Embodied Mediation: AVATAR and its Systems[*]

Bruce Clarke

1. Aeroflot

When AVATAR (USA 2009, James Cameron) debuted I did not run out to see it. I managed to miss opportunities to experience it in a theater, let alone in 3D. So this treatment of the cinematic text is extracted from its overlay of theatrical visual technologies. It will be a small-screen treatment. How small, you ask? In June, 2010, flying on Aeroflot from JFK to a conference in Riga, Latvia, AVATAR was an option on my entertainment center. So my maiden flight with AVATAR was on a Russian airliner, on the seat-back screen, listening with headphones. The outlines of this discussion first took shape during that viewing. When I got home I ordered the two-format set and watched the Blu-Ray disk on my 42" LCD TV. Later that summer, when I had the notion of preparing an AVATAR lecture, I put the DVD disk into my desktop drive and took notes and made drafts while it played on a 22" monitor. In more than one sense, the following essay is a »close reading« of selected aspects of the narrative.

I will examine the fictive technology that drives the story, in relation to the other »networks« named by the text. The avatar system is a media system and also, of course, a dream-flight technology. It couples an informatic telecommunications apparatus with an organic, bioengineered humanoid effector to transport its paraplegic but virtually disembodied »driver« into an actual but alien body, with capable legs and access to wings. A brief review of Gaian science, aka Earth system science, in light of Bruno Latour's observations on both Gaia and AVATAR, leads up to that central focus. The movie depicts Pandora's Gaia, *Eywa*, as »a global network«, as a telecommunications system in its own right. The avatar body is the cyberorganic microcosm of which Eywa is the superorganic macrocosm: both are embodied but metabiotic nodes in a mediatic network. And whereas direct connections to Eywa are possible through Pandoran biological organs, the avatar

within its Earth-based system is both organic-cognitive and technological-informatic, both human(oid) and non-human – a doubly two-sided form, as I will explain. In the realm of the science-fiction film, it does not matter so much that AVATAR and its systems have their conceptual wires crossed. One can still draw some wider cultural conclusions from a consideration of their schematics.

2. The Cybernetics of Gaia

In an essay in *New Literary History*, »An Attempt at a ›Compositionist Manifesto‹«, Bruno Latour jokingly accuses director and screenwriter James Cameron of plagiarism, since his 2009 movie AVATAR, set on the fictional planet of Pandora, »should really be called *Pandora's Hope*!«[1] Latour's 1999 volume *Pandora's Hope* affirms that at the bottom of modernity's technoscientific box of ills lies the hope of reassembling a new worldview in which human and nonhuman actors alike form alliances for the composition of an inclusive and networked collective, the communitarian »parliament of things« envisioned at the end of *We Have Never Been Modern*. Latour reads the narrative outcome of Cameron's AVATAR in this sanguine light: »I take this film to be the first Hollywood script about the modernist clash with nature that doesn't take ultimate catastrophe and destruction for granted – as so many have before – but opts for a much more interesting outcome: a new search for hope on condition that what it means to have a body, a mind, and a world is completely redefined«.[2] Latour treats the story told by AVATAR, then, as one that resonates with his ongoing scholarly and philosophical crusade for the end of »nature« as constituted by modernity – for the redistribution of worldly agency in a »nonmodernist« fashion.

However, with a relatively new polemical twist, Latour aligns his version of the movie's vision with a broad reading of Gaian science: »I am under the impression that this film is the first popular description of what happens when modernist humans meet Gaia«.[3] And while this encounter is »not pretty«, neither is it catastrophic, at least for the Pandorans. The peculiar and striking result is that Latour deflects the recent discourse of Gaia theory from the grim catastrophism of its progenitor, British atmospheric chemist James Lovelock, for instance, in his 2006 volume *The Revenge of Gaia*:

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[1] Bruno Latour: An Attempt at a ›Compositionist Manifesto‹, in: New Literary History 41 (2010), p. 471; See Bruno Latour: Pandora's Hope. Essays on the Reality of Science Studies, Cambridge, MA 1999; Bruno Latour: We Have Never Been Modern, Cambridge, MA 1993, trans. Catherine Porter.

[2] Ibid. pp. 471–72.

[3] Ibid. p. 471.

»The period we are now in is close to a crisis point for Gaia. The sun is now too hot for comfort, but most of the time the system has managed to pump down carbon dioxide sufficiently and to produce enough white reflecting ice and clouds to keep the Earth cool and to maximize the occupancy of Earth's niches. But […] like many regulating systems with a goal, it tends to overshoot and stray to the opposite side of its forcing. […] This is why the usual state of the Earth at present is an ice age. The recent crop of glaciations the geologists call the Pleistocene is, I think, a last desperate effort by the Earth system to meet the needs of its present life forms.«[4]

Lovelock's longstanding conviction is that Gaia has been in crisis throughout the Pleistocene era, such that he considers the current situation of global heating to be one of adding insult to injury. His cybernetic orientation goes back to his earliest versions of the Gaia hypothesis: the Gaian system is a natural homeostatic device, a planetary thermostat. Insofar as Lovelock's own thermostat, as it were, has been constantly set on crisis mode, however, he has obscured the vigorous systemic worldview otherwise there to be read in the wider discourse of Gaian science.[5] Witness Bruno Latour stepping in to restore Gaian science as a hopeful sign of cultural renovation. Lovelock's later career as a cultural prophet of ecological dislocation seems to have freed Latour to coordinate the nonmodern aspect of Lovelock's maverick scientific contribution for his own agenda.

