Chapter Ten

The Cyborg Soldier: Future/Present

Recall that it is not only that men make wars, but that wars make men.

—Ehrenreich (1987b, p. xvi)

Cyberwar is about organization as much as technology. It implies new man–machine interfaces that amplify man’s capabilities, not a separation of man and machine.

—Arquilla and Ronfeldt (1993)

At the outset we will assume that the “man–machine” system is more perfect than “man” (people) or “machine alone.”

—Druzhinin and Kontorov (1975, p. 16)

Soldiers Future/Present: Popular Images Troops

Wars do make men. And not just real wars. Possible wars, imagined wars, even unthinkable wars shape men—and women. Just as modern war required modern soldiers, postmodern war needs soldiers with new military virtues who can meet the incredible requirements of high-tech war. These new soldiers are molded, in part, by personnel science and marketing analysis in uneasy alliance with traditional military discipline and community. But in another sense it is the weapons themselves that are constructing the U.S. soldier of today and tomorrow.

Weapons have always played an important role in war, from the gear of the Greek hoplite to the tankers of the world wars. Today, however, it is not that the soldier is influenced by the weapons used; now he or she is (re)constructed and (re)programmed to fit integrally into weapon systems. The basic currency of war, the human body, is the site of these modifications,
whether it is of the "wetware" (the mind and hormones), the "software" (habits, skills, disciplines), or the "hardware" (the physical body). To overcome the limitations of yesterday's soldier, as well as the limitations of automation as such, the military is moving toward a more subtle man-machine integration: a cybernetic organism (cyborg) model of the soldier that combines machine-like endurance with a redefined human intellect subordinate to the overall weapon system.

Current DoD policy is creating a postmodern army of war machines, war managers, and robotized warriors. Logistics command sees the soldier as a digitalized "manprint," as Major General Wallace C. Arnold explains (1995). For him the key issue is the soldier-information interface. The ideal postmodern enlisted soldier is either an actual machine (information processing) or will be made to act like one through the psychotechnologies of drugs, discipline, and management. The ideal postmodern officer is a skilled professional who manages weapon systems and sometimes applies them in combat. In all cases soldiers are to be intimately connected with computers through hard wiring, lasers, and more traditional soldier-machine interfaces.

That is why in North America the cozy often comical images from modern war of U.S. (Kilroys, dogfaces, G.I. Joes) and Commonwealth (wisecracking Tommys, soft-spoken Canucks, loud Anzacs, and silent Gurkhas) soldiers from World War II (Combat, Hogan's Heroes, McHale's Navy) have been shattered. In film portrayals of the first postmodern war, Vietnam, multiethnic teams of clean-cut born-in-America guys (The Green Berets) coexist with men trapped in an insoluble moral dilemma (Deerhunter, Platoon) or even inside of Apocalypse Now. The Vietnam War means Vietnam protests (Coming Home, Fields of Stone), as even the charmed circle of all-American guys (Tour of Duty) must recognize. The first TV show about Vietnam, M*A*S*H, was set in Korea during that conflict, but it was always, psychologically and ideologically, about Vietnam. It was one of the most successful TV shows ever in the United States, and it still plays out its ironic antiwar message every day in syndication. Its dark humor is copied by some (Good Morning Vietnam), and its feminine healing focus by others (China Beach); but it remains unique, marking as it does in the mass media the critique of modern war first elaborated by the poet veterans of World War I and then by the novelist veterans of World War II.1

As the reasons for war have become less clear, the moral standing of the participants has also become very confusing to some of us. "Bad guys" and "good guys" (which translate as "us" and "them" or "friend" and "foe" in the jargon of counterterrorist experts, police, and the military) are harder to keep separate when one compares:

- Stateless terrorists and state terrorists
- "Right Stuff" astronauts ("one giant step for mankind") and "Top
Gun" pilots (killing Mu'amar Gadhafi's four-year-old daughter with a smart bomb)

- Jedi Knights (modeled on the Vietcong according to filmmaker George Lucas, the creator of Star Wars), the nickname given the war planning staff of General Schwarzkopf's Gulf War command (Gordon and Trainor, 1995, p. 126), and Rambo (a Nam vet whose first movie is all about killing policemen)

- Fat Pentagon officers smoking cigars with briefcases full of money (as shown in countless political cartoons), and naive soldier-engineers (Jimmy Carter)

- Losing superpower soldiers riding their tanks and helicopters out of Afghanistan and Vietnam, and the winners

