The Posthumanities in an era of Unexpected Consequences

Editorial for the special issue on the Transversal Posthumanities

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Abstract

The posthumanities constitute an affirmative, expanded development of the traditional humanities embedded within the posthuman convergence. Numerous changes impel recognition of wider forms and constituents of conditions no longer nameable simply as human; also implying mature relations to technology and science. The posthuman condition -- in fields as diverse as military strategy, health, education and machine learning -- brings entities and processes into transversal relation in ways that are normatively neutral but loaded with implications. Working in this condition is a task of the posthumanities. Being transversal implies risk. One such risk is the unexpected consequence. The article builds on Jevons, Merton, Guattari and Braidotti, to examine how transversality maps unexpected consequences, (such as pollution). Transversality is also a pragmatic method to render problems multi-dimensional: expressing active forces and capacities under the radar of established forms of articulation. Short summaries of articles by contributing authors complete this introduction.

Introduction

This special issue is part of a growing effort to rework the role of the humanities and their relation to science, technology and contemporary society on the basis that our idea of the human is fundamentally reaching its limits and changing.

If the humanities can be said to be broadly concerned with the self-reflection and understanding of the human species, the posthumanities come about when we recognize that growing computational systems, security terrors, new biomedical forms and drastic ecological damage amongst other factors impel us to recognize the wider forms and constituents of the condition that is no longer nameable simply as humanity. This convergence requires that the humanities rework their relationship to the sciences, bringing about changes in epistemic resources and theorisation of the locations, modes and objects of knowledge.

The assumption sustaining this issue is that the posthumanities are already creating institutional changes and new set of trans-disciplinary practices and narratives about, for instance, the influence of digital mediation upon our social practices and processes of self-representation; about the planetary dimension of globalized humanity; on the evolutionary sources of morality; on the future of our and other species. New research is also being developed about the semiotic systems of

technological apparatus; the ecosophical continuum between naturecultures; the multiple processes of translation underscoring new media and research on the process ontologies at work both in biology and philosophies of subjectivity. In this, we see the work presented here as complementary to the research on transdisciplinarity discussed in the TCS special issue on the topic. (Osborne, Sandford and Alliez)

At the institutional level, several new interdisciplinary posthuman studies research platforms are being currently set up across major universities and are running path-breaking experiments at present[i]. The question of the posthuman, pioneered by N. Katherine Hayles, Donna Haraway and Rosi Braidotti, is explored and sometimes more implicitly posed in discussions of ecoliterature (Morton, Wolfe), feminist cultural studies (Grosz; Hird; Åsberg and Braidotti), philosophy (Parisi, Laruelle, Meillassoux), software studies and computational culture (see the journal of that name http://www.computationalculture.ent/), animal studies (Timofeeva), cognitive science (A. Clark, Malafouris), the environmental humanities (Åsberg, Neimanis, Hedrén, Tsing, Gan), continental philosophy (Braidotti, Wolfe, Colebrook, Zylinska) and the diffusion of ecological thought (Chakrabarty, N. Clark, B.Clark, J.Gabrys), and humanities involvement with the life-sciences (Thacker, Rose) as well through the foundational work of feminism in this area (Åsberg and Braidotti).

As a consequence of this embarrassment of theoretical and research riches, we are currently witnessing a genuine proliferation of new work on the posthumanities. Maybe because of this wealth of options, however, there is no consensus either in terms of terminology or of key-concepts. As the saying goes, *this is not a crisis, but an opportunity*, which may lead to the generation of new ideas pointing in the direction is the overcoming of anthropocentrism, while preserving the legacy of critical posthumanism (Braidotti 2013). As we discuss below, this set of recognition of the expanded domains of knowledge, activity, and what count as active is by no means limited to the human, nor the disciplines and fields gathered as the humanities, but stretches beyond them in ways that are particularly inflected according to domain. Some of these domains may indeed however recoup the situation as a proper crisis, requiring that the posthumanities have a sustained and sharp political and ethical formation.

This special issue of *Theory Culture and Society* proposes to concentrate on the posthumanities' relationship to the sciences and their epistemic, methodological and institutional imperatives. Consequently, we aim to work also on the points where sciences gain traction on applications – in technologies. Technologies in turn produce technosciences, a particularly gnarly point of posthuman invention and a condition in which lives, politics and ontologies are played out. Our

thesis is that it is crucial for the contemporary posthumanities to generate the literacies and the methodological schemes needed to establish new productive dialogues in the midst of such a condition.

Technoscience achieves posthuman status by bracketing subjectivity via method, models and the pursuit of objectivity. Building on the historical emphases of the humanities, we want to keep questions germane to subjectivity and interpretation at the core, but must ask what the status of the subject and of subjectivity is today with changed relations between technology, science and cultural theory. These themes crystallise some of the most pressing and general forms in which questions of knowledge production and ontology (Foucault, Rabinow) fuse with those of power and how they affect the notion and practice of objectivity in science (Daston & Galison) and converge on issues of process ontology (Dupre, Longo) in both technoscience, society and the production of subjectivities and modes and mechanisms of interpretation.

Such work would change some of the traditional coordinates of critical theory. Although the sciences' multiple and various kinds of formation and discovery of reality need critical engagement, we aim to go beyond the classical critique of rationalisation. Overall, we need a way to think critically and experimentally along with science and sometimes as technologists without falling back into a bifurcation between the sciences and humanities. Such debates impel the question of the social

responsibility of the humanities (is there for instance within posthumanities room for a parallel to citizen science; the citizen humanities?) and pose strong questions of ethics, which provides a transversal thread carried across all the main research questions. We plan to address this urgent issue by analyzing the return to a public discourse of morality and moral values that also effect technoscientific practice. Scientific knowledge, for instance, is often mobilised as return to moral philosophy via a putative responsibility for one's genes, or the trope of the determining factors of psychology. Examples of such can be found in the study of neuroscience (Rose & Abi-Rached) and the study of "Primate Politics" (de Waal) but also in media studies (Castells, Verbeek).

Whilst acknowledging the value of this discourse we want to foreground an ethics that suspends questions of normative judgement and foregrounds questions of power and empowerment (Deleuze, Spinoza). This approach allows us to address social issues of inequality and lack of access to, for instance, new technology, in turn recognizing the questions of securitization and power that the field is riven with, while continuing to foster possibilities for trans-disciplinary exchange. A consequent aim is that, through dialogue with the technosciences, the posthumanities are able to increase the social relevance of the field and address many of the problematics facing the world today.