Latour's essay remarks: »there is no way to devise a successor to nature« – that is, to »nature« under the Modern Constitution – »if we do not tackle the tricky question of *animism* anew«.[6] Now, the accusation of animism has plagued Gaian science from its inception. But for Latour that is precisely its badge of honor, the mark of Gaia theory's nonmodernity, its groping toward a new formulation of the agencies of worldly assemblages. In an address to the British Sociological Association, Latour noted that, »in spite of the goddess's name, Lovelock knows fully well that ›she‹ is not a person, not even an organism, but the emergent property of all the feedback mechanisms that, on the whole, have balanced themselves well enough over the last billion years to maintain life on Earth inside some fluctuating

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4 James Lovelock: The Revenge of Gaia. Earth's Climate in Crisis and the Fate of Humanity, New York, NY 2006, pp. 43 – 45.

5 For more on Gaia and glaciations, see James Lovelock: The Ages of Gaia. A Biography of Our Living Earth, New York, NY 1988, chapter 6; on Gaia as a thermostat: James Lovelock: Gaia. A New Look at Life on Earth (1979), New York, NY 1987, chapter 4; on Gaia and systems theory, see Bruce Clarke: Neocybernetics of Gaia. The Emergence of Second-Order Gaia Theory, in: Eileen Crist and H. Bruce Rinker (eds.): Gaia in Turmoil. Climate Change, Biodepletion, and Earth Ethics in an Age of Crisis, Cambridge, MA 2009, pp. 293 – 314.

6 Latour: Compositionist Manifesto (as note 1), p. 481.

albeit restricted limits.«[7] With this accurate synopsis of current Gaia theory Latour affirms that, as Lovelock has argued for decades, the emergence of Gaian agency in the form of self-regulation at the level of the biosphere is not animistic – it is cybernetic. When Latour says, »call it ›animism‹ if you wish«, regarding »the odd resistance of reality: every consequence adds slightly to a cause«, and more force-fully, »consequences overwhelm their causes«, he parallels the neocybernetic dictum that, in the main, due to »inner states« that render them »nontrivial«, worldly processes are not deterministically linear but non-deterministically recursive.[8] For instance, Gaia evolves precisely because it is the constantly emerging metabiotic consequence of feedback loops between biotic and abiotic processes. And yet, for the »modernist« sensibility, convinced that the world is essentially a scene of *in-animate* forces and effects, Gaia theory and other systems sciences still conjure the specter of animism – anthropomorphism, teleology, God knows what:

»It is this conceit that lies at the root of all the critiques of environmentalists as being too ›anthropocentric‹ because they dare to ›attribute‹ values, price, agency, purpose, to what cannot have and should not have any intrinsic value (lions, whales, viruses, CO_2, monkeys, the ecosystem, or, worst of all, Gaia). The accusation of anthropomorphism is so strong that it paralyzes all the efforts of many scientists in many fields – but especially biology – to go beyond the narrow constraints of what is believed to be ›materialism‹ or ›reductionism.‹ It immediately gives a sort of New Age flavor to any such efforts, as if the default position were the idea of the inanimate and the bizarre innovation were the animate. Add agency? You must be either mad or definitely marginal. Consider Love-lock, for instance, with his ›absurd idea‹ of the Earth as a quasi-organism – or the Navis with their ›prescientific‹ connections to Eywa.«[9]

This is a quite superb moment of counter-polemic on Latour's part. Nonetheless, if we press the cybernetic subtext here, Latour's distinction between the modernist and the nonmodern mindsets maps fairly well onto a distinction previously developed in the discourse of systems theory, between »control« and »autonomy«:

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7   Bruno Latour: »A Plea for Earthly Sciences«, keynote lecture for the annual meeting of the British Sociological Association, East London, April 2007, under: http://www.bruno-latour.fr/article (31.01.2012). Also available in Judith Burnett, Syd Jeffers and Graham Thomas (eds.): New Social Connections. Sociology's Subjects and Objects, Houndmills, Basingstoke 2010, pp. 72–84.

8   Latour: Compositionist Manifesto (as note 1), p. 482, 484. On »nontrivial machines,« see, for instance, Heinz von Foerster: For Niklas Luhmann: ›How Recursive is Communication?‹, in: Understanding Understanding. Essays on Cybernetics and Cognition, New York, NY 2003, pp. 305–23.