- Good cyborgs (Robocop, D.A.R.Y.L., and hundreds of cartoon and sci-fi characters) and bad cyborgs (The Terminator and more hundreds of cartoon and sci-fi characters), often in the same movie (Terminator II, Robocop II)

- Elite U.S. soldiers invading countries (Grenada, Panama), training death squads (Latin America), killing civilians with high-tech weapons (Persian Gulf, Libya), and as victims of terrorism (Marines in Beirut, woman soldier in Germany, black sailor on hijacked plane, Scud victims in Saudi Arabia)

- Boring, nerdy war researchers (as characterized in David Broad's book Star Warriors) and Dr. Strangelove scientists

G.I. Joe is now a TV character who fights more battles with transformers (robots that can turn into cars and planes) and dinosaurs than any normal human enemies. Almost all of the violent children's cartoons involve cyborgs and other strange mixes of the human, the beastly, the alien, and the technological. Some shows allow the kids at home to join in the fight as well by using expensive interactive toys. In just the last four years of the 1980s the main war cartoons included (with their toy companies in bold and their TV network or producer in small capitals: the interactive Captain Power and the Soldiers of the Future (Mattel); interactive Photon (MCA–Universal); interactive TechForce (Axlon); Inhumanoids (Hasbro); Centurions: Power Xtreme (Kenner); G.I. Joe (Hasbro); Challenge of the Gobots (Tonka); Transformers (Hasbro); Dungeons & Dragons (TSR, CBS); Rambo: Force of Freedom (Coleco); Star Wars: Droids (Kenner, ABC); She-Ra, Princess of Power (Mattel); Thundercats (MCA–Universal); Jayce and the Wheeled Warriors (Mattel); Superpowers (Marvel Comics, ABC); Voltron (Matchbox); Lazer Tag (Worlds of Wonder, NBC); Star Wars: Ewoks (Kenner, ABC); Silverhawks (Kenner); HeMan & Masters of the Universe (Mattel); Robotech (Matchbox); Dinosaurs and Dinoriders (Legos).  

Postmodern war is as disjointed as the cartoons, even if it does lack dinosaurs. It is both the extrapolation of modern war motifs and weapons
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into their *reductio ad absurdum* and their unabsurd opposite images. So the atomic bomb and the computer, the two great military brainchildren of World War II, become nuclear overkill facing hijackers armed with handguns and the electronic battlefield is overrun (and undermined) by the agrarian Vietnamese. And, as alluded to above, the common-man foot soldier has assumed any number of other identities from a female soldier-tech repairing a faceless machine to an elite bloody-minded covert action warrior using a satellite to call in a killer droid.

In important ways the spies and spymasters of the CIA and other intelligence agencies have to be considered the precursors, and the comrades, of today's soldiers, especially the elite (counter)terrorist troops and commandos of the Marines and Delta Force. Since the 1950s the CIA has tried to use drugs, electricity, and hypnosis to turn some intelligence agents, their own and the opposition's, into functional robots. As one CIA psychologist put it, "The problem of every intelligence operation is how do you remove the human element" (quoted in Marks, 1979, p. 49). Just exactly how successful these attempts have been is impossible to find out, but several clear trends are obvious:

1. The replacement of most human intelligence collected by agents with signal and satellite data
2. The widespread experimentation on the use of drugs and hypnosis to create amnesia and to facilitate the reprogramming of agents
3. The use of direct electrical implants (bioelectronics) to control behavior

CIA experiments on many animals, including monkeys, dogs, cats, crows, and various reptiles (among others), certainly took place and may well be continuing. A CIA document from April 1961 admits that the CIA had a "production capability" in direct electrical brain simulation and that they were "close to having debugged a prototype system whereby dogs can be guided along specific courses." Less than a year later another CIA report claimed that "the feasibility of remote control of activities in several species of animals has been demonstrated." It went on to promise that "investigations and evaluations" would be aimed at applying "these techniques to man." What the CIA has managed to develop in the almost three decades since these reports is not public knowledge but research continued for at least ten years and possibly to this day (Marks, 1979, pp. 209–211).

**War Managers and Trainees**

My image in some places is of a monster of some kind who wants to pull a string and manipulate people. Nothing could
be further from the truth. People are manipulated; I just want them to be manipulated more effectively.

—B. F. Skinner (quoted in Marks, 1979, p. 214)

In many ways, trying to make soldiers into machines has preceded making machines into soldiers. Uniforms, hierarchies, discipline, training, and rules of war have all been used for some time to try to control soldiers, to make them interchangeable, and to mold them into an effective fighting unit. Since the early 1900s modern labor management (capitalist and state socialist) has coevolved with military personnel management. Both aim at fitting the individual worker-soldier into the military–industrial system.

