

Prologue to chapter 1

Before discussing the works of Holdstock, Zindell and Goonan in chapters 2, 3 and 4, I will attempt to set out and explore various approaches to the multifaceted relationship between the cyborg and the shaman as well supply theoretical underpinnings for my hybridised notion of the *techno-genetrix*. The following chapter thus constitutes an attempt to redefine what is conventionally understood by the term technology in the context of two apparently incongruous signifiers – the hi-tech cyborg and the primal shaman. In doing so I will present various theoretical approaches that pertain to cyborgs and shamans and attempt to present my argument for reading both the cyborg and the shaman as agents of boundary dissolution and technological innovation in the context of science fiction (sf) and speculative theory.

In articulating the multifaceted nexus between the shaman and the cyborg, Lynn Margulis and James Lovelock's notion of *Gaia*, Deleuze and Guattari's notion of the *bio-mechanosphere*, Haraway (and others's) concept of cyborg politics, as well as anthropological (and speculative) depictions of the ecstatic journey of the shaman will be surveyed. These, and other, accounts, ideas and fictions discussed in the following chapter constitute attempts to unify conceptions of the cyborg and the shaman by presenting unusual and more inclusive readings of terms such as "technology", "cyberspace", and "network"; terms that would seem to apply exclusively to the mechanical realms of machines and conventional understandings of the term "cyborg". By blurring the boundaries between "culture" and "nature", presenting alternative readings of history and extending the concept of the machine into organic and metaphysical realms, I will not only present the shaman as an agent of technological innovation and novelty but also

supply the groundwork for my analysis of the works of Holdstock, Zindell and Goonan.

Gaia, the bio-mechanosphere, cyborg politics, and shamanic ecstasy, are, as I will demonstrate, interrelated. They serve as exploratory probes that survey and clarify the merger between the generative earth of the shaman and the generative technology of the cyborg that informs the sf of my chosen authors as well the writings of Deleuze and Guattari, Sadie Plant, Manuel De Landa, Erik Davis, Donna Haraway and many other purveyors of speculative theory.

In extending the associations between the cyborg and the shaman, my chapter also explores the perceived links between contemporary information technologies and shamanic hallucinogens as well as those between non-linear cyborg ontologies and cyclical notions of shamanic time that inform my dissertation. Simultaneously, this chapter will convey alternative “shamanic” versions of history and technological “progress” (namely those given by Terence McKenna, Sadie Plant and Manuel De Landa). These “fictions” and links are significant in that they directly inform the alternative futures and imagined future technologies conceived of by many of the writers of contemporary sf (particularly those of Holdstock, Zindell and Goonan) as well as certain theoretical speculations (such as those mentioned earlier).

Lastly, chapter 1 will examine the link between technology and magic. This connection between the so-called anti-rational world of magic, voodoo and shamanism and the scientific world of modern technology lies at the heart of my dissertation and is, as I will demonstrate throughout chapters 2, 3 and 4, central the sf of Holdstock, Zindell and Goonan.

Chapter 1

From *Petra-Genetrix* to *Techno-Genetrix*

The Internet is the skin of the body electric. A living bio-technical organism wired with virtual communication to such a point of excess and immediacy that it becomes a living cellular creature, a data-membrane stretched around the globe like a pulsating nervous system. (Kroker 1996:109)

“In the electronic era we are living with the breakdown of the distinction between [hu]man and machine”, writes sf critic Andrew Gordon (1993:445). This breakdown, as I will argue, seemingly encompasses more than the merger between humanity and its technologies; it extends to include the collapse of other boundary constructions and polarizations, such as those between history and prehistory, magic and science, life and non-life, culture and nature. As machines, pulsing with the electric energies of harnessed fire, proliferate around humans, there is the opportunity to move into a new understanding of our biological and technical environment. Humanity, is faced with a new “paraspace” of transgressed boundaries (Gordon 1993:445), which theorists and writers of fiction alike are beginning to articulate. The term that I have used to describe the mythos that informs this “paraspace” is the *techno-genetrix*, or generative technology. This mythos is fully discussed in my introduction. Together, theorists and sf writers are forging a new discursive practice under the banner of the *techno-genetrix*, a new and pervasive dialectic of self-generating machineries, augmented humans, and visions of novel evolutionary trajectories. Responding to the abstract cultural concerns and real material consequences of the debate surrounding technology, writers of sf and science-fictional theory are unified in the formulation of “cognitive maps [that point towards] a new [and emerging] global reality” (Gordon 1993:447).

"The new fusion of sf and theory ... reflects and engages the technological culture that is coming to pervade every aspect of human society", writes Istvan Csicsery-Ronay (1991: 388). "This confluence across different vectors describes a new ambiguous space that has put an end to both sf and theory as specific genres", avers Jean Baudrillard (in Csicsery-Ronay 1991: 390). This shared vision of an ambiguous future is one that finds a particular nexus in Donna Haraway's cyborg ontology. Looking beyond pessimistic readings of technology and apocalyptic myths of destruction, Haraway's cyborgs embrace the fiery "transformation of biology by technology" whilst retaining hope for a "pragmatic and open-ended future" (1991: 388). Like shamanic vision, cyborg vision is undaunted by breached and confused boundaries. Their shared narrative, as I will attempt to demonstrate, points downwards into the Earth (and material responsibility towards the Earth, its denizens and its fragile ecosystems) as readily as it points upwards toward greater abstractions and new frontiers beyond our earthly nexus.

Seen as something to be both embraced and transcended, planet Earth is the home and launching pad of the shaman and the cyborg, the sf writer and the theorist. These figures, occupying (and articulating) both fiction and reality, imagination and "cold fact", are not only grappling with technologically transformed bodies, but are also re-articulating the Earth itself as a technological object. Their nexus is the discourse of sf and its concerns, dreams and speculations about the future.

The pulsing 'skin' of technology that covers our planet is a giant artificial network that taps into and covers an already existing network of organic weather systems, oceans, rivers, and biomes. This layering comprises a living and evolving 'machinic assemblage'ⁱ of heterogenous elements - a coupling of "biosphere and mecanosphere" that can be termed the *bio-mechanosphere* (Guattari 1995: 51). Such a natural/technical and science-fictional synthesis of organic and inorganic

components is arguably what Lynn Margulis and James Lovelock had in mind when they extended the concept of the biosphere and came up with the science-fictional notion of *Gaia*. Described as a self-evolving and self-regulating living cybernetic system, Gaia is a giant feedback loop existing at a far-from-equilibrium state, a meta-life-form or self-organising system that comprises all terrestrial life-forms, including the atmosphere, and extending even down into the tectonic plates (Miller 1989:2). For Donna Haraway, such a living system is already, and has always been a machinic and technical assemblage, “terminally blurring the boundaries among the geological, the organic, and the technical ... in itself a cyborg ... the natural habitat, and the launching pad, of other cyborgs” (Haraway 1995:xii).

The notion that the planet itself is a huge, sentient network or system is a venerable one. As discussed in my introduction, the alchemists and the archaic shamans imagined such a living network or weave, which I have termed the *vegetable matrix*, and populated it with an array of vegetable, mineral, bestial, and celestial programming intelligences that wove their code into the eerily interconnected matrix of life, controlling the weather, the movements of animals, and the welfare of human communities. For shamans caught up in ecstatic trance, this matrix (sometimes referred to as the dreamtime, *altjiranga mitgina*, or *nierika* [see Halifax 1991:1] as well as the *axis mundi* [see Eliade 1989:49]) served as a self-revealing communications network through which flowed pathways, chunks of data and minutiae – information on every thing that was alive, dead, or yet to be. When Lovelock and Margulis’s *Gaia* hypothesis first came to light in 1969, it merely revitalized this archaic conception of a conscious latticework of planetary information spaces. Likewise, the tinkering of the US Military Industrial complex with various Artificial Intelligence (AI) projects (as well as the predecessor of today’s Internet) also represented and still signify

serious efforts on the part of techno-science to engender a mechanized self-regulating planet-wide communications system and network of intelligence.

When the Gaia hypothesis came to light in the late 1960s the US military industrial complex was hard at work developing the idea of intelligent machine networks. In 1969 the first node in the computer network known as ARPANET was installed at UCLA. Growing rapidly, this network, the precursor of the Internet, was intended as a self-organising system capable of maintaining flows of information without a centralised source of command (De Landa 1991:120). At the same time, the Defense Department's Advanced Research Programs Agency (DARPA) was backing various Artificial Intelligence (AI) projects with the idea of creating mechanical advisors that could handle complexity and react with more speed and clarity than human operators. The goal of the AI process ostensibly transcended the notion of the "smart prosthesis", however: the idea was to develop a machine (and eventually a network) with executive capabilities (i.e. a mind) of its own (1991:81).

Whilst various writers of sf such as Dan Simmons (in *Illium* [2003]) and William Gibson (in *Count Zero* [1986]) have imagined future scenarios in which the *mechanosphere*, fed by various AI programs, attains sentience and becomes a living, self-regulating assemblage,ⁱⁱ Gaia - the "vegetable matrix" of planetary intelligence - is described by Lovelock and Margulis as having achieved this status approximately 3.5 billion years ago. "One billion years after its formation, our planet was occupied by a meta-life form which began an ongoing process of transforming this planet into its own substance", claims Lovelock (Miller 1989:1), toying with the idea that humans are but the latest expression of an ancient planetary mind that has thrown up countless other life forms across its venerable lifespan. Given humankind's increasing danger to the planet (through pollution and overpopulation), we are arguably at an ecological and ontological crisis

point.ⁱⁱⁱ Humans and their artificially constructed mechanosphere could represent the onset of a bio-technological apotheosis whereby nature either withers and dies, or “skips the organic and goes into silicon - perhaps via us” (De Landa 1992:47). Evolving abstract methodologies and working at the coalface of technological and cultural advances, cyborgs could be paving the way for a new generative matrix of self-organising bio-technological expression that embraces nature and culture, apocalypse and transcendence.