But this question of the ethical valence and traction of the posthumanities is important and comes together as a conjuncture (Hall) of tensions, confluences and also blind spots. An emphasis on the agencies of materiality can indeed sometimes be as much a displacement activity against political acuity as a charismatic intellectual polemic can be a means of eluding the risk of reflection. For instance, the potential disjunction between theoretical approaches that explore biotechnical constructivism as a mode of possible, sometimes poetically resonant, if highly conflicted, alliance-making, and activist work that rejects biotechnologies as simply means of enforcing monopolistic control over agriculture or bodily norms is one that needs to be surmounted. We see there are more confluences here than contradictions between such approaches. Challenges to capitalist forms of agriculture, health or intellectual property, can be made by funding unlikely pathways for transition and combination (Tsing, Demos). Opposition to forms of domination can be made by means of tangential knowledges, and the minor skills of turning asymmetries to advantage (Caygill). We will discuss this further below in terms of the complementarity of the speculative and empirical.

In this condition new tactics, new means of mobilisation mean that, in the present moment, one that seems so turbid and foreboding in economic, political and ecological terms, alliances might be made across

scales, locations, species. We live in an era of unexpected consequences, where what was not intended (think the pantomime of Brexit and its bleaker fallout) becomes as consequent, if not more so, than the products of reason and of planning. The force of negative relations and affects – anger, resentment, hatred- is felt acutely across the social field and it impacts strongly on the production of knowledge, values and representations.

In this era of the reign of unexpected consequences, finding the means of making an advantage from them – or at least of containing their negative impact- is something that is becoming part of a general technique, that finds itself formulated differently according to context. We need a language appropriate to what is happening, in order to abstract patterns and elicit dynamics, at the same time as to recognise affirmative or generative forces and capacities that are active under the radar of established forms of articulation.

One way of dealing with such a condition, as it maps into the university, has, to sketch it briefly, been a spasming of disciplines – fluctuating irregularly between absolutes of rigidity and motility – and, varying across territories, a culture of audit and performance review to give a sense of the reliable tractability of brains and ideas. But equally we see both a tendency towards the nomadic abandoning of disciplines, and also towards the generation of "grand challenge" style problems that

provide the appropriate *mis en scene* for the disciplines to array themselves within unchanged but inter-locking corrals. Neither the posthuman, nor the posthumanities are outside of these conjunctures.

The posthuman is, we propose, a condition. The posthumanities are a response to it, and a way of acting within that condition. As a condition, the posthuman is multifarious and finds itself realised in multiple forms across all fields of activity, and all scales of constitution of reality. To exemplify this, we briefly remark on two markedly different sites in which different aspects of the posthuman condition are marked, and in turn inflect the work to be done by the posthumanities.

One site parallel to those we aim to emphasise, but in which the posthuman condition can be readily discerned is that of the military. In the era of unexpected consequences the condition of war has changed. A People's Liberation Army research document of 1999 (Liang & Wang) established a model of "unrestricted warfare" as being the condition of contemporary conflict. Aside from the erasure of temporal limits to warfare, which it sees as ongoing, conflict is played out, triggered, and modulated through means that include *finance, smuggling, culture, drugs, media and fabrication, technologies, resources, psychological operations, networks, international law, ecologies, economic aid and urban terror*. War becomes post-disciplinary, multi-scalar, creative and

highly mediatic and technological, deploying specialised multi-skilled teams and techniques.

In such a fuzzy condition, conflict becomes partly a modality of everyday life as much as it is geopolitical. But it also goes beyond the Clausewitzian model of "total" war to draw upon combinations of forces that are as mimetic or that rely upon entangled alliances that are as uncanny as anything whose virtue is extolled in post-structural paeans to complexity. More recently, in 2013, General Valery Gerasimov, Chief of the General Staff of the Russian Federation, published a short article in the *Military-Industrial Courier*, outlining what he calls 'non-linear warfare'. The model does not discuss the expansion of kinds of agency in conflict as much as "unrestricted warfare" does, but explicitly talks about the informational elements of conflict reformulating its consistency and modes of operation. Non-linearity in this sense can be seen, following Russian military activity in border territories, to be predicated on ruses, proxies, ambiguous agency, hyperbole, the operationalization of 'mistakes' and unattributable forces. Indeterminacy and the diffusion of ostensible agency and the multiplication of kinds of agency are crucial. It is also a mode of warfare that recognises the way in which technological, communications apparatus are both an as yet unpredictable, and exploitable, terrain, and a condition in which warfare is operative.

The humanitarianism of NGOs and the modalities and actions of popular movements are all drawn into the expanded calculation of the conjuncture, along with financial and informational operations (Weizman). Gerasimov notes that **"**The role of nonmilitary means of achieving political and strategic goals has grown, and, in many cases, they have exceeded the power of force of weapons in their effectiveness."[ii] Conflict is post-disciplinary and expands into every scale of the terrain. This condition echoes something Paul Virilio, (Virilio) notably, has for a long time seen as being built into the fabric of cities, transport and media systems, and re-articulates to a greater degree the tendencies marked by Debord (Debord) in his mapping of "The Integrated Spectacle". However, both of these authors rely on a mourning for a lost condition of the human as the point of leverage for another world. We suggest that this is to misjudge the scope of the problematic. War, as despicable as it is, must be recognised as being enacted in the condition of the posthuman when it relies upon environmental effects, when it sites itself in the midst of communication networks or envisages itself as being independently carried out by "fully robotized units" (Gerasimov) and other factors.

Here, as in the case of the leaked emails from Democratic National Committee, (Wikileaks) organisations working for transparency and democracy, such as Wikileaks, can find themselves described as the

mediatic terrain for novel kinds of geostrategic intercourse regardless of the actual source of any such data. Such expanded and generative military ontologies, some of which may operate by the mediatic feints of fractal smearing exercises, operate beyond the discourse and technicity of security, but learn to operate via insecurity and destabilisation. The generalised cynicism that accompanies such a movement, becomes in turn part of the informational terrain. For the posthumanities then, to be able to articulate a critical relation to this generalising condition is to recognise not simply the fissiparous dispersal of power set out by Foucault, but the way in which expanded senses and conditions of action become active in ways that are both beyond established norms of good and evil, and urgently requiring of non-normative ethical and political reconfiguration.