Lawrence Radine, in his book *The Taming of the Troops: Social Control in the United States Army*, traces how current military managers have added to their traditional forms of “coercive” and “professional paternalist control” a new form he calls “co-optive rational control through behavioral science and management.” In his view personal leadership is being replaced by “testing, attitude surveys, various utilitarian and life-style incentives, and weapons systems” (1977, p. 91).

He points out that

One application of this social engineering approach is the way the military matches men to machines (as well as matching some aspects of machines to men). The man is the extension of such machines as artillery pieces or weapons systems generally; he is an adjunct for some limitation the machine has due to its incomplete development. (p. 89)

An important part of this is the very detailed study of the humans in their system context: “[The soldier’s] performance is measured and predicted to a degree of precision unmatched in previous human experience.” Measurement of behavior leads to more effective social control and might even “provide a nearly unlimited potential for the bureaucratic or administrative domination of man.” He credits C. Wright Mills for first describing this style of domination, and coining the term “cheerful robots” for the type of subjects it produces. Radine concludes that “the ultimate result of co-optive rational controls is cheerful states of mind, with no values or beliefs other than one’s own comforts, and automatic, mechanical performance” (p. 90).

The rationalization of social control in the U.S. military has many applications. In training it involves using B. F. Skinner’s principles of reinforcement and punishment as operant conditioning. Survey research is used to identify effective reinforcers, and they are administered carefully to maximize their impact. Just as important is the systems approach.

Radine notes that “social control is more effective when it is embedded in the totality of a situation,” and then he reflects upon the importance technology can have in maximizing the control of individual soldiers:
As weaponry gets more complex and is based more on hardware than on manpower, the interaction of various components becomes emphasized and is termed a system or a weapons system. The weapons system becomes, perhaps in an unanticipated way, a new and effective technique of domination. It elicits obedience and makes resistance appear senseless. The other development associated with the modernization of weaponry and hardware is the principle of training men who operate weapons systems through simulating the environment with a computer. (1977, p. 130)

As part of a system the individual soldier has less of a chance to deviate from expected behavior. Realistic simulations also serve as "a means of indoctrination" both because they serve to validate the system itself and because, for a technosoldier launching a missile, simulated conditions and real-war conditions are almost identical. Through systems analysis, social psychology, behavioral sociology, personnel management, and computer-mediated systems, the individual soldiers becomes part of a formal weapons system that is very difficult to resist. It produces "a kind of isolation" from the violence of war that allows for its unrestrained prosecution because the bomber pilots and other distant killers are removed from the bloody results of their decisions. And "the structuring of a situation through the use of technologically developed equipment and realistic team training" produces a "degree of conformity and effectiveness" that is much better than traditional leadership, because it "is very difficult for the individual to sense the degree to which this form of domination can control his behavior" (p. 142).

It is important to remember that as one goes up the chain of command the officers are supposed to be controlling, not controlled. In many cases they certainly shape events, but at times it seems they act as unconsciously as any enlisted soldier. Certain desires seem to dominate some military men. These hidden emotions return in the form of hubris and hatred. Under President Reagan they almost took over U.S. foreign policy, as a tight circle of military officers and spies with control of the National Security Council and the ear of the president sought to effect the military rollback of the communist menace around the world (W. Kennedy, 1987, p. 8; Zakaria, 1987, p. 19). But men like Oliver North, the zealot warrior who on his own time returned to Vietnam and went on dangerous combat missions, are the exception. Most officers who rise to power are cooler technocrats with better impulse control, such as the intelligence admirals (Bobby Inman, Stansfield Turner, and John M. Poindexter) or those consummate politicians Gen. Colin Powell and Gen. H. Norman Schwarzkopf. They wanted to manage the Cold War with the Soviets, and they want to manage the current Cool War with
the Third World, not fight it. They despise Ollie North because of his political approach to what they see as a technical problem: managing the U.S. empire. Besides, he didn't respect the military's own hierarchy, and he even put Republican politics above the needs of the military as an institution.

But their illusions are the same as North's, by and large: great faith in technology; unreflective belief in the rightness of the American empire; incredible hubris combined with the fear and anger of those whose profession is poised on the brink of exterminating the human race. But they don't get excited. They send a memo, make a proposal, procure that new weapon or management system that will really get the problem under control. And they don't forget their careers.