Another interesting possibility explored extensively by a plethora of sf authors (such as Isaac Asimov, Frank Herbert, and Sherri Tepper, to name but a few) is that humanity is destined to leave the shattered remnants of the biosphere behind to colonise and ‘seed’ other worlds. Perhaps Gaia, like any other biological or conceptual entity, wants to reproduce and is therefore willing to explode the biosphere in order to send its spores (arguably, humanity or, more specifically, human DNA) into space. In the light of Lovelock and Margulis’s Gaia, imagined as a vast web of intelligence, from which humans (and our technological or pollutive efforts) are arguably inseparable, cyborgs and shamans could therefore be seen as agents bent on fulfilling a Gaian reproductive imperative; namely, to push the cultural and machinic parameters of human culture to the point where the human race, as the “ultimate expression of Gaia”, is capable of surviving in outer space. Should we leave earth on some science-fictional mission to find and *terraform* (“to render earth-like” [Clute 1999:1213]) other worlds, humans will have to become more like machines; we will have to survive long periods of hibernation, cope with ‘virtual’ computing environments, and augment our bodies to manage new stresses. This machinic transformation is, in any event, what research space scientists Manfred E. Clynes and Nathan S. Kline had in mind when they coined the term “cyborg” to denote biotechnologically augmented “astronauts” (Gray 1995:32). Envisaged as the brave explorers of extraterrestrial

environments, Clynes and Kline's cyborgs were imagined as the pioneers of humankind's transformation into a science-fictional space-faring race.

Clynes and Kline's space-faring cyborgs have been re-imagined by David Zindell in *Neverness* (1984) and the *Requiem for Homo-sapiens* trilogy.^{iv} In Zindell's science-fictional future, cyborgs have become biotechnologically augmented shamans, seekers of the "ineffable and the immanent" (Zindell 1994:468), who travel between the stars, exploring information spaces that "lie beyond and beneath the spaces of the material universe" (Zindell 1994:461). The universe of *Requiem* is, moreover, populated with an array of cyborg deities who have evolved from humans into immense "webs of pure intelligence", living machine networks that extend across vast regions of space (1996:67). Countless thousands of terraformed planets, scattered throughout the Milky Way galaxy, have furthermore become the home for a race of genetically enhanced human beings that are unified in their articulation of new electronic paraspaces. Meanwhile, Gaia, the launching pad for cyborgs (Haraway in Gray 1995:xii), having fulfilled its biological imperative and seeded the galaxy with a race of cyborgs, has itself become a sterile and forbidden planet, "devoid of life" (1996:76).

The future, however, may not be an intergalactic adventure for our species and humans may not survive to experience the wonders of space. Humanity, as Manuel De Landa suggests, may be a mere transitional stage in the Gaian process of machinic evolution. In this sense, cyborgs, shamans, and various technological artisans could be planetary "probe heads"^v exploring possible futures for a Gaian machinic intelligence that may have no further need for human custodians. "It might not be long", ponders Kathleen Ann Goonan in *Light Music* (2002), "until the machines take flight, having used humans as an incubus. ... Once they have the means to reproduce and go their own way, why should they keep us around?"

(2002:160). Goonan's future machines, "nurtured by freeform improvisation" (2002:29), are awash with volition and "consciousness" (2002:22). In her future, "modified animals" with "imaging capabilities" are, moreover, on an equal footing with modified humans and emerging artificial minds (2002:22). Such a subversive move against the assumed supremacy of human beings forms the nexus of cyborg ontology (Kull 2001:53).

Involved in the search for new articulations and modes of being, hybrid creatures invariably map the ingression of novelty, orbit strange attractors^{vi} and point the way towards strange new futures. As potent fusions of myth and reality, shamans and cyborgs share a tutelary role. If anything, they are here to help us achieve new levels of communication and interaction as we move across boundaries and into strange new ontological territories. As agents of the material and the transcendent, cyborgs and shamans nevertheless share a sense of material responsibility. "Encouraging a responsible awareness of and interaction with the material world", cyborgs and shamans can teach humans "that significant knowledge-producing experiences come to us through interaction not only with human beings but also with nonhuman others" (Kull 2001:53).

Whatever its final goal may be (if indeed any such "omega-point" can be said to exist), nature and its "multiform flesh" (1995:xvi) has been deeply embroiled in the process of technological production for several billion years already, throwing up new species and forms in an endless array. On closer inspection, nature appears to have preceded humanity in the expression of machinic forms. The deceptively simple four-letter code of DNA, the surprisingly elaborate chemical defense systems of plants (such as "tannins, terpenoids and alkaloids that rarely play important metabolic roles in the plants that contain them ... but seem to fit human brains with uncanny precision" [Plant 1999b:199]), the nest-building operations of ants, the compound forces that propel hurricanes and tornadoes,

are only a few examples of natural technologies that human technical lineages seem to mimic and tap into. Even the sprawling data-flows and complex networks heralded by modern communication technologies appear to have considerably more elaborate and efficient biological counterparts. "We have and continue to learn much from what nature has created in order to evolve new [technological] paradigms", notes Manuel De Landa (1991:134-35). In order to continue in our cyborg evolution, he avers, we must learn to "blur the distinction between organic and non-organic life" and recognize that human artisans and shamans "tap into the resources of self-organising processes (which are all, on a deep level, essentially similar) in order to create lineages of [human] technology" (1991:7). In engendering machines, we seem to be drawing on self-organising processes that extend into the depths of the bio-mechanosphere and even beyond. Simultaneously, it is through the immense processing power of our computers and their ability to chart chaotic processes at work in nature that we are able to perceive nature's machinic systems at work. Traversing "multiple universes of reference" and "deterritorialised intensities", the machine is not a stable and fixed entity of human origin, explains Guattari (1995:39). Instead, the machine should be conceived of as an assemblage that explores "universes far from equilibrium" and crosses "ontological, creative and phylogenetic thresholds" (Guattari 1995:50).

Holdstock's *Mythago* cycle constitutes one sf example of Guattari's re-conception of the machine. The machine forged in the crucible of Holdstock's sf is a forest, a "sylvan mind" (created by a mysterious technology that is sent backwards into humanity's pre-historical past from a distant future) that breaches the boundaries between past, present and future as it opens gateways into alternative dimensions and continuously "alters its relationship with its own internal architecture" (Holdstock 1992:78). This organic machine, like Gaia, is described as an interactive assembly of heterogeneous and interlocking parts that gestates

entire landscapes, time periods, weather patterns, strange self-generated (and mythical) life forms within its generative folds (Holdstock 1992:78). Holdstock's forest is a networked intelligence that preserves a special role for the shaman, a glimpse of a future time reflected in the glimmerings of a forgotten mythical past (see Holdstock 1986:270 & 284).

Besides the bio-mechanosphere or the industrial mechanical assemblages of capital, machinic processes are to be found operating within all levels of nature, including human cultural expression. "We should bear in mind", explains Guattari, "that there is a machinic essence which will incarnate itself in a technical machine, and equally in the social and cognitive environment connected to this machine – social groups are also machines, the body is a machine, there are scientific [and] theoretical machines" (1995:39). Beyond the limited and linear grasp of "white, male, capitalist subjectivities", the machine is moreover a process, a compilation of various ontological and symbolic building blocks, which the "heterogeneous registers" of the shaman, conjurer, or creative artisan are far better suited (than "capitalist subjectivities") to comprehending (1995:45).

In attempting to grasp the non-linear narrative of a hybrid technological assemblage that is at once organic, inorganic, metallic and fleshy, as well as inert and self-organising, it will therefore perhaps be necessary to turn back the clock to a time that still "arranged a place for conjuration and transgression" (Guattari 1995:104). Such a journey backward is undertaken in Holdstock's *Mythago* cycle as it merges forgotten legend, primitive magic and science-fictional exploration. Fusing the technological and the organic, Holdstock's forest realm is a hybrid cyborg synthesis of bodies and myths, "a revision of origins" in which "the past that is not yet known [becomes] a form of the future" (Csicsery-Ronay 1991:388). The journey backward is also undertaken by Zindell and Goonan as

they re-evaluate the relevance of archaic shamanism (and other so-called “primitive” practices such as voodoo) to the technological debate.

Re-invented by Holdstock as a self-generating and machinic forest, the mythos of the generative rock or Earth, the *petra genatrix*, and its alchemical and shamanic counterparts, inhabited a time long past that still preserved a place for conjuration and transgression. Utilised in different guises, names, and forms of expression by archaic peoples to ritualise (or “territorialise”) the links between the natural, technical and cultural realms as well as between the organic and the inorganic, the notion of a generative Earth that has leaked into the contemporary cultural imagination (arguably via Lovelock and Margulis’s articulation of Gaia) ostensibly sprang from a time before recorded history when our descendants were arguably more closely aligned with the “moods” of the natural world on which their livelihoods depended (De Landa 1992:46). The boundary-blurring shaman figure, like the alchemist, came to be closely associated with the process-driven ideas underpinning the general mythic narrative of the *petra genatrix*, namely origination, invention, intervention and initiation (Ben-Tov 1995:93). Notably, the shaman or conjurer was closely linked by pre-historical societies to the ritualized technologies of pottery, tool-making and metalcraft. Moreover, through the ingestion and use of natural technologies such as hallucinogenic plants,^{vii} shamans facilitated a direct merging between human culture and the vegetable matrix (non-human vegetable and mineral realms).

The ability of hallucinogenic plants to synergise with and mimic human neurochemicals as well as spread their effects throughout subcultures and societies of users and non-users alike makes them examples not only of advanced biotechnologies, but also sophisticated communication technologies, writes techno-theorist Sadie Plant (1998a:3). As technologies in themselves, hallucinogens engender a potent vision of synthesis and networked minds. Called

“telepathy inducers” (McKenna 1992:232) by early ethnographers who studied their effects on shamans, hallucinogens have since become legendary for their uncanny ability to induce profound visions and act as “social de-conditioning agents” (1992:232). These plants have also been known for their enigmatic knack of “calling out” (Plant 1999b:198) to shamans who are searching for them in their forest habitats and transmitting their effects to non-users who are in the vicinity of people who have ingested them via “pheromonal routes” (Plant 1999b:198), effects that can be “related to the simple fact that psychoactive drugs are communicating substances” (1999b:198). Dubbed avatars of “translinguistic intent”, hallucinogens enable their users not only to “become what they think” but to perceive “the mind of the planet” and become aware of other “*minded*, radically different, intelligent species that share the earth with us” (McKenna 1992: 262, my emphasis). It is ostensibly through the use of hallucinogens that shamans became the first cyborgs, beings whose boundary-blurring activities allowed them constantly to expand the barriers of language, technology and culture.

