

Temporal Explorations in Cosmic Consciousness

Intra-Agential Entanglements and the Neuro-Image

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Contemporary cinema has become brain-cinema, in the sense that very often the camera has moved almost literally into the characters' heads. It is possible to think of a film like *The Eternal Sunshine of the Spotless Mind* as a sort of screwball comedy in the mind where ex-lovers try to erase their memories of each other by performing a lobotomy of sorts, or there is *Inception*, where a team of dream invaders implant seeds of thought into the minds of others, and *Divergent*, where the main characters help each other by entering each other's brain worlds. Many examples could be given. Typically, characters are hooked up to some kind of brain machine but such literal reference to neurological devices is not necessary to demonstrate that contemporary screen culture has changed on an aesthetic and an ontological level. Following from Gilles Deleuze's distinction between classical film as movement-images and modern postwar film as time-images, I propose calling contemporary cinema of the digital age 'neuro-images'.¹

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Arguing that cinema has become a brain cinema naturally raises the question of the body. Where does the body go? Doesn't the concept of the neuro-image confirm the traditional dualism between body and mind? Does it mean I accept the current deterministic 'We are our brain' discourse—one of the current paradigms in neuroscience—which runs the risk of reductionism, excluding not only the body but also the world? I would argue that this is not the case. That is, it is not the case if the neuro-image is understood in a new materialist way, where body, brain and world are entangled in what Karen Barad proposes as a non-representationalist, diffractive approach to matter and meaning. Barad does not speak specifically about cinema or the cinematographic, but here I argue that her ideas can be related productively to a post-Deleuzian conception of contemporary image culture and its specific temporal and cosmic dimensions of consciousness.

—BEYOND REPRESENTATION OF TIME

Both Barad and Deleuze have argued against representationalism and have proposed a more complex understanding of the connections between the world, science and philosophy. In *Difference and Repetition*, Deleuze demonstrated that the dominant 'image of thought' is governed by representation, which means understanding difference in terms of identity, analogy, resemblance and opposition. Deleuze's objection to representational thought is that by understanding difference only in such a reductionist '*principium comparationis*' (real as opposed to imaginary; actual as opposed to virtual; man as opposed to woman, and so on) we cannot see the differences that matter. Deleuze's proposal is to think difference in itself, and in combination with a complex understanding of repetition for itself.² In *Meeting the Universe Halfway*, Barad also sets out to provide an alternative to representation. Barad explains representationalism as the belief in the ontological distinction between representations and that which they claim to represent. She argues in particular against the idea that that which is represented 'is held to be independent of all practices of representing'.³ Also in Barad's view, representationalism has a problematic '*principium comparationis*' at work, since representation involves a reflection, a mirror-image that can be compared to the 'real thing'.

Both Deleuze and Barad propose a worldview in which all elements (things, images and instruments of measurement) intra-act and act on the world more directly and as such act in the world more directly. For Deleuze, cinematographic images have performative power; they do not just represent the world at a distance, but also operate with and in the world (like books, they 'form a rhizome with the world').⁴ And Barad shows how a performative understanding of scientific practices 'takes account of the fact that knowing does not come from standing at a distance and representing but rather from a direct material engagement with the world'.⁵ Both, then, propose a new materialist approach to phenomena in the world beyond the dualism of representationalism.

In the 1980s, when he wrote *The Movement-Image* and *The Time-Image*, Deleuze argued that in assessing cinema it would be useful to see how the screen, the cinematographic image, is related to the biology of the brain. '[T]he brain is the screen,' he said famously in *Cahiers du Cinema*.⁶ Much has been written about the differences between the movement-image and the time-image; here I look instead at contemporary cinema and elements of a third mode of cinema. But before doing so, I will recall briefly the ways in which Deleuze has characterised the non-dualist relations between body, brain, world and screen in the great modes of cinema that he introduced.⁷ As Deleuze has demonstrated, in the classical cinema of the movement-image relations between body, brain, world and screen are organic. They function according to the habitual and automatic sensory-motor schemes that we have incorporated. In the movement-image this organic relation between man and the world finds expression in many forms, but there is a basic principle that can guide us. Looking at the temporal ontology of this type of organic, sensory-motor cinema, the present is something we can rely on. In the movement-image the present gives us (as spectators), as well as the characters, a foundation in time that allows our bodies to orientate in space and allows our thoughts to relate to the perceived present. When we are in the present, everything we see has an organic relation to the world of the characters. A memory in the movement-image is always an organic flashback that is provoked by and related to the present—but also always clearly distinct from that present: the actual (present) and the virtual (past) are clearly distinguishable. In *Daybreak* for instance, every object (a teddy bear, a photo), every detail in the room in which Jean Gabin has locked himself, is

impregnated with organic significance.⁸ Each object opens up another recollection in flashback. We always return from the past with a little more knowledge with which to perceive the present situation and understand how and why the character ended up in that room, surrounded by the police. The movement-image gives us organic relations of body, brain and world, expressed on the screen in a temporal ontology of the present as stable sensory-motor foundation.

As Deleuze has demonstrated, this organic sensory-motor relation has changed with the time-image. World War II broke the habitual and organic sensory-motor link of man/woman and the world, and a different ontological relation to time became more dominant. Amid the ruins of the war, a new mode of brain–body–screen–world relations emerged. Characters no longer knew how to move and act; they became wonderers and wanderers, seers, imprisoned by the traumas of the past, as in Roberto Rosellini's *Germany Year Zero* (1948). It is not that these characters represent the traumatic experience of the war (even if this can be argued for on one level of understanding). Rather, the cinematographic apparatus connects to the new world order (or, rather, disorder) in an entangled way: following, exploring, expressing and producing new relations to the world. What happened in the time-image's temporal ontology is that instead of having a firm foundation in the present, the past becomes more dominant. In *Hiroshima Mon Amour*, for instance, layers of both the collective past and the personal past start to 'flash up' in the present; almost involuntary the past starts to speak for itself. These images are not chronologically connected to the present, but they are more repetitive and haunting, popping up as reminders of the impossible and the intolerable that has happened, which has not yet found an organic place to rest or to be understood. Similarly, the characters, and we as spectators, can no longer be sure about the difference between the virtual (past) and the actual (present). The enigmatic characters in *Last Year in Marienbad* (Alain Resnais, 1961) make us wonder about many things.⁹ What happened last year? Is Marienbad a memory or a dream? Are we ever in the present anyway? All the films Deleuze defines as time-images exemplify how the link between body–brain–screen–world has changed fundamentally. It is now grounded in (co-existing layers of) the past, which the cinematographic apparatus connects to and at the same time produces.

