

INTRODUCTION

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This special issue of *new formations* arose out of the conference on science and the humanities titled *One Culture?*, organised by the London Network for Modern Fiction Studies and the University of North London in May 2000. Over the past two decades, and in spite of some hostilities, there has been a gradual *rapprochement* between the two old sparring partners, with humanities scholars feeling their way around the nature of the realist ontology which science proposes, while scientists, still unable to resolve the problems posed by quantum physics, and now facing the mysterious behaviours of complex systems, find themselves revaluing the insights art (and even religion) has to offer.

The critical responses to that interest presented here suggest that a fairly substantial shift may be underway on all sides of the old 'two cultures' idea; and, although the Critical Realism associated with Roy Bhaskar (and here loosely represented in several essays) has been in progress for twenty years, the growing uses of complexity theory across the sciences and a significantly shifting tone within humanities criticism, suggest that a wider critical synthesis may be on the horizon. What this synthesis seems to involve is a reconsideration of modernity's separation of science from the arts and the humanities (and of fact from value), and the early stages of an attempt to achieve a new scientific understanding in which the subjectivism of experience can become a part of a *scientific* account of the world: hence the recent development of the new multidisciplinary research area of consciousness studies which includes cognitive psychology, artificial intelligence (AI), neuroscience, linguistics, anthropology, complexity theory and philosophy of mind.¹

It has never, of course, been truly possible to separate science from culture: to do so would be to act as though the former resides in some little bubble immune from the wider influences and conglomerations of ideas which make up a culture and its particular historical life. But marked by the particular and optimistic impulses of Enlightenment, especially in relation to the project of uncovering the universal truths of nature for the betterment of humankind, science's one-time confidence in the ultimate success of its mission as a new and different kind of truth has been severely dented in the twentieth, and now twenty-first, centuries. This has occurred not only as a result of public anxiety and scepticism in the face of scientific collusions with commercial and government interests in relation to food safety, genetic modification, cloning and other biomedical developments - none of which have done anything to help maintain the image of scientific disinterest in pursuit of truth - but also because of the manifest failures of

1. The *Journal of Consciousness Studies: Controversies in Science and the Humanities* came into existence in 1994.

positivistic determination in the social sciences. In the end and fatally according to some, it has occurred because of the logically inconsistent nature of the world revealed by particle physics. Here, it seems we have two worlds: the one we seem to inhabit, where 'classic' physics still holds good; and another, the realm of the incredibly small, where particles defy the law of the excluded middle, can be in two conditions or places at the same time, and appear to be able to influence each other at a distance with no observable channel of communication. This utterly counter-intuitive world is so at odds with all our beliefs about what is and isn't physically possible, that many scientists and philosophers of science have been led to conclude that no all-encompassing statements of truth about the whole world (at both macro and micro levels) are any longer possible. This has led to much excitement. First, amongst those in the Frankfurt School tradition and then, more latterly, those influenced by poststructuralist critiques of Enlightenment, for whom the rationality of modernity has always seemed to incline towards a new barbarism. But the cost of the post-Saussurean linguistic turn, with its critique of a scientific world-view seen as cripplingly positivistic, has been politically and ethically disabling because of the value relativism that it proposes. In response, many critics have sought to retrieve the truth of the experienced material world, either in the Critical Realist vein inaugurated by Roy Bhaskar, or in the phenomenological tradition developed by Edmund Husserl, Martin Heidegger and Maurice Merleau-Ponty. These seek to recuperate the value of the scientific endeavour in a post-positivistic fashion that may well overturn, and dialectically evolve, what we understand science to be.

In accord with this general move (and the tenor of other contributions here), in 'Philosophy of Science as "History of the Present": Quantum Theory, Anti-realism, and Paradigm Change', Christopher Norris guides us through the major arguments - between 'internal realism' or value-relativism on the one hand, and recognition-transcendent realism on the other - for and against various definitions of what can count as the truth in science. Noting that value-relativism has been strongly influenced by the dominance of the Copenhagen theory's claim to be a complete theory which must change our understanding of reality at *every* level (macro included - thus doing away with any 'naive realism'), Norris focuses on recent research on the historical and ideological factors leading to the Copenhagen theory's hegemonic status in debates about the (non)relationship between the very strange and counter-intuitive world of quantum physics and the macro world of 'classical' Newtonian physics. He argues that alternative views, such as those put forward by physicist David Bohm, which preserve the possibility of coherence between these two seemingly irreconcilable accounts of matter (and thus preserve scientific realism and the idea of truth), were intentionally marginalized - albeit for 'political' reasons with which one might well sympathise. Referring to work in the philosophy of science field which places the Copenhagen

theory in its historical and cultural context, Norris suggests that these more recent interventions 'mark a definite turn in the quantum-theoretical tide and the beginning of a large-scale revaluative project that will cast a very different light on this whole strange episode in the history of scientific thought'.