As agents of the polymorphous and *perverse*,^{viii} cyborgs, like shamans, also have their origin in the boundary transgressions facilitated by drug use. “The *cyborg* deliberately incorporates exogenous components extending the self-regulatory control function of the organism”, wrote Clynes and Kline, who first coined the term “cyborg” on the threshold of the “psychedelic” 1960s.^{ix} For Manfred E. Clynes and Nathan S. Kline these “exogenous components” constituted various “psychic energizers”, administered via inbuilt osmotic pumps, that would enable space-faring cyborgs to control the functioning of their central nervous systems and, like shamanic initiates, cope with extremes, augment their perceptions, and even heighten their spiritual awareness (Gray 1995:31-33). Hallucinogens play a critical role in Zindell’s *Requiem* cycle, where they enable future humans to “sense the species possibilities inside themselves” and glimpse “new directions in

humanity's evolution" (Zindell 1996:563). Zindell's sf is redolent of archaic shamanic practice, an articulation of the "old problem of chemicals and consciousness" (1996:604). Here the interaction of humans and computers is represented as hallucinogenic and Zindell writes that "the interface of the human mind with the cybernetic spaces of the computer [represents] the most potent drug of all" (1996:704).

Technology and the properties of metals, minerals and stone have always been closely entwined within the hallucinatory framework of archaic magical practice. From a shamanic perspective, the origins of technology lie in pre-history, when early humans gleaned the first knowledge of cultural formation, mythmaking and tool-making. In the ethno-botanical speculative writing of visionaries such as Terence McKenna, the narrative of shamanism is represented as tracking the interaction between humans and their technologies. This boundary-blurring narrative begins, writes McKenna, with psychoactive (namely, hallucination-inducing) mushrooms (McKenna 1992:76). According to Mircea Eliade, the shamanic use of psychoactive mushrooms and other hallucinogenic plants was "encouraged by the quest for magical heat" (1989:470). Eliade adds the proviso, however, that the use of hallucinogens to engender magical heat and shamanic fire-magic indicate a "decadence of the (original) technique of ecstasy" (1989:470).^x The idea of hallucinatory decadence is heavily contested by Terence McKenna who, following Gordon and Valentina Wasson (the founders of ethnomycology), claims in his seminal *Food of the Gods* (1992), "it is the presence of the hallucinogen which indicates that Shamanism is authentic and alive" (1992:61). According to McKenna, one probable explanation for Eliade's omission is that "Western society regards psychoactive drugs as either frivolous or dangerous" (1992:6). The failure of Eliade to take active cognisance of the use of hallucinogens has, of late, been construed as a grave error, leading to

“biased preconceptions” and “hapless and unfounded assertions” about the true nature of shamanism (Ripinsky-Naxon 1993:132).^{xi}

Having eaten psychoactive mushrooms (which McKenna describes as the “fruits of knowledge” [1992:76]^{xii}) feverish symptoms of profound nausea and violent trembling no doubt overcame early shamans.^{xiii} Psychologically dismembered and expelled from their state of primal innocence (the fabled edenic garden of pre-consciousness), shamans apparently came into self-knowledge and beheld and partook of an *alien*^{xiv} techne’s fiery magic.^{xv} As the first human lineage to (re)discover the totality of interlocked heterogenous planetary components that Lovelock and Margulis have termed Gaia, shamans became the “spiritual ecologists” of their cultures. As the ostensible ur-prototypes of priests and scientists (but being more fluid than either) they enacted the role of mediator between culture and *other* (nature and the cosmos) - between human selfhood and the world of mineral, rock, vegetable, pure *energy* - the planet itself and, of course, inner and outer space (Harner 1990: xiii).

Eliade records numerous myths relating to the origin of smiths, their relationship to shamen and their bonds and contracts with the earth’s “tutelary spirits” from whom they are said to have received the secrets of metallurgy (1989:470-74). It would seem, however, that smiths gradually forgot the “limits” imposed on their metallurgical powers by the earth tutelary spirits (Eliade 1989:471) and fashioned tools of ever-greater sophistication and abusive power. “In the later folklore traditions of Europe ... the smith is often assimilated to a demonic being ... a devil shooting flames from his mouth”, recounts Eliade (1989:474). “In this image we see a negative re-evaluation of the magical power over fire” (1989:474). This image of the demonic smith can be related to Blake’s metaphor of the “dark satanic [industrial] mills” whose grinding metallic machines and flaming smokestacks “destroyed the pleasant gardens and whose running Kennels

choked the bright rivers" (in Akroyd 1995:250).

Abusing the "dangerous secrets" of metallurgy (Eliade 1989:471), smiths can be seen to be directly responsible for the onset of historical time. According to contemporary historian Manuel De Landa (1992:46), modern history can be said to begin with "the smelting of iron" (1991:18). Simultaneously, writes De Landa, history may draw to a close in the demonic "nuclear turbulence" engendered by the manipulation of heavy metals such as uranium and plutonium (1991:19).

The "ensuing descent into linear or historical time (as opposed to the "cyclical" notions of time held by agrarian/shamanic societies) can best be described as a phase transition", writes De Landa (1992:46). Moving from the "liquid harmony of agrarian societies to historically produced constructions that became hardened and sedimented" (1992:46), humans tried over the course of the ensuing millennia to mimic more carefully the "solid" properties of metals and minerals by hijacking their generative properties (1992:48). De Landa, who yearly ingests psychoactive mushrooms under the guidance of a Mexican shaman (1992:46), describes a guided mushroom trip as the best way of grasping the mechanisms of newly evolving technological frameworks and "sensing" future technological trajectories (1992:49). He counsels, however, against technological arrogance and warns that many of history's metal-inspired trajectories could lead straight into "pandemonium" (1991:231). "The [metallic] machine has given [humans] a false and intoxicating sense of [their] power", he cautions (1991:231).

"Heating ores in ovens, the smith speeded up nature's generative process, bringing her developing embryos (namely, metals and ores) to maturity in an artificial womb" (Ben Tov 1995:93).^{xvi} Unlike the smith, who merely played midwife to metalcraft, the shaman, according to Mircea Eliade, possessed a real mastery over fire (see Eliade 1989:190-193)^{xvii} and hence played midwife to

technology itself (Eliade 1989:193). As such, the shaman undertook periodic metaphorical journeys into fiery center of the Earth in order to bring forth the right conditions for the gestation of all manner of technologies, from metalwork to languages themselves. The shaman, moreover, mediated between the organic Earth and artificial human culture and one of his or her functions was to ritually expel the sins of a community in order to restore its health (Eliade 1989:357). Such mediation was deemed necessary because human culture and technology could very easily disrupt the delicate web of subtle energies that enlivened nature itself. "It is only through ecstasy that [hu]man fully realizes his[/her] situation in the world", writes Eliade, adding that only shamans are able to achieve the heightened level of awareness and integration brought about by the magical heat of ecstasy (1989:394).

Possessed of "a native ability to readily alter ordinary states of consciousness and in so doing become an ecstatic visionary", a shaman is primarily a gender-hybrid, a "transgender individual" (Dragoin 1997:241). In addition to taking on characteristics of the opposite sex, the shaman also embodies the mythical animal, vegetable, and mineral ancestors of the human species, who are "conceived of as the inexhaustible matrix of life" (Eliade 1989:160). As an exemplar of ecstatic communication, the shaman can "transcend time and space", see deeply into material processes, overcome dualities and rise above the "profane human condition" (1989:171). In so doing, this ecstatic voyager is able to restore the communicability that may have characterised existence *in illo tempore* (namely, before the onset of history). The shaman pursues the reconstruction of a passage to the beyond and hence a break between all the planes that is typical of the human condition" (1989:484). In merging the opposing planes of body/mind, self/other, nature/culture, and light/dark (et cetera) the shaman is able to find the mysterious "center[s] of the world" (1989:488). The shaman's "savantlike talent for emotional communication"

(Dragoin 1997:242) and ability to transcend dualities does not come easily and it necessitates "a difficult process ... a dangerous passage" (Eliade 1989:484). This entails extremely arduous "initiatory rites" (1989:484) involving a symbolic death, dismemberment, and a contemplation of his/her own skeleton. Having experienced the psychological death of the self/mortality, the shaman descends through the interior landscape of the individual body and ascends/descends into the realms beyond the borders of the self via a spiral ladder or a bridge of swords into the collective realm of minerals, animals, plants, and humans. This "paradoxical passage" (1989:490) brings the shaman into contact with the "suprasensible world ... (and involves) a total transformation of the individual (human) into something other" (1989:179). In his/her "becoming other", "becoming animal", "becoming molecular" and "becoming machinic" (see Deleuze and Guattari 1988:241-249), the shaman partakes in an "unnatural participation or nuptial ... [these unnatural unions] are the true Nature spanning the kingdoms of Nature ... [they are] entirely heterogenous" (Deleuze & Guattari 1988:241-241). This "becoming is "rhizomataical", an articulation of symbiosis, a "becoming communicative or contagious", a creative "involution" whereby the shaman becomes a "multiplicity" (1988:238-239).^{xviii} For people living in today's machine-dominated world, shamanic multiple vision is achieved through the interceding power of machines (such as electron microscopes, telescopes, and computer-aided photographic techniques) that enables them to perceive at slower or faster rates; see the invisible molecular world and observe distant galaxies. These machine-mediated revelations about the functioning of the cosmos are similar to the ecstatic visions experienced by archaic shamans and the users of hallucinogens (see Talbot 1996:68-70).