Deleuze's conceptualisation of images has a Bergsonian inspiration that needs to be considered, with its continuous but variegated relationship between matter and memory, between the outside world of perception and the inner workings of memories, between the actual and the virtual. There is a perpetual exchange of the virtual and the actual, to the point where more profound changes can be noticed. In the time-image the virtual (from the past) gains more independent power, obstructing habitual sensory-motor action (in the present). Images, to be conceived as blocks of matter-memory, undergo a 'mutation'.¹⁰ It is a mutation within the virtual and actual forces contained within the image. This new mode of cinematography does not simply provide a different point of view on the world as, for instance, Rancière proposes to see the difference between movement-images and time-images. Something more profound within the temporal ontology of the image itself has changed.¹¹ These changes are immanently related to the world. While World War II is a marker for these shifts, Deleuze never argues it was the only cause of the remarkable change in cinema. There were internal causes, such as the limits of the movement-image in turning into clichés or into propaganda; and external influences such as the war and its direct consequences for European cinema production, including the development of new and lighter, more moveable cameras and other equipment, not to mention the deep traumatic effects the war had on the general population:

the crisis which has shaken the action-image [i.e. movement-image] has depended on many factors which only had their full effect after the war, some of which were social, economic, political, moral and others internal to art, to literature, to cinema in particular. We might mention, in no particular order, the war and its consequences, the unsteadiness of the 'American Dream' in all its aspects, the new consciousness of minorities, the rise and inflation of images both in the external world and in people's minds, the influence on the cinema of the new modes of narrative with which literature had experimented, the crisis of Hollywood and its old genres...¹²

The list of 'causes' is inconclusive. It is clear we cannot speak of one linear causal relation between a 'given' historical cause and an aesthetic expression. In fact, it could be argued that Deleuze's conception of the aesthetics of the movement-

image and time-image are closer to what Karen Barad has called 'phenomena' of entangled matter-meaning that call for a new conceptualisation of causality. Barad redefines materiality in the spirit of Niels Bohr's quantum philosophy-physics, conceiving any phenomenon as entangled matter and meaning, composed of intra-acting human and nonhuman practices.¹³ As Barad describes in *Meeting the Universe Halfway*, this new form of causality needs to be seen as various related agential apparatuses at work within the phenomenon.¹⁴ The relations between different agencies are important because they constitute the phenomenon. In fact, 'relations precede or determine the relata'.¹⁵ The entangled nature of different agential forces, or apparatuses, does not mean that everything is conflated in a pool of undifferentiated mass, but that within phenomena differences come to matter.¹⁶

It is impossible here to do justice to Barad's sophisticated and extended explication of this new non-dualist conception of materialism, and I will only raise one other central concept in her conception of matter. This is 'diffraction', the trope Barad uses as an alternative for 'reflection', which is usually employed to understand the relation between things (such as world reflected in images) in representationalism. Barad uses the concept to describe her methodological approach to attending to 'specificities of relations of difference and how they matter'. As she explains, where the metaphor and physical phenomenon of reflection implies mirroring and sameness (comparable to the dominant 'image of thought' that Deleuze describes in *Difference and Repetition*), 'diffraction is marked by patterns of difference'.¹⁷ Reflection is based on the idea that representations have no effect on the object of representation, because the world is held at a distance. In diffraction, the world is entangled with material-discursive practices that engage in its becoming through intra-actions.¹⁸ Transposing Barad's methodology to cinema, we can see that Deleuze's conception of images is fundamentally intra-agential in this new materialist sense: screens and the images on our screens are not distinct from the world (as second order representations at distance) but they form an integral part with it. Cinematographic images are part of the fabric of the world that is woven between screens, bodies and brains and nonhuman phenomena. Cinema has performative power in that cinematographic images are intra-agents that contribute to the emergence of new phenomena (thoughts, memories, actions), all juggling the actual and the virtual.¹⁹

In this sense, it can also be suggested that the movement-image and the time-image continue to become, mutate and change together with other phenomena in the world. When I am arguing that in the neuro-image we have yet a different relation between brains, bodies, screens and worlds, then, I do not mean to imply that the old relations have disappeared or that there has been a total break. Rather, the image has evolved, as has our ontological relationship to the world and knowledge of the world. New apparatuses (in science, in technology, in politics) and new entanglements also change the phenomenon in co-evolution. In *The Neuro-Image* I propose several 'causes', in this new agential sense, that have led to a slow emergence of a third age of cinema. The fall of the Berlin Wall on 11 September 1989 and the fall of New York's Twin Towers on 11 September 2001 are marking events around which several changes emerged. Connected to these marking events there are heterogeneous other phenomena such as a changed world order (the end of the Cold War and the beginning of the War on Terror), the rise of hyper capitalism, the digital revolution (from the massive introduction of the PC to Web 2.0) and the rise of neurosciences (with new non-invasive visualisation technology such as MRI scans). All these events have precursors, and none of these events is uni-directly related to changes in the aesthetics and ontology of the image.²⁰ The simple observation that I want to make here, though, is that in a new materialist conception of the image, all these agents cooperate within and with the image-in-becoming.

