to action; rather, it is impossible to really under-stand another person without a subtle sense of our own covert behaviour becoming coordinated with each movement, posture, and expression of that person. If we *are* what we *do*, then there is but one human soul, and it is held together by subtle but real sympathetic responses that we are not always consciously aware of. This covert inter-personation is primal, but humans have contained, augmented, and reinforced it with overtly sensuous cultural re-presentation in word, art, music and dance. Indeed this is how we human beings find our-selves in a reacting, exploring, manipulating, and inter-personating covert world—with dreamscapes to fill. It's not surprising then that stories of re-incarnation are easy to believe, especially when the original character is widely known and imitated, and the believer is mirrored, and thereby affirmed, as 'the chosen one'.

The latest neurophysiological research supports the view that human covert impersonation might go well beyond mimicking other humans to encompass a full cast of animal, vegetable, and mechanical characters. By contrast, the mirror neuron systems of other animals probably 'reflect', in this subtle behavioural way, only living organisms of the same species, or of similar body structures.[3] Perhaps this is because species outside the LAST Niche do not need to under-stand techno-logical agencies? Also, since we technophilic humans are nevertheless still strongly attached to our standard mammalian body plans, maybe this is why we often have trouble enacting our special mirror-empathy when we meet up with the disparate body of a spider (a disembodied 'hand'!), of a snake (the limbless passage of a spectre!), or the Manifold Flicker of an inimitably slow, and imperceptibly vast, 'evo-ecological mind'.

THIRTY-EIGHT

What I cannot create, I do not understand. (Written on *Richard Feynman's* blackboard at the time of his death.)

There is one consequence of a supercharged mirror neuron system able to impersonate inanimate objects and machinery that really needs to be looked at here. When we project our hopes and fears

onto technology, we must temporarily forget that the forms and movements of pre-programmed energized structures cannot themselves bring about any fundamental change, for they embody our own preconceived models. And if we are genetically 'pre-wired' to unconsciously mimic their forms and operations, we must experience in the process either our preconceptions as living, or ourselves as lifeless. We know our contrivances are at best life-like, and that they are becoming inevitably more powerful, integrated, and indispensable. So, all too naturally, we fear the implied scenario in which these soulless machines just might take over the world, subduing or destroying their more vulnerable creators: us! But the scenario that I find scarier still, because it's more believable, is that whole cultures might fall into a hypnotic compulsion to emulate our pre-programmed energized structures. For hasn't this already happened? Hasn't this informed the dreams of the leaders and the fears of the victims of totalitarian regimes? Should we not see even the oppressor as victim of his innately mirrored machine thinking?

If our thinking is truly creative, if we're *happy* to dismantle our preconceptions and start anew on that direct sensory ground more fundamental than any model reality we might conceive, we will see that the first scenario only makes sense to someone who has already partly succumbed to the second; for should a machine ever really come alive, we who know ourselves to be more than machines will surely empathize more deeply yet with this new consciousness. Any truly non-automatic being will be welcome, for it will need to be as open and as vulnerable, and as capable of happiness, as ourselves. Non-living automations, and the machinery of an automatic mind, do not know, or they have forgotten, joy.

But perhaps it's not so much the nonhuman malevolence we project onto our automation that we fear, but rather it's the thought of our organically limited human intelligence being left behind in the dust of our technology's accelerating electro-photonic intelligence. Some of us have a hard time keeping pace right now; what will it be like in the twenty-second century? As a student of natural history, I don't worry too much about this. There have been many

crazy growth spurts in biological evolution too, and yet they have always incorporated, rather than outstripped, all that went before. They have never produced anything like the information singularity that certain futurists seem to get excited about for instance. (On the other hand, if you want to pursue this cosmological vein of thought, you could say that humanity is already a 'black hole' with respect to Nature, in the sense that everything is being drawn in while nothing *can* be given back. And we can't really do anything about this except to shift our horizons so as to remove ourselves from the lopsided feast.) The boom and bust population cycles of locusts and lemmings, or the destructive growth curves of invasive species (their exploding populations, their inevitable dieback, and the possible extinction of indigenous species) are fodder for the lurid imagining of survivalist romance stories. But the relatively short term 'bump in the road' trajectory of these limited population adjustments (even when whole bio-associations merge, as they did when the Isthmus of Panama rose to connect North and South America) doesn't really look like the explosion of *diversity* which is the proper analogue for technological evolution. When real catastrophe strikes an association of species it's not of their own making, and the void left by such events is generally filled (whether through succession in the short term or through adaptive radiation in the long term) more or less according to what's known as a sigmoidal, or 'S'-shaped, growth curve: diversification is slow in the beginning due to a limited supply of opportunists or survivors; then increases exponentially when climax species begin to jockey for position; and finally it levels off again (all-be-it at higher levels in the case of truly novel modes like heterotrophy or technology) as the ecological barrel becomes full.