The Modernist impulse has very often been associated with, or thought to be derived from, Bergsonian and similar emphases on subjectivity, flux and *durée*. In 'Science and the Aesthetics of English Modernism', Patricia Waugh argues that what is frequently seen as Woolfian mysticism can, more accurately, be understood as an engagement with early twentieth-century physics. Roger Fry's influence is here reassessed (Fry was trained in science) in terms of a literary culture absorbing the implications and metaphors of the new physics. With this, Woolf's major influences are no longer seen to be romanticist, but, rather, scientific: 'Fascination with continental influence, and the tendency to accept the Eliot-Pound construction of Modernism' has, Waugh argues, 'sustained critical neglect' of the influence upon Bloomsbury of scientific accounts of reality in the early twentieth century, and has produced a misconceived notion of Modernism 'as an anti-science artistic and cultural movement'.

A good candidate for a theory of the kinds of forces and regular features to be found at all levels of investigation, from cellular automata to our everyday experience of the natural and social worlds - whether in the living, evolutionary and adaptive behaviours of nature/culture or in the self-similarities of fractal geometry - is complexity theory. In 'Reading the Texture of Reality: Interpretations of Chaos Theory in Literature and Literary Studies', Merja Polvinen notes the spreading popularity of chaos and complexity theory - both as literary figures and theoretical tools - and argues that criticism which uses these can now be seen as forming into two distinct camps. One is, broadly speaking, poststructuralist; the other is what Polvinen, borrowing a term from epistemology and cognitive theory, calls 'externalism'. Whereas the poststructuralist-influenced critics emphasise chaotic indeterminacy, fractal marginality, infinite regression and radically non-communicative nature of texts, externalists, on the other hand, emphasise the high cognitive value of literature (and, indeed, all forms of mimetic endeavour). The development of complexity theory (which is interested in why there should be simplicity and pattern at all) from chaos theory in science, Polvinen suggests, is mirrored in the movement from poststructuralist to externalist theory in literary and cultural criticism. Debates about the truth in *science*, have, in turn, led to wider debates which, conjoined with arguments about the ways in which language moulds our experience of reality, and others which say that this moulding supports particular interests and world-views, have produced a worryingly influential consensus, in parts of the academy and beyond, that all truth claims can only be relative. In some quarters, and perhaps even more troublingly than such relativism, this has encouraged the view that every claim to truth is as

valid as any other. Were this strange belief to be widely accepted, it would be hard to see how any argument about ethical and political goods could possibly have any purchase - and democracy would be reduced to a 'sales pitch' between competing commodities. Some may feel that this is already on the way to becoming the case. However, very many voices have also been raised in opposition to such a degradation of life. Many of the essays here suggest - whether explicitly or implicitly - that we are living through a period of deep epistemological change.

In 'Everything is Real: Gilles Deleuze and Creative Univocity', Peter Hallward explores Deleuze's utopic philosophical claim - in a lineage from Leibniz, Spinoza, Nietzsche and Heidegger - that all particular kinds of being are an expression of singular Being. In this account, it is in the nature of ordinary human being to shield and shelter itself from the searing creativity of Being by recourse to conventions and opinions. But the tasks of philosophy, science and art, in their own different ways, are to tear open a momentary rent in this apparent firmament (which is really more like an 'umbrella'). Understanding the human as Being with downcast eyes, for Deleuze the object of philosophy, science and art, is essentially a redemptive 'liberation from the human'. In this interesting view, Hallward says, 'science - unlike the merely thoughtless representation of creatures - *analyses actuality* so as to *prepare* it for its eventual *counter-actualisation* (itself undertaken through art and philosophy)'.