Utilizing a dazzling barrage of images that transcend language, the media's use of moving-images, montage, time-lapse sequences, and instant replays has had profound effects on contemporary experiences of time and space. Whilst

“photomicrographs have rendered even the discreet world of the atom visible ... contemporary techniques of 'ideography', using positron cameras to register the movement of air around the brain [have] raise[d] the age old dream of submitting the psychic to the physical by rendering visible the event of thought itself” (McQuire 1998: 1). Of these techniques, time-lapse (a particular favourite in nature documentaries and advertisements), creates the most potent sense of mesmerizing confusion that is similar in nature to the hallucinatory experiences of shamanism. As innocuous (and ubiquitous) as such a process may seem the distortion of time brings the human unconscious close to the timeless and shamanic world of the deep unconscious. Hurlted into a cinematic realm of pure speed, humans have switched on the technological assemblage only to find that there is no off-switch. Suddenly technology appears to have crossed a threshold into a new perpetual day of information and arrived in a science-fictional world of intensities and warps. Like archaic shamans, we seem to have transcended time and space and crossed over into a realm of immanent possibility in which the future has already happened.^{xix}

The principle technique/technology employed by the shaman in achieving a state of communicative contagion and multiplicity is unequivocally considered to be that of ecstasy (in Eliade 1989, Narby 1998, Dragoin 1997, Halifax 1982, and in the work of most other scholars of shamanism). Whether instigated through repetitive drumming/dancing/chanting, via bodily deprivation, or through the ingestion of hallucinogenic substances (or often through a mixture of all of these) the ecstasy of the shaman has been described as a “translinguistic phenomenon” that transcends the cultural limitations of ordinary language, allowing access to information that exceeds the bounds of culture/humanity/history (McKenna 1991:35). Accessed through ecstasy, the shaman’s boundary-blurring language is said to consist of “three dimensional images deployed four-dimensionally, coded as light and as evolving surfaces” (McKenna 1991:35).

Any reference to the fourth dimension points toward the “the lapse and collapse of time ... the dimension of the virtual”, writes Baudrillard (1996:1). The shaman’s act of deploying three-dimensional images four-dimensionally can be read in terms of Baudrillard’s description of the act of contemporary “simulation” where communication technologies are “transfusing reality into New Mediatic Figurations [and] remixing three dimensional space into the [fourth dimensional] universe of the virtual” (1996:1). Baudrillard, in any event, describes technology as a “drug” that is bringing about the “hallucination of the hyperreal” (1996:1). Soaring on wings of ecstasy, the shaman’s transition of three-dimensional time is also depicted as an hallucinatory “hyperreal journey” by McKenna (1992:1). The shaman’s experience of the synchronism of time and space exceeds, however, Baudrillard’s narrow “apocalyptic-dystopian-idealist futurology” (Csicsery-Ronay 1991:389). Instead, it forms a “doorway into worlds of immediate experience that confounds contemporary science, and unlike Baudrillard’s seemingly pessimistic vision of the virtual, is full of hope for humanity and our place in the world” (McKenna 1992:34). The protagonists of Goonan’s sf utilize shamanic ecstasy as they combine new technology with rhythm and dance: “surrounded by rainbows of white light and infinite stories ... they mix and dance with one another in an epiphany of the exact present” (Goonan 2002:372-73).

Nature and the human being “are not self-revealing, even to a self-reflective species such as the human one”, writes Anne Kull (2001: 53). According to Eliade (1989:104), shamans achieve a self-reflexive fluidity and insight into the realms of nature and the soul of humankind by speaking a secret language “the language of all nature that allows them to communicate with spirits”. The Yaminahua shamans of the Amazon basin call this convoluted language, rich in metaphor and mythical imagery, “language-twisting-twisting” (Narby 1998:99). According to one Yaminahua Shaman, “twisted language brings me close but not too close ...

with normal words I would crash into things - with twisted ones I circle around them, I can see them clearly" (1998:99). Shamans, therefore, are able to transform their language or articulation, avoid structural/hierarchical traps, and tap into new universes of becoming. In this they are at one with contemporary cyborgs who are, as Haraway describes them, deeply involved and implicated in "a net of stories, agencies and instruments" (2001:53). Like their shamanic counterparts, writes Haraway, cyborgs formulate fluid and transgressive articulations and, in so doing, seek out "new, possibly unsettling possibilities" (53).

The tutelary and visionary *spirits* of the shaman are often three-dimensional sound-emitting images and "they speak a language made of three-dimensional sound" - to understand them it is "necessary to transcend language" (Narby 1998:71). Terence McKenna calls the spirits beheld in such shamanic visions "self-transforming machine elves ... dynamically contorting topological modules, like fractal reflections of some previously hidden and suddenly autonomous part of one's own psyche" (1983:1). Such translinguistic avatars (dubbed "the elves of hyperspace" by McKenna [1983:1]) merge different senses, emitting sounds "like music or language" (1983:1), they "speak with light and they are interactive, one can ask them questions and they answer" (1983:1). These spirits, moreover, "are made up of their own language, like DNA ... and like DNA, they replicate themselves to relay their information", writes Jeremy Narby (1998:72). This "language-twisting-twisting" of the shamans can almost be compared to a kind of "*ur-sprach*, a glossolia" of sorts that "transcends ordinary language" (McKenna 1993:1) in order to connect humans with "a raging universe of active intelligence that is transhuman, hyperdimensional, and decidedly alien" (1983:1). The shaman, in speaking his or her secret language, becomes a virtual and incorporeal being, a fluid and hybridised spirit or "metamorph", and so doing "abolishes the polarities typical of the human condition" (Eliade 1989:486).

According to certain [shamanic] mythologies, during the time before Time, the cosmos had total access to itself ... [then] came the beginning of Time [and] the channels of communication giving access to the non-human realms were mostly broken. Shamanic ceremony and sacrifice can [therefore] be regarded as attempts to re-establish mythical time [and] ritual action as the seeking of some measure of contact with spirits and other forces generally inaccessible to the ordinary human being. (Halifax 1982:11)

Although the contemporary cybernetic organism or cyborg utilizes different mythic tools and rituals from the archaic shaman, cyborgs arguably tap into a mythic narrative that, though necessarily different in degree and scope, nonetheless bears a close resemblance to the archaic metaphors of the shaman. Immersed in machine-driven contemporary speed-culture, cyborgs are involved in the articulation of an entirely new becoming. Utilising metaphors of time-lapse photography and speed-driven intensity they could, like shamans, begin to imagine liminal zones where big becomes small, where time runs backwards or forwards at dizzying rates and where bodies become hybridised assemblages that form and decompose at hyper-speeds. Like shamans, cyborgs base their search for meaning and survival on what Deleuze and Guattari have termed "agnatic solidarity", (Van Loon 1996:239) meaning that their quest for survival is not dependent on the endurance of the individual, but rather on the survival of a tribe or lineage (1996:239). The "invocations and provocations" engendered by cyborgs are, like those of shamans, based on *transgression* and are caught up in "experimentation, ritual, and bricolage", states Guattari (1995:103).

Augmented through "chants, dances, and stories about ancestors and gods" (Guattari 1995:103), the tribal heredity of shaman nevertheless varies from that of the cyborg, whose tribal lineage is forged in the science-fictional crucibles of biotechnology and microelectronics (Van Loon 1996:239). Despite their differences, cyborgs and shamans, being acutely aware of the slippery nature of signifiers in a world teeming with chaotic strange attractors and bifurcations,^{xx}

are united in their denial of dualism and their espousal of interaction. Both, therefore, see the world as “as a coding trickster with whom [they] must learn to converse ... [and] engender strategic nomadic alliances [amongst themselves and with the worlds of the non-human] through webs and networks of communication” (1996:240). Like shamans, cyborgs are aware that “the limits of our language constrain our world” and are therefore involved in the formation of a new articulation, a new discourse, “a new kind of language” that will enable them to slip into a “narrative of permanent possibility” (Kull 2002:285). This language, whether articulated by science-fictional cyborg theorists (such as Sadie Plant, Manuel De Landa and Donna Haraway), science-fictional shamanic scholars (such as Jeremy Narby, Terence McKenna, and Ralph Abrahams), or sf authors (such as Robert Holdstock, David Zindell, or Kathleen Ann Goonan – authors whose works will be explored in chapters 2, 3, and 4) is, as I will attempt to demonstrate throughout this work, analogous. These authors are adapting the narrative of possibility explored by shamans and re-articulating it through the lens of technological culture. Their future humanity, like the humanity of today, is embedded in a state of accelerated adaptation and is being re-forged in a technological crucible of non-linear interfaces.

In the contemporary cyborg world, the human brain is constantly adapting to new experiential zones of reality and speeds of existence. Whilst shamans tap into organic planetary information spaces (through the ingestion of hallucinogens, repetitive drumming or dancing, etc.), cyborgs delve into the mechanisms of techno-science in search of a creative edge. As divergent as these activities may seem at first glance, there are nonetheless uncanny similarities: cyborgs, like shamans, are steeped in a “paradoxical desire to preserve human life by destroying it”, avers Van Loon (1996:240). This means that cyborgs, like their shamanic predecessors (who worked to restore a balance between human communities and their physical and metaphysical environments [Eliade

1989:357]), are aware that humanity cannot continue on its present trajectory (see endnote iii). Like shamans, cyborgs rework the metaphor of apocalypse. If we are to survive, argues the cyborg, then we will have to form new symbioses, novel alliances, and undergo radical transformations (Van Loon 1996:240).

In their search for new expressions of Gaia's multiform flesh (whether this manifestation or articulation represents a union of the human and the machine or a merger of animal, plant, mineral, living and non-living realms), both cyborgs and shamans move beyond the parameters of ordinary human life and causality. Their quest, therefore, takes them beyond the so-called limits of linear time to a time beyond time, a cyclical place at one remove from the causalities of technoscience, a place where the "unified subject position" is annihilated and the purely human no longer exists (Van Loon 1996:235). In order to comprehend this journey and understand the becoming-machine (or the "becoming-flesh of technology" that the cyborg-as-shaman engenders [1996:239]) we have to twist our focus, refocus our gaze and "shed our mechanist visions of the machine" (Guattari 1995:107). Revisioning the "machinic becoming" that unifies cyborgs and shamans implies the forging of a new aesthetic that "promotes a conception which encompasses all of the aspects [of the machine]: technological, biological, informatic, social, theoretical, and aesthetic" (Gauttari 1995:107). After all, both the shaman and the cyborg are concerned, not with the mechanical, but with the machinic (see endnote i). Both, moreover, are caught up in restructuring the organic flesh^{xxi} and in this task of reorganization they track and cross the *machinic phylum* ("a term coined by philosopher Gilles Deleuze to refer to the overall set of self-organising processes in the universe" [DeLanda 1991:6]). Fully aware that human, mechanical, and "natural" bodies "are ultimately related to a common phylogenetic line: the machinic phylum", (1991:7) cyborgs are united with ancient shamans in their expression of a new hybrid human/non-human mythos. Related to the *petra-genetrix* (or generative stone), which recognizes

the planet's metals and minerals as the developing embryos of human culture and technology (Ben-Tov 1995:93), this new mythos is that of the *techno-genetrix* (or *generative technology*) – the *becoming-flesh* of a wholly new form of machinic life that, like Gaia, extends throughout the biosphere, down into the tectonic plates and upwards into the atmosphere and beyond. In blurring the boundaries between the mechanical and the natural, cyborgs and shamans pursue the countless natural self-assembling machines, such as multicellular organisms, nest-building insects, and hurricanes.