Thus, most of today's officers are technocrats, not combat leaders. In the Air Force almost 60 percent of the officers have graduate degrees, and even the Army boasts that a quarter of its officers have a Master's or a Ph.D. degree (Satchell, 1988, p. 2). Roughly half the Navy's officers are line officers who might see combat; the other half are in noncombat specialties. There is no combat specialty at all, while three systems of technomanagerial specialization coexist, each with powerful bureaucratic sponsors. While 200 Navy officers were in senior service colleges learning "warrior craft" in 1985 some 1,200 were in full-time pursuit of advanced degrees in science, engineering, and management. Also, while the Navy has over 200 public affairs officers, less than 30 officers teach coordinated battle group tactics. Instead of "the management of violence" there is "management for its own sake" (Byron, 1985, p. 68). Actually the Navy is quite right to worry about public affairs more than coordinated battle group tactics, as cuts in public spending are much more of a threat to the Navy than any enemy fleet. The management of information, even the public meanings of naval battles, is of crucial importance.

Studies of World War II by historian S. L. A. Marshall (1947) purported to show that less than 25 percent of the men in combat were really shooting at the enemy. Some men didn't want to kill, he claimed, while others were too afraid to try. While Marshall's research has been discredited, there is little doubt that war is almost off the human scale. It is also very revealing that the U.S. military establishment was so willing to believe Marshall's theories even though most World War II combat troops have always considered them bunk. Here is a case of a pseudoscientific claim (Marshall said he had conducted thousands of after-combat interviews as the basis for his research) becoming "fact" in military discourse even though it was denied by combat veterans (including generals such as Maxell Taylor and Matthew Ridgeway), and it hardly reflected well on the image of the American fighting man either. The reason Marshall's ideas were so popular is that they paraded as science, they confirmed the belief of many high officials (civilian and
that war could be studied and managed, and they supported the drive for weapons systems in detail.

Later, more valid psychological studies showed that almost every human has a limit as to how much battle he or she can stand. Only 2 percent of all examined soldiers were capable of continued heavy combat of more than a few months. The vast majority of this 2 percent tested out on standard psychological profiles as pure psychopaths with no conscience or emotional involvement in the killing and dying around them. They can act coldly, with calculation and aggression but not blood lust. Producing more such soldiers seems to be the aim of many training schemes and significant military drug research (Gabriel, 1987).

To the bureaucrats one of the biggest management problems is finding, or making, soldiers like this. To manage war there needs to be a way to facilitate the average soldier performing well under the extraordinary stress of war today. The World War II studies showed that traditional training does not suffice. So, years ago, the Pentagon began its search for ways to improve the integration of human soldiers into the inhuman battlefield, at least until there are more effective killer robots. The DoD will try almost anything.

Training for postmodern war involves a central paradox, however: potential external stimuli (death and destruction) are much greater than in previous wars, but the duties of the soldiers are more technical and complicated. How can psychological limits be overcome and yet human judgment preserved? This was one of the central problems addressed at a symposium held in 1983 by the Army Institute for the Behavioral and Social Sciences at Texas Tech University in Lubbock, Texas.

In order to avoid “cognitive freezing” in battle, the academic and military experts at this symposium proposed several different approaches to training, including: “overtraining” so that under stress the desired behavior occurs; creating quantitative instead of qualitative tasks (spraying automatic weapons fire instead of aiming single shots at people); and forming strong peer groups. Also, the use of hypnotism and drugs has been hinted at (Hunt and Blair, 1985). Officers, technical specialists, and even the average soldiers to some extent will have to be helped to be innovative and show initiative, two qualities high-tech weapons, in general, and AirLand Battle (ALB), in particular, depend upon. Many analysts see such conflicting advice as indicative of the unrealistic assumptions of ALB, which is probably true. But it also shows that postmodern war calls for more than one type of soldier. At a minimum there must be those who can perform almost mindlessly under extreme conditions that most humans cannot bear, and at the same time there is a need for experts in management, technical repairs, and the application of weapon systems.
Psychotechnologies: Be All That You Can Be Made Into

Eyes of men running, falling, screaming
Eyes of men shouting, sweating, bleeding
The eyes of the fearful, those of the sad
The eyes of exhaustion, and those of the mad.
Eyes of men thinking, hoping, waiting
Eyes of men loving, cursing, hating
The eyes of the wounded sodden in red
The eyes of the dying and those of the dead.

—Anonymous

Since the Spanish–American War more U.S. soldiers have been lost to psychiatric collapse than have been killed in action. Recent wars have seen the rate climb to twice the number killed and almost a third of all casualties. In a conventional war in Europe between Great Powers it is estimated that 50 percent of the casualties will be psychiatric. On a nuclear (or chemical/biological) battlefield they will certainly be extremely high among survivors. It is the escalating speed and lethality of battle that is seen as the cause of these increased psychic casualties.

