

Future Imperfect: Technology and Freedom in an Uncertain World

By David D. Friedman

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In 2002, the former Boston Red Sox slugger Ted Williams was cryogenically frozen at the Alcor Life Extension Foundation in Scottsdale, Arizona. The hope for Williams and others whose bodies or heads have been frozen at Alcor is that medical science and technology will advance and make available cures which did not exist at the time of their deaths, allowing them to resume their lives. There are obvious moral and legal consequences associated with cryogenics and the subject is one of many which David D. Friedman¹ addresses in *Future Imperfect: Technology and Freedom in an Uncertain World*.

The theme throughout *Future Imperfect* is the notion that new technologies fundamentally change the way we live and interact with each other but do not necessarily improve our situation in all respects. The success of cryogenics, for example, will require changes in both our legal and social realities. Currently a cryogenically frozen person has no legal status, although one might be necessary if technology becomes capable of creating a transient state between life and death. Further, the decision of when to freeze someone could have both moral and legal consequences. Presently, it would be an act of murder to cryogenically freeze someone waiting on an organ donor list, but perhaps in the future that act would be viewed as preserving the patient's life until a suitable organ donor could be found.

¹ David D. Friedman, Professor of Law at Santa Clara University, California, obtained a Ph.D. in theoretical physics before switching to the field of economics.

These are just some of the questions that Professor Friedman poses in his discussion on “curing” aging and death through technology.

According to Professor Friedman, death and dying are not the only problems which may be solved by technology in the near future. Diseases may become a thing of the past if gene therapy makes individual cell repair possible. As Professor Friedman points out, nanotechnology will probably play an essential role in any widespread gene therapy, most likely in the form of nanoscale machinery inserted into a virus. One example of nanotechnology applied to disease involves the concept of a nanoscale compressed air tank circulating in the blood. This synthetic version of a red blood cell would be capable of releasing oxygen to the organs and extremities in the event of heart failure, affording the patient several hours between heart failure and loss of consciousness to seek treatment. The nanoscale compressed air tank is one example put forth by Professor Friedman in which nanotechnology might positively impact medical science.

Genetic testing has implications which may fundamentally alter more than the way diseases are treated; it may change the way society addresses disease. Genetic fingerprinting has already come under scrutiny for fear of discrimination against those with genetic “defects.” Indeed, Professor Friedman addresses the conundrum associated with health and life insurance that might exist if genetic testing were widely available. The cost of an insurance policy is based on a calculated risk of illness or death. If individuals, through genetic testing, could assess their risk for disease and death prior to purchasing coverage, those who knew of a substantial increased risk would purchase greater coverage than those whose risks were minimal or nonexistent. Eventually, only those who tested positive for a genetic disease would desire health or life insurance because of the substantially increased risk and the insurance companies will

price the coverage accordingly. Thus, Professor Friedman posits that routine genetic testing might render life and health insurance unaffordable for those who need it most.

Genetic manipulation may also have profound effects on human reproduction and Professor Friedman devotes an entire chapter to the discussion of designer genetics. This technology may eventually allow couples to select which genes they wish to impart to their offspring. Throughout his book, Professor Friedman maintains that technology has always met with resistance and reproductive technology is perhaps one of the most controversial topics. Indeed, as Professor Friedman acknowledges, in vitro fertilization was met with opposition when it was first developed. However, today many forms of assisted reproduction are considered viable social and moral options for couples unable to conceive naturally. Further, one method of genetic testing, amniocentesis, is now routine for women with high risk pregnancies. Professor Friedman suggests that, in the future, technology may offer us the ability to insert artificial genes into our DNA. These artificial genes may be designed, for example, to prevent aging or fight acquired diseases. Genetic manipulation may one day even be capable of creating the biological offspring of both partners of a homosexual couple.

Professor Friedman is not just interested in biotechnology and human health. Rather, he allocates a full one half of *Future Imperfect* to computer technology and its implications on privacy, commerce, and law enforcement. Computer technology has broadly influenced current society. Online communication, education, and commerce are all staples of today's culture. However, the continued incorporation of computer technology into our lives may render obsolete the ways in which society has traditionally dealt with crimes, torts, and privacy. Currently, commerce, law enforcement, and personal identity exist both in real space and online. Nevertheless, as more transactions are conducted online rather than in real space, we will have to

adapt our present laws and accepted practices to meet the challenges presented by an increased reliance on computers.