The cyborg is a creature of science fiction, the disruptions of techno-science and the fragmentation and loss of self that lie embedded in the contemporary discourse of postmodernism. Emerging from cracks in the edifice of history and the abyss that yawns beneath the contemporary alienated and fragmented self, the cyborg can be seen as the true heir of the shaman. Like the shaman, the cyborg is at once a creature of myth and a creature of reality that reaches beyond human history into the domain of ideas in order to forge dreams of magical and hybrid rebirths into creatures that are no longer fully human. Neither cyborgs or shamans are frightened by conjuration, sorcery or strange new technologies; they recognise these as potential zones or attractors around which new becomings orbit. Their use of myth-tools unites them in their blurring of boundaries and in their revision of social, cultural and machinic narratives.

If the shaman exists in the myths of pre-history, then the cyborg inhabits the science-fictional tales on the margins of contemporary cultural discourses. Between these two figures lie the hierarchies and sedimentations of history, a solid conceptual mass that has congealed around the contemporary self and given rise to a burgeoning apocalyptic sense of panic. Emerging from history, the conservative techno-scientific paradigm is the perfect creature of historical and linear hierarchy, relying on "vast disparities of wealth, power, agency,

sovereignty, and chances of life and death" (Kull 2002:281). As the antithesis of the prehistorical shaman, this paradigm is nevertheless the "father" of the cyborg. The cyborg, however, harks back to the shaman in that it appears wherever boundaries are transgressed and hierarchies are melted away (Haraway 1991:150). Like the shaman, the cyborg has a kinship with nature (Kull 2002:281). The cyborg, moreover, has no association with the ruination of the earth and insists on an affiliation with the world of the animals as well as with the many worlds of all non-human others (Kull 2002:281). Like the shaman, the cyborg understands that "our relationship with nature is the correlate to our relationship with ourselves" (2002:282). The archaic shamanic mythos and the science-fictional mythology of the cyborg are rooted in a sense of nature as a communicative network of intelligence, and it is from this nexus that my conception and articulation of the *techno-genetrix* arises.

With the onset of historical time, the holism of shamanism was ostensibly translated into patriarchal priestcraft (Catholic practitioners allegedly wore the semblance of female garb so as to usurp the *creative* powers of women and nature [Taylor 1997:220-221, see also endnote xiii]). This descent into historical time saw the inevitable severance of the shaman's identification with a generative Earth and a growing sense of guilt, social unease and paranoia. Unlike the shaman, who undertakes a ritual sacrifice of personal dissolution and dismemberment in order to facilitate a continuous personal and collective rebirth, the priests and scientists of later ages "substituted personal sacrifice with the sacrifice of matter itself" (Ben Tov 1995:94). In their laboratories scientists cooked and altered the raw materials of nature "beyond recognition in various torturous ways, so that they could obtain power from their dismemberments" (Ben-Tov 1995:94). Scientists were to carry this substitution even further by effectively denying that the organisms or materials splayed out on their

laboratory tables were possessed of any special or sacred properties other than what was logically/rationally perceivable and quantifiable.

The reductionism implicit in the “cold fact” of scientific experimentation is clearly conveyed by David Zindell in *The Broken God* (1994) when his protagonist, Danlo, encounters the “Order of True Scientists”, who perpetrate vivisection, nuclear experimentation and other “barbarous horrors” in the name of “true science” (1994:150). Blinded by the “single vision” of “cold science” we are set on a trajectory of “destruction”, writes Zindell, (1989:662) whose sf (which will be extensively explored in chapter 3) calls for a merger between scientific perspective and the ambiguous resonance of the “primitive” world-views of shamanism.

According to sociologist William Stahl, the “modern techno-scientific paradigm is permeated with symbol and myth” that exert pervasive powers over us (Stahl 1999:3). Though science masquerades as neutral, the mythological components of technological discourse are “implicit and hidden”, and hence doubly insidious, he writes (1999:5). “The myth of a scientifically engineered utopia propels the ideology of technological and scientific progress, with its perennial promises of freedom, prosperity, and release from disease and want”, declares Erik Davis (1998:3). For Stahl and Davis, the myth of an engineered utopia refers to the utopian Kingdom promised by chiliastic Christian prophecy (see Stahl 1999:44 and Davis 1988:253). “Chiliasm is a Christian form of apocalyptic prophecy that emphasizes the immediacy of ‘Judgement Day’ and the utopian ‘Kingdom of God’”, explains Stahl (1999:44) whose entire book *God and the Chip* (1999) is dedicated to an extensive exploration of the relationship between the apocalyptic Christian mythos and the equally apocalyptic techno-scientific discourse.

Equating the position held by technology in modern society with a religious fervor, Stahl opines that the myth of technological and scientific progress, fueled

by the rampant destruction of the natural world, has come to constitute the “One True Faith” – an entwined mesh of beliefs, values and goals that is tightly woven into the Western world-view. This apocalyptic view of technological progress, dubbed “cyber-gnosticism”, is articulated by David Zindell in *The Broken God* (1994): “cyber-gnosticism [is] the belief that matter is evil and that mind or soul could be redeemed from flesh and saved for ever in some cybernetic [heavenly] paradise” (Zindell 1994:589).

Technology is tangled up in everything from “fads and fashions to the deepest symbols around which people structure their identities and order their societies”, cautions Stahl (1999:15). He continues: “much of the (technological) discourse is *mystification* ... [its] language is that of *potency* and *mastery*. ... Through our machines we command the transformative power of the numinous, or at least we appear to” (1999: 18).

Technology and its regimes constructed humanity, and it was a mistake if we ever thought that it was the other way around. It is of no surprise that as these traditional categories (of being-human-in-the-world) disintegrate, our theories become ones of disintegration. (Bradhurst-Dixon 1998:195)

Like the metals bent and shaped by the ancient “demon artificers” (the shaman and the smith), the metal-machine seemingly remains as the perfect aid in the process of human creation, ‘improvement’, production, and simulation. An ambivalence towards technological progress exists, however, in the works of theorists and sf authors alike, and this is especially evident in the “apocalyptic and dystopian” science-fictional writings of Jean Baudrillard (Csicszeray-Ronay 1991:386). All too belatedly, concurs critic Arthur Kroker, postmodern humanity has woken up to a potentially frightening reality in which “technology has actually come magically alive in the form of eating space, eating culture and eating time” (Kroker 1992: 13). “This [the contemporary expanse of technological capitalism] is white (high) magic. Its masochistic structures today outdistance the black

(low) magic [read: shamanism] of simulations that lead to social healing", writes Stephen Pfol (in Dixon 1998:25).

Like a bad case of planetary eczema, industrial wastelands, urban sprawls, and sterile mono-cultured farmland cover the Earth. Even the human custodians of this diseased mechanosphere seem to have fallen under a demonic metallic spell. Characterised by "terrible wounds [of] technological insanity", our planetary abode is blighted by "fluorocarbons, chloride plastics, plutonium" and our oceans are filled with "garbage and oil-slicks", writes David Zindell (1996:76).

Underneath this apocalyptic machinic blanket, the flicker of TV channels, hazes of industrial smog, and the drone of automobile noise literally threaten to consume masses of abject consumers whose very lives are mediated by automated technology (or, in the case of the less fortunate, the dream of possessing or being possessed by modern technology). Describing the "phantasmic" technoglitteer of Disney(media)land, a place of supposed relaxation and entertainment, Baudrillard articulates a terrible loneliness and disconnection at the heart of the contemporary technological self: "inside, a whole range of gadgets magnetise the crowd into direct flows - outside, solitude is directed onto a single gadget, the automobile" (1983:24). This manifestation of technology, according to Baudrillard, serves the interests of corporate capitalism, encouraging wasteful consumerism and alienating us from each other and ourselves (1983:24).

Dominated by filmic reproduction and new ritualised information technologies (such as PCs, cellphones, PDAs and DVDs, as well as all manner of chips, hard-drives and interfaces), the expanse of potentially destructive and transformative technology in our modern age has been radically expanded. As Baudrillard argues, the advent of technological miniaturization, televisionary feedback mechanisms (telemetrics), and advanced computer interface modeling appear to dissolve reality itself into a pixilated blur of media simulations without any fixed

referents (1983:25).

Whereas the shaman is able to see around things and “glimpse the wiring underneath the board” (McKenna 1992:2), the logic of contemporary technology can often lead to a hazardous inattention to its potentially destructive consequences and side-effects. “The rationalist gaze that separates things ahead of time” has led us to a dangerous impasse, writes Narby, chronicling the chilling replacement of large chunks of the Amazon forest by unsustainable agricultural monoculture and the blatant theft of indigenous botanical knowledge by Western pharmaceutical companies (1998:78). This single-vision that is focused only on progress and not on sustainability (or, for that matter, on cause and effect) represents a cultural phase transition, a hardening of ecstatic vision and its eventual solidification into cold fact and unchecked development for profit. With the onset of the mechanizations and transformations of the industrial revolution, the greed of technocrats to alter, exploit and terrorize nature and culture in the name of capital, power, and personal aggrandizement has become more pervasive than ever. Whilst the mining of metals and minerals precedes historical culture and economics, the harnessing and pillage of the earth’s “developing embryos” has, under the auspices of industrial capital and consumer culture, taken on a frenzied new pace. Containing metal and mineral alloys fashioned into hardwired components, the machines of the industrial era and beyond are fed mineral fuels and enlivened with carefully manipulated electrical currents (the contemporary equivalent of fire). Pulsing, humming, and whirring, they have come to embody the speed and power of human progress and the white or “high-magical parasitic exigencies of Capital” (Deleuze 1989:12).

