Chapter XIV
The Rise of the Electrophorus

INTRODUCTION

When Jacques Ellul (1964, p. 432) predicted the use of "electronic banks" in his book, *The Technological Society*, he was not referring to the computerization of financial institutions or the use of Automatic Teller Machines (ATMs). Rather it was in the context of the possibility of the dawn of a new entity- the *coupling of man and machine*. Ellul was predicting that one day knowledge would be accumulated in electronic banks and "transmitted directly to the human nervous system by means of coded electronic messages… [w]hat is needed will pass directly from the machine to the brain without going through consciousness…" As unbelievable as this *man-machine* complex may have sounded at the time, forty years on visionaries are still predicting that such scenarios will be possible by the turn of the twenty-second century. A large proportion of these visionaries are cyberneticists. Cybernetics is the study of nervous system controls in the brain as a basis for developing communications and controls in socio-technical systems.

Michio Kaku (1998, pp. 112-116) observes that scientists are working steadily toward a brain-computer interface. The first step is to show that individual neurons can grow on silicon and then to connect the chip directly to a neuron in an animal. The next step is to mimic this connectivity in a human, the last is to decode millions of neurons which constitute the spinal cord in order to interface directly with the brain. Cyberpunk science fiction writers like William Gibson (1984) refer to this notion as "jacking-in" with the *wetware*; plugging in a computer cable directly with the central nervous system (i.e. with neurons in the brain analogous to software and hardware) (Gates, 1995, p. 133).

In terms of the current state of development we can point to the innovation of miniature wearable media, orthopedic replacements (including pacemakers), bionic prosthetic limbs (Davis, 2006), humanoid robots (i.e. a robot that looks like a human in appearance and is autonomous), and radio-frequency identification implants (Jones, 2006). Traditionally the term *cyborg* has been used to describe humans who have some mechanical parts or extensions. Today however we are on the brink of building a new sentient being, a bearer of electricity, a modern man belonging to a new race, beyond that which can be considered merely *part man part machine.* We refer here to the absolute fusion of man and machine, where the subject itself becomes the object; where the *toolmaker becomes one with his tools* (McLuhan, 1964). The question at this point of coalescence is how human will the new species be (Toffler, 1981);

and what are the related ethical concerns? Does the "evolution" of the human race as recorded in history, come to end when technology can be connected to the body in a wired or wireless form?

FROM PROSTHETICS TO AMPLIFICATION

While orthopedic replacements corrective in nature have been around since the 1950s (Banbury, 1997) and are required to repair a function that is either lying dormant or has failed altogether, implants of the future will attempt to add new functionality to native human capabilities, either through extensions or additions (Figure 1). Kevin Warwick's Cyborg 2.0 project for instance, intended to prove that two persons with respective implants could communicate sensation and movement by thoughts alone. In 2002, the BBC reported that a tiny silicon square with 100 electrodes was connected to the professor's median nerve and linked to a transmitter/receiver in his forearm. Although, "Warwick believe[d] that when he move[d] his own fingers, his brain [would] also be able to move Irena's" (Dobson 2001, p. 1), the outcome of the experiment was described at best as sending "morse-code" messages. Warwick (2002) is still of the belief that a person's brain could be directly linked to a computer network. Commercial players are also intent on keeping ahead, continually funding projects in this area of research. IBM's Personal Area Network (PAN) prototype transmitter, showed the potential to use the human body's natural salinity as a conductor to sending or receiving data electronically. While the devices used were wearable, it showed that as many as four people could exchange electronic messages simply by shaking hands (Scannell, 1996).

THE SOUL CATCHER CHIP

The *Soul Catcher* chip was conceived by former Head of British Telecom Research, Peter Cochrane. Cochrane (1999, p. 2) believes that the human body is merely a *carcass* that serves as a *transport* mechanism just like a vehicle, and that the most important part of our body is our brain (i.e. mind). Similarly Miriam English has said: *"...I like my body, but it's going to die, and it's not a choice really I have. If I want to continue, and I want desperately to see what happens in another 100 years, and another 1000 years... I need to duplicate my brain in order to do that"* (Walker, 2001). Soul Catcher is all about the preservation of a human, way beyond the point of physical debilitation. The Soul Catcher chip would be implanted in the brain, and act as an access point to the external world (Grossman, 1998). Consider being able to download the mind onto computer hardware and then creating a global nervous system via wireless Internet (Fixmer, 1998). By 2050 Cochrane has predicted that downloading thoughts and emotions will be commonplace (LoBaido, 2001). Billinghurst and Starner (1999, p. 64) predict that this kind of arrangement will free up the human intellect to focus on creative rather than computational functions.

Cochrane's beliefs are shared by many others engaged in the *transhumanist* movement (especially Extropians like Alexander Chislenko). Transhumanism is abbreviated as >H or H+ and is an international cultural movement that consists of intellectuals who look at ways to extend life through the application of emerging sciences and technologies. Marvin Minsky believes that this would be the next stage in human evolution; a way to achieve true immortality "replacing flesh with steel and silicon" (Kaku, 1998, p. 94).