Reinventing Technology:
Artificial Intelligence from the Top of a Sycamore Tree

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Between Indymedia and the Tree-sit

Every good essay begins with some scandalous confession, and I'll share with you mine: I am a researcher in artificial intelligence, and I live in a tree. To be more precise, a tree-sit, where a motley band of poets, primitivists, hippies, and anarchists are making the last stand to save a beautiful Caledonian glen from being bulldozed to make yet another road. This is a paradox at its heart: for artificial intelligence seems diametrically opposed to the natural intelligence embodied by living eco-systems. Artificial Intelligence (AI) is the ultimate technologizing project: To re-create human intelligence in the digital image of the computer, AI and technology in general seems to be at odds with any attempts to preserve nature and humanity. In fact, technology seems to be the prime means by which global capitalism enslaves and enframes the world, regarding it as one giant "standing-reserve" to be used to fuel its endless drive for ever more production to paraphase both Marx and Heidegger. I have to admit that I myself find this paradox strange, but one does not learn from running away from paradoxes. Modern calculus came from a careful inspection of Zeno's paradox, and classical anarchism itself came from the seemingly paradoxical (at least to bourgeoisie ears) statement that "Property is Theft." History has proven time and time again that paradoxes are interesting places to be. So here I am, sitting on a branch high up in the tree I am defending, being woken this morning by an orchestra of supportive birds, and contemplating the place of technology. Our world is large, and wide enough, to hold both beautiful sycamores who have the air of the mystical and the eternal about them, and the immaterial and eternal memory of the Web. The question of technology brought up by Heidegger has not disappeared: far from it, this question is at the heart of the global justice movement. How are we to use the master's tools, the computers and all other technology, to bring down the master's house, without sacrificing what we are trying to save in the process? To answer this we should listen to both the silence of the sycamore and the nearly invisible buzz of our computers.

Just as in some readings of Marxism, capital is thought to be the driving motor that inflicts upon labor the sufferings of work, for many latter-day anarchists, it seems it is technology itself driving relentlessly forward against life, crushing nature beneath its terrifying gears. As shown by countless hackers and activist websites, and even the occasional work of a few autonomist Marxist theorists, technology itself is often subverted and used for distinctly revolutionary ends. From my tiny platform in one of

Scotland's last remaining forests, this revolutionary use of technology, to be backed up by quoting obscure passages of Marx regarding the , seems so far away. For in the horizon I can literally see the creeping concrete wasteland of the industrial estate. If I strain my ears I can hear the infernal rumblings of hundreds of automobiles on a motorway that is just barely out of sight. If not out of mind - for this motorway is as surely as night follows day, and as real subsumption follows formal subsumption of labor, is going to be expanded. And this expansion of the motorway will involve the destruction of this little forest, and the beautiful twisting sycamore upon which I am sitting on will be cut-down. It is almost enough to make on nauseous. Still, I buckle up my harness and slide down the rope, for a long hard-day of chopping wood and programming computers.

The scene changes. Now I am in a cramped basement, a veritable hacker's delight, filled to the brim with half-functioning and nearly dead computers. This is the literal remains of the Indymedia Centre set-up in Edinburgh to serve as the communications hub of the 2005 G8 summit mobilization. As one of the co-founders of Scotland Indymedia, I felt astounded to see the ethereal Indymedia network materialize itself in my adopted home-town of Edinburgh, where formerly it existed primarily as as a web-site and scattered film showings. The abandoned church upstairs of the art cafe suddenly hosted hundreds, if not thousands, of anarchists and other assorted radicals from across the world, who were busily checking their e-mail, uploading pictures, editing video and otherwise radically reappropriating technology. One cannot help but think how crucial technology is to this revolution-in-progress that is the global justice movement. As I sit in this little basement that holds the remaining computers that were left behind, a resident of the tree-sit I'm at is busy designing the website for the tree-sit we both inhabit, his eyes fearsomely focused as he adds a picture of the our triumphant little tree-house to the latest world-wide mapping service Google Maps. A young Greek anarchist woman is busy moderating the list-serv she established to help co-ordinate resistance to the G8 in Edinburgh, and she's fighting off the spammers that threaten to turn this our local communication hub into a cesspool of ads for better erections through chemicals. I proceed to get distracted by helping an elderly Scottish man make sure he's properly saved his hours of typing up photo-copied UFO reports unto his diskette, for he takes the Zapatista call for an "Intergalactic" very seriously. Who am I to argue that the G8 were not covering up the existence of aliens; I'm sure both us protesters and the capitalists appear to be aliens to many of the Scottish people who wondered why all of a sudden the entire world focused its struggles here? As the bytes frenetically trace their electronic paths through cyberspace, carried on the backs of the GNU/Linux software designed by voluntary association by hackers determined to preserve my freedom, I can only wonder at what a weird world we live in. My previous trepidation at the technological plague this morning seem strangely naive.