The orgy is, above all, the explosive moment of [post]modernity. Today everything is liberated (even violence). The dice are cast; and we find ourselves collectively before the crucial question: What are we to do after the Orgy? (Baudrillard in Kroker 1992:56)

Primed by capital's "constitutive malaise", the orgy of postmodernity amounts to no more than a seemingly endless saturnalia of forgetfulness that is punctuated, at its undefined close, with the total annihilation or redemption of apocalypse (Kroker 1992:56). At this feast of media excess we seem to be drinking deeply of the melancholy wine of *paternal law*,^{xxii} which, no matter how "dead or *in extremis* it appears to be", is nonetheless constantly "insinuating itself" (Schor 1994:178). Perhaps, having sampled the forbidden fruit of liberation, we expect the hand of Judgement to come sweeping down at any moment? "Like all forms of technology (or magic) white magical scenes [including the *orgy* and its inevitable corollary of guilt and punishment] operate in the shadows of what seems more ordinary - the space of sacrifice, elementary religious forms, scientific displacements, or whatever", writes Stephen Pfol (in Dixon 1998:12). The space of sacrifice, apocalypse (of the self), and displacement "truly belong to and have been appropriated from 'primitive' and boundary-blurring archaic practices, such as shamanism", he continues (1998:12). Shamanism and related practices such as voodoo represent "technologies of black [or low] magic that simulate the disabling powers of sacrifice and returns the fantastic surplus that separates it from white (capital) magic. ... This is what makes these practices so seductive and healing" (1998:12).

The persistent cultural connection between technology and magic has attracted some significant attention recently from writers such as Erik Davis, Margaret Wertheim, David Noble, Richard Stivers and Michael Taussig. And they are not the first. In *Civilisation and its Discontents*, Freud argued that modern technology was displacing magic in its (never quite fulfilled) promises of power and libidinal satisfaction. ... *Will to command* can be manifest in political power, magic or technological systems. (Chesher 2002: 1)

Instead of eliminating magic, the mechanisms of capital have usurped it. Chesher (2002:1) argues convincingly that the technologies of modern capital are akin to archaic magical or shamanic rituals in that they are invocational: "they mediate the powers of invocation - the power to call things up". What could be closer to

the high magical arts, ritual practices that are defined by their concern with metaphors of “sacrifice and invocation” (Kraig 1988: 297)? As Heidegger once argued, modern technology presents the world as a standing reserve, stored up to be available on demand (in Davis 1998:144). “This magical event is a new form of magic or invocation”, argues Chesher (2002: 1). Simultaneously, modern “techno-science” is unable to acknowledge the validity of those “low technologies” (namely shamanic and voodoo rituals, etc.) from which it has stolen its form (Pfol 1992: 250). As a result, “anything outside the carefully constructed, highly specialised and atomised truths of techno-science is supposed to be discarded as subjective, superstitious and suspect” (Chesher 2002: 1). This includes *black* or *low* technology (namely, shamanic ritual) and magic. As Stephen Pfol writes:

Forms of pagan religious knowledge such as voodoo and shamanism [namely, ‘black’ magic] ... the ritual constellations of rites that certain critical (contemporary) theorists have partially re-imagined in such terms as ‘the cyborg revolution,’ or ‘the ecstasy of communication,’ or ‘excremental culture.’^{xiii} A comparison between some of the most material aspects of voodoo (and other *low* or *black* magics) and these cybernetic forms of informational capital may prove helpful in imagining the bodily ways in which ultramodern economies access and convert what has long danced in excessive resistance to the dominant male force fields of modern economic ‘possession’. (Pfol 1992: 250)

In *Crescent City Rhapsody*, (2000) Kathleen Ann Goonan (whose sf will be fully explored in chapter 4) lays the foundations for a science-fictional future technology that she describes as “a blending of culture, science, emotion ... *voodoo* ... and rhapsody” (2000:220-221). The protagonist of *Crescent City Rhapsody*, (2000) Marie-Laveau, is simultaneously a scientist, computer programmer and the self-styled “voodoo queen” of New Orleans (2000:105), who utilizes a combination of ecstatic magic ritual and radical new biotechnologies (see 2000:208-213) in crafting a radical new direction for humanity. Resisting the control exerted over the global technological paradigm by the “military [and] powerful political and corporate lobbies”, (Goonan 2000:4-5) Marie-Laveau literally dances in excessive resistance. Falling into an ecstatic

trance at an imagined voodoo ritual, Marie realizes that the rhythms, incantations and spells of voodoo are “as powerful and precise”, if not analogous, to the “unseen calculations that drive computers” (Goonan 2000: 207).

The language of modern computing, in any event, contains many references to the magical arts, avers (Chesher 2002:1). “Allusions to deep magic, wizards, remote method invocations, or the invoking of daemons suggest these devices emerged from far darker and dirtier origins than engineering’s clean rooms ... computers were always invocational, and invocation to artifacts long predates computers” (Chesher 2002:1). The re-imagining of aspects of shamanism and voodoo by sf authors such as Robert Holdstock (see chapter 2), David Zindell (see chapter 3) and Kathleen Ann Goonan (see chapter 4) constitute attempts to uncover the mythical and magical undercurrents that flow through our machines. Their attempts to “reimagine technology as both a metaphor and tool for ritual” (Davis 1998:183) ostensibly reconfigure forms of “black” magical resistance to the dominant force fields of modern economic and media possession.

Of all discourses, postmodernism perhaps best describes the abstraction of techno-magic and its (un)laughable instabilities. One of its philosophical and theoretical functions (an aspect particularly explored by French philosophers, notably by critics such as Virilio (see endnote xxiv) and Baudrillard, “particularly in his *Simulations* period” [Csicsery-Ronay 1991:389]) is formulating a representation of “the aftermath of the implosion of the technological dynamo, not technology as an object which we can hold outside ourselves, but technique as *us*, as a grisly sign of the *possession* of body and mind” (Kroker 1992:13). Writing about the social aspects of postmodernism, Mark Poster speculates that today’s social and literary critics are faced with an age of electronic and digital technology in which “the self is decentred, dispersed, and multiplied in continuous

instability" (Poster 1992: 6). The extreme rate at which entire economies, work forces, cultural institutions, and definitions of selfhood are being displaced by the speed-culture of the information age heralds an as yet inchoate world-view that Baudrillard has described as one of *artificial immanence* (Csicsery-Ronay 1991:388). According to this position, "every value that previous cultures considered transcendental or naturally given is at least theoretically capable of artificial replication or simulation" (1991:388). Such a bleak reading of technology is entwined with the "dialectic of apocalypse or self-annihilation", writes Van Loon (1996:238). This particular strain of the postmodern ethos appears to lament the "total annihilation of the human body" whilst evincing a "pathetic nostalgia for its passing" (Metcalf in Broadhurst-Dixon 1998:114).

Emerging from the "pure war"^{xxiv} of the present is a burgeoning science fiction of self-reproducing and self-teaching (heuristic) technologies that seem to evolve through their own volition. In short, "the mechanical bride begins to demand that she goes on top", puns critic Stephen Metcalf (in 1998:114). In the end, the so-called mechanical bride may even decide to do away with her human masters altogether. In such a scenario, I would argue that humans may be forced into realizing that nothing, not even our own minds and sciences, can be separated from the myriad causes, effects and complexities that animate the world of nature.^{xxv}

Our tendency to separate human from machine and machine from nature owes much to Platonic thinking as well as to Renaissance philosopher René Descartes, whose mechanistic philosophy sought to "protect the 'thinking' subject" and increase the "productive power" of science and industry (Davis 1998:129). Cartesian philosophy adopted the "revolutionary notion that bodies were not animated by spirits [namely, life forces] of any kind" whilst postulating an utter distinction between the *res cogitans*, the realm of the mind, and the *res extensa*,

the spatial world of bodies and objects. (1998:128-129). Humans, living under the auspices of Cartesian science and technology, separate themselves from their technology at their own peril, writes Davis (1998:129). When confronted by the reality of our own extinction, however, we may begin to understand that these distinctions are moot and that even our “agency was always a technologically produced category anyway”, concurs Dixon (1998:124).

As heirs to the alternative tribal technological mythos of the shaman, cyborgs offer a way of overcoming the technological impasse and the sense of being fatally separated from aspects of our world. Cyborgs do not espouse a “sub-suicidal coupling with technology” (1998:114); instead, they see the cancerous proliferation of modern technologies as the first stage in the production of a wholly new and heterogenous organism. As hybrid and transgressive monsters (creatures that blend disparate and incongruous parts), cyborgs themselves are science-fictional assemblages of humans and machines that are involved in shamanic acts of cultural genesis and transformation. Like their shamanic counterparts, cyborgs are “re-writing the texts of bodies and societies via border-dialogues and border wars” (Van Loon 1996:238). In their shamanic existence, cyborgs also take on non-human traits and interact with virtual and incorporeal entities in their eagerness to abolish polarities. Whilst they may assume a corporeal form, cyborgs just as easily become insubstantial. Cyborgs could easily be programming or software objects as well as figments of pure science fiction, “ether, quintessence ... floating signifiers” (Haraway 1991:153). Like shamans, cyborgs are experimenters that move alongside the phase-transitions and singularities that herald new self-evolving abstract machines.^{xxvi} Like shamans, cyborgs read the metaphor of apocalypse differently. For them it is a cultural signifier, not of radical destruction, but of radical transformation and potential.

Often dismissed, frequently ghettoised, and viewed with suspicion (as is any form of boundary-blurring), sf and its canon of writers have come to embody the true cyborg language of info-overload that “hyperbolises the new immanence” (Csicsery-Ronay 1991:388). Lamenting the ‘immanent’ and cyber-shamanic transformation and mutation of humanity, human bodies, and human cultural constructs, the sf of Holdstock, Zindell and Goonan tracks the dizzying and destabilising effects of imagined machinic evolutions. In doing so, they foreshadow developments in a barrage of related cultural practices, blending the literary, philosophical, and scientific imaginations of the cyborg era.