To deal with this problem, the U.S. Army set up the Human Resources Office (HUMRRO) and other think tanks. HUMRRO coined the term "psychotechnology." It has sought to apply its vision of "human engineering," "human quality control" and the "man–weapon system" to U.S. military problems since its founding in 1951. But this systems view is just the beginning. The human component must be modified if it is not to be the weakest link in an integrated weapons system. The incredible demands of postmodern war have precipitated a bureaucratic scramble for technological solutions.

Among the most significant projects for understanding the role of the future soldier are those to introduce artificial intelligence (AI) into the cockpits of Air Force planes and Army helicopters. Through the Army–Air Force program to build the AI Virtual Cockpit, and DARPA's "phantom flight crew" of five expert systems in the SCP's Pilot's Associate demonstration project, the pilot will be intimately connected to his or her flying-fighting machine.

The goal is to improve "man–machine interaction," including "control through line of sight, voice, and psychomotor responses." Computerized "decision aids" are proposed, along with a vague call for techniques to "effectively and efficiently couple operators to advanced systems."

Kenneth Stein reports that "all on-board systems" will be "monitored and diagnosed" for their "health and current/projected operational status." This includes the human pilot who is prone to blackout, redout, exhaustion,
wounding, or distraction. The "tactical planning manager . . . may wait for
pilot confirmation or may initiate responses" itself. "Where there is time for
the pilot to make a judgment" it will graciously suggest possible actions and
recommend one (Stein, 1985, p. 73). The monitoring program has been
dubbed "the guardian" (Editors of Time-Life, 1988, p. 81).

This "pilot state monitoring" is slated to include systems that read the
pilot's brain waves, follow eye movements, and test the conductivity of sweaty
palms. All this is in order to gauge his or her mood so the computer will know
how to communicate with the pilot, or even when to take over the plane from
the pilot if it is deemed necessary (Faludi, 1986; Wilford, 1986).

Work is also proceeding on a number of subroutines that will plan the
Pilot Associate's possible future duties by predicting the pilot's requests and
actions ahead of time. As a team from the Artificial Intelligence Laboratory
at the Air Force's Institute of Technology coyly notes: "Because the pilot and
computer have trained together, the pilot expects the computer to begin
problem solving when the situation dictates it." The team goes on to
propose a "goal detector" to "deduce" the goals of the pilot "by observing his
actions" (Cross et al., 1986, pp. 152, 163). According to some of the other
Virtual AI Cockpit researchers, this "mindware" is supposed to create "a fully
interactive virtual computer space" wherein the human and the computer
"live together" (Wilford, 1986).

For the more distant future the military is clearly aiming for direct
brain–computer connections. It could be through computer monitors "reading" the pilot's specific thoughts. The Navy has been sponsoring such studies
since at least 1970. A report on some of this early research is called "Electrical
'Windows' on the Mind: Applications for Neurophysiologically Defined
Individual Differences." This survey claimed, "Real progress toward a more
fine-grained window on the mind began when digital computers became
generally available" (Callaway, 1976, p. 90).

A Stanford Research Institute (now called SRI) project in the early
1970s, funded by the DoD, aimed not only at reading minds but also at having
a computer insert ideas and messages into the brains of people. Project
director Dr. Lawrence Pinneo reported that his computers were 30–40
percent accurate in "guessing" what a person was thinking (Counterspy
Staff, 1974, p. 5). Research at Johns Hopkins University has managed to sort out
enough brain waves to predict when a monkey will move its arms by reading
its electrical mental patterns before it acts. At Wright–Patterson Air Force
Base they've gone even further. Human subjects have been trained, using
biofeedback signals of flickering lights, to fire brain waves in increasing or
decreasing amplitudes. These signals turn their flight simulator left or right,
as if they were flying by brain waves (Tumey, 1990, p. 16).

Then again, perhaps the connections will also be hard wired neuron to
silicon. The Air Force has paid for much of this biocybernetic research since
the 1970s, including work in its own labs that puts computer chips into dog brains in experiments aimed at giving pilots “an extra sensing organ.” But it is the Army that has paid for the work at West Texas State (and maybe the similar work at Stanford) that has succeeded in growing rat and monkey neurons to silicon chips (Goben, 1987, p. 13; Scientific American Staff, 1987, p. 67). The goal is to develop biochips that can be activated by hormones and neural electrical stimulation and which can, in turn, initiate hormonal and mental behavior in humans. It is hoped that such human–machine integration will result in quicker reaction times, better communication, improved control, and greater reliability overall.