Beyond the Technological Image of Humanity

Artificial intelligence is itself the product of astounding naivete. The essence of artificial intelligence is that the intelligence of humans, "natural intelligence," can be simulated by a machine. In its stronger form, "the computer is not merely a tool in the study of the

mind, rather the appropriately programmed computer really is a mind" (Searle, 1980). In its earliest formulation, it was thought there was a limited (large, perhaps numbering in the millions, but finite) amount of knowledge that exhibits the phenomenon known as human intelligence (Lenat and Feigenbaum, 1987). Therefore, with the help from a logical inference engine and a million "common-sense" facts encoded as logical propositions, we could create intelligence. It is in an symptom of logical positivism mutated to almost ridiculous heights. If everything must be expressed in logic, "that of which one cannot speak, one must pass over in silence," and this does leave out most of the world (Wittgenstein, 1961).

Twenty years in research to the nature of intelligence have shown the picture drawn by classical AI to be dead wrong. The original Cartesian image of intelligence as rational deliberation, far removed from engagement with the material world, is a myth of the Enlightenment. Indeed, almost all the classic binary divisions our culture teaches us are shown to be wrong, and not through clever application of critical theory, but through careful attention to scientific experiments on everything from reaction-times to neuroscience. Emotion influences and guides our decision-making (Damasio, 1994). There is no mythical central executive that lies at the top of the hierarchy of the brain, instead the neurons of the brain are a decentralized network of produces behaviour through co-ordination (Andres, 2003). The mind relies not on perfect representation and deduction over logic but a number of short-cuts and heuristics based on exploiting the body and the environment (Clark, 1997). Language is not a poor substitute for logic, but logic a poor substitute for the flexibility and analogical power of natural language, whose very heart is poetic metaphor (Lakoff et. al., 1999). We should not think of ourselves as rational disembodied intelligences but as radically engaged with our world in all sorts of powerful but far from orderly ways. This view of humanity goes directly against modern neoliberalism, which pretends we all have access perfect information and are perfectly rational.

This "philosophy of the flesh" misses the point entirely: artificial intelligence was never about humans anyways, but it was a "celebration of computers": exploring and stretching their limits and demonstrating their possibilities (Bolter, 1984). The argument that computers are not intelligent because they do not possess the phenomenology a human living through their five senses and so do not possess Merleau-Ponty's "optimal grip" on the world is also dead wrong (Dreyfus, 1972). Computers simply have a different grip on the world, and are as physically embodied as us humans. It should come as not surprise that computers, being constituted of transistors and plastic and communicating with the world primarily through whatever we humans type into them, have little chance at being qualified as intelligent in the same way that we humans are intelligent. However, all sorts of intelligent tasks are done ease by computers: fly airplanes, play chess, make music, and search unprecedented volumes of text. We still don't really trust them with the full vast range things humans do, such as taking care of children. Yet we trust them implicitly to help extend our horizons. The most pertinent example is the decades-old example of e-mail, in which computers extend our ability to communicate. As this expands with

"texting," voice calls over the Internet, and more: it appears increasingly that humans are in a love affair with digitizing our communication. And why not? Unlike the spoken word that slips into oblivion the moment we utter it and the slow and heavy letter, computers allow our communication to conquer time and space, providing communication literally at near the speed of light. Increasingly, through use of digital photos, blogs, and music, we now trust computers with our vast collective memory as well, which also makes sense given the notorious fragility of human memory. From Scotland Indymedia to text-mobs at the Republican National Convention in 2004 to endless activist e-mail listservs, we activists have shown ourselves equally if not more adaptive to using these digital networks of communication.

