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The Crisis of InfoWar

Introduction

InfoWar is a sexy term for a very unerotic set of concepts. While the idea might be good for military budgets and mass market magazines it doesn't actually describe a new type of war so much as it disguises the crisis of contemporary war itself, locked into two key paradoxes. From the 1500s to 1945 modern war developed into a complete industrial-scientific system whose goal was effective total war. Ironically enough, it turned out that total war was impossible to pursue at its highest level because it would result in a real apocalypse. This is the first central paradox of contemporary war and it led directly to the advent of post-modern war.¹ Both modern and postmodern war depend on the manipulation (and increasing power) of information and yet we don't really know what information is. This is the second central paradox.

The Crisis of Information

Albert Einstein's $e=mc^2$ explains mathematically the relationship between energy and mass. This is emblematic of the great strides science has made in understanding energy and matter. But reality is made up of one other fundamental aspect which we barely understand at all: information. Of course " $e=mc^2$ " is information itself but the formula is about energy and mass, not why energy equals mass times the speed of light squared. Our ability to manipulate energy and mass has allowed us to produce weapons of mass destruction; without a similar understanding of the laws of information we will probably use them to destroy ourselves.

Much information theory isn't really. For example Claude Shannon's famous laws of information are about signal redundancy actually, and nothing about what information is. Over the last 2,000 years discrete elements of information have been studied with some success: logic and mathematics by the ancients, statistics, natural processes, and more mathematics by the moderns. But only in the late 20th Century have people started pursuing a unified theory of information, as opposed to the wild Platonic idea that all information is already in our minds or the crude claims of mathematicians like Leibnitz that to study mathematics was to study everything worth knowing.

Norbert Wiener coined the term "cybernetics" for this search for a unified information theory and the very success of the idea has rendered the explicit discipline of cybernetics pretty redundant. Instead, the information processing paradigm has colonized most disciplines from physics and chemistry, through genetics and medicine (where infomedicine formulations have supplanted biomedical metaphors), even into the social sciences and the humanities. There are also the disciplines totally predicated on the information revolution: computer science, information systems, systems analysis, ecology. And the idea has gone further, of course, taking over military thinking to a large extent, breeding that strange beast "InfoWar."

Out of all this work have come some real advances in understanding information. Interestingly enough, the first thing about information we have really understood are the limits to our understanding. Hans Gödel showed that any formal information system would either be incomplete, or have paradoxes, or both. He proved it mathematically, and applied it to mathematics, which made some mathematicians, such as John Von Neumann, actually sick. What was sicker was the illusion that mathematics was the "language of God" and capable of

explaining everything. It's nice, its beautiful, it is powerful, but it isn't "complete." Alonzo Church and Alan Turing soon showed that Gödel's proof applied even to infinite computing machines as well. The perfect computer is impossible.

These proofs are related philosophically to the claims from quantum physics (which made some traditional physicists physically, ill by the way) that in many cases to know one thing is to be denied the possibility of knowing something else (such as electron behavior) and that the observer of an event is part of it, and therefore affects it (Heisenberg's Uncertainty Principle).

The realization that from one perspective the observer is part of the system shows just how plastic the definitions of systems are. Actually, any system is made up of subsystems and it, in turn, is part of larger systems, thus revealing both the complexity of experienced reality and how important definitions are. To define a system is to determine just what it is possible to know. Gregory Bateson was the first to deeply explore the implications of this and he concluded, among other things, that a part of a system cannot fully understand the whole system. Which pretty much means that humans cannot fully apprehend reality. Not that we can't understand parts of it, but as the principles from quantum physics sketched above imply, we have to realize that to understand one thing often means we cannot understand some other thing.

Bateson also looked for principles to understand the dynamics of systems and systems of systems better. He noted the importance of symmetry, the significance of patterns and their similarities across systems, and the many complicated ways feedback can work. Feedback was the dynamic that fascinated Norbert Wiener and it is easy to see why. Feedback can be positive, negative, simple, complex, or any combination of the four. And feedback loops can intertwine and interpenetrate in incredible complexity and out of these dynamic dances other interesting properties become apparent.

There is the importance of recursion, for example, which lies at the heart of fractals. And complexity theory has shown that small events can have incredible implications (the "Butterfly Effect") thanks to the multiplying possibilities of feedback loops. Ilya Prigogine has contributed his elegant work on dissipative systems to show how in some very interesting cases some systems can transition into more complex systems with profound implications for our understanding not just of basic informational principles from physics which are still only partially understood (like entropy and extropy) but also of such complex systems as life itself. Our understanding of such systems, termed by some "out-of-control" systems because we can't control them² is growing significantly.

The irony is that the concept of InfoWar is almost totally unaffected by what we already know and are learning about information theory, especially the limits of our knowledge and the impossibility of controlling, or even predicting the behavior of, most complex systems. Instead, military InfoWar doctrine is focused on an infatuation with the growing computational power of machines and on illusions about their military usefulness. The hope is that information machines and systems will "save" war from its current crisis.