Jeffrey Moore, a scientist in the elite advanced weapons group at the Los Alamos National Laboratory, wants to use the biocybernetic brain-computer connection work of the Pilot’s Associate and related programs to allow a foot soldier to control a 200-pound suit of armor called PITMAN. It would be capable of stopping a 50-caliber bullet and offer CBN protection. A series of small electric motors would move the massive limbs and a brain-accessing computer would control them. Los Alamos even calls it “a mind-reading protective suit” (Davies, 1987, p. 78).

Even farther out is the research by the Delta Force, who coined the Army’s motto “Be All You Can Be.” This Delta Force got its name from the belief that technology was the difference, or delta, between the United States and the USSR. (It is unrelated to the antiterrorist commando teams of the same name.) A Delta Force spin-off proposed the First Earth Battalion plan in 1981 for the “warrior-monk” who had mastered “ESP, leaving his body at will, levitation, psychic healing and walking through walls.”

Lt. Col. Jim Channon, U.S. Army, the originator of the First Earth Battalion, explains that the United States lost in Vietnam because “we relied on smart bombs instead of smart soldiers.” He also states that “stronger than firepower is the force of will, stronger still is spirit, and love is the strongest force of all.” But actually Channon’s ideal is more in the line of the cyborg. He thinks the future of war belongs to psychoelectronic weapons and explains why the “free world” will have an advantage in developing them:

If you look for clear examples of where the free world has an advantage over the world of nonbelievers, you will discover two resources that clearly stand out in our favor. They are God and microelectronics. The beauty in that is you can use the microelectronics to project the spirit ... brains work like that. Hence the field of psychoelectronic weaponry. (quoted in McRae, 1984, p. 124)

Can one ask for clearer proof that at least some military leaders not only have a religious faith in computers but also invest them with deep mystical powers? The urge to create life, to defeat death by dealing it out, and to master nature
are so powerful, at least in this case, that military policy becomes stranger than most science fiction.

A number of Channon’s ideas on training were investigated by the Pentagon, and the First Earth Battalion had over 800 officers and bureaucrats on its mailing list, including eight generals and an undersecretary of defense. But it was not a major research effort. It got less than $10 million a year (p. 6). More important, it shows how desperately the U.S. military is searching for solutions to the paradoxes of postmodern war, and how even the most ‘spiritual’ formulations can suddenly be twisted around to become part of the general hypercomputerization of the U.S. military.

This technoscience turn is a common one when the military describes its attempts to find strategic advantage in occult practices. Studying Soviet ESP becomes research into “novel biological information transfer” for the CIA, and psychically tracking submarines is, according to the U.S. Navy, investigating “the ability of certain individuals to perceive remote faint electromagnetic stimuli at a noncognitive level of awareness” (p. 5). The Army has even given out a number of contracts to buy psychic shields for missile silos to prevent psychics from detonating the warheads before they can be launched. Other studies have explored performing and preventing psychic computer programming. As Ron McRae notes in his book on military psychic research, Mind Wars, the military point of view is that the “psychic control of computers would indeed be analogous to a nuclear monopoly” (1984, p. 54).

Related projects include SRI’s numerous studies, by researcher W. F. Hegge, aimed at “controlling automatic responses to stress and injury” for the “non-drug management of wound-related pain” (Manzione, 1986, pp. 36–38). Another, is the U.S. Army’s use, in 1981, of remote-viewing psychics to look for one of its officers, Brig. Gen. James Dozier, kidnapped in Italy by the Red Brigades. Three years later the U.S. military launched Project Jedi (yes, it was named for the Star Wars movie knights), to see if neurolinguistic programming could improve soldier performance (Squires, 1988, p. 3). All of these programs involve reconceptualizing New Age and occult knowledges with metaphors of information transfer, networking, and programming from computer science. They also share a very low success rate.

In light of the failure of these esoteric methods and considering their social context, it is unsurprising that the U.S. military would put the most energy into developing more direct and traditional (at least in the United States) ways of controlling stress: drugs.

