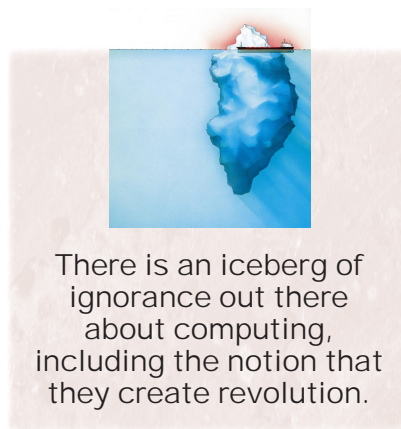# The Myth of the Computer Revolution

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One of the more bizarre and disquieting aspects of the Y2K Problem is the occasional but recurrent journalistic report that depicts a hapless Cobol programmer of 30 or so years ago lighting on the ill-fated notion of leaving the "19" off the year in order to save storage space. Where are journalists getting this idea? Surely they didn't observe it, so some person or persons in the computing industry must be promoting this misleading (if not pernicious) idea.

Indeed there are such people in our industry. Some very recent but hardly isolated evidence appeared in *IEEE Computational Science and Engineering* (Norris Parker Smith, "The Millennium Is Close At Hand: Stock Up on Zeroes," Apr.-Jun. 1998, pp. 104-C3). Smith writes that in the 1960s "programmers adopted the convention of designating years through two digits rather than four." Of course this statement is not strictly erroneous. The problem is that "adopted" implies "invented at about that time."

The truth is that two-digit year encoding was adopted in the data-processing industry long before Konrad Zuse built his first digital computer in the '30s. The data-processing industry didn't invent two-digit year encoding either: The practice was already widespread in the clerical industry. It's just a highly practical

There is an iceberg of ignorance out there about computing, including the notion that they create revolution.

abbreviation that we use in everyday speech.

ICEBERG OF IGNORANCE

The misbegotten ideas about the origin of the millennium bug are only the tip of the iceberg that is computing history ignorance.

A few years ago there was a spate of stories on Australian television in celebration of the fortieth anniversary of the first commercial use of computers. According to these reports, the first computers dramatically changed the operations of those companies that were rich enough and foresighted enough to buy them. The first digital computers, so these reports said, had changed business accounting and record-keeping overnight.

The truth is that anyone associated with these innovations at the time would not have seen it that way. Early computers, in fact, were installed in well-established departments that had automated

data processing decades earlier, using punched cards or paper tape. Typically, the earliest computers were installed simply to replace existing machinery, not existing processes.

There was, therefore, no overnight change associated with early computing. The first Cobol programmers did not develop new applications, they merely converted existing procedures.

COMPUTERS AND INNOVATION

There is a related but somewhat more dangerous misconception that the computing industry seems to foster: the myth that the computer *causes* change, perhaps even revolutionary change.

The truth is quite the opposite. Computers have always been used by industry and government (the two sectors that matter the most socially) as a way to *avoid change and to reinforce the status quo.*

Many companies and departments adopted electronic computers so that they wouldn't have to innovate; so they wouldn't have to find new ways to achieve their objectives.

There is no doubt that computers did a better job than the old machines and eventually even did it cheaper. In fact they did their job too well: Using computers, big organizations could exert far more control over their operations, their employees, and eventually their clients. The trend now is to use computers to replace employees altogether.

These changes have not brought innovation but consolidation. Big organizations can go on doing what they have done all along, but in far greater detail. Greater detail translates to greater control. Governments can store and administer enormously greater numbers of laws and regulations than ever before. Big business can more effectively predict and avert adverse application of those laws and regulations.

The effects of consolidation run even deeper. As big organizations and government departments become more dependent on computing systems, they become less able to make any change but incremental change. Witness the Y2K Problem—technically trivial, organizationally immense. The Euro conversion

problem is technically more difficult, and it's merely a change in a unit of measurement.

THE COMPUTER REVOLUTION?