9   Ibid. p. 481.

»In system theory, the autonomy/control distinction appears more specifically as a recursion/behavior distinction. The behavioral view reduces a system to its input–output performance or behavior, and reduces the environment to inputs to the system […]. The recursive view of a system, as expressed in the closure thesis, emphasizes the mutual interconnectedness of its components.«[10] In other words, stated in a neocybernetic idiom, it is entirely possible for Gaia to be a self-referential cognitive system producing self-maintaining regulatory dynamics without having to assume the agency or anima of a *conscious* system. In a way reminiscent of the anthropomorphic automated subway system in Latour's *Aramis, or The Love of Technology*, the narrative of AVATAR is also the story of a remote control regime forced to take into account the emergent autonomies of its own effectors.[11]

As Latour rightly insists, only in a system that couples together human and nonhuman actors can such autonomies be fully distributed. Such a system is properly observed as a network of discrete and differential subsystems. All technological systems »need allies, friends, long chains of translators. There's no *inertia,* no *irreversibility*; there's no *autonomy* to keep them alive […]. No; for technologies, every day is a working day […]. You can't manage if there's no one left working to maintain the technologies that are up and running«.[12] That is, the extra-technological *maintenance* of a technological subsystem is part of the overall system: technologies are »self-maintaining« only when human actors are coupled to the nonhuman mechanisms. Within the terms of these conditions, however, the story of AVATAR really does retell with the highest Hollywood production values a classic Latourian fable about the emergence of *systemic* autonomy within sociotechnical networks by the transformation of passive intermediaries into active mediators. At the same time, the movie's very derivativeness reminds us that for all his creative brilliance, Latour has also lifted without acknowledgment a ready-made masterplot from the annals of cybernetics.

3. The Avatar System

This neocybernetic itinerary from first-order control regimes to second-order autonomies recurs in the transition *to* the movie AVATAR from Cameron's prior megahit, TITANIC (USA 1997, James Cameron). In *The Language of New Media*, Lev Manovich recalls how the beginning of TITANIC shows »an operator sitting

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10 Francisco Varela: Principles of Biological Autonomy, New York, NY 1979, p. 86. See also Bruce Clarke and Mark B. N. Hansen (eds.): Emergence and Embodiment. New Essays in Second-Order Systems Theory, Durham, NC 2009.

11 Bruno Latour: Aramis, or the Love of Technology, Cambridge, MA 1996, trans. C. Porter.

12 Ibid. p. 86.

at the controls […] wearing a head-mounted display that shows an image transmitted from a remote location. This display allows him to remotely control a small vehicle, and with its help, explore the insides of the ›Titanic‹ lying on the bottom of the ocean. In short, the operator is ›telepresent‹«.[13] Manovich addresses informatic tele*presence* as a precondition for active remote control, tele*action*. A telepresence system draws signs from remote objects, allowing an operator first of all to control the activity of the remote equipment producing the signs. The frame narrative of Cameron's TITANIC places into the cinematic frame a representational technology for rendering an observer telepresent at an extreme location. Then teleaction adds interactivity to the control regime. »Telepresence can be thought of as one example of *representational technologies used to enable action, that is, to allow the viewer to manipulate reality through representations*«:[14]

»The ability to receive visual information about a remote place in real time allows us to manipulate physical reality in this place, also in real-time. If power, according to [Bruno] Latour, includes the ability to manipulate resources at a distance, then teleaction provides a new and unique kind of power – real-time remote control […]. Coupled with a computer used for real-time control, electronic telecommunication leads to a new and unprecedented relationship between objects and their signs. It makes instantaneous not only the process by which objects are turned into signs but also the reverse process – the manipulation of objects through their signs.«[15]

Informatic teleaction turns worldly phenomena at one location into transmissible signals received elsewhere, within a total circuit of telecommunication through which cognitive responses to those signifiers can be sent back to remote effectors and so alter the things that they signify. In this circuit, the signifying process does not merely represent a remote world, but also allows it to be worked over and in some degree refashioned. However, what would happen if the remote effectors of a teleaction system declared independence from their previous operators in favor of a new set of allegiances and obligations?

Let us now fast-forward to James Cameron's latest global blockbuster, AVATAR. The avatar in AVATAR is precisely a remotely-controlled teleactive informatic device. But it is also the instantiation of an informatic technology structurally coupled to biological and cognitive systems, living bodies socially interacting within a living world. AVATAR lifts the informatic interactivity of a virtual-reality or cyberspace scenario into a realm of autopoietic cognition. For a tale of rebellious

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13   Lev Manovich: The Language of New Media, Cambridge, MA 2001, p. 164.
14   Ibid. p. 165.
15   Ibid. pp. 169–70.

teleactivity within the »natural« alien storyworld of Pandora, this cinematic fiction imagines the anthropomorphic fulfillment of a biocybernetic system by submitting a media technology to a condition of humanoid embodiment. A narrative realization of *embodied mediation*, the avatar in AVATAR is the organic metamorphosis of a media system.

At closer range, and as first focalized by the human characters, an unlinked avatar is an inert but living husk – a body awaiting animation. Bioengineered on Earth and grown in vitro en route, they appear as unborn adult fetuses floating in their amniotic vats. Dialogue informs us of their hybrid genome, mixed from human and Na'vi DNA, allowing the neural connections needed to hardwire the cross-over from a human mind to a Na'vi body. Fresh avatar bodies are decanted fully ready to be operated, and as Jake Sully reports early on to his video log, he is there »to drive these remotely-controlled bodies,« once his mind is linked to his avatar's sensory and motor systems. In other words, an avatar is both the object of real-time remote control through its driver's teleaction – essentially and by design, a drone – and also the living effector by which its telepresent operator can interact with or manipulate other objects or persons at the avatar's location. An individual avatar, then, is just one node of a complex and regimented system, one component of a biotechnological consortium and technosocial network reaching back to a genetic-engineering infrastructure on planet Earth.

