Chapter XI
Nanoscale Research, Ethics, and the Military

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ABSTRACT

Military researchers are working to exploit advances in nanoscale research for military uniforms, medical diagnosis and treatment, enhanced soldier performance, information and surveillance systems, and weaponry and guidance systems. These domains of research pose ethical questions in regard to the motives for this research, the way in which it is carried out, and its social effects, especially in regard to its medical aspects. Much of this research can be defended in the name of soldier protection and national defense, but close attention to the practice of research involving human subjects and nanoscale devices is nevertheless warranted because the military is governed in ways that sometimes put its overarching goals ahead of protecting the rights and welfare of individual soldiers. Moreover, the contribution of nanoscale interventions to a new kind of arms race should not be underestimated.

INTRODUCTION

Military theorists have not failed to appreciate the significance of nanoscale research when it comes to protecting soldiers and giving them advantages in military operations. Researchers working for and with the military work to identify ways in which emerging technologies can be put to their advantage for personnel, weapons, and operations. Specifically, militaries around the world anticipate that this research might lead to new information systems, improved protective gear, means to improve the performance of military personnel, and innovations in medical diagnosis and treatment. Nanoscale research does not occur in a scientific vacuum, and this research goes forward alongside other domains of research, including neuroscience research that works to describe and gain measures of control over sensation, neurological function, and human behavior. Some commentators expect that these domains of research might come together in ways that fuse biological function and nanoscale mechanical interventions. For example, it might

be possible to develop biochips that could "read" the sensory processes of neurons directly, in other words independently of the person whose neurons are involved. Or, these interventions might enable officers to control the emotional affect of personnel under their command.

Even if there were no wars and no military operations, nanoscale research conducted for entirely civilian purposes would be of considerable ethical interest because of the way it stands ready to amplify powers of information and to extend control over human behavior. That this research also carries potential military applications makes these ethical issues all the more pressing because of those ethical issues unfold in the context of larger political and strategic purposes of military function, purposes that sometimes subordinate individual interests. For this reason, it becomes important to try and identify ethical standards by which to evaluate research and applications of nanoscale and neuroscience technologies, to identify ethical standards that help guide decision-making. The discussion here first identifies key domains in which nanoscale research is of interest to military theory and practice. It then offers some suggestions about principles by which to judge the value of interventions.

MILITARY INTEREST IN NANOSCALE RESEARCH

The military is looking to nanoscale research and technology in five main areas: (1) better information, (2) better weapons, (3) better uniforms, (4) better performance, and (5) better medical diagnoses and treatments.

Better Information

The military has an abiding interest in sensory mechanisms that can collect intelligence about the enemy and confirm whereabouts and status of its own personnel during operations.

Nanoscale technology might enable the creation of biochip implants could also be developed to 'read' sensory input directly – without introducing the possibility of error – by a soldier who misunderstands or misinterprets exactly what he is seeing (for example, what type of missile or jet is approaching). The military and intelligence agencies also have an interest in knowing whether and to what extend nanoscale technologies could enable them to 'read' people's minds, for example, captured enemy soldiers. Some technologies currently exist that are able to predict roughly what someone is thinking. On a more developed scale, this kind of technology would be extremely useful in interrogating captured soldiers, to learn the status of current operations. These technologies could even bypass contentious debates about whether or not torture is permissible in order to gain information that might be needed to avert imminent loss of death. They could also:

- Use **biochips** to track soldier movements in realm time via sensors.
- Insert **microcomputers** to relay sensory input: 'Read' raw sensory data via biochips or other technologies. For example: read the visual input of a pilot, transmit that input to a remote location, check it against profiles of enemy jets and make decisions about how to respond.
- Use **microcomputers** or **biochips** that evaluate health status of soldiers in real time (heart rate, temperature, secretions, etc.). Knowing the medical status of its personnel enables command to understand its strengths at any given time, or record and relay medical aspects of a soldier's status. Desirable technologies of this kind are discussed in Better Medicine.
- Use **biochip** implants to distinguish the certainty of statements made by people under interrogation, which could eliminate need for harsh interrogations and torture of any kind.