**Just Say Yes to Drugs**

medicines that work "without degradation to performance" are a high priority. The noted military psychiatrist Dr. Richard Gabriel claims that this research for "a nondepleting neurotrope" ("a chemical compound that will prevent or reduce anxiety while allowing the soldier to retain his normal levels of acute mental awareness") is nearing success with grave implications:

Both the U.S. military and the Soviets have initiated programs in the last five years to develop such a drug; the details of the American program remain classified. . . . The U.S. military has already developed at least three prototypes that show great "promise." One of these drugs may be a variant of buspirone. If the search is successful, and it almost inevitably will be, the relationship between soldiers and the battle environment will be transformed forever. . . . if they succeed . . . they will have banished the fear of death and with it will go man's humanity and his soul. (1987, pp. 143–144)

While unique in terms of their potential effectiveness, these current projects to develop such drugs are part of a U.S. research program going back to the 1950s and military traditions thousands of years older.

There is indeed a long history of using drugs to improve performance in war. Dr. Gabriel notes that the Koyak and Wiros tribes of Eurasia used a drug made from the mushroom Amanita muscaria that was probably quite effective. He also discusses the hashshashin ("assassins"), who used hashish, Inca warriors chewing their coca leaf, and the traditional double jigger of rum for British soldiers and sailors about to face battle. The Soviets combined strict discipline (over 250 general officers shot for cowardice in World War II and thousands of those in the lower ranks executed) with issues of vodka and valerian to calm Red Army soldiers, and caffeine to wake them (pp. 136–140).

Official U.S. interest in drugs other than alcohol can be traced to the 1950s. As early as 1954 the Air Force was testing the performance effects of dextroamphetamine, caffeine, and depressants on men at Randolph Air Force Base, Texas. Three years later the amphetamine was tested again (Payne and Hauty, 1954, pp. 267–273). There have probably been hundreds of studies since.

When it was revealed that the CIA had secretly dosed unsuspecting subjects with LSD and sought ways to psychoprogram killers (with drugs and by using "psychology, psychiatry, sociology, and anthropology"), a giant scandal ensued (Congress of the United States, 1975, p. 610). An important side effect of the resulting investigation was the public unveiling of most military human-subject research up to the mid-1970s. Bearing in mind that each human-subject study was probably based on many more animal studies, it becomes clear that millions of dollars was spent between 1950 and 1975
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on the search for drugs that would lower stress and fear while raising or maintaining performance levels.

For example, between 1956 and 1969 the U.S. Air Force sponsored over $1 million in research by doctors at Duke, Baylor, and the University of Minnesota on the effects of stress. This included Dr. Neil R. Burch's work on "Psychophysiological Correlates of Human Information Processing," which he claimed had "direct potential applications to problems of interrogation . . . and may be employed in programing an on-line automatic analysis of data." In other words, he hoped his work would help develop a machine to interrogate prisoners. The guiding principles of this work were clearly stated by the Duke doctors: "to develop specific means to alter or modify responses [of humans to stress] in any desired fashion" (Congress of the United States, 1975, pp. 1135-1138).

In 1971 two researchers at the Army's Aberdeen Research and Development Center and Proving Ground published an annotated bibliography on behavior modification through drugs for the Human Engineering Laboratories, showing the ongoing military interest (Hudgens and Holloway, 1971).

The congressional investigation of 1975, chaired by Sen. Edward M. Kennedy (Dem.-Mass.), revealed that at that time there were at least 20 human-subject studies on controlling stress being conducted by the military. At Walter Reed Army Hospital, there were experiments on the effects of stress on "higher order . . . human performance," "psychophysiological changes . . . of problem solving," and "military performance." At the Army Research Institute of Environmental Medicine, researchers examined "the effects of emotional stress" and assessed "visual response times" under stress. "Metabolic, physiological, and psychological effects of altitude" were measured at the Letterman Army Institute of Research. The Army Medical R&D Command sponsored in-house research on recovery from fatigue. The Navy in Oakland, CA, took a much mellower line and looked into hypnosis for pain relief and relaxation through meditation. While their fellows at the Navy Research Lab did large studies on "effects of combined stresses on Naval Aircrew Performance" and the "psychological effects of tolerance to heat stresses" along with a dozen studies on the effects of cold, water pressure, acceleration, and biorhythms on military performance (Congress of the United States, 1975, pp. 620-627, 640).

The biggest program reported was run by the Edgewood Arsenal and involved an attempt to make a self-administered antidote for soldiers exposed to chemical weapons, specifically oximes. The antidote tested was a combination of atropine, the mysterious TMB4, and the antiphobic drug benactyzine (pp. 765-791).