Moreover, in a way that the filmic discourse never spells out, the avatar system must also be assumed to incorporate a transceiving apparatus, an interactive tele-communications link. By some means of mutual neural-psychic communication, information about the perceptions and actions of a linked and functioning avatar is transmitted back to and received by the driver as he or she lies physically immobilized in a closed berth at a link station and phenomenologically immersed in that prosthetic body. The intentions and decisions of the remote driver must also be instantaneously transmitted to and received, reconstructed, and enacted by the avatar. On the side of the human driver's instrumentation there may be some exterior transceiver attached to the link station, but on the side of the avatar there must be a transceiving device of some sort embedded within or genetically engineered into its body. In sum, one is to imagine a technologically-instantiated, mutual and material informatic circuit between the cultured and vat-grown hybridized Na'vi avatar body and the human mind in seemingly detached command, a command-and-control circuit to both carry out the driver's intended behaviors and feed information back registering the avatar's complex of bodily experiences.

The story will dismantle the corporate engineers' assumption of such operational detachment in favor of the inexorable if unintended attachments built into any technological system. Gilbert Simondon remarked during the heyday of the first cybernetics that the progressive *concretization* of the technical object leads to a

state analogous to a natural system, »as if an artificial object differed in no way from a physical system studied in all knowable aspects of energy exchange and of physical and chemical transformations«;[16] as with unforeseen developments in the avatar system, »in the concrete object each piece is not merely a thing designed by its maker to perform a determined function; rather, it is part of a system in which a multitude of forces are exercised and in which effects are produced that are independent of the design plan.«[17]

4. The Link – »I was in the place the eye does not see.«

This overdetermined media technology works insofar as it corresponds to its audience's more-or-less unconscious desire for such a hybrid or cyborg fusion to exist. The proxy and sign of such a desire is deposited in a magic little word: when the system works, there is a *link*. Nonetheless, quite helpfully for entertaining twists and turns of the story, the link between driver and avatar is inherently precarious. The link comes with contingencies of attachment: while the avatar is active its driver must be alert but immobilized; in order for the driver to take care of his or her own bodily needs their avatar must sleep. While linked, the driver is literally helpless, a kind of fetus umbilically connected to a technological womb and vulnerable to a forced abortion. These contingencies lead to any number of adventurous scheduling issues, vigorously exploited by the plot. But as important as these manufactured complications are the formal implications of the avatar regime. Both as an observing system in its own right and as an element of the tale under the viewer's observation, this hybridic biocybernetic apparatus generates significant existential contradictions. One could say that the cultural unconscious of this technological fabulation is meaningfully paradoxical. Stated in the idiom of form theory, the operational entity constituted by the avatar system is already a *two-sided form*. This particular formation already alerts us that the story at hand will climax with a posthuman metamorphosis.[18]

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[16]   Gilbert Simondon: On the Mode of Existence of Technical Objects (1958), London 1980; retrieved at http://accursedshare.blogspot.com/2007/11/gilbert-simondon-on-mode-of-existence.html (19.04.2011).

[17]   Ibid.

[18]   »A difference-theoretical theory of form […] treats forms as pure self-reference, made possible by the marking of the form as a boundary that separates two sides – made possible, in other words, by the fact that form is essentially a boundary«. Niklas Luhmann: Art as a Social System, Stanford, CA 2000, p. 28, trans. Eva Knodt. See Bruce Clarke: Two-Sieded Form, in: Bruce Clarke: Posthuman Metamorphosis. Narrative and Systems, New York, NY 2008, pp. 87−89, and more broadly, chapter 3, »System and Form«, pp. 61−93.

Consider the famous duck–rabbit image, for which it is easy to conceptualize but impossible to observe both images at once, that is, to observe the unity of its two possible constructions. To see one is to not see the other. At best, one oscillates ever so rapidly between the two options. As viewers of AVATAR, we are afforded a second-order observation and understanding of the avatar system's functions. But for us as well as for its sentient components as observers in their own right, while the system operates, only one side of its function can be indicated and observed at any given moment. The text of the film constantly cuts back and forth between two different bodies that are called by the same name. The question is: are they actually occupied by an identical mind? As I construct the story, the idea is that, due to its doubled bodily experiences, the person possessing this mind – »Jake Sully« – is gradually going to become someone else. Nevertheless, to speak about this process precisely, we will have to pry apart its main components and keep them distinct. Otherwise, our own narrative desire to reify the metaphor will condense them back into a spuriously seamless unity, the supposed psychic unity of our two-sided protagonist.

Jake's two-sided nature had already been intimated by his having an identical twin, now dead, whose murder back on Earth has displaced Jake into his twin's place as avatar driver. The question now becomes, who is »Jake Sully« when he drives and so inhabits his Na'vi avatar? His apprehended avatar gives the Na'vi its driver's name. However, that avatar is also an embodied being, and when the being in question is the person of the avatar in action, it is precisely *not* Jake Sully – precisely not, let us say, *Jake S*. When Jake S and his avatar body are linked, we will call the embodied being that breathes the Pandoran air unbreathable by humans *Jake A*. While Jake A is active, Jake S is elsewhere.