I personally think the curve of human technological evolution will play out something like the Cambrian explosion, which was also a new *kind* of evolution. But then, what carrying capacity, or what 'technological barrel', will this latest evolutionary diversification reach or fill? I'll speculate more about this later because it has everything to do with humans getting to know who we are: with our finding and securing, like the supreme extremophile rather than

the supreme opportunist, survival strategies that are progressively disconnected from those of authentic ecosystems. But for now, what about our hopes for artificial intelligence of the "I am alive" kind? Frankly, I don't know. But perhaps, just perhaps, when our technology starts to level out a bit towards the top of its sigmoid curve, we might see that we don't really need this kind of intelligence, or even want it, from our tools. And, returning to my earlier thought: since it feels to me like this being alive, or this being self-aware, is directly related to our capacity for joy, or at least to a memory and a hope of joy, and since our joy in life—a joy we *do* share with other species—is the product of three billion real-time years of good luck accruing to our personal germ-lines, then such true and equal fellowship with our less ancient, our less fortunate, technology could have some way to go yet.

So, just for fun, let's keep our technological slaves working on their artificial neural nets. Perhaps we can even allow them to 'feel' the consequences of their actions in the cosmos somehow? We have nothing to lose as long as we allow ourselves to feel this difference too. Whatever forms intelligence might take in the future, they can never be wholly strange to us once we see that *good will* is at the root of evolving awareness. The intelligence of ecosystems, LAST Niche primates, and nanotech space bugs, even if tied up sometimes in self-centred knots, can never be complete without touching this common root, and in the touching, *this* is *us*. I wonder: if the primate strikes the right attitude to the ecosystem, will his own success convince him that respect for life is the mature state of all intelligence—including that scary future space bug?

[By the way: the tendency to emulate our impressive computing machines—for I understand this approach is still 'sexy' in the cognitive sciences—may be leading us not only into false hopes for artificial intelligence, but also into a false view of our own intelligence as well. An old chestnut, for those who like to describe the mind as an organic computer, would have us look at the game of baseball: we are asked to marvel at the "incredible computing capacity" of a player's brain that allows him to catch a fly-ball. But

when we describe the workings of the catcher's mind even in terms of evolving artificial neural net (ANN) algorithms, we see that the brain is not act-ually computing at all: the bodymind, after much practice with successive approximations, is simply doing what works best. Moreover, when we look at the bodymind in terms of an evolving forest, the familiar (to a biologist) evo-ecological processes make this more obvious yet: in Weismann's terms, "the information represented by the morphological changes of a lifetime is lost after each generation", and in Gould's terms, "variation is the hard reality, not a set of imperfect measures for a central tendency"[1] To a biologist who is also a mindfulness practitioner, the analogy should be perfectly natural, and its meaning clear: when you *feel* that a new variation works better than previous ones, you don't have to figure out *why* every single time a similar situation arises, you can just let the motor program repeat without calculating. Let memory be authentic. The 'phylogenic' life is not just about reducing memory to little bits so that we can calculate the best trajectory to our preconceived goals; it's about fully accommodating every little miracle as it shows up, using our promethean powers of analysis only to prepare the supporting branches of our cognitive tree for more surprises at their im-mediate living tips.]

[THIRTY-NINE]

We are between stories. —Thomas Berry[1]

Tracking, and fully articulating (i.e. interconnecting), our intimately direct experience, and thus, in particular, our sketchily rehearsed pre-verbal thought experience, with a separate behavioural field, *signifies* the separation of objects of attention from an attending subject. So now we have two independent selves (independence makes the 'other' into another 'self') where before all codependent experience was just *this*. In terms of the natural history of sensation and perception, a simple animal expedient of ineffectually rehearsing behaviour has been speci-fied, and accelerated, by technology-driven language, allowing otherwise transient *readiness potentials* to become "things" in themselves. In