Pursuing what art and science, hand in hand might be accomplishing today, Lisa Lynch's 'Trans-Genesis', an interview with the artist Eduardo Kac, explores the ways in which the procedures of Kac's aesthetic projects, with their initial scientific improbability, show up in artistic form the fantastic (and fantasmatic) nature of contemporary genetic science. *GFP Bunny* - an art-work as running narrative - synthesises many of the themes of the contemporary cultural world in its mix of modernism, biogenetics, late capitalism, and transnational negotiations (and their limits); but it does so by also introducing aesthetic and affective concerns. The literalisation of the genetic as art-form perhaps concretises certain themes from the social critiques of Marcuse, Reich, and Barthes whom Kac cites as influences. Kac elaborates his development of a formal and theoretical consciousness of a 'dialogic aesthetics' which progresses through 'holopoetry' and 'telepresence' to culminate in an artistic and controversial concern for the 'enigma of animality'. In many ways, Kac's art works as a positive instantiation of the human, animal, machine confluence, extolled by Donna Haraway in Shaw's contribution, ethically problematised, but celebrated, by Steve Baker's essay, and critiqued in Kate Soper's essay. A debate that demonstrates the difficulties of the new critical synthesis explored in this issue.

In a creative commentary upon both the Lynch/Kac interview in this issue, and also upon Kac's 'transgenic art' more generally, Steve Baker offers a meditation, in 'Philosophy in the Wild? Kac and Derrida on

Animals and Responsibility', on the rightness of art's 'possibly going wrong'. That art always implies a 'yet to become' of ethics, and that, thus, it might sometimes throw us into *better* ethical dilemmas *even inasmuch as it is wrong*, is, Baker argues, one of the fundamental tasks of the art work: 'being wrong', he suggests, sometimes provides a better, and more creative, path to 'finding right'.

One 'scientifically interested' response in contemporary theory has involved the advocacy of the dissolution of human, animal and machine distinctions. In 'Humans, Animals, Machines', Kate Soper challenges the purportedly progressive view that certain kinds of ontological and axiological distinctions are necessarily oppressive, and that 'emancipation can only be entrusted to a monstrous subjectivity'. Noting that the emancipatory discourses of modern humanity have all stressed the differences between human labour and mechanical production, and have argued keenly against the bodily and spiritual suffering occasioned by various forms of bodily and mental mechanisation of the life-world, Soper points to the ways that directing suffering humanity *away* from the life of the flesh has been a mark of the most life-denying forms of religion.

In the twentieth century, the ground upon which much modern biomedical and psychological science have stood has been pharmacological. As with the mechanistic causality of Newtonian physics, pharmacological causality has seen an undermining of what once seemed like its positivistic grounds. One of the first practitioners to push pharmacological theory beyond its original normative limits - and into a social arena in which it functioned as both religion and art - was certainly Timothy Leary. In 'The Scientist Goes Surfing: Timothy Leary, LSD and the Internet', Debra Benita Shaw examines the meeting of scientist and spiritual guru in the person and adventures of Timothy Leary. Leary began his professional life as a Behaviourist psychologist, but his belief that the aims of psychology in the 1950s were to teach 'deviants' to play better social games, alongside his sense that these 'games' were part of a hegemony of technocratic modernisation, eventually led him to herald psychedelic experience as a way in which individuals could be reconnected to the direct bodily experience of their cellular evolution as free (i.e. non-modernised) creatures. In this way, Leary thought that technological society and science (and in this we can see some distant confraternity with Deleuze) was preparing its own surpassing. With the development of cyberspace via the internet, Leary believed that human beings had created a non-referential space between man and machine which would facilitate the development of the posthuman - understood, as by Michaux (who is a reference point in understanding the work of both Deleuze and Leary in both Hallward's and Shaw's essays), in terms of the scientist who is *also* an artist.