Considering all this research it is no surprise that the U.S. military issued illegal drugs during Vietnam to elite units and probably still does. As Elton Manzione, a former LRRP (member of a Long-Range Reconnaissance Pla-
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toon), reports, “We had the best amphetamines available and they were supplied by the U.S. government” (1986). He also quotes a Navy commando:

> When I was a SEAL team member in Vietnam, the drugs were routinely consumed. They gave you a sense of bravado as well as keeping you awake. Every sight and sound was heightened. You were wired into it all and at times you felt really invulnerable. (p. 36)

Dr. Gabriel argues that major advances in the esoteric disciplines of molecular biology, biocybernetics, neurobiochemistry, psychopharmacology, and related fields means that much more effective drugs can be developed. As noted above, he fears that both the United States and the Russians are about to develop such a drug with the effect of not only keeping soldiers from feeling fear but almost anything else as well, making them functional psychopaths.

Since the postmodern battlefield also requires humans to fight 24 hours a day, there has to be research like Project Endure of HUMRRÔ to develop night goggles and scopes, or even to modify the human eye itself for night vision, by using atropine (a belladonna derivative) and benactyzine for dilating pupils. The 1978 investigations by Optical Sciences Group of San Rafael, Cal., A. Jampolsky, chief investigator, brought in $700,000 for one of the experiments (Manzione, 1986, pp. 36–38). Of course, infrared and other night vision devices have proven very effective in this regard as well.

The programming of soldiers with drugs is analogous to programming computers. Imagine your immune system programmed against VD (venereal disease), viruses, bacteria, and various toxins; a body with attached bionic parts and eye inserts; a brain hard-wired to a mechanical associate; your mind drugged or psychoprogrammed against stress, fear, altitude, depths, heat, cold, and fatigue; continuously connected and monitored by the computer systems that you watch and use; riding in some secure CBN microenvironment protected by autonomous and slaved weapon systems and controlling vast resources in destructive power and information manipulation: you are a cyborg soldier.

### Postmodern Soldiers

> There's a difference between a soldier and a warrior.
> —**Delta Force operator**

Advances in networking technologies now make it possible to think of people, as well as databases and processors, as resources on a network.

> —**RAND analysts, Arquilla and Ronfeldt (1993)**
The Future

That there will be future warriors is the only certainty.
—Col. Frederick Timmerman, Jr. (1987, p. 55)

Col. Frederick Timmerman, Jr., U.S. Army, director of the Center for Army Leadership and former editor-in-chief of Military Review, embraces this creature with pleasure, naming it the future warrior:

In a physiological sense, when needed, soldiers may actually appear to be three miles tall and twenty miles wide. Of course in a true physical sense nothing will have changed. Rather, by transforming the way technology is applied, by looking at the problem from a biological perspective—focusing on transforming and extending the soldier's physiological capabilities... [can we not achieve the superman solution]? (1987, p. 54)

Consider the range of Colonel Timmerman's speculations. (And they are not just his, actually, but as we have seen they are military policy. They are breathing people with healthy budgets. They are embodied in real weapons and real soldiers.) They don't seem very coherent. They are a search, a recognition, that if war is to remain central to human culture, as it is now, and technological development continues, then soldiers will have to change, even "transform," their bodies and also their role. Colonel Timmerman again:

It sounds radical, but the time when soldiers are merely soldiers may be ending. Because of an enhanced social role, soldiers of the future may have to be social engineers, appreciate the political implications of their every move and be able to transform themselves to perform missions other than those currently classified as purely military. ... Finally, we may actually be able to use enhanced social capabilities to degrade an opponent's social cohesion. (p. 53)

The good colonel seems to have slipped through an elision in time. This is what covert soldiers (spies, spooks, mercs, operatives, special forces, commandos, delta force, spetznek) from Central America to Central Africa to Central Asia do already. Today. And didn't NATO's arms race ("enhanced social capabilities") have some effects on the Warsaw Pacts' "social cohesion"? "Language skills" are already a primary weapon through black and white propaganda and public relations.

So in many strange ways certain themes of information, high technology, computerization, and speed remain consistent. When they collide with traditional military culture (as institutionalized in the armies, navies, and air forces of the most powerful world empire ever) these themes produce the many cyborg images and realities of the U.S. military today. But they represent just some of the potential developments of the postmodern soldier.
Even as they come to pass they are inevitably confounded and contrasted with other fragments of the warrior icon, because the same conditions that have forced the U.S. military to reconceptualize itself (especially the advances of technoscience) have led others, soldier and civilian, to appropriate the warrior mythos within an argument that the organized killing of war must end.

This is what the final chapter is about. But before we go there the imagining of future wars, in military planning, must first be confronted. Sadly, all our dreams of peace come from the waking nightmares of war.