Chapter 65
Privacy vs. Security:
Smart Dust and Human Extinction

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ABSTRACT

This chapter bridges the dilemma created by intrusive surveillance technologies needed to safeguard people's security and the potential negative consequences such technologies might have on individual privacy. It begins by highlighting recent tensions between concerns for privacy and security. Next, it notes the increasing threat to human life posed by emerging technologies (e.g., genetic engineering and nanotechnology). The chapter then turns to a potential technological means to mitigate some of this threat, namely ubiquitous microscopic sensors. One consequence of the deployment of such technology appears to be an erosion of personal privacy on a scale hitherto unimaginable. It is then argued that many details of an individual's private life are actually irrelevant for security purposes and that it may be possible to develop technology to mask these details in the data gleaned from surveillance devices. Such a development could meet some, perhaps many, of the concerns about privacy. It is also argued that if it is possible to use technology to mask personal information, this may actually promote the goal of security, since it is conjectured that the public is likely to be more willing to accept invasive technology if it is designed to mask such details. Finally, some applications to society's current uses of surveillance technology are drawn. Policy recommendations for surveillance organizations such as the National Security Agency are briefly canvassed.

INTRODUCTION

Edward Snowden's revelation of the extent of surveillance of U.S. and foreign citizens' personal communication by the National Security Agency (NSA) and other agencies has been descried as "one of the most significant leaks in U.S. political history" (Greenwald, MacAskill, & Poitras, 2013). The revelation has prompted what one author calls a "long overdue" discussion of privacy and security (Bird, 2013).

The dilemma that pits privacy versus security is familiar enough. Those concerned with privacy are troubled by the extent to which the NSA and other agencies use technology to monitor emails, phone

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calls and other personal communication between private citizens. Snowden's disclosure of the invasion of privacy of private citizens has evoked comparisons between private citizens in the U.S. and Orwell's dystopian novel *1984* (Bird, 2013). Yet, a case for the NSA's activities can also be made in the name of security. If surveillance can help us avoid a terrorist attack such as the destruction of the World Trade Center on September 11th, 2001, then the moral payoff in terms of saving of lives and property is clear.

A little armchair anthropology suggests the dilemma between privacy and security is probably at least as old as humanity itself.[1] It is not hard to imagine that our pre-civilization ancestors, who lived in groups of several hundred people, faced the same dilemma. Imagine a couple from one pre-civilization tribe thought they were having a private conversation when they found another member eavesdropping. The couple protests to the chieftain that their privacy was violated; the eavesdropper defends his actions on the basis that he wanted to make sure that no secrets about their impending attack on a neighboring tribe were being discussed. And thus, according to our little "just so" story, the dilemma between privacy and security was born.

So, although the dilemma has a long history, technological developments are heightening the tension. Consider first the relationship between technology and security. The number of persons that a single individual can kill in half an hour has risen dramatically in recent history. It was only a few centuries ago that the best one could do in this respect was to dispatch a couple of dozen or so people in this time frame with a sword. Such numbers would depend crucially on the skill and the strength of the swordsman. For over a century now, mechanized weaponry such as machine guns has increased this number into the hundreds, chemical weaponry into the thousands, and nuclear technology into the millions. And no longer do assailants require great physical prowess or skill: these technologies leverage the power of our minds, not our bodies. As horrifying as this is, developments in technology promise to only increase this number. In a small secret lab set up for a few thousand dollars, terrorists could—even as you read this— be working on a virus with the potential to wipe out humanity. Much of the knowledge is freely available online. For example, research scientists have published genetic information about the Spanish flu that killed millions of people in 1918 (Tumpey et al., 2005). You could set up a small genetic lab in your basement or garage for a few tens of thousands of dollars (equipment can be ordered online for your convenience) and start constructing the next pandemic virus.[2] Looking just a little further down the road, a number of technologists have theorized that self-replicating nanobots could potentially be deployed to destroy humanity.[3]

It is horrifying when we hear about innocents killed by terrorists, or a gunman's victims in shooting rampages in high schools and universities; but it is absolutely unthinkable that individuals might be able to, in the foreseeable future, turn this same destructive rage against all of humanity. The primary worry here, of course, is that it is difficult enough to get whole nations to work peacefully and co-operatively, how can we possibly think that we could do this for all living individuals? That is, even if we could get every government to foreswear the developing technologies that could potentially put the whole world at risk—that could wipe out every last single human—how will we ensure that individuals will not do so? As intimated, the problem is that there is some possibility that such weapons could be developed in secrecy by a single person or a few individuals. Detecting a small genetics lab is not like looking for evidence that Iran or North Korea is building atomic weapons: there is no large-scale infrastructure that is visible from spy satellites in orbit. The problem is more like this: how do you know that your neighbor is restoring a 1969 Ford Mustang in his garage, as he claims, rather than using the space for a genetics lab? Fortunately, the number of people bent on destroying many or all humans is fairly small, but the