The Internet, in particular the World Wide Web, is usually taken to be a revolutionary innovation. Certainly its use is increasing dramatically and will go on increasing. But what looks like a revolution today will usually be seen as an evolution tomorrow. PCs seemed revolutionary in the 1980s; operating systems

> **Technology that looks revolutionary today will appear evolutionary tomorrow.**

in the 1960s; telegraphy in the 1800s; canal transport in the 1700s; and so on and so on. PCs and the Internet may still be around some decades hence, but they will be seen as small components of technological evolution.

Things do seem to change faster and faster. Partly, at least, this is an illusion. What is new seems bright and changing, and we tend to forget that what is old was once new. Across the centuries and across the world people have seen themselves living through revolutions that in fact caused little long-term change. The old saying, "The more things change, the more they stay the same" makes just this point.

SOCIAL REVOLUTION?

The question remains: Do current social changes constitute a revolution made possible by digital technology?

In talking about the developed world, you might be tempted to answer yes. I disagree. Even in the developed world, only a minority of the population uses computers, even when PCs are factored in. Across the globe, only a very small percentage—not even one percent—of the population has ever handled a computer. The way things are going, only a small percentage ever will.

And even in developed nations, again, the most significant use of computers is by big, powerful organizations to make them even bigger and more powerful.

Revolutionary social change for the general good is not their goal. Globalization is, and surely globalization is made possible by computers and networking. Unfortunately, globalization has not brought general good. If it had, we would be witnessing a reduction in the gap between rich and poor. To the contrary, the United Nations Development Program has long been reporting that the gap separating rich and poor nations is widening, as is the gap between rich and poor people in most if not all nations (http://www.undp.org).

This gap had begun to narrow after World War II and then began to widen when digital computers came into common use. I do not believe this is merely a coincidence. Nor is it a coincidence to me that wealth and power are stratifying more as computers and telecommunications bring globalization of business and bureaucracy.

In short, computers enable the more efficient governance of the lower class by the middle class for the benefit of the upper class. (Don't take my word for it. Read, for example, J.K. Galbraith's *The Culture of Contentment*, Houghton-Mifflin, 1993.)

RISE OF NEOFEUDALISM

The current changes in social structure are all part of a natural correction that is returning us to feudalism. There is nothing unnatural about feudalism. Something like it has prevailed in most inhabited countries for most of their histories. Society seems inevitably to want to stratify into some kind of hierarchy of social power.

Liberty, equality, and fraternity: these are what's unnatural. These are the unattainable ideal. Nevertheless, those who strive for this ideal are our most noble and admirable citizens. Computer-aided feudalism—*neofeudalism*—is moving us further from it.

Neofeudalism has some new characteristics. First, it's global. Second and more worrisome, it is rapidly changing the social balance. Feudal societies have always had four main classes: upper, middle, lower, and outlaw. The outlaw class usually isn't mentioned much in the history books. It is a "nonparticipating"

class, which means that when it gets too big it tends to destroy civilization.

This fourth class is at present evidenced in the homeless, the mentally ill, the long-term unemployed, the illiterate, the refugees, the lesser criminals. The International Labor Organization (http://www.ilo.ch) puts the size of this group at more than one-third of the Earth's population and growing.

Computing contributes directly to the growth of this class in the neofeudalistic society: Digital technology displaces lower-class workers, who eventually leave the lower class and join the outlaw class. Too many outlaws and you eventually have bloody disruption.

Neofeudalism, I'm afraid, is in our future. Unless, that is, the computing profession adopts some unattainable ideals and does something concerted to move us toward those ideals rather than away from them.

Technology is neutral. It's the use of technology that can bring the good or the bad. Television, for example, could have been a wonderful aid to education; instead it has become primarily a vehicle for applied consumer psychology. The Web could be developed into a wonderful aid to education. The world's governments seem to be promoting its conversion to a vehicle for electronic commerce. The parallel with television should be obvious, and the computing profession should be strongly criticizing the more crass aspects of this development and actively working to see that the egalitarian aspects of the Internet are not drowned in the tidal wave of economic rationalism.

Perhaps what's needed is for social and technological history to be part of all education of computing professionals. This would be a basis for informed promotion of—and practical action toward—social rationalism as a counter to economic rationalism. ❖

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