The Crisis of Postmodern War

What is this crisis of contemporary war? To put it bluntly it is that it might destroy us. War is a very old institution but it is not an inevitable or natural part of human nature the way, for example, aggression is. War is one way aggression, and competition is performed between cultures and for individuals but throughout human existence most people have not fought in

wars, most cultures have not been war-like, and wars have not been continuous. That said it has to be admitted that war is a very powerful institution and it will not just go away.

The increasing power of weapons systems has led to the crisis of postmodern war that now frames international relations. In large part this has resulted in returns to older forms of war, limited and even terroristic, and conflicts through proxies as the Cold War was fought. But it has also produced in the military an incredible technophilia. There is a raging desire for new weapons of science fictional powers and for new types of war without the political costs of traditional conflicts.

Information is central to all of these theories of new types of war. For example the U.S. military has tried mightily since the the 1970s to apply artificial intelligence (AI) to battle with no success. Not surprising since the traditional approach to AI has been as ignorant of information theory as the military is. For centuries the role of science and technology in warfare has been increasing, culminating in the establishment of a permanent war economy in the U.S. in 1945³ that institutionalized technoscientific innovation in the military and also led to the militarization of the economic and scientific spheres of society in what has been termed pure war⁴. Michel Foucault⁵ pointed out that now "politics ...is war continued by other means" instead of the other way around. The goal of much of politics now is war's survival. The method is information, automated, manipulated, and reified into machines of ever increasing complexity.

The seductiveness of information as a military element is based in part on its long history. The first, and perhaps best, analysis of war, Sunzi's *Art of War*⁶, emphasized good information above all, something every great general has understood. But Sunzi and all the great theorists since him have also understood that you could never have perfect information in war. Whether they called it "fortuna"(Machiavelli⁷) or the "fog of war" (Clausewitz⁸) they knew that some things would only be known after the battle was over, the most important thing being who would win. But in the age of weapons of mass destruction such an understanding makes wars not only ineffective as politics, but insane.

For obvious reasons the military is not going to declare war obsolete, although many retired soldiers and generals have done just that. So since 1945 there has been a desperate search for ways to "save" war, that always emphasize the importance of information in some form. In the United States military, for example, there was game theory and crisis management to control nuclear weapons (themselves a product of the information revolution), there was the electronic battlefield to win the war in Vietnam, there was low-intensity conflict doctrine following that, and there was the craze for AI weapons that culminated in the Star Wars system. The latest permutation of this quest is InfoWar and the related doctrines of cyberwar and netwar.

There are always new technologies and theories to justify these recurrent "revolutions in military affairs" (RMAs) but the basic premises remain the same: war is inevitable and new information technology wins wars. In the case of InfoWar many of the aspects of the earlier RMAs have been exaggerated incredibly. Illusions of low-casualty conflicts have morphed into totally virtual battles in cyberspace, the blurring of the line between peace and war has dissolved into a general state of continual conflict, and dreams of controlling war have been transformed into fantasies of micromanaging every aspect of battle.

These elements are all part of every military analysis of InfoWar but when one looks closely at the actual proposed implementations⁹ in the form of weapons systems and doctrines and

those cheery war "games" the soldiers like to play, it becomes clear that InfoWar in actuality will just expand war into that new place, cyberspace, and it will just magnify long standing trends in postmodern war to add new layers of command and control to the military and to further deconstruct the difference between peace and war. It also continues the militarization of outer space, the growing integration of humans into weapon systems (cyborg soldiers) and the manic search for new technologies, the latest craze being nanotechnology.

One key part of InfoWar doctrine is a strong argument. Almost every reflective InfoWar theory links the new military doctrine to fundamental changes in human culture. There are all sorts of schemata, including one that focuses on four epochs defined by power sources¹⁰ but the vast majority of military theorists look to the work of the futurists Alvin and Heidi Toffler¹¹ who argue that human culture has gone from primitive, agricultural, and industrial ages into a new informational age. To their credit, in their own book on war the Tofflers focus almost as much on the need for peace (anti-war they call it) as they do on the new opportunities the information age offers conflict.

Many anti-war activists have hopefully proposed that in fact the information revolution favors peace and democracy over war and authoritarianism. Perhaps. It has yet to be proven. While many cyberdemocracy initiatives seem hopeful and the interlinking of the world brought about by various technologies (space exploration, telecommunications) and theories (from ecology mainly) are certainly positive, many peace activists seem to think that peace is now inevitable, pushed along by a few virtual sit-ins or spectacular hacks into the Pentagon. Hardly. The War Movement is still much stronger than the Peace Movement and they have embraced the information revolution just as ardently (if perhaps even more clumsily). The future is clearly not yet written.