Our second vignette returns to the question of media and technology. A change in the media by which things inter-relate and become known changes their composition. The posthuman condition is, for this reason, computational as much as it is environmental and ecological. In this condition, unexpected consequences are anticipated - it is hoped, and generated - it is desired, by the revival of interest in a technology that characteristically founds itself on a model of structural indetermination. Machine Learning (Flach, Mackenzie) stands as a totemic indicator of posthumanity for two reasons. Firstly, it is a kind of

entity that arrives through a genealogy of logical abstractions from the idea of nervous systems (McCulloch and Pitts, Minsky and Papert, Anderson) that in turn is capable, to greater or lesser degrees of resolution, of engaging in further processes of abstraction, that may in turn generate grounds of operation that are outside of the original conditions abstracted from, and thus producing novelty. That they are both capable of basic abstraction – from feature-detection to pattern-recognition, to training, promises a wide range of application. Numerous reports have suggested the implications for jobs as diverse as drivers to lawyers, in which human operations may or can be surpassed (Ford). This form of the posthuman is post- simply in the analysis of a tendency of the entities engaged in the provision of labour. Humans, let alone human needs or desires, are exiled from the centre of economic activity, which further gains its own autonomy.

Secondly, machine learning is indicative of the condition of the posthuman due to its highly *generic* nature. Machine learning technologies, trained on examples and counter-examples, are often aimed at generalising past behaviour into future behaviour. The more effective they are at this generalisation the better. In order to do this effectively, they always have to be beyond being fit simply to act upon past training. There must be sufficient openness to variation, so whereas in many instances there is a tendency towards a high degree of correlation

between the features to be discerned, the models that those features correspond to, and the tasks that the system is assigned[iii] there also needs the capacity to recognise a new feature that still corresponds to the task, and thus reshapes the mapping that the model enacts between them.

In practice, outside of the press releases that trumpet new breakthroughs, there is a lot of to-ing and fro-ing between these stages, and the wider configurations of the technical set up (Mackenzie). Machine learning needs training, fine-tuning, evaluating, revision. But this predication on the possibility of novelty means that machine learning technologies – with high degrees of variation amongst kinds, applications and strengths - need to be generic in another sense, that they are premised on being open, unfinished. It is, in a certain way, an attempt to make a technology without pre-conceptions as to its purpose, one that by means of logic and electronics and a concatenation of other dependencies and conditions, might initially exist, as it were, prior to experience and prior to reason. It is a technology that goes on to experience (in the limited sense of undergoing and being modified by a process) and then, in a rudimentary way, operates analogously to minimal forms of reason in relation to that experience. In acting recursively upon itself as a set of features, models and tasks, (as for instance in a type of neural network called generative adversarial networks (Goodfellow et al) and given the capacity to produce novel and beneficial responses to conditions that it

has not been fully prepared for, machine learning establishes itself as a generic mode of rationality that is not pre-delimited to that established by humans. (But that does, iteratively, have plenty to do with the limitations and capacities of computing.) Nevertheless, it is an attempt to make a technology that is not insulated from its outside but that idiomatically prehends it, one that retains a certain plasticity inherited from its abstracted relation to the connectionist genealogy of cognitive science and the cybernetic sense of experiment (Pickering). We might even say that it would be possible for the idea of a certain innocence – a gracious downgrade from absolute objectivity, but a hypostasised subject without a subjectivity nonetheless - to be fabricated *in silico*. This quality makes it a set of technologies fit for the era of unexpected consequences. Nevertheless it is one constituted within them. A number of researchers have shown the ways in which the micro-to-macro politics of racism can be recapitulated and entrenched in such technologies (Sweeney, Angwin et al, Dixon-Roman et al, Amaro) by simply learning and repeating the pattern.

The above examples indicate that the posthuman is a condition, the posthumanities, as a term, describes what both happens to the humanities in this condition, and proposes a set of approaches to naming, shaping and operating in it. Technology is at the core of the two of them, but also so are a series of displacements, both of the human, but more generally,

of the figure of agency and knowledge more widely. Mediation, even from one weighted node in a neural network to another is crucial, and one played out very differently in different mediatic forms. The posthuman is not so much an abolition of the human, but an expansion of the terrain in which it is constituted, and an acknowledgement that the human is never neutral, but rather structured by multiple grids, gradients, layers and locations. Moreover, this high degree of materially embedded diversity is complicated by the fact that the human today is only one of many dynamics and formations that is active and coming into being in this conjunction.

Transversality

The term transversality arrives in the vocabulary of cultural theory, psychoanalysis and philosophy via the work of Guattari (2003, 2006, 2015) and of Deleuze(2000), both separately and together(1983, 1988). Here it is used to describe ways in which desire works to destabilise, invest, upset, reformat relations between things. It names a condition as well as a relation, and it is a term that is suggestive for the intense interdisciplinarity that we map above. Originally an idea from geometry that describes the intersection of two or more lines it is an idea also elaborated in areas such as differential topology that formalises

descriptions of how different spaces intersect. As part of the mathematical conceptual bequest to contemporary philosophy and cultural theory it joins a number of terms to describe relations between relations. In the work of Guattari, it starts as a means of finding a way beyond the specific form of the transference in psychoanalysis, towards the creation of a figure that could be understood as a collective means of working on the unconscious, on material arrangements (of say work, or the formation of a therapeutic organisation) and on desire.

Tranversality implies a desire in interdisciplinarity for knowledge and practices that are in some senses yet to be made proper.[iv] Interdisciplinary scholars have expertise without necessarily being disciplinary experts, or despite being such experts recognise all to well the necessary quanta of uncertainty attendant to it. There is an unruly yearning in their relation to knowledge. This condition articulates some of the shifting ground that the posthumanities seek to address and which motivates this issue of *Theory, Culture and Society*.