Before delving more deeply into the notion of the embodied and embedded nature of the brain in the neuro-image, which needs to be seen in close connection to some strands in contemporary neuroscience, I offer a few words about how the temporal ontology of the neuro-image is entangled with the rise of digital technology. It is both these aspects of the neuro-image—the digital as related to its specific temporal relations and neuroscience as related to the body—that I develop in the remainder of this essay.

—THE MAKING OF TEMPORALITY: DATABASE LOGIC AND OPEN FUTURES

If one compares the temporal ontology of contemporary cinema of the digital age to previous image types, it is striking that the future has become such an important temporal reference. It is not that there was no concept of the future in previous

image regimes; one can think of the future from both the present (as a habitual anticipation) or from the past (as a cyclic repetition based on knowledge of the past). Rather, we can observe that the future has gained a different status as the dominant temporal framework of our age. Compared to the certainty of the present as safe anchor in the movement-image, and to the haunting return of the past in the time-image, in the neuro-image the future as such (always to some degrees undetermined) has become the most important time-scale from which to think and rethink the present and the past. In the larger argument about the temporal dimensions of the neuro-image I explain these differences in temporal ontologies in the movement-image, time-image and neuro-image by referring to the three synthesis of time developed by Deleuze in *Difference and Repetition*.²¹ In this way it becomes possible to see how the present, the past and the future are proposed as three different ways of synthesising time: past, present and future can be synthesised from the foundation of the present (first synthesis), from the grounds of the co-existent layers of the past (second synthesis), or from open-ended future (third synthesis). In terms of cinema, the neuro-image has the future (as third synthesis of time) as its ontology. And since the future has not happened yet, it has a speculative dimension to it: we can think of a multitude of scenarios, parallel or serialised, of what might happen, what would happen or what will happen.²² In terms of the actual and the virtual, it is possible to argue that the virtual is now more defined as ‘what might happen’ or ‘what might have happened’ (as endless potentialities) than by ‘what has happened’ (as the co-existing layers of the pure past in the time-image).

It is not so difficult to see that we have entered a period in which we, collectively, predominantly think from a future-perspective. One simply needs to think of polling, profiling, pre-emptive measurements and other predictions and pattern recognitions that determine increasingly our actions in politics, policing and prevention strategies. This obsession with the future enfolds in itself again many intra-agential forces. But one particular ‘strong intra-agential force’ is digital technology—especially the way everything can be stored in databases that accumulate increasing amounts of documents, images, sounds, files and other information. These Big Data databases have several characteristics, including random access and algorithmic pattern search, comparison and reconfigurations,

and reordering. A concrete, albeit obvious, example from contemporary cinema makes this clear. In the film *Minority Report* (2002), it is Tom Cruise's character's job to prevent crimes before they have happened, based on predictions by clairvoyants. The narrative of this film shows what it means to think and act based on indeterminate speculations from the future. But the logic behind the power of prediction that informs the actions is connected to the fact that every past, present and predicted crime can be stored digitally in databases. Significantly, too, *Minority Report* introduces the touch screen five years before it became a common object with the iPhone—indeed, at designer conferences this film is often cited as a virtual inspiration for the iPhone's screen. The touch screen and the tactile and affective qualities of the image are also part of the digital logic of the neuro-image, to which I will return. What I most want to point out here is that the digital implies a database logic that allows for all kinds of reconfigurations, remixings and re-orderings of past and present events.

Remixing and re-ordering are things one does from future points of view, in the third synthesis of time. As Deleuze points out, the third synthesis of time is the most complex, since it cuts, assembles and (re)orders from the virtual of the past and the future to create something new. As James Williams explains, in Deleuze's work on the third synthesis of time there is a sense of openness of the future with respect to expectancy and archiving, 'freeing ourselves from the particular ways time has been synthesized in the present'²³ For Deleuze, this third synthesis of time is profoundly related to Nietzsche's concept of the eternal return of difference and the impossibility of the return of the same. This philosophical framework is important in understanding Deleuze's complex temporal ontological philosophy, but for my concerns here, I think it is also useful to make a connection to Karen Barad's agential philosophy of diffraction. Using this, we can see how our contemporary digital tools intra-act with our conception of time—besides the database they also imply, for instance, serialised and parallel narratives in convergence culture and digital aesthetics. One can think very concretely of the remixing and mash ups of images on YouTube which create an open-ended series of versions of the past, as one can see, for instance, in the various remixes of *The Battle of Algiers*.²⁴ Another example is the radical contingency that John Akomfrah in films such as the poetic *The Nine Muses* (2010) embraces through remixing and reordering of the often-unseen materials

found in the depths and folds of the British migration film archives. Akomfrah indicates why revisiting and unfolding the archive is necessary for the creation of new perspectives ('free from the particular ways time has been synthesised in the present'):

It is important to read images in the archive for their ambiguity and open-endedness. Migrants were often filmed in relation to debates about crime or social problems, so that's how they get fixed in official memory. But that Caribbean woman standing in a 1960s factory isn't thinking about how she is a migrant or a burden on the British state; she's as likely to be thinking about what she's going to eat that evening or about her lover.²⁵

Akomfrah adds that the biggest challenge of working with the archive is that one has to work with what there is. History in itself is not changed. But we can create different relations to it, because there is a radical contingency in the actualised forms of history and indeterminacy within the layers of time. This allows it to be bended and reshaped in concrete forms that can escape from mnemonic depths and get a new life, thus creating a new possibility for the future. For Deleuze this is important for keeping open the possibility of a future that differs from the past, important for his idea of politics and a 'people to come'.²⁶ Barad, referring to Derrida rather than Deleuze, also emphasises 'the possibilities for justice-to-come [which] resides in every morsel of finitude'.²⁷ This is the politics of material diffractive practices in which matter and meaning are intensely entangled ontologically, epistemologically and ethico-politically. Barad, too, argues that it is not that we can undo the past but that 'the past is open to change. It can be redeemed, productively reconfigured in an iterative unfolding of spacetime matter'.²⁸ Arguing from a quantum mechanics perspective, Barad calls this the making of temporality, which seems to resonate in important ways with Deleuze's third synthesis of time:

[Time] is not universally given, but rather time is articulated and re-synchronized through various material practices ... what we take to be the past and what we take to be the present and the future are entangled with one another ... they exist in intra-active entanglements. That is the only reason we get a diffraction pattern, by the way. And importantly, the original diffraction pattern doesn't return, a new one is created, one in which the diffraction (that is, entanglement effects) is a bit challenging to

trace. So, the issue is not one of erasure and return. What is at issue is an entanglement, intra-activity. The 'past' was never simply there to begin with, and the 'future' is not what will unfold, but 'past' and 'future' are iteratively reconfigured and enfolded through the world's ongoing intra-activity ... the fantasy of erasure is not possible, but possibilities for reparation exist.²⁹

When I suggest that the neuro-image has its own particular temporal configuration of time, predominantly 'made' from the future (or possible future scenarios), this is a temporal logic that is entangled with the concrete material practice of cinematography (as a practice of rewriting history) in the digital logic of our contemporary age. It is not that the third synthesis of time has only come into being with the neuro-image; the three syntheses of time form a temporal ontology of modern man more generally.³⁰ But I do want to argue that one 'apparatus of measurement' that is an agential practice which has performative power and influences how we conceive our temporal relations are our digital tools, entangled as they are with our conception of time as predominantly conceived from the future.

—THE EMBODIED BRAIN IN CONTEMPORARY COSMIC CINEMA

As indicated earlier, a salient characteristic of the neuro-image as cinema of the digital age is that we increasingly experience the world from within a character's brain space. This is related 'intra-agentially' to the enormous growth of neuroscience and the prominent place of the brain in the culture of our times. The dominance of the brain in contemporary culture has met considerable criticism, especially from a humanities and social science perspective where the reductionist idea that 'we are our brain' has been problematised.³¹ However, contemporary neuroscience has many branches, some of which are increasingly taking the embodied and embedded nature of the brain into account. Arguably, these approaches imply a more modest, or at least a more interconnected, place for the brain.³² In the neuro-image, too, we encounter an embodied and embedded brain that implicitly resonates with such developments in neuroscience. It is possible to see a difference to the aesthetic expression of brain-worlds in the time-image where mental landscapes are often rendered with more distance, as in the *mise-en-scene* of *Last Year in Marienbad*. There is certainly passion or violence in the brain-cinema of

Alain Resnais or Stanley Kubrick, as Deleuze discusses in *The Time-Image*.³³ The mental spaces and brain worlds of the neuro-image, however, are much more embodied, affective, visceral and sensuous. Considering this aesthetic transformation in a diffractive way, it is possible to argue that new insights in neuroscience co-evolved with these changes. This can be seen as a new materialist acknowledgment of the immediate connection between matter and meaning. Let me unfold this further through looking more specifically at the genre of science fiction, which has developed interesting ways to connect outer and inner space.³⁴

Science fiction and voyages to other planets have been part of cinematographic imagination since George Méliès' *A Trip to the Moon* (1902), made when actual space-travel was considered pure fantasy. In the 1950s, when aeronautic space exploration became an element in the Cold War, outer space and alien invasions appeared as metaphors for the dangers of communism and nuclear attacks in many cult films. *The Day the Earth Stood Still* (Robert Wise, 1951) and *War of the Worlds* (Byron Haskin, 1953) are the two most notable of the many cosmic Cold War allegories. While Stanley Kubrick gave his own satirical take on the Cold War and space technology in the black comedy, *Dr Strangelove, or How I stopped Worrying and Learned to Love the Bomb* (1964), a couple of years later he took the genre of science fiction to an entirely new level. The beautiful composition of every image of *2001: A Space Odyssey* (1968), as well as the meticulous craftsmanship of the special effects of spaceships and the solar system, elevated the aesthetics of the genre as a whole. The realistic portrayal of state of the art space technology and knowledge about orbital conditions in the early 1960s added an important scientific dimension that took the film beyond mere fantasy.



Figure 1: Screen shots from *A Space Odyssey* (Stanley Kubrick, 1968)

Before men actually landed on the moon in 1969, Kubrick's space travellers coped with zero gravity and floating objects. Most importantly the film introduced metaphysical questions of humanity's relation to technology and the vastness of the cosmos. Of course these questions were not new in the 1960s, but the way they obtained a new cinematographic expression marked the beginning of more philosophical cosmic investigations of life in film history. Andrej Tarkovsky's *Solaris* (1972), for instance, is another film that brought a metaphysical dimension into outer space narratives. In this film an astronaut travelling to the planet Solaris is confronted with the materialisation of his unconscious thoughts in his deceased wife, who keeps on appearing inside the space ship. Tarkovsky's film questions human consciousness in a cosmic perspective.³⁵ Within commercial Hollywood cinema around the same time, George Lucas's *Star Wars* trilogy of the late 1970s and early 1980s transported the classic genre of the western into space. Space which becomes the new frontier, with the traditional western battle between 'good' and 'bad' continuing extra-orbitally. In spite of enormous differences in modes of narration, the cinematographic cosmic explorations of these films that reinvented the science fiction genre are all related to actual space-travel. With varying degrees of metaphysical depth, they all show characters that explore galactic space extensively by leaving the planet Earth. As Deleuze indicated when discussing Kubrick's space odyssey, the cosmology of galaxies can meet the inside of the brain in a philosophical and scientific search for life and death.³⁶