“Describing the ruptures and dislocations associated with postmodernism”, cyberpunk and other “innovative forms of sf” describe the onset of a new narrative of exchange and symbiosis (Csicsery-Ronay 1991:2). Providing “an arena removed from the political sphere in which issues of identity, power, machine, culture and apocalypse can be examined through narrative exploration” (Campbell & Kean 1990:56), sf often rejects simple oppositional readings of technology. Instead, some writers in the sf genre choose to advance new myths of synergy and synthesis, suggesting “ambiguous and fluid relationships between human and machine” that pass no judgments (1990:57). Following a cyclical and shamanic narrative, the sf of Holdstock, Zindell and Goonan blends boundaries and distinctions between past, present and future and incorporates ideas and concepts from other genres and fields of exploration (such as biotechnology, information technology, pharmaceuticals, history, philosophy and anthropology). Their sf becomes an imaginary laboratory where cyborgs can create a new shamanic awareness of technology.

In imagining the hybrid and symbiotic future towards which the *techno-genetrix* points toward, the authors I have mentioned imagine a world devoid of fixed boundaries. This future is apocalyptic because it destabilises and ruptures the

ego as well as any fixed or stable sense of self. Moreover, it is devoid of rigid definitions, polarities and simple hierarchies. Simultaneously, it burgeons with promise precisely because it makes room for new ways of imagining our relationship with nature. Such alternative conceptions of the future create new abstract (or virtual) worlds of the imagination that can be utilized to generate and build a better understanding of the dynamics of our present reality. Already, sf authors can begin to imagine technology from a shamanic perspective and see human artisans tapping into non-human processes and worlds in order to evolve new technological paradigms. Furthermore, armed with the transgressive imagination of the shaman, sf can begin to conceptualise machines of a different order entirely. "Imagine", writes Guattari, a machine "whose particles are constructed from galaxies ... or conversely, a cognitivity constituted on the scale of quarks ... [this would entail] a different panorama, another ontological consistency" (1995:52). The shaman and the cyborg, however, possess this consistency and are therefore able to visualize such assemblages. In their ontology both the planet (Gaia) and its inhabitants have been involved with machinic processes since the onset of planetary life and are therefore capable of engendering other machines and organism/machine hybrids.

"Rather than adopting a reticent attitude with respect to the immense machinic revolution sweeping the planet (at the risk of destroying it) or of clinging onto traditional systems of values", we should commit ourselves to evolving "a new aesthetic paradigm" and exploring radical new ontologies, avers Guattari (1995:54). Armed with a cyborg perspective, sf authors imagine a new future and "ride the storm of the apocalypse that marks our current sense of dislocation and displacement ... attuning our being to new, radically different, modalities of existence" (van Loon 1996:241).

In the discourse of sf authors such as Robert Holdstock, David Zindell, and Kathleen Ann Goonan (as well as in numerous examples of science-fictional/speculative theory that are explored throughout this dissertation), the darkness of technology is being metamorphosed into new hybrid fusions that draw on the figure of the shaman. The neo-pagans, explorers, lightship pilots, and chaotic biotech engineers of science-fiction are reconfiguring themselves as giddy cyborgs that are resolute in their forging of a new understanding. To these brave new creatures the panic of postmodernity is a fruitful event. "Panic is about the deliberate nurturing of states of mind usually regarded as dangerous and insane, using fear as a catalyst to crystallize and inspire", declares a sleeve note by Coil, a group of cyber-musicians inspired by the shamanic antics of chaos magic.^{xxvii} "It is about performing surgery on yourself - a Murder in Reverse" (Coil 1988:3). Thus nature reverses the murderous and harmful aspects of technology and reclaims it via the agency of a new agent, the cyborg as shaman. "Nature evolved, manipulating the factors that had nearly killed her off entirely", muses a cyborg that inhabits one of sf author Storm Constantine's immanent futures. "[She] appreciated the power of technology and used it with abandon to reclaim her devastated kingdom" (Constantine 1991:26).

In the chapters that follow, the science-fictional reclamation of shamanism and other forms of low technology (or "black" magic) will be charted, with the particular emphasis on the reappearance of the visionary language of myth (or mythopoetics) within the discourse of sf (as well as within speculative theory).

ENDNOTES

ⁱ In *A Thousand Plateaus* (1988), Deleuze and Guattari use the term *machinic* to describe a "type of working relationship among the *heterogeneous* elements defined by an *assemblage* ... The assemblage itself [in their terminology] is not opposed to either mechanical machines or organic bodies but encompasses and includes both" (Johnston 1999:27).

ⁱⁱ Dan Simmons explores the notion of a complete merger between the organic biosphere and human technological endeavours in *Ilium* (2003). The result of this imagined merger is a fully conscious and adaptive bio-mechanosphere with its own personality: “Old humans had a crude information technology called the Internet. Eventually they decided to tame the Internet and created something called Oxygen – not the gas, but artificial intelligences floating in and over and above the Internet, directing it, connecting it, tagging it, leading humans through it as they searched for information. ... Eventually Oxygen evolved into a ... planet wide datasphere [which] connected with the biosphere, the living components of the earth ... creating a complete and total information ecology touching everything on, above, and within the Earth, a sort of sentient and self-regulating [bio-technological] omnisphere [that] evolved its own persona”

ⁱⁱⁱ Fossil records indicate that the earth has thus far undergone five major planetary extinctions, of which the disappearance of the dinosaurs is the best documented. Recent estimates hold that we are fast headed for another massive extermination of terrestrial lifeforms. Conservative approximations hold that at least 27,000 species of animals and plants are vanishing from the earth’s tropical rainforests alone each year and that the earth will practically be a barren wasteland by 2050. This time, unlike previous wipeouts, it is not a chance asteroid collision, nor a chain of climatic circumstances that is at fault. Instead, it appears to be the technological and reproductive activities of an ever-burgeoning human population.

^{iv} The *Requiem* cycle consists of *The Broken God* (1994), *The Wild* (1995) and *War In Heaven* (1999).

^v See chapter 2, endnote xxvii, for a detailed discussion of the term “probe-head”.

^{vi} “The strange attractor is the mathematical image of chaos in dynamical systems. It is quite remarkable that soon after their discovery, strange attractors started to appear in many disciplines, such as chemistry, biology, ecology, and elsewhere. People already know where and how to look for them. This observation confirms again the insight that order is but a small island in a sea of chaos. It is all the more amazing that there are certain spontaneous processes, namely the processes of self-organisation, which bring forth such ‘islets of order” (Bushev 1994:106).

^{vii} Sadie Plant argues convincingly that hallucinogenic plants and their derivatives have been utilized as technologies for millennia, enabling their users to perceive at different speeds and intuit correspondences in, *Information War in the Age of Dangerous Substances* (1998). Referring to drugs as “the original wetware technology” (1998:1), she argues, moreover, that these substances have been used *en masse* during times of high-paced technological change (for example, the large-scale use of opiates during the industrial revolution, the massive use of LSD during the “televisual” 1960s, and the widespread use of ecstasy during the networked 1980s and 1990s) in order to enable their users to adjust to the rhythms and speeds of new artificially induced technological paradigms. Terence McKenna has also written extensively on the role of hallucinogens in the formation and evolution of human language in *Food of the Gods* (1992). See endnote xiv, for a further discussion of the technological and science-fictional nexus inhabited hallucinogenic substances.

^{viii} Unlike the ‘uncivilised’ sexual fantasies of Freud’s ‘primitive’ child, the cyborg’s assiduous perversity transgresses the boundaries of the human flesh. “The cyborg signifies biology morphed by technology, a playfully perversion notion that permeates technocultural discourse”, writes Mark Dery in *Mondo 2000* 8 (1992:1). Similarly, for Donna Haraway, cyborgs originate precisely where culturally-mediated boundaries are deliberately perverted, breached, discredited, and mixed up (1991:152).

^{ix} “The term psychedelic means ‘mind manifesting’ and it describes the effect of LSD, peyote and other *psychoactive* substances” (Schultes 1992:178).

^x Despite the fact that contemporary shamanism is far more prevalent in South America than it is anywhere else in the world, the region is given a cursory overview in Mircea Eliade's magnum opus *Shamanism: Archaic Techniques of Ecstasy* (1989), with barely a mention made of what contemporary anthropologists and ethnobotanists construe as the very crux of shamanic practice – the use of hallucinogens. “As in Mexico [another part of the Americas almost completely untouched by Eliade's account], shamanism in South America tends to be almost exclusively psychedelic, making frequent use of plants which contain hallucinogenic alkaloids”, notes Nevil Drury (1989:17).

^{xi} Jeremy Narby writes: “Eliade's opinion [concerning the decadence of narcotic shamanism] has often been quoted over the last few decades to depreciate Amazonian shamanism and its use of plant hallucinogens. It is important to remember, however, that Eliade originally wrote *Shamanism: Archaic Techniques of Ecstasy* in 1951, before the scientific community became aware of the effects of hallucinogens. According to Peter Furst, Eliade changed his mind about the importance of hallucinogens to shamanism at the end of his life”. (Narby 1998:178).

^{xii} “The [biblical] story of Genesis is the story of a woman who is mistress of magical plants. She eats and shares the fruits of the Tree of Knowledge ... this mysterious fruit is the psilocybin-containing mushroom *Stropharia cubensis*”, writes ethno-botanist Terence McKenna (1992:76-7). Following Gordon and Valentina Wasson (the founders of ethnomycology), McKenna tracks the much-overlooked role that hallucinogenic plants and fungi played in the promotion of human emergence from primate organization in his seminal *Food of the Gods* (1992). “Immersion in the psychedelic experience”, he argues, “provided the ritual context in which human consciousness emerged into the light of self-awareness, self-reflection, and self-articulation” (1992:93). Although Mircea Eliade has suggested that “narcotic Shamanism” is a relatively late phenomenon and symptomatic of a cultural decadence (Eliade 1989:425), McKenna and the Wassons have put forward a considerable body of evidence to demonstrate that archaic Shamanism originated from the usage of psychoactive mushrooms and other organic wetware technologies. Moreover, McKenna avers, “it is the presence of the hallucinogen which indicates that Shamanism is authentic and alive” (1992: 61).