Transversality is an approach that draws on the geometrical, where in differential geometry transversality describes spaces in terms of their intersection. In these terms, it has a partial consistency with set theory, by means of which transversality is sometimes described. Guattari's therapeutic introduction of the grille (Goffey 2016) can in some ways be said to draw from this image of transversality as the intersection of sets,

in that those used to one role, or hierarchical plane, in the hospital would be assigned tasks characteristically allotted to another to create new institutional 'part objects'. The grille, or grid, is a classical means for making such descriptions of sets. But there is also a more general consideration in that transversality also draws on the ways in which mappings may be made from one entity or mode of mapping onto another. The complexity of twentieth century geometry's articulation of such processes is something taken up in Fernando Zalameo's profound and remarkable book 'The Synthetic Philosophy of Contemporary Mathematics'(2012). In these terms differences also find expression in the ways in which this mapping occurs. The terms of the transformation, the kinds of correspondences that arise between things, create not a static register of commutation from one array of signs into another array of signs, but a rich emphasis on the transformations themselves as much as what they bring into communication. Much of this is worked through in Deleuze's work on Proust and Signs (2000) where the spatio-temporality of transformation comes to the fore.

A key aspect of such mapping is the aberration that is produced in the processes of mapping. each different mapping has its own individuation (rather than acting as an unambiguous transposition.) an example of this in recent theory is Preciado's (2013) use of testosterone as something like a "recreational" drug alongside its use as an entity solely

belonging to medical systems of reference. Here, there is a technical practice that finds or uncovers new systems of coordinates for bodies in the use of a substance designed for another purpose, or at least coded with other systems of reference and control of access. This working through such systems of co-ordinates is very fleshy but also highly inducive of imaginaries and capacities to rethink what is given.

More generally kinds of transversality may be found also in the 'gliders' (to use a term from cellular automata research - another kind of grid)[v] that emerge from particular conjunctions, but that then gain a certain autonomy from them, and live on. Such persistence may be found in neuroses without their original object, or that persist as things one learns, amongst other things. But as a form of geometrical relation it is one that also proposes a form of abstraction, in that it draws out from a conjuncture and translates it. We can call this *aberrant abstraction*, in the sense that evolution provides a story of aberrations in which a mutation becomes independent of its originating context or retains a transformed response to a condition that it has yet to resolve a sustained norm-arranging response to. As such, this is a very material form of abstraction, found in how one sort of stuff, is transformed in relational composition with others. Such sorts of stuff includes ideas, and ways of fixing them. In aberrant abstraction, as with evolution, transformations

occur non-dramatically, in a mundane way, but also with cascades of effects and. unexpected consequences, which we will return to below.

Transversality, in vital materialist systems of understanding, provides ways of articulaing inter-relation, but without fixating on oppositions and dichotomies as primary principles. Amongst the proliferating kinds of transversal relation, the principles of collage and juxtaposition, and the reflexive articulation of the grounds and principles of such transformations that transversality sometimes implies, is also it has to be said, a form of humour. Jokes often rely on the mismatch between forms of mapping and their denouement. One understands a story, or the inflection of a word, going one way, only to find that it slips into another register or interpretation. The pun, double-meaning, irony, misinterpretation, symbolism, the occultation of things, are all forms of transversal figuration that take aberration as a founding principle, but that also recognise the desiring that is present and active in mappings themselves. (And here our mapping frays since, whilst they should be recognised, some of these mappings in turn sometimes imply little in the way of transformation.) It does not take much to see how these may extend from the material practices of linguistic jokes to the slapstick of other scales of reality-formation. Here we can turn to one sort of such slapstick, in a brief genealogy of unintended consequences. As we do so, a slight divagation is required, to note the way in which many of the

kinds of transversality that we have mentioned above imply an ethical recognition of their terms of composition. Transversality is not in itself a 'good' of course, but is a dynamic that we might both recognise and learn from, but also begin, at the very least, to tell jokes back to as it plays them on us.

Unintended Consequences

Earlier, we remarked on unintended consequences as somehow characterising the present era. It's now time to flesh this out a little. We start with a brief genealogy of the formulation, and then move to some reflections on the posthumanities as a response to a generality of such consequences. On the face of it, Unintended consequences is a common-sensical term; one that is so much so that they are sometimes described as a 'law'. Adam Smith's concept (1991) of the Invisible Hand wherein the aim to pursue apparent economic self-interest results in the creation of general wealth is for instance often invoked as such, even when not translated into legislation or the natural contract.

Amongst the catalogue of kinds of unintended consequences, one of the most telling for our present condition is that of Jevons' Paradox; a nineteenth century formulation whose insight persists. The economist William Stanley Jevons observed that the introduction of steam engines that were more efficient at burning coal lead to the use of more coal and

the development of larger factories. The anticipated effect of the improved engines, as they developed from, for instance those of Newcomen to those of Watt and the later Cornish engineers, amongst other refiners of the system, was that the consumption of the resource would lessen. Instead it effectively lowered its cost, as he remarks: "It is the very economy of its use which leads to its extensive consumption."[vi] Since Jevons saw high-quality coal as the main source of the wealth of the British Empire, the threat of running out of coal was, to him, a serious one. Jevon's work combines a fine understanding of figures with a vigorously physical sense of their significance for the project of imperialism. His articulation of the relation between simple improvements in a technology and its wider economic and material effects verges on the formulation of a system of feedback *avant la lettre*.

The following century sociologist Robert K. Merton made a first systematic mapping of unexpected consequences in his 1936 article, *The Unanticipated Consequences of Purposive Social Action*. Merton ties in questions of partial knowledge, social structure and capacities of prediction amongst other things into his map. The relation of dynamically-arising needs and wants to the capacity of a society to bear them are remarked on as well as the psychic dimension of such decisions. Actions ramify from the field in which they are intended to have results, to those which were not taken into account. A relatively simple example

of an unintended consequence which a short chain of causation is the introduction of CDs as a music storage media to replace vinyl and cassettes. When music became digitised in this way, it lead to the incorporation of CD-drives into computers as a means of storing data as well as listening to music. This occurred just before the widespread uptake of computer networks. That latter conjuncture resulted in an ease of copying and distribution that reorganised the status of music as a commodity.

One of the interesting if brief sub-discussions in Merton's text is the question of the quanta of time needed to process the information required to respond in a fully or at least adequately informed manner to any problem at hand. Such questions have been one of the key drivers of information technology, from the Hollerith Calculator to Vannevar Bush's Memex, the Soviet Cybernetics network OGAS to the Chilean Cybersyn project to the World Wide Web and, in another tendency, from expert-systems to machine learning amongst other things. Equally, radical movements have often required that the time of processing socially important information be fundamentally socialised - hence the importance of the form of the assembly in the present as for instance in Cherán, Mexico and Rojova, Kurdistan and elsewhere, or the emphasis on consciousness-raising and affinity groups at different times. The micropolitical dimensions of such processes become key here.