The cosmic continues to be an important reference-point for metaphysical investigation, and has become an even more profound dimension of twenty-first century cinema. An important difference, however, is that actual space-travel is no longer an absolute condition for cosmic consciousness. The cosmos has become part of our consciousness without the need to show space travellers literally leaving the terrestrial orbit. In any event, even in *Gravity*, as I will argue, the relation between Earth and the other planets tends to be explored *intensively* (in time, in the mind) rather than *extensively* (in space). The neuro-image is also profoundly occupied with an intensive cosmic consciousness different from the space explorations in the previous generation of films mentioned above. The Spanish film *Earth* is an early example of this new intense cosmic cinema.³⁷ The main character of the film, Angel,



Figure 2: Screen shots from *Earth* (Julio Medem, 1996)

is a woodlice fumigator on a Spanish island. Dressed in a white fumigator suit, standing in the red stony landscape of the island, he looks like an astronaut on Mars. Throughout the film, suggestions are made that he is an angel descended from heaven—or, that he suffers from schizophrenia and thinks he is an angel descended from heaven. The narrative keeps his actual status ambiguous. In any case, Angel seems to be a mental space traveller. He regularly refers to the mysterious and awesome complexity of both the brain and the cosmos. In *Earth* we never leave the planet and yet we travel into the cosmic dimensions of the universe through the mental journey of its main character.

Lars von Trier's *Melancholia* (2011) is another example. This film is the expression of pure affect, a pure intense, inner experience. It is an apocalyptic story where the Earth is hit by another planet, Melancholia. But more than that, the planet Melancholia is the expression of depression and fear, embodied by Justine and her sister, Claire.



Figure 3: Screen shots from *Melancholia* (Lars von Trier, 2011)

In *Solaris* the main character had to travel to another planet to confront his fears related to memories of his deceased wife, but in *Melancholia* we neither leave Earth nor make the distinction between what is real and what is imagined. Every image, every sound in the film is the expression of pure cosmic affect. Another film, *The Tree of Life*, opens up a cosmic perspective and returns the question of Being to the genesis of life on Earth, referring to God's powers of creation that manifests greatness in glimpses, a ray of light, the rustling of trees, a newborn baby. And James Cameron's *Avatar* (2009) could be considered the *Star Wars* of the digital age. Although there are many differences from *Star Wars*, *Avatar* is closest to the action genre of science fiction with its battle between good and evil that involves space-travel. But even in this action genre we experience the whole adventure (this time quite literally) on the brain screen of the main character, who needs to be hooked up to a cerebral machine to enter the planet Pandora.

Each of these films demonstrates a changed relation to the cosmic that deserves analysis in its own right. But for this moment, most important is the cosmic consciousness that Kubrick brought into cinema by leaving Earth and travelling into space. Contemporary cinema translates this idea intensively, travelling into the mind and travelling differently in time, not from the past or present to the future, but from the future back to the present and the past.³⁸ Let me conclude by unfolding this a little further in respect to two other cosmic neuro-images.

The Fountain (Aronofsky, 2006) presents the mental landscape of its main character and asks metaphysical questions about life and death. What would it mean to live forever? What does it mean to die? These universal questions are enfolded in three variations, across three ages. Moving between sixteenth-century Spain, twenty-first-century North America, and a twenty-fifth century somewhere in outer space, *The Fountain* is essentially the story of the same couple, played by Hugh Jackman and Rachel Weisz. In the present, the twenty-first century, Tom is a brain surgeon who tries to find a cure for his wife Izzy, who has a brain tumour. She is dying; she will die. He wants to find a cure for death. This story unfolds into the past where conquistador Thomas wants to save Spain and the Queen Isabelle by finding a holy tree, the tree of life, in the New Spain; and into the future where the astronaut Tom travels through space in a biospheric 'bubble-ship', and tries to deal with the