The difficult distinctions between science, religion and art, or science and philosophy, with which this journal issue deals, are the very stuff of

modernity. Should philosophy (and art) merely be the toiling ‘under-worker’ of science, as some suggest? Or should philosophy and art be acknowledged a more creative role in the exploration of the modern life-world? In ‘Demon-Haunted Darwinism’, Roger Luckhurst shows that the impervious membrane between science and the things of the spirit that both nineteenth and twentieth-century science have mainly wished to preserve and re-inforce is rather more leaky than Darwin (and others) might have wished. Every move to shore up the dykes, Luckhurst suggests, simply results in more little holes elsewhere. Tracking the Darwinian’s encounter with the populism of nineteenth-century Spiritualists, ‘Demon-Haunted Darwinism’ requires us to reassess that infirm boundary once again. In this historical reassessment, Luckhurst implicitly points us towards more willing and troubled reassessments of the science/spirit divide found in the science of the late twentieth, and early twenty-first, centuries. Luckhurst notes that ‘Darwin was sufficiently shaken by Spiritualist claims inside and outside his family and scientific circle to attend a seance in 1874, and that this directly related to fractures amidst the fragile fraternity of Darwinians in the 1870s’. In establishing a cartography of the intricate relationships that define the seance as a social process integral to the world of Darwin and his supporters, Luckhurst allows us to see how the necessary encounter with spiritualism, and its subsequent rejection, formed a part of a transformation of the public perception and encounter with the science engaged in by Darwin and others in order to sustain a naturalistic scientificity. The revival of populist spiritualism permeated even the core group of Darwin’s supporters and led in part to the expulsion from Darwin’s circle of St George Jackson. Luckhurst analyses the ongoing conflict, and, in the process, creates a dialectical account of the ‘ghostly excess’ of occult spiritualism as inextricably expressive of some of the inadequacies of [I]nhuman systems of thought, or projects that lamentably fail to account for the complexities of cultural life’.

Offering another reminder of the history of science’s confrontations with poplar experience, in ‘Future Imperfect: Versions of Science in the Theme Park’, Deborah Philips looks at the ways in which carnival sites draw upon a powerfully charged synthesis of the imaginative and rational. In the nicely ordered world exemplified by the Disney theme park, ‘science’ connotes the most progressive form of ‘modernity’ and ‘futuraity’. This latter, itself, connotes the ideal of the clean and proper bourgeois life. Philips argues that the popularisation of science as progress has always, since the nineteenth century of Prince Albert’s 1851 Crystal Palace Great Exhibition, found itself a fertile ground in the purlieus of the theme park. Here, public pleasures in thrills have been harnessed to a particular view of science as benevolent in the company of capitalist commerce presented as utopic.

In ‘A Brief History of Stephen Hawking: Making Scientific Meaning in Contemporary Anglo-American Culture’, Megan Stern both returns us

to present popularisations, and raises again the question of the cultural determination of meaning in science. Referring to the narratology of popular science and scientific procedures, Stern pays close attention to the iconic figure of Stephen Hawking. The figure of Hawking, she argues, plays a significant role in the promotion of science as transcendent, disembodied truth. She then goes on to notice, however, that this transcendental figuration is severely compromised by Hawkings' appearances, alongside the 'cyborg human/machine' conundrum of the character Data, in *Star Trek: The Next Generation*. Here Hawking, the physically compromised living human scientist, is representationally compromised as inhuman cyborg.

Today both science and artistic and philosophical responses to it are undergoing a series of marked reassessments. It is true that continual change is one of the central features of modernity but, to us at least, those changes currently underway - especially the widening scientific rejection of positivism, and the renewed phenomenological turn to the lived body and to the complexities of human (and non-human) experience of the life-world - hold the promise of theoretical and practical re-engagements in a political and theoretical world of late grown ever more cynical and tired and empty of hope. Anti-essentialist and linguistic constructivist credos did their work in undoing the strangle-hold upon thought of certain historic 'European' or 'Western' bourgeois ideologies, but they also precipitated much intellectual life into a sort of relativism in which no progressive political claims could finally be justified at all. No positive political programme follows either from the deconstruction of various rhetorics or from the observation that we are all endlessly made and caught up in bio-power (in which the 'bio' bit is really nothing - clay before God - until the power shapes it). What we were left with was simply the idea that, to quote Janis Joplin, 'freedom's just another word for nothing left to lose'; in other words, you're free (in a Buddhist sort of way) when nothing earthly matters to you anymore. Politically, this is the kind of disengagement which 'saves' the individual at the cost of losing the collective world which, in fact, we all inhabit. Contemporary scientific and artistic developments, we think, propose something rather more social and optimistic. That this 'new materialism' (or meta-realism) is a dialectical response to a period of 'slackening' seems, to us, clear.