Contemporarily, the effect of the Jevon's Paradox can be observed with systems such as email; in a way that may be familiar to the reader. The protocol for sending mail within a computer network was a simple implementation and initially treated as a useful novelty. It didn't take up too much attention. Within a few decades, if attention can be counted as a natural resource, it faces depletion. At this point, certain rather charming systems for automated categorising, composing and responding to emails take over and begin to talk to and email each other.

What concerns us here though is a further aspect of unexpected consequences. Merton draws on a remark by the mathematician Poincaré that was later to becomes key to the discussion of non-linear effects[vii] to the effect that chance consequences are those which are occasioned by the "interplay of forces and circumstances that are so complex and numerous that prediction of them is quite beyond our reach." Parisi and Amoore in this issue each remark on such phenomena in related to technologies of reason and prediction.

We propose that certain aspects of the empirical conditions to which the posthumanities is a meaningful response move from the relatively short chains of intention-to-consequence articulated by Merton to the longer chains of consequence in which chance becomes a more structural force. We may be a little too benevolent in calling it chance in some cases, since

what is described as such also consists of substantial amount of predeliction and structuration of heterogeneous kinds. In this regard, and to return to Jevons, it is fundamental to note the brilliant and inventive science of the eighteenth and nineteenth century as a source, not just for the problems of the present, but also an understanding of its paradoxes, and transversally to their duress (Harney and Moten) and violence. In a number of places in his book, Jevons approvingly remarks on the work of Justus von Liebig, the remarkable German chemist, at that point late in his career, who in the mid-C19 also invented nitrogen fertiliser, refined the concept of the laboratory and was an early advocate of recycling but also the inventor of ostensibly nutritious animal tissue-extracts that were a side product of the leather industry. Jevons remarks that, "Civilization, says Baron Liebig, is the economy of power, and our power is coal. It is the very economy of the use of coal that makes our industry what it is; and the more we render it efficient and economical, the more will our industry thrive, and our works of civilization grow."[viii] This is a salutary reminder of the question of civilization in an era of climate damage. But further, to read such an account of civilization is to be reminded of its inverse, exemplified in Fanon's remark that, "When I search for Man in the technique and the style of Europe, I see only a succession of negations of man, and an avalanche of murders."[ix] These negations of man are multidimensional. What is erased is not only the humanist man

so carefully attended to and fought for by Fanon, but also the man of the kind of rampant civilization that Jevons promulgated. To some extent, the posthumanities is merely a delayed response to this unexpected consequence. What kind of thought can render itself adequate to such a condition, whilst itself being partially and multiply composed in being an unexpected consequence of such a thing? To do justice to the internally fractured complexities that constitute the posthuman convergence, the Posthumanities need to look critically at the legacy of post-humanism, as well as the dazzling array of post-anthropocentric knowledge currently produced. The posthuman without an ethics, and without an active analysis of power risks simply being advertising for the anthropocene.

Part of the condition of the posthumanities is thus in embracing both empirical and speculative modes of knowledge as a means of inhabiting such tensile conditions. Part of this is expressed in a particular kind of amazement and even disgust at aspects of the present, but part is also manifest in a required severity and rigour of thought and action that requires an abandonment of preconceptions about the limits of intellectual practice. Bringing together the speculative and the empirical means to combine the important work of critique with that of interpretative and political action, ethical engagement, and aesthetic invention. Critique and creativity work in tandem to activate the transformative potential of the Posthumanities.

Long-chain consequences are the space of operations of more than one kind of speculation. In her recent science fiction postporn film, *FLUIDØ* (2017) the artist Shu Lea Cheang proposes a scenario in which the HIV virus has mutated into a pleasure-giving drug called *Fluid*. As such it has become subject to far more substantial measures of control than when it was a mere 'plague' that happened to disproportionately afflict social outcasts. (Schulman). In the film, the AIDS activism of the 80s and 90s becomes a precursor to an underground trade in the ambivalent virus. In order to capture the drug, massed stalls of men are constantly 'milked' of their ejaculate like female bovines are in the machine economies of milk, meat and reproduction. The shifting role of the virus creates new conditions for exploitation, inverting gender roles, at the same time as shifting lines of affinity are drawn between defective androids, addicts of the fluid, and an uneasy but relentlessly libidinal milieu of dealers, madams, cops and clients. Long-chain consequences are parlayed, traded, betrayed as much as they open up escape hatches from which realities and subjects shudder and emerge.

Long chains of consequence are temporal gambits, wagers which history lays on its own capacity for self-surprise. This is the century by means of which a number of long chain consequences return with a vengeance. Escalating climate damage is the gift of industrialisation based upon fossil-fuels, and one intensified by the globalisation and of

capitalism. The presidency of Donald Trump is the gift given with a sideways glance by what passes for democracy. And systems of ostensibly non-hierarchical communication and openness have given us unprecedented mechanisms of control, sorting and aggregation. These three alone are unexpected consequences *par excellence*, but they are in turn riven and constituted by others.

Unexpected Consequences as a form of Transverality

The question of unexpected consequences is, as Merton notes at the end of his text, often one of speculative philosophy. As a question of ontology however it is immense practicality, since it is often, sometimes in many kinds of unspoken ways, 'upstream' from practices. One of the problems we might face is that those who anticipate the achievement of a particular future and final condition for humanity, such as, for instance a particular instance of unalienated human life associated with the achievement of a just social order create a teleological condition in which what is aimed at is rendered partially inaccessible due to the anticipated mechanisms of recuperation and instrumentalisation that critical theory has mapped so well. A different ontological expectation, such as those associated with pragmatism, process, micropolitics, and other formulations does not purport an in advance state in which history will be consumated. Indeed, history sprouts into being in a highly multiplicitous

manner everywhere. This is not necessarily a cause for optimism, but for work, and the recognition that such activity is unequally participated in, worked across and transversally inhabited by numerous entities and process. This is perhaps especially the case when history is grim.

A network of routes into this condition of transversal inhabitation has been assembled by the analytical and inventive powers of feminism in its capacity to rework articulations of gender and power through multiple conjunctures, and in this reworking to saturate institutional, familial, cultural, technological and other worlds with the capacity for active thought about their consequences and modes of composition. This is part of the incredible gift of feminism, and its demand: the entwined capacity to think and to act. It is the multiplicitous capacity of history, conjoined with the budding and blossoming of ethics.