The All-too-Human Roots of Technology

So, computers aren't special, and as the example par excellence of technology aren't the replacement for humanity that Marx envisioned, supplanting "living labor with dead labor, replacing the variable capital of human workers with the fixed capital of machinery." (Dyer-Witheford, 2000). Computer just highlight certain characteristics in all of us, make up for some of our weaknesses. Computers are social corrections for our lack of a perfect memory, for the finite reach of our voice, for the limitations of our abilities to calculate and deduce. Intelligence is highlighted best through the combination of humans and their technology. As Marshall McLuhan noticed, we extend ourselves through various artifacts. This is not a uniquely human characteristic. Tuna propel themselves through taking advantage of miniature eddies in currents. Very intelligently, tuna then create these eddies in order to make themselves swim faster (Triantafyllou et. al., 1995)! In humans this behavior is endemic. In order to give precision to our ability to count things, our ancestors manipulated piles of pebbles. Then made notches on sticks, and after millennia, created the entire edifice of modern mathematics that reached its logical conclusion in the creation of computers (Logan, 2000). So when we need to calculate, we just press a few buttons. While some may lament the lost of the ability for humans to do a large calculations "in the head," others may view this as liberatory; after all, now we can do other and possibly more interesting things with our memory. Indeed, whenever humans run into a limitation, we seem to be more than willing to create the solution ourselves in some artifact. Even music can be considered a way of extending and externalizing our emotions into vibrations of the air. Contrary to Zerzan, language and by extension communicative technology is a way of communicating exactly that which is difficult to communicate with sheer gestures and pointing, and technology inherently the most human of endeavors (Zerzan, 1994). The general failure of artificial intelligence to create human intelligence should remind us pay attention to the radical yet obvious conclusion that humans manifest intelligence through the control and manipulation of their immediate physical environment, and this manifests itself in the creation of technology such as computers (Clark, 2003). Artificial intelligence got it backwards: all intelligence is artificial.

Technology Against and For Global Justice

The musings I had this morning in my tree do not leave me. We need to press deeper concerning our relationship with technology, for "we shall never experience our relationship to the essence of technology so long as we merely conceive and push forward the technological, put up with it, or evade it." (Heidegger, 1977). The world we are surrounded has been shaped by generations of humans shaping their physical environment. What has this left us with? A world rapidly being encased in concrete, whose very life-support system that we depend on is nearing collapse. With rising temperatures due to the CO2 emissions causing the melting of glaciers and the rapid decomposition of the remaining rain forests, we may have literally destroyed our life support systems. Despite the prophecies of Bell that somehow the new "post-industrial" economy would lift us from the grime and dirt of industrial production, this wild fantasy is simply not true (Bell, 1973). As I learned in my days as sweat-shop protester in college, the world of seemingly abstract bytes is profoundly embodied in the extraction of copper, silicon, and other raw materials from earth, and these force a heavy price in the ecological and social devastation. The disposal of computers is a environmental nightmare as they are simply toxic to the core (Kuehr et al., 2003). This may be the literal death of computers: being so heavily energy-intensive to create, when the inevitable event of oil runs out, new computers and parts for repairing existing computers will be unavailable, leading to social crisis in this computer-dependent world.

Technology can escape its bounds, and be used to seize control of someone else's physical environment against their will. From the worker forced to work on assembling microchips in a factory, to the programmer forced to program banking databases, everyone can be caught in the dehumanizing power of technology, as we become merely part of "an automatic system of machinery" that is "consisting of numerous mechanical and intellectual organs, so that the workers themselves are cast merely as its conscious linkages."(Marx, 1973). In this way technology can often be seen as a reified thing-in-itself, an external and dominating force that cruelly shapes humanity in its image. For every well-paid, white, and male white-collar computer programmer given free coffee and the ability to pop into the office when they so please, there are hordes of "mass workers" from the Global South employed in menial jobs assembling computer components in frankly Taylorist and sweatshop conditions. Where is the technological freedom to create and control the physical environment for the majority of the world's population, who seem ever more at the mercy of capitalist tyrannical forces beyond their control? For all the liberatory uses of computers to help organize demonstrations and provide knowledge, we cannot forget the origins of them lie in computing ballistic missile trajectories. Even the toiling masses are slowly using technology, becoming the "socialized workers" for whom "communication is to the socialized worker what the wage relationship was to the mass worker" of a generation ago (Negri, 1989), constantly subverting capitalism's use of computers for their own ends. Does this outweigh the fact that computers are the electronic nervous connections of global capital, allowing stocks to be transfered at the speed of light, and directing missiles to murderously enforce its

regime? Without computers, there might not be a global justice movement. However, then there would be no all-encompassing capitalist globalization.