When the nearly naked Neytiri first looks down from her tree limb and recognizes this »dreamwalker« as an avatar (its Levis give it away) lost and floundering in her home forest, she understands it for what it has come to mean to her people, an interloping predator, an invasive falsity disguising an alien intent. This perception is directly articulated later by Tsu'tey when due to a broken link Jake A collapses in their midst: »Look! It is a demon in a false body!« Neytiri's initial and immediate inclination is to slay the trespasser. However, she is stayed by the first of several animistic plot devices – the testimony of the »seeds of the sacred tree« that hover about him, detecting something genuine and worth preserving in this dubious being, and which she understands to be »a sign from Eywa.«

From then on, Neytiri takes the person of this avatar at face value. But we must decline the invitation to identify with her empathy, and stay instead at our proper level of narrative observation. The problem is that the text equivocates with regard to how entirely immersed the mind of Jake S is in the body of Jake A. Can the mind of Jake S, while it is linked to Jake A, really detach itself from the thoughts

and utterances that are proper to the psychic and social systems that are simultane-
ously coupled by that avatar body? Or again, can the mind of Jake S be at once
both a first-order hetero-observer and a second-order self-observer? After their
night of lovemaking, Neytiri whispers to Jake A: »I am with you now, Jake. We
are mated for life.« Right then, Jake S opens his eyes in the link berth, breaking
his link with the post-coital avatar. Even after a broken link, however, the conse-
quences of newly forged attachments continue.

5. Displacements of the Link 1: The Bond

The cinematic discourse fills these logistical and existential gaps in the workings
of the avatar system with other signs elsewhere in the story. We can call these
particular folds in the narrative discourse *displacements of the link*. They are precisely
metonymies of the narrative desire pressing toward the ultimate condensations or
metaphorical epiphanies of the story's conclusion. I will draw out two of these
displacements. With regard to the first, many Pandoran life forms have an organ
not possessed by terrestrial animals. On the first evening of Jake A's existence as a
link-driven human-Na'vi hybrid, it bunks in the avatar camp, overseen by the den
mother of the avatar project, the scientist Grace Augustine in her avatar incarna-
tion. Jake A notices how his braided Na'vi ponytail ends in a cluster of waving
filaments. Grace A remarks dismissively, »Don't play with that, you'll go blind.«
But her masturbation joke strikes home: its function is neural intercourse. The
ease of its operation stands counter to the complicated media-technological sys-
temics of the link needed to connect a human mind to its living avatar body. This
Pandoran organ suggests that a relatively immediate organic coupling of one sen-
sorium to another is as easy as twisting two wires together.

In the Na'vi language, this function of this organ is *tsaheylu* – a making of »the
bond,« direct neural contact between two beings, and also between the Na'vi al-
together and Eywa, defined in the online Na'vi-English dictionary as *world spirit*,
Gaia.[19] As the story progresses, through acts of *tsaheylu* Jake A will bond with and
ride upon a series of animals, will hear the Tree of Voices, and finally, connect
with the Tree of Souls, the main line to Eywa. The Pandoran bond, then, is a
naturalized displacement of and organic supplement to the biotechnological link
between a human driver and its avatar. What then happens when Jake A, which
being achieves personhood only through the link with Jake S, makes the bond
with another Pandoran being? In a manner parallel to the delegation of narrative

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[19]   *Na'vi-English Dictionary*, v.11.341. Comp. Richard Littauer (Taronyu). http://eanaeltu.
learnnavi.org/dicts/NaviDictionary.pdf (17.09.2011).

focalization from a narrator to one or more characters, this delegation of teleactive agency produces a mediation within a mediation. The mind attached to the avatar momentarily takes up a further attachment to *another* creature, adding it to the network under composition. In the process, the human link is remediated by the Na'vi bond, yielding a second-order displacement of the sentience that frames and is framed by these embedded levels.

Befitting the informatic structure of these species-specific phatic or connective operations – the link and the bond – the narrative discourse provides both with distinct signs. The cinematic sign of the *link* is a pulsing energy vortex suggesting the mind or spirit's speed-of-light leap across space to make contact between its sender and receiver, while the sign of the *bond*, when established between Pandoran vertebrates, is an opening or dilating eye. The film's semiotics represent the link as a transmission, the bond as a reception. Short of death, they both convey the establishing of a two-way circuit, but the link is focalized from the position of the sender, the bond by another's observation of the receiver. In the movie's final scene, when the mind of Jake Sully succeeds in passing through the eye of Eywa permanently into the body of Jake A, the reception of his living metempsychosis is figured as Eywa's accomplishment and marked instantaneously by the sign of the bond: we watch his Na'vi eyes open wide. To sum up this phase of the discussion, *tsaheylu* – the bond – may be understood as a displacement and renaturalization, an organic interiorization of the *connectivity* of the teleactive link. Bodily organs are put back into the place of exteriorized telecommunicational prostheses. I will come back to this.

