

**Info@War.Mil: Nonlinear Science and the Emergence of Information
Age Warfare in the United States Military**

by

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An Abstract of a Thesis Submitted to the Graduate

Faculty of Rensselaer Polytechnic Institute

in Partial Fulfillment of the

Requirements for the degree of

DOCTOR OF PHILOSOPHY

Major Subject: Science and Technology Studies

The original of the complete thesis is on file
in the Rensselaer Polytechnic Institute Library

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Troy, New York

May 2008

(For Graduation August 2008)

ABSTRACT

This study traces the enlistment of concepts and metaphors from nonlinear science (e.g. chaos and complexity theories) by the U.S. military in its attempts to cope with the perceived demands of new information and communication technologies (ICTs), as well as an emerging post-industrial, “information age.” In the last three decades, the U.S. military has increasingly conceived of information gathering, processing, and distribution; knowledge formation; and decision-making—along with the denial of those capabilities to the adversary—as the central activities of a new mode of warfare referred to in this study as “informatic warfare.” Over the last thirty years, nonlinear science has played an increasingly important role in the various attempts to theorize informatic warfare, the most recent example of which is the theory of “network-centric warfare” (NCW), which has both shaped and been shaped by U.S. actions on the battlefields of Afghanistan and Iraq. In NCW, the world of the information age is seen as more complex and chaotic; the battlefield as a nonlinear, chaotic space; and enemies as networks that behave like complex adaptive systems. In response, military theorists have increasingly asserted that the U.S. military itself must adopt both the behavioral characteristics (flexibility, adaptability, self-organization), as well as structural characteristics (networked, decentralized, distributed), of a complex adaptive system. Military-specific ICTs, such as those used for Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR), are seen as the key enablers of this “military transformation.” Nonlinear science, then, has emerged as a key “node” in the network that is the articulation of informatic warfare, providing a common conceptual grounding for linking military understandings of ICTs, information-driven warfare, and the Information Age.

By combining a science studies perspective with a number of concepts from recent rhetorical theory, this study is able to trace the rhetorical, intellectual, and institutional conditions that have allowed for the enlistment of nonlinear science into the service of U.S. military theory. In short, it accounts not only for the uses that military theorists have made of nonlinear science, but for the conditions that have made that use possible in the first place. To accomplish that task, the enlistment of nonlinear science is examined in relation to the longer-term, wider historical role that the sciences in general have come to

play in the ways that Western militaries have understood the “nature” of warfare; the general requirements for victory in warfare; the relationships among society, technology, and war; the military organization’s relationship to the “outside” world; as well as the military organization’s understanding of itself, its culture and values, and what it means to be a military professional. In doing so, this study deepens our understanding of the construction of military theories, doctrines, and strategies; the relationship between the military and the sciences in the postwar period; the ways that the sciences are enlisted for various purposes in realms typically considered “outside” the sciences; and finally, the way that recent changes in the U.S. military map onto those larger patterns of social and intellectual change often characterized as “post-industrial” or “postmodern.”