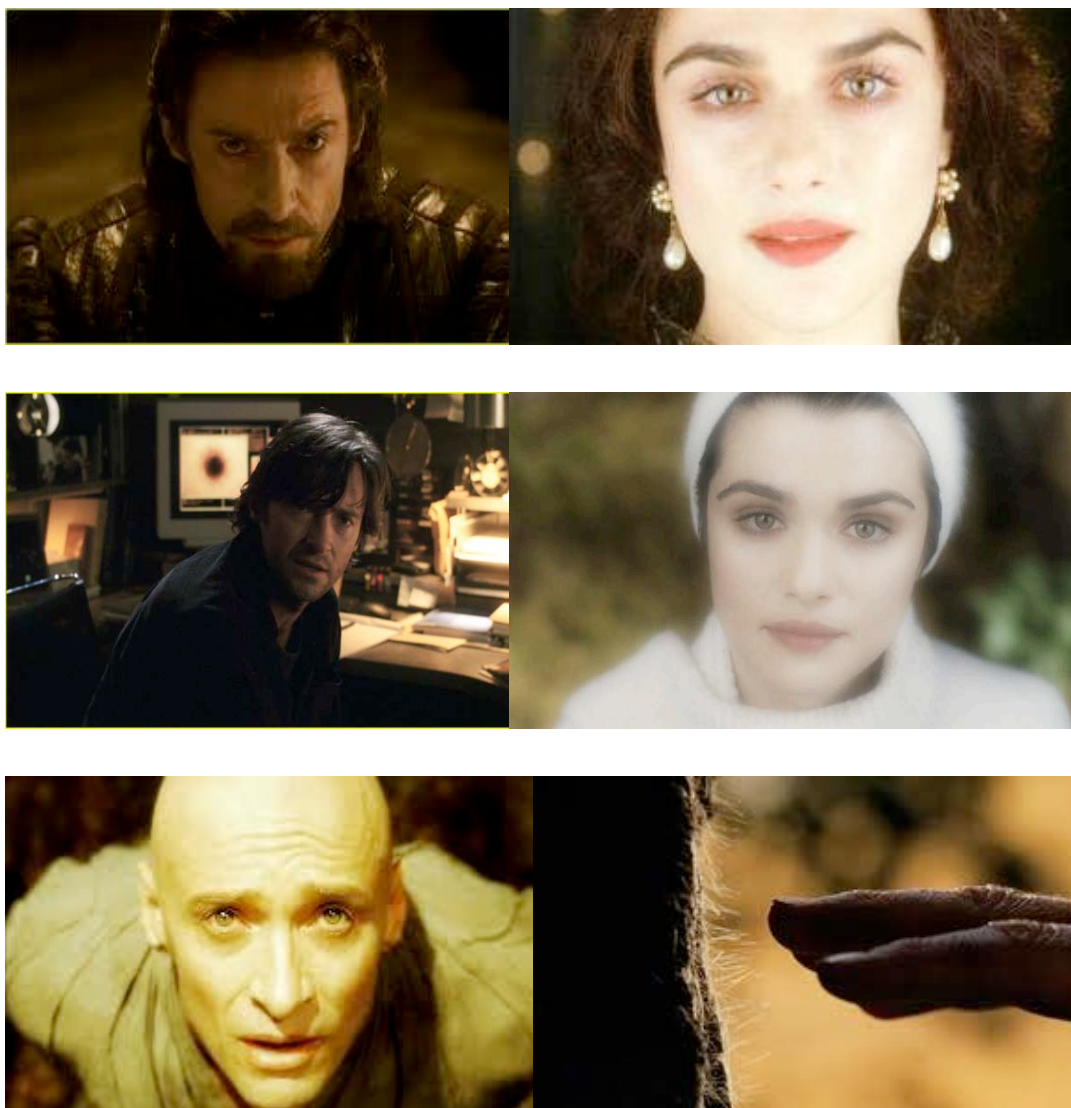


Figure 4a: Screen shots from *The Fountain* (Darren Aronofsky, 2006)

previous stories. It is from this future that the film is told. At least this is where inner space is translated as outer space and takes us on a mental journey. As with other cosmic films of the neuro-image, the brain world is visceral and sensual, full of affection-images, faces and hands in close-up, smelling, touching and tasting. If we are in a brain world here, if outer space is actually inner space, it is in a very embodied and embedded kind of aesthetics. There is noticeably more emphasis on the sensual aspects of the brain world than there is in the ‘colder’ and more ‘distant’ rational *mise-en-scene* of Kubrick’s mental worlds.

In this, and in respect to its temporal ontology, *The Fountain* is a typical neuro-image. First, because of its speculative dimension: when the narrative departs from the future, the story is serialised. As in other neuro-images, such as *Mr Nobody* (Van Dormael, 2009) and *Cloud Atlas* (Tykwer and Wachowski, 2012), the story contains parallel lives told from a future parallel world.³⁹ *The Fountain* also shows us that it is *only* in the third synthesis of time, in the future, that the other two times can come together and be repeated with differences. They are repeated as diffractive feedback loops, following differential patterns, where some things can productively be reconfigured, redeemed and refolded, even though eventually death cannot be escaped. In *The Fountain* it is only in the third time of the future that Tom can see Isabella from Spain and Izzy from the twenty-first century and is able to rethink their story.

Many scenes are repeated throughout the film. Most striking perhaps is the scene, three times repeated, where Izzy suddenly appears, dressed in a white winter coat and a white knitted cap, to say ‘Take a walk with me.’ The first time Tom replies, saying ‘Please Izzy’, as if he wants her to leave him alone. The second time the scene plays out and we hear ‘Please Izzy,’ Tom explains that his colleagues are waiting for him for an operation. We move more deeply into that layer of time, discovering how the surgeon is obsessed with curing the fatal illness of his loved one. With the third repetition of the scene, Tom changes his mind and does follow Izzy into the snow. This will lead to Tom’s final decision to finish the story of the conquistador in the past (a story Izzy was writing and repeatedly asks him to finish), to finally die in the future (the climax of the film where space traveller Tom dies in the nebula of a dying star and becomes a celestial particle), and to accept Izzy’s death by planting a seed on her grave in the present time. The future therefore is



Figure 4b: Screen shot from *The Fountain* (Darren Aronofsky, 2006)

also the time of spiritual and ethical choices. The re-doing of time is intrinsically related to 'the material configurings of spacetime mattering'.⁴⁰ Again we notice that the neuro-image is sensual and physical, profoundly connected to its embedded environment. It is a connection beyond the human action-sensory motor scheme of the movement-image and beyond the petrification of the past of the time-image. The microcosmos of the brain and the macrocosmos of the celestial and planetarian outer space are fundamentally connected, to the point where everybody returns to stardust and the cycle of eternal return continues. The last neuro-aesthetic characteristic of the future is that it relates to death and the acceptance of death as a spiritual-ethical choice of the inevitable.

And then there is *Gravity* (Alfonso Cuarón, 2013). Like *Interstellar* (Christopher Nolan, 2014), *Gravity* is a contemporary science fiction that seems to bring us back to extensive space exploration. At the same time, there are many reasons to argue these films are, like *The Tree of Life* and *The Fountain*, neuro-images that deal with celestial consciousness as inner space travel in different ways from the cosmic cinema of the time-image. I consider *Interstellar* a neuro-image, because of its temporality and the very prominent idea of parallel worlds from the future. However, I focus in this last section on *Gravity*'s cosmic new materialism. *Gravity* is as much about mourning, death, love and life as the other cosmic neuro-images that I have mentioned. While tethered on a space ship, dealing with the loss of gravity, trying to avoid orbital debris and finding her way back to earth in broken equipment, medical engineer Ryan Stone (Sandra Bullock) is coping with the loss of her daughter. Most of the film we are inside Stone's capsule, even inside her head. At certain moments we know for sure that we are experiencing the delirium of this desperate main character. It is when she is hallucinating that her colleague, astronaut Matt Kowalski (George Clooney), who just died, returns to tell her not to give up. But the whole film can be considered a delirious 'neuro-image', an inner struggle presented as an outer space adventure, as 'two forces of death which embrace'.⁴¹

Cuarón's *Gravity* is as visually stunning as Kubrick's *2001: A Space Odyssey*, but it is no longer science fiction. What we see is not a futuristic image that projects an image of the future from the past and the present into outer space; rather, it is a realistic image of 'the future that is now', a spacetime from which we can look back



Figure 5: Screen shots from *Gravity* (Alfonso Cuarón, 2013)

at the Earth. So again, the idea of the future as such, the future as third synthesis of time from which to think back (and not project forward as in Kubrick's film), is the dominant temporal dimension of this film. The future was the most important dimension, even on the level of production design.. Strikingly, the film was post-produced before pre-production or production.⁴² Sandra Bullock was literally strapped in a tank, a 'temporary tomb' that was her space pod, that gave her no room to move and which gave us the powerful experience of being locked in her mental space as much as her physical space.