6. Displacements of the Link 2: Eywa

In a second, more recondite displacement of the link, what is displaced and renaturalized is whatever it is that *powers* it. At one level, this is a practical matter of storyworld logic, but it is never addressed in the given discourse of the film. This occulting of power sources is entirely typical and endemic especially to science-fiction cinema. For instance, no one asks the text of STAR WARS to give an accounting of how a star cruiser repeatedly hits trans-galactic warp drive. The genre is used to banking on a limitless energy account. Viewing AVATAR, if one is worried about verisimilitude, one just assumes that back at headquarters, the primary link station taps into whatever generators run the base. When Grace repairs with her avatar team to the »mobile link at site 26«, and then later, when they haul that module all the way to the outskirts of the Tree of Souls, we assume the availability of mobile generators and their fuel sources. Similarly but more mysteriously, we must assume that avatar bodies can tap their organic meta-

bolisms to run the recondite circuitry of their embedded or bioengineered trans-ceivers.

However, in this second or further displacement of the implications of the link, we go from occulted energy sources to *occult* energy sources. In AVATAR, all explicit discourse about energy, electrical or otherwise, in the service of communication is offered in reference to Eywa, the biosphere and/or biospirit of Pandora itself. Or, in short, energy becomes anima. This element of the fabula emerges from bits and pieces of dialogue. Out in the Pandoran forest, inserting an electrical probe into a tree, avatars driven by Grace and Norm make scientific conversation: »That is signal transduction from this root to the root of the tree next to it.« »So it's probably electrical, based on the speed of the reaction.« Before his conversion experiences, Jake S reports to his ongoing video log about Neytiri, »she's always going on about the flow of energy, the spirits of animals. I really hope this tree-hugger crap is not on the final.« Grace gives him an ethnographic tip: »Try to see the forest through her eyes.« A bit later he's more receptive: »I'm trying to understand this deep connection the people have to the forest. She talks about a network of energy that flows through all living things. She says, all energy is only borrowed.« The importance of Grace's ongoing witness of Jake S's cultural transformation is that through her mediation, native Na'vi beliefs about natural energies are granted human scientific validation through empirical measurement. Grace observes satellite images of the Tree of Souls: »It's their most sacred place. See the Flux Vortex in these false-color images? […] There is something really interesting going on in there biologically.«

This verbal and visual imagery conveys the perennial Western muddle between science and spirituality, physics and metaphysics, energy and anima – Bruno Latour country indeed, and the air that science fiction breathes. We get a stereotypical polarization between the callous and mercenary insensitivity and convenient racism of the corporate exploiters and the incommunicable intuitions of the indigenous exploited race. Nonetheless, the scripted vocabulary of the film approaches the profundity of actual Gaian science, the vigorous systemic worldview I alluded to earlier – the interconnectedness and systemic co-evolution of life and its environment, the autopoietic biosphere that our culture is genuinely and desperately trying to bring to working cognition. In this mass-mediated entertainment, however, that vista must come into view through neural metaphors for geobiological processes, leading off into New Age equivocations between energy, mind, and spirit. Latour would seem to contend that, such as it is, this vision of an interconnected biosphere is at least one step beyond the dead atomistic reductivism of the modernist sensibility.

Couched in this popular vehicle, the properly sundry material and conceptual couplings of electronic, computational, and organic systems are reified and dis-

tributed in a Pandoran approximation of Gaia. From this complex of information and cognition, however, the narrative solicits animism rather than cybernetics – spiritual forces rather than emergent systemic functions. But when Grace pleads with her corporate masters for a moratorium on the assault on Home Tree, she does so both to honor the validity of Na'vi spiritual beliefs and in order to preserve its scientific usefulness as a field site. There is no necessary contradiction between these intentions:

»Those trees were sacred to the Omaticaya in a way that you can't imagine […]. I'm not talking about some kind of pagan voodoo here, I'm talking about something real, something measurable in the biology of the forest […]. What we think we know is that there is some kind of electrochemical communication between the roots of the trees. Like the synapses between neurons. And each tree has 10^4 connections to the trees around it. And there are 10^{12} trees on Pandora […]. It's more connections than the human brain – get it? It's a network. It's a global network and the Na'vi can access it, they can upload and download data, memories – at sites like the one you destroyed.«

These heterogeneous informatic and cognitive systemic elements flow into the validated reality of Eywa, and like Gaia for real, Eywa is priceless, beyond all corporate accounting. Eywa is also the measurable reservoir and emergent personhood of the »network of energy that flows through all living things« on the planet, for which reason, as Jake S has now realized, the Na'vi have no need for the beads and trinkets with which the Earthling exploiters want to buy their planet.

Eywa presides at extreme moments such as the scene of the ritual effort to save Grace from her deadly wounds. Here at the threshold of death or transcendence, the filmic discourse gives us direct second-order observations of the two-sided form of the avatar system. We see it when Jake S undergoes his metempsychosis into Jake A. Grace's dying human body also lies directly next to her avatar, which itself cannot live without a mind to drive it, but which is also the potentially permanent receptacle of her telecommunicated personhood. As the scene proceeds, the imagery of Eywa is driven to a spectacle of pagan delirium. With native drums pounding and the people gathered together each in Lotus position around the many-rooted Tree of Souls, the Na'vi bond directly to Eywa through their glowing *tsaheylu* connectors, tap into, access and augment Eywa's global network. But what is more telling and less clichéd is this scene's amplification of embodied mediation. Up from Pandora more filaments like root hairs above ground proliferate around Grace and her avatar, called forth to wire together Eywa's mediation of the organic transmission of this person from one body to another, trying for enough, so to speak, bond-width to transmit an entire soul. But Grace makes it only half way. Both of her bodies die as »all that she is« ascends to Eywa.