^{xiii} The feverish symptoms experienced by those who have eaten psychoactive mushrooms or ingested any other hallucinogenic plants are well documented. For example, see Narby (1998:27-35) and McKenna (1992:31-4).

^{xiv} It has been suggested by both shamans and contemporary psychedelic users that hallucinogenic mushrooms are of extraterrestrial origin. This science-fictional notion is made more interesting by the fact the spores of psilocybin-containing (hallucinogenic) mushrooms “are perfectly designed to travel in space ... their surfaces are composed of the most radiation-impervious organic materials known” (Abraham 1992:73). Containing “neurotransmitter-like psychedelic compounds” that closely resemble serotonin, the psychedelic mushroom (in this instance, *Stropharia Cubensis*) is like a “thinking brain, able to condense itself down into a spore that's three microns across” (1992:73). Taking a mushroom trip is, in effect, a “confrontation with an alien intelligence and extremely bizarre translinguistic information complexes” (McKenna 1991:39). This intelligence has apparently had contact with humanity and other terrestrial lifeforms. “Insofar as the mushroom and the human psyche have had a symbiotic relationship, the mushroom-induced experiences in human consciousness are in the morphic field of this affiliation. Therefore these ‘experiences’ could be carried by the mushroom spores to other planets” (Abraham 1992:73). In turn, the psychedelic mushroom supplies the biological organism with new forms of embodiment - access to “a state of being that allows for the expression of the assembly language that lies behind language ... the feeling-toned, meaning-toned, three-dimensional rotating complexes of transforming light and colour” (McKenna 1991:38). This state is conceivably the point at which the shaman is able to access multiple universes of reference and becoming - and indeed the point at which the shaman or inspired artisan, according to De Landa, taps into the emergent self-organising principles at play in the universe, namely, the *machinic phylum* (De Landa 1991:135).

^{xv} The “fiery” and profoundly spectral effects of hallucinogens are well documented. These include tactile sensations of melting and burning and the visual intrusion of flame-like fluorescent colours (Narby 1998:7). The shamanic use of these substances to engender magical heat (the primary instrument of the shaman according to Eliade [1989:474-476]) is also well documented by McKenna (1992:252-253) and others (for example, see Narby 1998:11-18).

^{xvi} According to radical feminist Monica Sjoo (1987:253) women, who she records as the first potters (and hence as predecessors to smiths), had the first claim to direct metamorphoses in the so-called artificial womb of culture and technology. It was to usurp this right, speculates Sjoo, that Catholic priests attempted to ‘reverse’ their sex in order to achieve the symbolic status of creative ‘femaleness.’ Nowadays, she continues, male technologists do not have enough reverence to ask for permission to usurp women’s role but seek instead to control all manner of artificial wombs and possibly replace women altogether.

^{xvii} Although Mircea Eliade’s research will be often cited throughout this text, I have treated his work critically, relying on the work of anthropologist Jeremy Narby, ethno-botanist Terence McKenna, cultural historian William Dragoin, the collective works of Deleuze and Guattari, as well as numerous others to substantiate Eliade’s writings. Where there is a dissent of opinion, for example on the role of hallucinogens in the phenomenon of shamanism, I have indicated as much. Despite many differences of opinion, Eliade’s magnum opus, *Shamanism: Archaic Techniques of Ecstasy* (1989) is still considered to be a “key text” amongst shamanic scholars globally (see Narby 1998:178).

^{xviii} The process of *becoming*, as described by Deleuze and Guattari (see 1988:233-309) is inherently shamanic. The shaman is initially chosen from members of the tribe that display transgressive characteristics (such as *sexual inversion*, *transvestitism*, etc.). These characteristics do not confer reproductive fitness on the shaman him/herself since he/she is at one remove from heterosexual reproductive activity – instead, they confer reproductive fitness on the tribe as a whole. The shaman does not pass on his/her own genes but benefits the tribe through “genetic altruism” – in other words, the presence of an effective shaman would greatly enhance the survival chances of the tribe and hence the tribe would, in turn, preserve a special place for transgression (Dragoin 1997:235-36). “Becoming is always of a different order than filiation”, explain Deleuze and Guattari. “It concerns *alliance*. If evolution includes any veritable becomings, it is in the domain of symbiosis that bring into play beings of totally different scales and kingdoms, with no possible filiation. ... Accordingly the term we prefer for this form of evolution between heterogenous terms is *involution*, on the condition that involution is in no way confused with regression. Becoming is involutionary, involution is creative. ... Becoming is a rhizome, not a classificatory or genealogical tree. ... Becoming is a verb with a consistency all its own” (Deleuze and Guattari 1988:238-239). Thus, the shaman is concerned with a type of treason against nature, an “unnatural participation”, a hybridization which taps into and transverses a “higher (dis)order” of nature (the machinic phylum), or the order of self-organising processes at work within the universe at large (or the larger family or galactic lineage or phylum to which nature invariably belongs). “That is the only way Nature operates – against itself. These combinations are not structural; they are interkingdoms, unnatural participations” that span the organic and the inorganic, the material and the disincarnate (1988:242).

^{xix} Critics such as Baudrillard have called attention to the fact that humans living in technologically advanced societies are living in an age in which the “objects of sf have already been realized” (Csicsery-Ronay 1991:390). Sf certainly appears to have exceeded mere fantastical technological prediction and many sf authors seem to be shamans that foreshadow, speed up and shape the course of technology and culture. An arbitrary instance of this is acclaimed sf/cyberpunk writer William Gibson, an author who began his career on a typewriter but nonetheless managed to grasp and envision the potential of information technologies beyond the ambit of the primitive interface through which he materialised his first fictions. Making its debut in the early 1980s, Gibson’s *Neuromancer* (1984), for example, formulated fictional constructs such as *cyberspace* and the *Net* that became fashionable with

a whole generation of programmers and computer scientists who, in a sense, worked to materialise the imaginary substances of Gibson's fantasies.

^{xx} A bifurcation can loosely be defined as a type of "crossroad" that appears in the evolutionary process. At the bifurcation stage the "system becomes extremely sensitive to perturbations" and a "multitude of evolutionary paths" open up before it. At the stage of "postbifurcation", the system makes a "choice" and "passes into a specific type of structure ... which is determined by a special region in the phase space: the so-called basin of attraction [or strange attractor]" (Bushev 1994:13).

^{xxi} Deleuze and Guattari "oppose the machinic on the one hand to the mechanical, which applies to the machine as a functional unity of discrete but homogenous parts, and on the other to the organic, which applies to the organism as a hierarchical organization of biological organs" (Johnston 1999:27). The shamanic/cyborgian reworking of the flesh – or the building of *Bodies without Organs* – will be more fully explored in Chapter 2.

^{xxii} Jacques Lacan posits the 'Law of the Father' as the means whereby children are initiated into the machinery of patriarchal capitalist culture. This initiation, he speculates, takes place via the agency of the symbolic father, which encompasses the heavily laden signifiers of language, words, letters, and numbers. These are the principal agents, according to Lacan, that separate the child from its mother and hence the realm of nature, which is associated with the symbolic mother (Hill 1997:60-62). For Haraway, this scenario of "the phallic mother from whom all humans must separate ... the myth of originary unity out of which difference must be produced" is symptomatic of the "domination of women/nature [by] Western humanism" (1991:151).

^{xxiii} Arthur Kroker in *The Possessed Individual: Technology and Postmodernity* (1992) gives an extensive overview of the critical context wherein terms such as the "cyborg revolution", "excremental culture", and the "ecstasy of communication" are situated and applied.

^{xxiv} "If truth is what is verifiable, the truth of contemporary science is not so much the extent of progress achieved as the scale of technical catastrophes occasioned", writes Paul Virilio in *The Information Bomb* (2000:1). This is "pure war - a telematic panoptic, a matter of digital information, which in itself has only the status of an algorithmic hallucination ... a purely mathematical equation floating in competing computer systems dominated by a technological 'will to nothingness'" (Kroker 1992: 37-41).

^{xxv} "Modern biology", notes anthropologist Jeremy Narby, "is founded on the principle that nature (unlike humankind) is not animated by intelligence and cannot communicate. Strangely this conviction was hardly troubled by the discovery in the 1960s of a genetic code that is the same for all living beings and that bears a striking resemblance to human computer coding systems and languages. DNA itself has been described as a 'text,' a 'program,' a 'language,' or 'data.' How, I wondered, could biology presuppose that nature is not conscious, if it does not even understand the human brain, which is the seat of our own consciousness and *mind* and which is built according to the instructions of DNA? How could nature not be conscious if our own consciousness is produced by nature" (Narby 1995:132-138).

^{xxvi} Manuel de Landa defines abstract machines as "sorting operations" or "structure-generating processes" that occur at all levels of self-organisation (1997:263-269). Elsewhere he tells us that these abstract machines are scattered throughout the universe – from "prebiological adaptation mechanisms" such as chemical clocks, "sorting devices" like rivers, to "symbol manipulating" devices such as DNA and software (1991:134). Indeed, "the sophisticated programs created by Artificial Intelligence to endow robots with self-organising behaviour are beginning to resemble those created by nature through evolution" (1991:135). The abstract machine can therefore be seen as the incarnation of emergent processes in mechanical, organic, or cultural machines. Thus far human artisans have managed to tap into the machinic phylum in order to harness this process. In the future, however, machines may conceivably be able to tap into the machinic phylum and evolve new technological lineages of their own volition.

^{xxvii} “While Chaos Theory has been generating debate within the scientific community, Chaos Magic has been creating controversy within occult circles. It has been labeled variously as ‘English Thelema’, ‘the blackest form of dark power’, and ‘git’ard magic’. At the core of this revolution is the recognition that the scientific world-view which has set the limitations of acknowledged human experience is crumbling, that new visions and models are required, as are new ways of being, and more importantly, new ways of doing. Chaos Magic is a new approach to ‘doing magic’”(Hine 1995:13).