In a comparison of *2001* and *Gravity* the movement (or gesture) of technology is inverted. In *2001*, at the end of the prologue of the film, the famous prehistorical bone (as a first technological apparatus) is thrown up from the deep past into the future to be transformed into a cosmic space ship. Kubrick's film literally moves from the past (the dawn of men) through the present (the 1960s aesthetics in every detail of the mise-en-scene of the film) to the future (space travel that is about to happen in the real world). In *Gravity*, the final movement of the 'apparatus' is



Figure 6: Screen shots from *2001, A Space Odyssey* (Stanley Kubrick, 1968)



Figure 7: Screen shots from *Gravity* (Alfonso Cuarón, 2013)

downwards, back to earth. It is almost as if the metaphysical star child at the end of Kubrick's film has matured and returned to Earth as a fully grown woman who has suffered and struggled but who finally manages to overcome her grievances and loss. As some critics have argued, this could be seen as a sort of answer to the depressive collision of planets in Von Trier's *Melancholia*.⁴³ Fallen back on Earth, Ryan Stone is reborn. *Gravity* is as much a metaphysical film as *Tree of Life* and *The Fountain*. A metaphysics that asks us not to look up and away from Earth into space, but to return, discovering a 'new materialism', calling for a renewed connection to the elements of planet Earth in which our bodies, brains and screens are in a continuously evolving entanglement.

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- ¹ Patricia Pisters, *The Neuro-Image: A Film-Philosophy of Digital Screen Culture*, Stanford University Press, Stanford, 2012.
- ² Gilles Deleuze, *Difference and Repetition*, trans. Paul Patton, Athlone Press, London, 1994, p. 138.
- ³ Karen Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*, Duke University Press, Durham and London, 2007, p. 46.
- ⁴ Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi, The Athlone Press, London, 1987, p. 11.
- ⁵ Karen Barad, *Meeting the Universe Halfway*, p. 49.
- ⁶ Gilles Deleuze, 'The Brain is the Screen', trans. Marie Therese Guirgis, in Gregory Flaxman (ed.), *The Brain is the Screen: Deleuze and the Philosophy of Cinema*, University of Minnesota Press, Minneapolis and London, 2000, pp. 365–73.
- ⁷ Gilles Deleuze, *Cinema 1: The Movement-Image*, trans. Hugh Tomlinson and Barbara Habberjam, Athlone Press, London, 1986 and Gilles Deleuze, *Cinema 2: The Time-Image*, trans. Hugh Tomlinson and Robert Galeta, Athlone Press, London, 1989.
- ⁸ *Daybreak* (Marcel Carné, 1939)
- ⁹ *Last Year in Marienbad* (Alain Resnais, 1961)
- ¹⁰ Deleuze, *Cinema 1*, p. 215.
- ¹¹ Jacques Rancière, *Film Fables*, trans. Emiliano Battista, Berg Publishers, Oxford and New York, 2006, p. 114. Rancière conceives images in a representationalist regime where the materiality of the world emerges as a (more or less faithful or distorted) reflection in an aesthetic representation in which thought is always formed in a dialectic exchange between the voluntary and involuntary, the sensory-motor and its disorientations, the movement-image and time-image. So for Rancière these two image regimes always dialectically communicate and form a continuous spiral without a historic break. Deleuze argues more radically that there are two different logics, or temporal ontologies that correspond to the different 'ages of cinema'.
- ¹² Ibid. p. 206.
- ¹³ See also the interview with Karen Barad in Rick Dolphijn and Iris van der Tuin (eds), *New Materialisms: Interviews and Cartographies*, Open Humanities Press, Ann Arbor, 2012, p. 56.
- ¹⁴ Karen Barad, *Meeting the Universe Halfway*. Apparatuses are not merely the instruments we can deploy for determining structures of a social nature. Rather, 'apparatuses are specific material reconfigurations of the world that do not merely emerge in time but iteratively reconfigure spacetime matters as part of the ongoing dynamism of becoming', p. 142; see also p. 146.
- ¹⁵ Ibid. p. 139.

¹⁶ For an evaluation of the misunderstandings of Barad's work as producing an 'undifferentiated mass, see Max Hammarström, '(Mis)understanding Intra-active Entanglement', *Kvinder, Køn & Forskning*, vol. 4, 2012, pp. 39–46.

¹⁷ Karen Barad, *Meeting the Universe Halfway*, p. 71.

¹⁸ *Ibid.*, pp. 89–9 for a schematic overview between reflection and diffraction as methodological tools.