InfoWar and Society: Confusions, Tensions, Opportunities

The problem of InfoWar specifically and information theory in general is epistemological. How do we know what we know? In many respects this is a political question. Consider the rise of fundamentalist movements and states that combine the simplest of epistemologies with the most sophisticated weapons of mass destruction. It is no coincidence that fundamentalist world views often embrace apocalypse. The frightening thing is that they now not only have a belief in apocalypse but the technical means to bring it about. A modest epistemology based on what we know of the limits of information is the counter to fundamentalism. Politically this often takes the form of multiculturalism. Not the caricature fundamentalists promulgate that claims multiculturalism is pure cultural relativism, but rather the realization that no one culture, no one point-of-view, no one belief system, contains all truth. The truth is "out there" in more ways than one, but not in any one place. And knowing some truths, precludes knowing others. This is the way we "construct" truth, as Michel Foucault pointed out. Not out of whole cloth, but out of our choices (conscious or not) about what, and how, we want to know.

A related problem is of future shock and fallout from it such as infoglut. The military hopes InfoWar will protect it from the uncertainty of a rapidly changing world and from the deluge of information it brings, but actually these are the very aspects of postmodern society that doom InfoWar. The pace of change, in information and in society, clearly outruns any military procurement cycle imaginable. Since information is increasing exponentially while wisdom and knowledge increase only arithmetically (if at all), and because encryption always trumps decryption, information cannot be managed. In fact, it is the most information-intensive societies that are most vulnerable to InfoWar attacks and disruptions, which should

be another argument for the elimination of war but instead becomes a rationale for the militarization of cyberspace and more of the public realm.

It is the differences between data, information, knowledge, and wisdom that are least understood in terms of information theory although these may be the most important distinctions of all. The problem is that information theory comes out of mathematics, logic, and computation and these may not be the right tools for understanding wisdom and knowledge, to put it mildly. This is why it is so appropriate for an arts festival to take up an issue like InfoWar. InfoWar, like all war, is too important to be left to the generals.

Art, for some of us, involves using information to create knowledge, even wisdom, that escapes all simple logic-chopping formulas. Words turn back from some great truths. Some knowledge can only be articulated in art works, even art acts. As the physicist Niels Bohr pointed out, the opposite of a great truth is often another great truth. That is why we need to use a more sophisticated epistemology than those advocated by most philosophers who are limited to the most simple logical steps and human senses. Reality is bigger than that and more alive. It is even more dynamic than the dialectic (thesis, antithesis, synthesis) based on simple dualities. Most dualities are not helpful. Peace is not just anti-war. The so-called artificial is also part of the natural world. Systems, whether organic or machinic use the same principles and today more and more systems are combinations of the evolved and the made: cyborgs.

This is why I myself and some others have proposed a cyborg epistemology to help us transcend dichotomies: thesis, antithesis, synthesis, prosthesis ...and again.¹² Reality is lumpy, paradoxical, dynamic, and more than we can understand. But we can know enough to survive. Or at least to not kill ourselves off with illusions of InfoWar hiding real war.

Hakim Bey¹³ has written one of the best analyses of InfoWar and its danger. He points out that the Terminal State still relies on war to control bodies. Bodies are the basis for war after all is said and done.¹⁴ And besides, "information is a mess," he remarks laconically, pointing out our current poverty in terms of information theory. When you combine that "mess" with the bloody reality of war you get bloody mess. That is what we face if we don't apply what little we know about how little we know to the concept of InfoWar and all war and say, Enough. Let us have peace.

¹ Gray, Chris Hables, *Postmodern War*, Guilford and Routledge, 1997.

² Kelly, Kevin, *Out of Control*, Addison-Wesley, 1994.

³ Melman, Seymour, *The Permanent War Economy*, Simon & Schuster, 1974.

⁴ Virilio, Paul & Sylvère Lotringer, *Pure War*" (Polizotti trans.), Semiotext(e), 1983.

⁵ Foucault, Michel: *Power/Knowledge* (Gordon et al. trans.), Pantheon 1980, S. 90.

⁶ Sun Tzu, *The Art of War* (Griffith trans.), Oxford University Press 1962.

⁷ Gray, Chris Hables; Heidi J. Figueroa-Sarriera; Mentor, Steven, "Cyborgology: Constructing the Knowledge of Cybernetic Organisms", in:

Machiavelli, Niccolò: *The Art of War* (Farnsworth trans.), Da Capo Press, 1990.

⁸ Clausewitz, Carl von, *On War*, Graham trans., Penguin 1962

⁹ Arquilla, John & David Ronfeldt: "Cyberwar is Coming!", in: *Journal of Comparative Strategy*, 12/2, 1993, S. 141-165; Defense Science Board Task Force, *On Information Warfare-Defense*, Dept. of Defense, November 1993

¹⁰ Bunker, Robert, "The Transition to Fourth Epoch War," in: *Marine Corp Gazette*, September, 23-32.

¹¹ Toffler, Alvin & Toffler, Heidi: *War and Anti-War*, Warner Books, 1993.

¹² Gray, Chris Hables; Figueroa-Sarriera, Mentor (eds.), *The Cyborg Handbook*, Routledge, 1995, 1-16.

¹³ Bey, Hakim: "The Information War," in: *Ctheory* (electronic), 1995.

¹⁴ Scarry, Elaine: *The Body in Pain*, Oxford University Press, 1985.