7. Embodied Mediation

»In the place the eye does not see«, in the avatar body of Jake A and in the name of Grace, Jake S takes his righteous revenge against his forsaken corporate nation. The human system-designers of the Na'vi avatars do not appear to have taken into consideration the potentially corrupting or emancipating influence upon their human drivers of the *tsaheylu* filaments that come along with the Na'vi genome. Jake S goes off the reservation at least in part because through his immersion in Jake A he gets close enough to the Na'vi to access *their* network and measure the difference between his own, relatively clunky virtual technological link and Jake A's elegant and consummate organic bond. Jake S will ultimately transform into Jake A due to the formal pull of his avatar body's enhanced ability to mediate its world, the gratifying access his Pandoran frame has to Eywa's organic Internet.

The desire to return from technological exteriorizations to bodily reconnections is a significant trend in technoscience fictions of metamorphic displacements. Such stories seek to remediate disembodied mediations, to turn signs back into objects, to transform the word back into flesh, while at the same time overcoming the discreteness and separation of bodies and minds in some more encompassing holistic ensemble. If a human technology is not available for these purposes, an alien body or metaphysics can be made to do. For instance, in another striking narrative of human/alien encounter leading to a posthuman metamorphosis – the late African-American science-fiction author Octavia Butler's brilliant *Xenogenesis* trilogy – the alien Oankali seduce their human partners with organic capacities entirely reminiscent of the digital networks arising in the author's world in the 1980s. Friedrich Kittler might read the Oankali's advanced memory and communication functions as alien-ated media devices personifying the posthuman destination of the digital convergence of previously separate data streams. Even in the long slumber of the chrysalis phase of their developmental metamorphoses, like sleeping monitors or voice-activated recorders, the Oankali are always *on*. These alien designers of construct bodies resemble self-reproducing organic computers with nervous systems that naturally undergo metamorphic upgrades, passing on accumulated genetic memories, downloaded by lateral cellular transfer from one generation to the next.

Moreover, Butler's aliens also come organically equipped with sensory tentacles for direct neural connections among discrete bodies. Here is a telling prior telling of embodied mediation – the fictional return to organic conditions and capacities of technological and telecommunicational functions. As with the *tsaheylu* connectors on Pandora, the attraction of such organs is that through them communication no longer has to suffer real-world delays, need not go through the »bottleneck of the signifier« or the detour of social systems operationally distinct from the psychic

systems that they mediate.[20] In the first book of the *Xenogenesis* trilogy, the human heroine Lilith witnesses how through neural interconnection the Oankali can communicate without language. More so than Jake S in his link berth, more like the Na'vi around the Home Tree, the Oankali signify a social intimacy and solidarity that puts the fallibility of linguistic interaction in the shade: »Controlled multisensory stimulation. Lilith suspected it was the closest thing to telepathy she would ever see practiced.«[21]

And while this first of presumably many AVATAR movies to come does not exploit the suggestion of Grace's earlier wisecrack by presenting Neytiri and Jake A making the *tsaheylu* bond ponytail to ponytail – for their mating scene these filaments are discretely put away from cinematic display – Butler goes the distance. The Xenogenesis trilogy develops the sexual exchanges of her human and alien characters through the inclusion of an *ooloi*, a bodily-specialized member of the Oankali trained to be a sexual and reproductive mediator, with supplemental limbs extruding sensory filaments for binding the intercourse of mating pairs or clusters into a directly neural affair. Making love to her human mate, Joseph, with her bonded *ooloi*, Nikanj, in their midst, Lilith »never knew whether she was receiving Nikanj's approximation of Joseph, a true transmission of what Joseph was feeling, some combination of truth and approximation, or just a pleasant fiction […]. Nikanj focused on the intensity of their attraction, their union. It left Lilith no other sensation. It seemed, itself, to vanish.«[22]

In the end AVATAR tells a tale of posthuman metamorphosis, metempsychosis by embodied mediation. The soul of Jake Sully undergoes literal transmission into the avatar body already prepared by hybridization with the genome of his identical twin brother. The avatar system produces temporary technological metempsychoses, telecommunicational leaps, by beaming the minds of the drivers into the bodies of their vehicles for discrete periods of time. But on Pandora, the mind of Eywa is at the same time the body of Eywa, the planet and its life forms envisioned as an emergent networked sentience, a globally embodied media system. If he is to become one of the people, the human being Jake Sully must slough off his mortal coil and leap through the eye of Eywa into his proper quasi-Pandoran body. At that point, having expelled the temporary Earth-born irritant of the RDA mining company, the Pandoran system reasserts its operational closure, its cosmic autonomy.

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20 »Texts and scores – Europe had no other means of storing time […]. All data flows […] had to pass through the bottleneck of the signifier«, Friedrich Kittler: Gramophone, Film, Typewriter, Stanford, CA 1999, p. 4, trans. Geoffrey Winthrop-Young and Michael Wutz.