The kind of work entailed may even be evince certain aspects of optimism. One kind of organised optimism we can call *technology*. There is an optimism of an intention making its passage into the world. In order to do what is planned for them technologies require the buzzing, jostling and clarifying work of stabilisation around them, (Stengers) and create the conditions for such work of stabilisation to convene itself through common objects; as mapped by Daston and Galison. Such work of stabilisation varies immensely, from the reloading of a battery into a watch or the simple maintenance of a garden spade, to the vast budgetary,

laborious and technical work around something as complicated as a nuclear power station, often the equivalent of a luxury watch for the adornment of a state.

This recognition of multiplicity of the eventfulness of the world, and the necessity of this work of the dance of agency (Pickering 2008) that sustains technology and intellectual enquiry bring us back to the question of transversality. The formulation of the transversal is used by Guattari as, in part, a way of getting beyond the figuration of seriality depicted by Sartre in his *Critique of Dialactical Reason*. Seriality - the normative subjectival structures of the modern era - is an example of expected consequences entrenched, channeled and amplified. In a notable text on Guattari's working of the idea of transversality, one of his translators, Andrew Goffey, (2015) notes that inherent to the formulation is a recognition of the difficulty of relying on language and epistemological niceties as simple fixes to problems. Transversality therefore also implies the formation of collective means of working to find ways beyond the blockages, divisions and impasses that may arise in an individual or in the figure of the expert. Transversality renders a problem both more mobile and multi-dimensional in order to find a way beyond it. These qualities are an acknowledgement of the real range of the conjuncture. But tranversality in itself does not guarantee a therapeutic, that is to say beneficial, result. Finding a route beyond an

impasse by expanding the terrain of the problem might be achieved by treacherous means. The word transversality has many partial translations within a language,[x] all of them slightly or abruptly modify it, but it retains a kinship to them. Dialogue, ambivalence, duplicity, are all express some of the difficulties potentially embedded in transversal currents. Transformation of the kind that implies reconstitution, with all the difficulties of energy and expression this requires. But this quality of difficulty in the transversal means that transversality is a way of navigating a society of unexpected consequences. It does so by inhabiting, inverting, mirroring, or over-anticipating some of its consequences. If we are to frame this in ecological terms, the way in which entities such as plastics and pharmaceuticals are dumped into water supplies or into the ground, working their way into food chains and are then concentrated in the tissues of certain species, modifying or eliminating them, or rendering them toxic to those that eat them, echoes a certain aspect of the transversal 'working through' of psychic problems to render them tractable at a different scale. Side-effects are 'merely', in this deadly game, the reworkings of a pollutant by different kinds of matter.[xi]

But there is of course a caveat or two, the empirical register is alluring in its apparent offer of a fix. When one mentions, for instance, the recent discovery of opioids (alongside antidepressants and a

chemotherapy drug) in mussels, (Rice) and the parallel existence of a campaign (P.A.I.N.) to name the Sackler family (part of whom are private owners of Purdue Pharma the manufacturers of Oxytocin) as profiteers from these highly addictive and questionable drugs through making public their links both to prominent art sponsorship, and the mute complicity of the high-cultural institutions they fund and whose rooms they adorn with their name (Goldin), there is a temptation to say, "Ah, so that 's what this is about after all..." One can brush an uncanny and corrosive network off as yet another example of the familiar figures of greenwashing, corporate self-redemption, and so on. There is a cynical as well as toxic dimension to the endless deterritorialising violations of capitalism that render it allegedly beyond good and evil in that it has the capacity of the psychopath that names the truth of its own perception of the interconnection. It also displays narcotic, criminal and violent modes of relation that insert pathologies at the core of the contemporary social nexus. But the field is not saturated by such negativity - and here is where the speculative dimension comes in - it must and has the ability to outpace this condition. This means, in aesthetic terms, not simply a recognition of the juxtapositions characteristic of modernism, but an articulation and a probing of the modes of co-composition of different scales of reality and their ideation. Goldin's recently published photographs of the drug kit scattered across her floor show the both

intimate and industrial, technical and chaotic, serial and transversal nature of this transversal aesthetics.

This is not an attempt to 'cure' the psychotic elements of contemporary social pathologies, as much as to situate them in their respective socio-temporal locations, the better to transform them. The force of the virtual is at work even in the most negative situations and engenders the possibility of transformative evolution. The narcotic addiction to what is fundamentally bad for our bodies and minds also expresses the capacity for transversal connections that are not exhausted by the negative. Thinking through such complex formations is one of the aims of this issue. It is as a contribution to developing the generative potential of this relational tendency that this issue aims to work on the question of the transversal posthumanities. Each article traces and enacts transversal connections between the speculative and the empirical, reversing the pull of the negative as they go.

Overview of Articles

This issue of *TCS* starts with an initial mapping article by Braidotti that maps the stakes in the posthumanities at large. This article sets out a critical cartography of the Posthumanities, built on a series of inter-related convergences that compose the analytic grid of the field. Our current location is situated between the Fourth industrial Age and the Sixth Extinction, between an advanced knowledge

economy, which perpetuates patterns of discrimination and exclusion, and the threat of climate change devastation for both human and non-human entities. This calls for critical interventions in the form of intersecting critiques of western humanism on the one hand and of anthropocentrism on the other. Braidotti discusses the impact of these critiques upon three major areas: the constitution of our subjectivity; the general production of knowledge and the practice of the academic Humanities. It explores the multiple intersections between cognitive capitalism and the current state of academic knowledge, notably in the academic humanities. What are the implications of the fact that knowledge production is no longer the prerogative of academic or formal scientific institutions like the university ? What are we to make of the sudden growth of new trans-disciplinary hubs that call themselves: the Environmental and Digital Humanities, the Medical, Neural and Bio-Humanities, and also the Public, Civic and Global Humanities and so on ? Braidotti proposes a qualitative criterion of assessment, based on affirmative ethics and the distinction between Royal or Major and nomad or minor sciences.

