

Cyborgs we are, the Borg we shall become
By Ethan Rand Robert McCarty

“Of bodies chang'd to various forms, I sing:
Ye Gods, from whom these miracles did spring”
Ovid's Metamorphoses

The difference between hardware software and wetware blur more so each day as we exploit advances stemming from having cracked the genetic code. With each of these technological triumphs we come closer to realizing a capability to program gene sequences just as we program computers. In fact, there's little difference between a series of amino acids and a series of zeros and ones except, perhaps, that DNA has advantages over binary code in its density of information. Once the digital arts match (and more elegantly interface with) biology, cyborgs will crop up faster than you can say "domo arigato, Mr. Roboto."

If we qualify a cyborg as requiring the transdermal intermingling of carbon and silicon, then humanity has already begun taking baby steps toward a cyborg future. While the state of the art does not yet allow us to take those baby steps on robotic legs, you need look no further than page 144 of the November 2005 issue of Wired magazine to see an X-Ray of Michael Chorost's cranium revealing the cochlear implant imbedded in his skull that allows him to hear.

However, we don't necessarily need to have installed a pacemaker, cochlear implant or radio-frequency identifier chips (like those used to track cattle) in order to become cyborgs. Nor do we need patented lines of customized genetic code coursing through our mitochondria. That train has long left a subtler station; I'd argue that most of us reading this article are cyborgs already. Thanks to the cell phones, iPods and Bluetooth-enabled devices we hold so dear, we have begun to reach the aim of the cyborg: the extension of human capability through an intimate connection to personal electronic devices. There's an interesting implication or two when we allow the electronic world into our individual physical spheres – even if these devices never quite penetrate our flesh.

You are your hard drive

When IBM scientists invented the hard disk drive in 1956 they could hardly have foreseen the complete ubiquity their invention would enjoy a mere 50 years later. Nor could they have known to what degree individuals would rely upon and embrace hard drives.

The first mass storage devices were massive, indeed. IBM's 305 RAMAC (Random Access Method of Accounting and Control) used fifty, 24-inch diameter disks to store a paltry five megabytes (that's about as much storage needed to hold a single MP3 version of Pink Floyd's "Welcome to the Machine".) Of course, as you read this article, ever-smaller versions of the iPod roll out of Apple's labs with denser and denser hard drives and a blossoming portfolio of software capabilities. It's hard to resist observing here that the iPod is a portable memory machine in the truest sense of the word: it stores calendar entries, phone numbers, music and now video. If your senses can observe it, the iPod will hold it. Will smells be next?

The iPod is pure memory. Your memory.

Look at the devices in our pockets and on our persons. Take, for instance, a cell phone. With its power to transmit our voices into data and back again, the telephone has all but crossed the line: it has become part of our bodies. What is it but an extension of our voice and ears? It's more. Along with extending our native ability to hear and speak by granting us the ability to talk to others far away, witness the rise in text messaging and cell phones with email capability. These silent, interpersonal connections are practically electronically-enabled telepathy. As I walked along an East Village avenue yesterday I received a one-line text message from a colleague and replied in kind. A whole conversation took place there – wordlessly, secretly, instantaneously and as if directly from one mind to another. If the cochlear implant can successfully transmit audio data from an electronic device directly into the wet tissue of the inner ear, we are but microns

away from other data entering us in the very same way: from bit to thought. We are almost there already: how many people wear Bluetooth headsets *all day*?

We depend on our little devices like limbs – so much so that we give them pet names signifying our dependence. For example my colleagues and I are so hooked on our Blackberry email phones that we half-jokingly call them “Crackberries.” The addition of video and imaging in cell phones serves to further replace and enhance our carbon based brains' capabilities.

The wonder is not the meteoric advancement of the technology so much as the corresponding willingness of us humans to surrender to it. We are outsourcing our frontal lobes. And I say bring it on (with caution). If Samsung offers in my lifetime a compact flash drive that I could plug directly into my cerebral cortex, I'd seriously consider signing up. What would I give for a gig' or two of infallible, hot-swappable memory? What have we already given?

The Borg we shall become

Nearly all of the devices we carry along through our daily lives can be reprogrammed remotely – new features added and updated at the demand of the marketplace and the whim of the device's manufacturer. Did you notice your iPod now lists podcasts? Have you updated the firmware in your phone to improve reception? Or downloaded "critical updates" from Microsoft? With an array of network-connected devices held close to our persons (and soon enough within our bodies) we are at the cusp of running instructions sent to us from a potentially wide range of sources.

Furthermore, a sea change in content distribution is taking place. By content, I mean the text, images and sounds we consume and store on our electronic devices. An open programming standard called XML (Extensible Markup Language) popularized by the internet has made the

syndication of incredibly specific data streams possible for all kinds of content publishers at very low cost. While XML wasn't designed specifically for content syndication (it can allow just about any two electronic systems to interoperate, not just content publishing) some common examples of web content with XML data feeds are blogs, podcasts and publications with RSS feeds. All of these are examples of data feeds that individuals can create, subscribe to, customize and consume. XML content syndication has raised the volume of individual voices in juxtaposition to their megawatt media counterparts. This democratization of the "airwaves" is explosively diversifying the information available, but not without consequences. The questions remains: what will happen when the "channels" of information available to us on the 'net amplifies by a factor equal to the number of humans on the planet earth? Or put more bluntly: how will we cope with 6.5 billion voices in our heads?

Will we be able to discern remotely broadcasted operating instructions and programming (to borrow a term from broadcasting) from our own thoughts?

In *The Oversoul*, Ralph Waldo Emerson describes a force within humanity in terms that would serve well as a description of an electronic device's operating system.

"...the soul in a man is not an organ, but animates and exercises all the organs; is not a function, like the power of memory, of calculation, of comparison, but uses these as hands and feet; is not a faculty, but a light; is not the intellect or the will, but the master of the intellect and the will; is the background of our being in which they lie..."

Emerson was describing a connection between all individuals in humanity, not predicting its manifestation in silicon, radio waves and plastic. But we must nonetheless begin to prepare for the collective human psyche's evolution into a widely distributed operating system for humanity. In other words, connected by devices integrated within our persons, our collective electronic

consciousness -- or in Emerson's terminology, the oversoul – might become a kind of operating platform for the massively parallel computational engine of the earth's 6.5 billion human inhabitants.

At the very least we should be thinking about who we permit to update and modify the code running on devices we integrate with our physical selves. We must carefully consider who we will entrust to choose the programming of our minds. If this is our soul rendered in silicon, is it an area for government regulation? How about the church? Do we entrust it to corporations as we have done with the operating systems and content of our personal computers and devices thus far? Or will humanity's operating system run as an open source platform according to open source principles and standards bodies populated by content generated by individuals?

We have the opportunity to lay the groundwork now for what could be described as a utopian convergence of humanity – an unprecedented era of knowledge-sharing and expression of the human spirit. But I'll leave you with one more quote from Emerson, which we might do well to read as a warning: "Thoughts come into our minds through avenues which we never left open, and thoughts go out of our minds through avenues which we never voluntarily opened."