21 Octavia Butler: Lilith's Brood (the Xenogenesis trilogy), New York, NY 2000, p. 107.

22 Ibid. p. 162.

8. Performance Capture

There is a media technology that vanishes from AVATAR's text, and yet is greatly in evidence among its promotional paratexts. It could be thought of as yet another displacement of the link, but one outside the text to begin with, and by which the movie's imagery of corporealized mediation is returned to exterior technological conditions. *Posthuman Metamorphosis* and the earlier *Allegories of Writing* elaborated the thesis that, as constructed in a given narrative medium as an element of the fabula, the metamorphic body is itself an allegory of the transformativity of that medium. Thus, for instance, stated deconstructively, a literary character that undergoes a bodily metamorphosis is an allegory of writing – of erasure and translation, of the transposability and iterability of written signifiers, the deviations and corruptions of texts.[23] *Posthuman Metamorphosis* states a related idea systems–theoretically: »posthuman metamorphs couple the media systems that enact them to the social systems communicating them. The medium – whether the words of a text, the code of a program, a narrative frame, or a bodily frame – transforms the forms it brings forth […]. Narratives of metamorphosis are allegories of narrative communication«.[24]

The transformativity of narrative mediums extends beyond literary semiosis to any regime of the trace and its erasure, to anything that fits under the headings of analog and digital media technologies founded on informatic and communicational coding and storage regimes. When cinema is the medium of the metamorphosis, it leaves its own particular traces on the cinematic text and its fabula. AVATAR draws to a head just how many different media technologies are currently available for remediation within the cinematic medium.[25] Thus a significant amount of social chatter around this movie, when not obsessing its themes or complaining about its derivativeness, has been about the back–story of its innovations in CGI, computer–generated imagery. But I have not yet found discussed any notion that the story told by AVATAR is an allegory of the media technology that went into its own production.

You will have noticed, however, that my initial focus on Cameron's telepresence system for filming the sunken Titanic suggested viewing that prior episode as an anticipation of AVATAR's cinematic fantasy of the avatar as a literally embodied teleaction system within which its operator is bodily immersed. I will also suggest that an actual production technology – one that, unlike the 3D rendering,

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23 See Bruce Clarke: Allegories of Writing. The Subject of Metamorphosis, Albany, NY 1995.

24 Clarke: Posthuman Metamorphosis (as note 18), p. 177.

25 Jay Bolter and Richard Grusin: Remediation. Understanding New Media, Cambridge, MA 1999.

remains outside any version of the text of the film – presents the most telling subtext for the avatar system inside the film. This technology is the »performance capture« process perfected by Cameron's production team. It marks an advance upon previous motion-capture processes, I am informed, because it bypasses the need to fill in the finer details of facial expressions with animation. Thus it is sometimes dubbed »e-motion capture.« It yields the faces of main characters believably »human-like,« even when their bodies are those of three-meter tall blue humanoids with tails. Right here, the animism of the fable reverts back to the hyper-animation of its text's technological instance.

YouTube is full of promotional AVATAR clips showing this production technique.[26] A window with a finished scene is placed next to another showing a film of the performance-capture »filming« of the acted component of the scene. These clips render the two-sided form of the avatar system once again, through a display allowing a second-order observation of both sides of the production process. The actor's body is wrapped in the usual motion-capture garb, to which has been added the performance-capture enhancement of a head-mounted camera aimed back at the actor's face. The data from that real-time high-definition facial scan is then transmitted to the CGI computers, out of which process comes the realized representation of the screen character. In a word, as in a video game, the metamorphosed cinematic representation is precisely the *digitized* avatar – as it were, the transmitted emotive soul in a new, virtual body – of the performance-captured actor. The CGI studio-capture of the actor in cinematic performance is the actual transmission of which the temporarily or permanently transmitted mind of the human driver into its Na'vi avatar is the allegorical sign.

On this level at least, AVATAR is an allegory of computer-generated cinema. Its discourse is the inverted sign of its own production process. I remarked at the beginning that AVATAR takes the digital interactivity of a virtual-reality or cyberspace scenario and sends it through a biocybernetic system that everts it into a tale of teleactivity within a natural storyworld. The fable told by AVATAR envisions the renaturalization of the technological by way of the spiritual. But then, as Niklas Luhmann has suggested, »What is ›Spirit‹ if not a metaphorical circumlocution for the mystery of communication?«[27] AVATAR and other tales of embodied mediation dramatize a desire for which no amount of communication will ever suffice, and which thus keeps the mysterious wheels of social autopoiesis turning: the desire to return from signs back to objects by way of souls.

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26 A good short example, »Zoe Saldana VS Neytiri« is available at http://www.youtube. com/watch?v=fOHPCI_9-eQ&feature=related (31.01.2011).

27 Luhmann: Art as a Social System (as note 18), p. 10.

AVATAR is thus, at every level, self-contradictory and wrapped up in its own paradoxes. But that's not a fault, really, that's what's most authentic about this fantasy. This is what can happen when, as Bruno Latour suggests, »a new search for hope« is enacted »on condition that what it means to have a body, a mind, and a world is completely redefined.«[28] However, the existence and the exhilaration of the text that tells this story rests on what is actually and always possible, the transformation of objects into signs – more precisely, objects being supplemented by their signs – taken out here to a somewhat miraculous extreme. Placed into its total package, further refining a process for the informatic duplication of physical bodies in digital bits, AVATAR celebrates the power of media-technological links to manipulate reality through its representations.

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28   Latour: Compositionist Manifesto (as note 1), p. 472.