we force symmetry on asymmetrical tracing. We enforce continuing similarity of the original I by expelling the change caused by asymmetrical transformation. The expelled change is a surplus that we refuse to take account of. It is a presence outside us. However, it is not a pre-given presence that exists in and of itself. It is a presence that comes to be through tracing a radical absence. I am this radical absence, and this is how and where I find myself. I am not an object, and not a relational body. I am a radical absence inscribed into a presence. I am the relation between the present world to what it is not.

Another point to consider is the matter of existential equivalence between the original I and the traced I. This means the original I should not be considered more real than the traced I, and there should be no reason not to commence a tracing from the traced I to produce the original I as a traced I. Existential equivalence is established when the transformation commencing from the original I is symmetrical to the transformation commencing from the traced I. The symmetry of these transformations is an intricate process. However, detailed consideration is not required for the present discussion. It is sufficient to note that the system comprised of the original I and the traced I should remain unchanged under the symmetry of these transformations, and that enforcing symmetry between them results in an expelled surplus, constituting a presence outside the system.

## **Psychological moments of ontological acceleration**

How should we understand our psychological drive for change, given the three moments of ontological acceleration discussed earlier? In this paper the journey began with our ontological acceleration of the dehumanized object under the Cartesian gaze. The drive for self-objectification was an awakening, the desire to appear, to be gazed at and to be something in the other's eye, to find a place amongst others. The objectification was successful. We become cogs neatly fitted together in the mechanical machine we built. The mechanical age became an era of significant technological and socioeconomic progress. But the cost was our humanity. We yearned to regain our humanness in networks of relations. We embodied ourselves as nodes of relational intersections, nodes where information is processed, and relations calculated. We escaped the Cartesian gaze and established ourselves at the vantage point of perception. Instead of being looked at we became the calculating and calculated observer embedded in a network of calculations. We built the computer, a calculating machine in our image, which became even more successful and created even more wealth than the mechanical one we assembled earlier. However, we encountered two difficulties namely that the democratic relationships we hoped for did not quite materialise in the computer age. The electronic machine like its mechanical counterpart could not escape hierarchical organisation. The second problem concerned space and time. The network of relations did not operate well in space and time, at least not as well as the network of objects were able to earlier. Slowly a new realisation dawned on us. The drive for democratic equality came with significant responsibility. It was not sufficient to be an observer of and a participant in the world. We had to be willing to accept responsibility for the world we create.

There are obvious manifestations of these ontological accelerations in our evolution, such as progressing through the industrial and information ages to the world promised by 4th industrial revolution or learning to start caring for the planet instead of living ruthlessly off the planet. But there is also the more fundamental implication of becoming increasingly more responsible for our ontological acceleration. It is more difficult to deny responsibility for ontological acceleration in a world one claims to be responsible for than to do so for an objectified world left to its own mechanical devices.

We have begun to accept responsibility for ontological acceleration by inscribing ourselves into the relation between the present world and what this world is not. In this relation we are as much subjected to the world as the world is to us. It is a relation in which we cannot escape responsibility for the world. We may not have embraced trace ontology in our daily lives yet, but we certainly move towards it. Our desire to understand the world opened it up in terms of forces and objects, for a long time understood as purely mechanical, later also as relational and now we see the category of force carrying particles related to the surplus of asymmetrical tracing of I, and the category of mass carrying particles related to the surplus of asymmetry between asymmetric tracings of I. Furthermore, we already implement processes that rely on physical particles popping into and out of existence from nowhere to accomplish real tasks. The electronics of modern-day computers is an example of a technology that relies on this phenomenon.

Our drive for democracy and equality is another manifestation of our movement towards trace ontology. However, without fully embracing this ontology we are not likely to really understand phenomena like democracy and equality, and we are not there yet. An analysis (unfortunately too lengthy to be included) of the individual grounded in trace ontology reveals the individual as an inside related to its outside, claiming the entire world in this relationship. There is an abstract mathematical object that can be used to describe the transformations of this entity, called a spinor (Penrose, pp. 204-208), but in its concrete manifestation this entity is an individual differed and deferred from itself as the other, manifesting in the experience that you are me differed and deferred from myself.

Few will dispute the fact of our collective evolution because it is evident in our history. Given sufficient time we can determine the average rate of change and conclude that we have a constant rate of evolution. However, considered over shorter periods of time we may notice changes in our rate of evolution, and conclude that there are periods of accelerated change. We know that acceleration is a function of force and inertia. More force means more acceleration, and more inertia less acceleration. Any change in our rate of evolution, our ontological acceleration, is a function of our drive for change and our resistance to change. Thus, to understand our ontological acceleration we must consider what compels us to change and what keeps us from wanting to change. Positive ontological acceleration means we have to have more drive for change than resistance to change. Negative ontological acceleration means a slowdown of our evolution brought about by higher resistance to change than drive for change. If the resistance to change becomes extensive our evolution grinds to a halt, we stagnate and perhaps begin to degenerate. In this paper we focussed on the drive for change. We did not consider resistance to change, although obtaining a complete picture of our ontological acceleration would certainly require this to be done at some stage.

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