For the global justice movement, the Internet is the prime example of a decentralized network, and the new primarily network-based forms of organization seem to be both reflecting its struggle and due to their network-based organization immensely apt at using it. It is not by chance that the only true international network to have emerged from the anti-globalization struggles is the Indymedia network, which exists almost primarily as web-sites and communicates primarily through digital means. One has the feeling of that the use of networks as forms of organization and the rampant use of technology to communicate struggle in the global justice movement is only the tip of the iceberg. In one touching example given by Arun Mehta, poor farmers in India write their questions to be searched on the Internet on postcards that are mailed to their local radio stations. The local radio station then finds someone who speaks English and the local Indian language to search the Internet, translate the answer, and broadcast it over the radio, for a simple handheld radio receiver is the one piece of technology even the poor in India have access to. It is unclear what will happen once the excluded masses fully gain access to global communications, but one would imagine that the first thing on their minds will be to change the global system that keeps them at the bottom. However, this technological eschatology does not bode well with my tree. Does it really redeem technology, and even if wide-spread computer technology did somehow lead to an end to global capitalism? Yet what other hope do we have? Revolutionaries of the last century from Kropotkin to Marx did not clearly foresee two crucial things: the coming ecological collapse that may very well destroy any revolutionary social movement by destroying humanity along with it, and the information technology that would allow unprecedented speed in the formation and co-ordination of revolutionary social movements.

The Ecology of Technology

Returning in the evening to the tree-sit, I see the dying light reflected off of her branches and am snapped out of my computational reverie. How blind I have been! The tree-sit has no computers. It doesn't even have electricity, and water has to be gathered through midnight missions to taps, as industrial farm-waste and general pollution has rendered the waters that run through the tree-sit undrinkable. Yet all around me I see the direct physical shaping of the environment. The houses that are set high off the ground with nothing but rope and some clever knots. Careful choice permeates the technology; a more simple mind would have tried to hold some of the structures to the trees with nails, but ropes don't physically damage the tree, which serve as the literal organic foundation of the buildings. A greywater system allows water to be disposed, and everything from waste-food to human shit is composted, and there are plans afoot to build a garden outside the woodlands in a nearby industrial wasteland. Even the smallest of things: the construction of insulation from scraps of carpet retrieved from the trash, the creation of stoves from disposed tin cans, everywhere in this tree-sit that exists to defend wild nature, there is the sign of technology. Is this technology so far removed from the computers that

have concerned myself? In principle, it seems a matter of degree, not of kind. While there is a case to be made for the hegemonic position of computers in global capitalism, every activist technologist might have a better chance of actually understanding the question of technology by looking away from computers and to small-scale, low-tech, and sustainable forms technology that exemplify even more clearly than computers humans seizing control of their own environment. Permaculture in general is a good example of this (Mollison, 1997). Not only taking control of the environment, but working with the environment, not as stewards but as equals. It is the mundane and everyday uses of technology, such as helping replant a forest that in twenty years time will produce enough fruit to feed a community, that may point the way to the meaning of technology, and the possibilities therein.

This is far from putting a inseparable gulf between computers and my tree-sit; far from it, for both the alluring glow of the computer screen and the simple act of lighting a fire point both are fundamentally technological: and both are the extension of one's ability to shape one's environment and not to "conquer" the environment, but to establish some mutually beneficial way of interacting with it. There is a world wide web of plants, dirt, and bacteria far outside the digital Web that we are all part of, and the digital Web is an outgrowth of this real world, not a replacement for it. When contemplating the Scotland Indymedia Centre, this one small revolutionary node of in the vast Internet, one is taken aback by the sheer complexity of the global task in front of us. At stake is nothing less than the fate of the entire world: the global justice movement needs a space to communicate and connect resistance movements. For this task, carrier pigeons simply won't do: only computers have the ability to feasibly allow the global anti-capitalist movement to connect and co-ordinate. Yet to save this little precious glen in Scotland, a different type of technology is needed: that of tree-sits, lock-ons, walk-ways. For all the computers in the world are useless here without a stable source of electricity, and all the global communication comes to nothing if there is no humans willing to physically put their body on the line between the bulldozers and these trees. And these people need a place to live far up in the branches of the tree, ways to get in and out of trees using harnesses and ropes, and ways to keep warm. In essence, like all good uses of technology, the solution fits the problem at hand. And these uses of technology I do not find dehumanizing like the concrete industrial estates or endless cubicles in a IBM, but I find these technologies to be united in their common desire: not to fight against the world, but to save it. Surprisingly, from Indymedia to our little tree-sit in Scotland, they seem to be working.