The issue then moves to a sequence of three articles by Longo, Parisi and Goriunova that look at the interrelations between computing, mathematics, philosophy and subjectivity and the epistemic questions arising from their interweaving. We then move into a pair of articles by Amoore, and Fuller and Mazurov that partially map the posthumanities in relationship to politics in particular relation to some of the concerns of the first three. They address the relations between technoscience and geopolitics, and the position of the individual subject in relation to them. Questions of agency and of political methods are in turn filtered through

a micropolitics of file formats and the interplay between forensics and counter-forensics.

Giuseppe Longo presents us with an article in two parts. An introduction, "Quantifying the World and its Webs", addresses the question of the significance of the difference between discrete and continuous forms of number and relations between numbers at various points in the history of modern mathematics. The discrete and the continuous are not simply complementary and symmetrical ways of understanding numbers. They imply, Longo suggests, absolute or situational modes of knowledge respectively with consequences for thought and knowledge.

Following this, the "Letter to Turing" is an epistolary article addressed to Alan Turing that draws on the way in which Turing both breached various mathematical cordons including that between the discrete and the continuous in order to elaborate his formulations on morphogenesis, and gave them new ground, in his landmark paper on computability. Longo's letter is a deft weaving together of many of the debates in twentieth century mathematics with philosophical reflection on them via a sustained consideration of the work of Turing. One would necessarily take a deep breath or two before daring to write to Turing. Longo's audacity arises out of a driving curiosity, but also of a sense of the vitality of mathematics and the intensity of the consequences of that

liveliness. This quality, as it is woven into a life is one taken up again by Louise Amoore in her article discussed below.

Luciana Parisi builds her article through a set of stages encountering the machining of thought. Often abjured as figure a callow hubris, or the *ne plus ultra* of alienation, the automation of thought is here taken to be a line of a philosophical enquiry that, following the prompts of Friedrich Kittler, takes its own media into account. In so doing, the question of instrumental reason arises. Parisi argues that indetermination, rather than utter predictability can be seen to characterise some possibilities for this field, opening up possibilities for a philosophy that is constituted by pluralistic modalities of experimental reason. Experiment here consists finding new ways in which the composition of thinking as a form of composition occurs. Here, Parisi takes a lead form a number of recent artworks that take tangential relations to the normal concerns of much machine learning. Here also, there is an alliance with pragmatist figurations of experimental logic, and also significantly a new figuration of the questions that pace the cages of popular representations of artificial intelligence. That other logics are possible becomes a guiding and exploratory theme.

Olga Goriunova's formulation of the digital subject proposes a new kind of entity in the world arising out of the interlacing of processes including data-mining, surveillance structures, predictive analysis and the

registerable activities of people. As it becomes informationally dense, begins to circulate without reference to any person in particular, and by other means, the digital subject gains a kind of autonomy of existence. Much of the debate on the subject in digital capitalism emphasises the question of control on the one hand and the perils and possibilities of self-manifestation on the other. This article takes a supplementary approach that proposes a category of subject that arises through the intersection of data-gathering processes, not simply as a result of "misplaced concreteness" (Whitehead) but of a 'distance' operating between a person and the digital subject that it has some kinds of affiliations to. This distance is intensive and densely packed. It is a site for numerous kinds of activity to arise, each with their own temporalities and structures of reading and abstracting data but also speculating upon it until it achieves another kind of consistency than the merely indexical. This is a crucial insight in Goriunova's article, one that emphasises technical systems as having their own conditions of composition that a shift to posthumanities considerations can, we argue, more fully encounter.

Fuller and Mazurov work with material from the field of digital forensics in order to trace the movements around a series of video files leaked to online sharing sites. Going further, they also use such techniques on the methods used to control the circulation of files, proposing a form of “counter-forensics”. Building on work by the

Forensic Architecture group (2014) and by Matthew Kirschenbaum (2012), who have respectively pioneered political and cultural forms of forensics, they suggest that forms of technical engagement with the movements of culture that in turn engender further circulation and access are a means of rendering cultural technologies public. Work with technologies that explicitly recognises their wider political and cultural valences produces a different approach to technology and its constitution. One methodological aspect to draw out of this contribution is the question of detail. Long a significant concern in relation to the humanities when it comes to historiography or to the conservation of objects, technical detail – such as that entailed by the metadata of a file – becomes a grain around which a whole series of events might condense. Posthumanities approaches suggest that such condensations are not naturally given, but are skewed by the medium in which they gather, so a further question for such approaches might be an elaboration of the forms of organisation or institution that can give rise to such work. What form of laboratory or library (in the software sense) must we invent or bring together to develop such work?

Louise Amoore draws on the experiences of renowned physicist Richard Feynman to formulate the question of doubt as something that crosses in profound and numerous ways between the sciences and humanities. Doubt is situated and embodied, even within the depths of

epoch-cursing military-scientific endeavours such as the Manhattan Project, within which Feynman worked. A doubting subject, formed both of a human, and the apparatus, instruments, data and wider purpose that they work within and that sustain and inflect such doubts as a complex composite process of cognition, forms the grounds for a recognition of the partiality of knowledge in such contexts. This given, the way in which posthuman forms of knowledge production, involving calculations of probability formed by technological composites are laminated onto the idea of a liberal humanist subject when calculating the ethics of a mechanism for adjudicating, say, a drone strike, show the disjunctures and difficulties that doubt must encounter. Faith in the "human in the loop" is shown as a statistical unlikelihood when compared with the number of figures such as Edward Snowden or Chelsea Manning (Fuller 2018) who act in a decisively ethical manner in such circumstances. Nevertheless, by reading Feynman's analysis of the *Challenger* space shuttle crash, set in plat by a cascade of unexpected consequences, in which he probed the apparatus, component by component, going beyond the aggregate ironing out of doubt a proposition for doubt as method is made. Such doubt intervenes strongly in the context of the data-based predictive technologies that form the grounds of Amoore's research where probability is converted too readily to a more saleable "Single Version of Truth" in threat-assessment. Doubt, by contrast, coupled with

a propensity to fearless speech (Foucault) allows for a more adequate inhabitation of composites that may need dismantling.