A person's right to privacy is one of the most valued rights in our society and computers make online privacy possible through encryption. Encryption prevents unauthorized persons or agencies from reading a private message or monitoring transactions. However, increased privacy may be accompanied by a corresponding decrease in the ability to deter crime as law enforcement becomes unable to match online identities with real space persons. With public key encryption, stolen credit card numbers, bomb-making instructions, or terrorist cell communications would all be readily available and yet untraceable to a real world person. When viewed in this light, a world of strong privacy seems less than ideal.

Conversely, a transparent society presents its own unique challenges. Although cameras at every intersection and in every doorway are intrusive, those same cameras record crime as it happens. There would be no need for eye-witness testimony because a suspect's every move would be captured on tape. Professor Friedman uses the infamous Rodney King case to illustrate how law enforcement within a transparent society could function. He believes law enforcement officers, knowing their every move is being recorded, would conduct themselves accordingly. Of course, as Professor Friedman acknowledges, such recordings would naturally be controlled by some person or agency. The result would be a transparent society that is only transparent in one direction, analogous to a one-way mirror where those watching can see everything while the subjects being watched are unaware.

Just as computers transform the way in which we protect privacy, the same technology also requires adaptation of commercial transactions to cyberspace. Contract enforcement becomes infinitely harder when contracts are entered into online. Contracts in real space are

relatively easy to enforce because the parties presumably know each other's identity and are in close enough proximity to be under the same legal jurisdiction. Contrary to real space, the internet enables the formation of contracts between people who are not necessarily in the same country. Further, encryption technology can facilitate contracts without the need for knowing the real world identity of the other party. Litigation can be costly and cumbersome when contracting parties are not under the same jurisdiction. When coupled with the anonymity that encryption affords, online contract enforcement may become substantially nonexistent under existing legal systems.

Professor Friedman offers the reader a solution to the altered landscape of contracts that is common throughout *Future Imperfect*. He advocates relying on the same technology to protect the very entity it is jeopardizing. Professor Friedman asserts that, despite an inability to enforce online contracts in a court of law, a seller will continue to abide by the terms of the agreement because the failure to do so risks losing his reputation as a respectable merchant. Professor Friedman supports this premise with the success of EBay, where buyer feedback is the prominent method of reputational enforcement. Sellers have a vested interest in upholding their end of a sales agreement because buyers can submit feedback relating to all aspects of the transaction, such as the timeliness of delivery and quality of products. Similarly, sellers can leave feedback regarding the buyers' conduct. Both positive and negative feedback are visible to all who consider contracting with the person and enough negative feedback would give any potential user reason to hesitate. Thus, the technology which impedes contract enforcement also provides a mechanism for reputational enforcement, and contracts become self-regulated.

In the last chapter, Professor Friedman offers his personal opinions regarding the future of technology. He closes with a comparison of the impact technology has had on the last century

– the advances of medicine, transportation, and communication have transformed our daily lives in countless ways – and how the current landscape of technology was as unpredictable then as it is now. Vaccines, antibiotics, and a myriad of surgical techniques were non-existent in 1908. Automobiles, airplanes, and subways were in the early years of development. Cell phones, computers, and television were all many decades away from becoming the indispensable devices that they are today. In his conclusion to *Future Imperfect*, Professor Friedman wisely cautions that attempting to make plans for the future using today’s information and technology is foolhardy, and “risks wasting valuable resources solving problems that will solve themselves . . . or, worse, spending our resources pushing the world in what will turn out to be the wrong direction.”²

In *Future Imperfect*, Professor Friedman urges his readers to think critically about the possible futures we as a people might face as technology advances. As he speculates about the next generation of technology, he provides a candid and informed analysis of the possible changes that technology may bring. He offers plausible scenarios for the future that have support in present-day events. Cryogenics, stem cell and genetic research, virtual reality, and computer technology are already in existence in some form and improving daily.

Throughout the book, Professor Friedman has taken the time to explain the relevant aspects of the technologies to the reader, some of which are drastically more complex than he alludes to. However intricate the technology, Professor Friedman has demonstrated a talent for distilling the pertinent details without patronizing the reader. Acknowledging that some readers may be technophiles and thus interested in a more advanced explanation, he has included endnotes with links and references to more detailed discussions on the subjects. The chapters are divided into smaller cohesive sections, making the book easy to put down and come back to

² DAVID D. FRIEDMAN, *FUTURE IMPERFECT: TECHNOLOGY AND FREEDOM IN AN UNCERTAIN WORLD* 321 (2008).

later. With so many topics covered, it is likely that any reader will find a subject that appeals to him and Professor Friedman's aptitude for explaining the technology will ensure that no reader is left behind. *Future Imperfect* would interest anyone who wishes to learn more about technology and the implications it may have on our future.