¹⁹ Both Deleuze and Barad emphasise the dynamic and continuously changing interrelation between the actual and the virtual that creates a radically open ontology with an infinite range of virtual/actual materializations. In his last text, 'The Actual and the Virtual', Deleuze declares that every actual is surrounded with a cloud of virtual images, and every virtual can draw closer to actual images (Gilles Deleuze and Claire Parnet, 'The Actual and the Virtual' in *Dialogues II*, trans. Eliot Ross Albert, Continuum, Athlone Press, 2002, pp. 148–52). Barad discusses the endless virtual particles that are indeterminacies that can be actualized (Karen Barad, 'What is the Measure of Nothingness? Infinity, Virtuality, Justice', *100 Notes*, no. 099, dOCUMENTA, no. 13, 2012, pp. 4–17). Even though Deleuze explains the virtual in a classical way as things that too rapidly or briefly pop in and out of existence, a definition rejected by Barad, both Deleuze and Barad agree upon the indeterminacy between being/non-being of the virtual, and of the real effects of the virtual: 'Don't for a minute think that there are no material effects of yearning and imagining. Virtual particles are experimenting with the im/possibilities of non/being, but that doesn't mean they aren't real, on the contrary.' (Barad, 'What is the Measure of Nothingness?', p. 13). Compare this to Deleuze's 'The plane of immanence includes both the virtual and its actualizations simultaneously, without there being any assignable limit between the two', Deleuze, 'The Actual and the Virtual,' p. 149.

²⁰ For more elaboration on these complex causal agents, see Patricia Pisters, *The Neuro-Image*, pp. 299–306.

²¹ Deleuze, *Difference and Repetition*; Pisters, *The Neuro-Image*; and Patricia Pisters, 'Flashforward: The Future is Now', in Shane Denson and Julia Leyda (eds), *Post-Cinema: Theorizing 21st-Century Film*, REFRAME Books, Sussex, 2015 (forthcoming).

²² See Pisters, *The Neuro-Image* and 'The Future is Now'.

²³ James Williams, *Gilles Deleuze's Difference and Repetition: A Critical Introduction and Guide*, Edinburgh University Press, Edinburgh, 2003, p. 102.

²⁴ See Pisters, *The Neuro-Image*, pp. 217–42.

²⁵ John Akomfrah, 'Migration and Memory', *The Guardian*, 20 January 2012, <<http://www.theguardian.com/film/2012/jan/20/john-akomfrah-migration-memory>>.

²⁶ Deleuze, *The Time-Image*, pp. 215–24.

²⁷ Barad, 'What is the Measure of Nothingness?', p. 17.

²⁸ Barad interview in Dolphijn and van der Tuin, *New Materialisms*, p. 67.

²⁹ *Ibid.*, p. 66.

³⁰ Niklas Luhmann has argued that time is a more complex phenomenon for modern man than it was for those of previous historic periods. See Niklas Luhmann, 'The Future Cannot Begin: Temporal Structures in Modern Society', *Social Research*, vol. 43, no. 1, 1976, pp. 130–52.

³¹ See for an overview of reactions to neuroscience in the humanities and social sciences instance, Des Fitzgerald and Felicity Calard, 'Social Science and Neuroscience beyond Interdisciplinarity: Experimental Entanglements', *Theory Culture and Society*, 2014, pp. 1–30. DOI: 10.1177/0263276414537319.

³² See John Protevi, 'One More "Next Step": Deleuze and Brain, Body and Affect in Contemporary Cognitive Science', in Rosi Braidotti and Patricia Pisters (eds), *Revisiting Normativity with Deleuze*, Bloomsbury, London and New York, 2013, pp. 25–36. Neuroscientists who argue for embeddedness and embodiment are, among others, Michael Gazzaniga, *The Mind's Past*, University of California, Berkeley, 1998 and Vittorio Gallese, 'The Shared Manifold Hypothesis: From Mirror Neurons to Empathy'. *Journal of Consciousness Studies*, vol. 8, no. 5–7, 2001, pp. 33–50. See also Vittorio Gallese and Michele Guerra, 'The Feeling of Motion: Camera Movements and Motor Cognition', *Cinema & Cie*, vol. XIV, no. 22/23, 2014, pp. 103–12; Alva Noë, *Action in Perception*, MIT Press, Cambridge and London, 2004.

³³ Deleuze, *The Time-Image*, pp. 204–15.

³⁴ Some of the science fiction films discussed in this section I have also discussed, in different ways, in *The Neuro-Image* (pp. 101–8 and pp. 148–55) and (in relation to *The Tree of Life*) in Patricia Pisters, 'A Metaphysical Star War?' in Sonja Neef, Henry Sussman and Dietrich Boschung (eds), *Astroculture, Figurations of Cosmology in Media and Arts*, Wilhelm Fink Verlag, München, 2014, pp. 181–94.

³⁵ Tarkovsky's *Solaris* could be seen as a precursor to the neuro-image, because in a way the spaceship is the main character's mental space. In terms of its temporal ontology, however, *Solaris* remains more close to the second synthesis of time, in that the past, the dead wife, keeps on popping up, at unexpected moments, to ask haunting questions.

³⁶ Deleuze, *The Time-Image*, p. 206.

³⁷ *Earth* (Julio Medem, 1996)

³⁸ The *Back to the Future* trilogy (Robert Zemeckis, 1985, 1989, 1990) of the second half of the 1980s is a popular example of an early example of this temporal ontology that becomes more prominent in the neuro-image. *The Man who Fell to Earth* (Nicolas Roeg, 1976) is an even earlier case in point 'avant-la-lettre'.

³⁹ *Mr Nobody* (Jaco Van Dormael, 2009) and *Cloud Atlas* (Lana Wachowski, Tom Tykwer and Andy Wachowski, 2012).

⁴⁰ Barad interview in Dolphijn and van der Tuin, *New Materialisms*, p. 68.

⁴¹ Deleuze, *The Time-Image*, p. 206. See also Gawie Keyser, 'In het oog van de storm: Gravity: Koortsdroom en delirium', *De Groene Amsterdammer*, 2 October 2013, <<http://www.groene.nl/artikel/in-het-oog-van-de-storm>>.

⁴² See Dan Jolin, 'Gravity: Touching the Void', *Empire*, November 2013, pp. 80–5.

⁴³ Roger Luckhurst, 'Gravity: Space is the Place', *Sight and Sound*, December 2013, p. 28.

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