The last article, by Kirksey, address the posthumanities from the point of view of biological knowledge and experience by looking at the quirky formative actions of bacteria. Determined to displace the paradoxical anthropocentrism of dominant Anthropocene discourses- that by blaming humans for the environmental devastations end up perpetuating a form of negative exceptionalism, Kirksey rethinks the issue starting from the centrality of invertebrates and their associated microbial life-forms. Not only are bacteria older (some 150 million years) than humans and endowed with more resilience to survive nuclear and other ecological disasters, but they are also more flexible and creative in their modes of relation. Thus, Kirskey's argument focuses on the multi-species and trans-gender aspects of bacterial reproductive life, proposing microbial companions as a model to rethink human sexuality and affectivity in post-human times. Microbes can help humans forge new promiscuous and convivial associations – breaking down filial divisions along lines of race, class, and nationality to generate new queer kinship networks. Their queer bio-politics and multi-species entanglements are a way of recasting endosymbiotic love and survival after the Anthropocene.

The different contributions that compose this special issue are best

approached as a non-linear assemblage themselves: they resonate and intersect with each other in disjunctive as well as conjunctive ways. One of the binding affects that flows through them is the desire to reach a more adequate understanding of the conditions that sustain the posthuman convergence, by adopting an affirmative transversal approach.

Is transversality more supple than unexpected consequences, can the one outpace the other by the velocity or indeed doubtfulness of their trajectories across history? This would be a comforting claim to make, but an illusory one. There are hard realities to be faced in the contemporary posthuman condition, as well as a bounty of unexpected consequences. Transversality is non-normative, but nonetheless highly ethical approach, having started out its conceptual and practical life as an alternative to Freud's methodological figuration of transference. For Deleuze and Guattari it is an experiment in thinking otherwise, as a laboratory illness that can be de-pathologized and treated as something distinct. A gesture that allows therapeutic manipulation and differential transpositions to take place. By contrast to transference, transversality implies a collective reworking of affective, desiring and intellectual forces through the re-articulation of virtual forces, that is to say what it was possible to express through roles and organisational structures. It implies a shift in habits, in frames of reference, but also in daily interactions and activities.

In the framework of the posthuman convergence, such transformations impact strongly on the so-called ‘crisis’ of the humanities and in their abilities to bounce back and construct a different kind of institutional health. The Posthumanities are a clear expression of the unexpected vigour and creativity of a field so many in neo-liberal governance have given up for dead. They are intensely critical and inventive without being bound to any disciplinary identity, and that can also be a means of developing intellectual and theoretical work's attention to its own working habits and modes of thought. Beyond the simple and too often binary requirements of constructivist reflexivity and the mere cognitive mapping required by recognition of situation, the constituent qualities of transversality in the posthumanities go beyond discourse analysis, by pushing their critical reach to the outward-bound, material consequences. The posthumanities as collective transversal praxis imply a reworking of the organisation of practical and conceptual work.

The articles gathered here are a relational call to practice, an invitation to play. By focusing on the relation to the multiple kinds of the scientific and the technical modes of relation and production, the contributors to this issue sustain some daring but productive relays between practices, kind of knowledge and forms of ideation. They compose a plane of encounter for heterogeneous but resonating practices.

In this, they are both driven by the problems they treat in terms of their own interdisciplinary genealogies, embroiled with their dense particular histories and the need to achieve some kind of transformation in them –as well as inspired by the impetus gathered in the wider torsions and expansive momentum of the posthuman convergence as we falteringly come to grasp it.

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[i] See for instance the work on new media technologies, software and mediation at the Digital Culture Unit, Goldsmiths, University of London; The 'Posthumanities Hub' at KTH, Stockholm; HUMlab at Umeå University, and the research on the posthuman in the Centre for the Humanities at Utrecht University in the Netherlands; the 'Institute for the Future of Humanity' in Oxford. the 'Anthropocene Humanities' at the University of Wisconsin-Madison; the Aarhus University Research on 'Human Futures' in Denmark; the 'Trans-Humanities' project at the Ewha Institute for the Humanities in Seoul, Korea and the massive 'Anthropocene' and 'Technosphere' projects at the Haus der Kulturen der Welt, the Deutsche Museum in Berlin and the Rachel Carson Centre in Munich. Also the 'Posthumanim Research Institute' at Brock University, Canada; the 'Posthuman Research Group"at New York University and the research on posthuman pedagogy at the University of the Western Cape in South Africa. Cary Wolfe's book series on 'The Posthumanities' is foundationally significant, as is work on posthuman architecture at the University of East London in the UK; See also the website: http://criticalposthumanism.net/
This list does not include all research work in fast-growing thematic interdisciplinary areas like 'Human Animal Studies', the 'Digital Humanities' or the 'Environmental Humanities' amongst others.

[ii] https://toinformistoinfluence.com/2015/11/24/the-gerasimov-doctrine-and-russian-non-linear-war-2/

[iii] For instance, software tasked with spotting plagiarised essays includes recognising the features of previous texts, the model that identifies what counts as their characteristics, and the broader task of identifying plagiarism.

[iv] Here it is important to note the valuable mapping of transdisciplinarity within philosophy made in the TCS Special Issue, "Transdisciplinary Problematics", Volume 32 Issue 5-6, September-November 2015

[v] In this issue, Giuseppe Longo discusses the distinction between digital and continuous forms of calculation. Cellular automata are subject to the kinds of translation effects that Longo describes as being often left unacknowledged in digital or discrete forms. As such, the figure of the glider is limited in describing more general aspect of emergence.

[vi] Jevons, p.104

[vii] Henri Poincaré, "Small differences in the initial conditions produce very great ones in the final phenomena" *Calcul des Probabilités*, 1912, p.2

[viii] Jevons, p.105

[ix] Frantz Fanon, *The Wretched of the Earth*, trans. Constance Farrington, Penguin, London, 2001, p.252

[x] Translation within a language is one of the literary techniques proposed by OuLiPo. See, Alistair Brotchie and Harry Matthews, eds., *OuLiPo Compendium*, Atlas Press, London, 2005.

[xi] Alongside the question of ecocide, one of the concommitants of this is that we find that the society of unexpected consequences to be partially analogous to a complex of delirious narratives called psychoses. We would not be the first to remark on this analogy on the problems of contemporary society and psychosis (Deleuze and Guattari, Guattari). The segregation of the world of the mad from the rest of society is operative to the extent that the former exonerates the latter from self-recognition. The great chains of separation that constitute social ordering, of nature-culture, of classes, of races, run in parallel to this. But as with psychoses, these are not simply abstract conditions that solely need conceptual reworking, they require immediate and fulsome responses, not only at the level of nuanced analytical triage but of transformation. The insistence on the jointly empirical and speculative work that characterises the posthumanities is part of this.