Technology For a World Worth Fighting For

Technology can both be empowering and warmly human, and also dehumanizing and cold. To the extent that technology is inhuman, its inhumanity is a reflection of some aspect of humanity that is itself selfish and destructive. We are, in a very real sense, parts of our technology, and what parts of ourselves we try to hide are sometimes mercilessly exposed in broad daylight by our technology. Complex cycles of feedback exist between

any technology and the humans brought up in it. One cannot help but wonder that if someone if there was industrial collapse, if all of our technology just disappeared, would humanity then be free? Or would we not be substantially disempowered, at a lost with how to deal with the perennial issues of food, clothes, shelter, and communication. If technology is an extension of the humans who created it, then by what miracle do we expect to prevent the cycle of technology and domination to begin again?

If we instead accept technology as part of ourselves, we then have our duty as radicals, theorists, and activists to foster and create technologies that are both liberatory and apt for the problem at hand. This means defending and building on any technology that builds skills instead of destroying them, technology such as GNU/Linux that preserves the freedoms to "run a program for any purpose, to learn how the program works, and adapt it to your needs." (Stallman, 2002). Any technology worth fighting for is not just a choice between Coke and Pepsi, but the ability to create your own options that suit and improve not only the environment of yourself, but all living things in it. Technology is needed that is both accessible and cheap, such as building tree-houses out of locally available waste, and technology that is expensive and complex must remain available for use by those who would otherwise be excluded from them, such as the open computer access at the Scotland Indymedia Centre allows. It will be difficult to tell the differences and long-term repercussions of any technology, and how they shape our character and reflect our values. For these elements, we activists need to develop a discerning eye.

We must all be technologists, finding what is called in computer jargon "hacks" - elegant and clever ways of solving our problems piecemeal, employing whatever is at hand. And as much as technology effects our character, it may be good that the sense of practical problem-solving and "dealing with finite resources" that pervades computation may be close to the character we need to confront the problems of global justice and ecological collapse (Bolter, 1984). Those that are privileged, like myself, to the time and privileged to read anarchist theory, to program computers, to live in a tree - we must find ways to make sure everyone can have access to the resources we have. We radical theorists and technologists must learn from those who have different privileges, such as the privilege the poor have of knowing how to get by on little, or many indigenous people have of how to sustainably live in their ecosystem. I have learned some of this from community gardens in Glasgow, the Eco-village set-up in Scotland around the G8, the tree-sit I live in currently, but I have much to learn. These relationships of mutual aid and learning with people from all walks of life are crucial to our movements and the design of our technology. From this vast network, the technology and wisdom that this world is crying out for will arise.

I have never liked the saying "Another World is Possible." Another world is possible, but this world is ours. For all its beauty and horror, it is this world that must be taken seriously, and it is this world that is worth fighting for. We must not forget the original technologists were alchemists, and it is us latter-day alchemists, radicals of all backgrounds, that must somehow overcome the ancient split between mind and matter,

the world and humanity, and return a sense of wonder to this world. As I walk down the hill at night back towards the tree-sit, I hear the strange sounds of accordions and flutes drift towards me from the camp-fire in the distance. It is as if I have stepped into some enchanted world beyond the enclosures of capital, a tender shoot of the deep rhizomes of the global justice movements. Our task as theorists is to remind of ourselves to wonder and puzzle over the subtle connections that are the hearts of these networks. As activists, we must fight to preserve these networks and expand them. Finally, as technologists we have to provide solutions to their problems that respect the very human and ecological origins of these networks. To finally succeed in this task on a global level, we have to tear down these artificial divisions between technology, activity, and theory. Through this we can heal the division between humanity and the wide world around us. Technology is no more neutral than we ourselves are neutral to the struggles of our day. As for the increasing number of technologists that are joining the struggle for global justice, the purpose of technology, long-shrouded by its misuse by capitalism, becomes clear at last: the re-enchantment of everyday life.

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