GETTING IT WRONG

PETER H. SALUS

peter@usenix.org

I've been publishing historical articles and books since 1963. I look into a rearview mirror, viewing things in retrospect. Yet we seem to be compelled to forecast, to predict, despite the obvious fact that we're really bad at it.

Orwell's *1984*, published in 1949, is a pessimistic view of technology, leadership, and morality gone awry.

Forty years later, in 1989, Francis Fukuyama published an article in *The National Interest*, called "The End of History?" (a few years later, Fukuyama inflated it into a 450-page book). Fukuyama speculated that liberal democracy might be the "final form of human government" and that "a true global culture has emerged, centering around technologically driven economic growth."

In 1949, both EDSAC (Cambridge, UK) and EDVAC (University of Pennsylvania) came into operation; IBM's SSEC was already on view at the corner of Madison and 57th (I can recall standing there, fascinated by it—far more compelling than Macy's or Gimbel's windows). But that was it. UNIVAC came two years later. Both Steve Jobs and Bill Gates were to be born in 1955.

In 1989, Usenet, the Internet, Apple, Microsoft, Sun, DEC, and myriad other computer firms were flourishing; both USL (UNIX Systems Laboratories) and OSF (Open Software Foundation) were in existence; home computers were becoming common.

But let me move back a bit.

In 1973, the U.S.Armed Services Research Office sponsored a symposium on the high cost of software. In 1974, the keynote at the National Computer Conference raised similar issues. Then SHARE commissioned a study (by Ted Dolotta and others) which was published in 1976: *Data Processing in 1980–1985: A Study of Potential Limitations to Progress*. And in 1984, the International Council for Computer Communication issued *So This Is 1984*. I want to look at these two works.

Of course, I'm being unfair. *Data Processing* was "concerned with the 1980's successors of computer series such as the IBM System/360 and System/370, UNIVAC 1100, Honeywell 6000, etc., rather than with the successors of small, stand-alone minicomputers, or successors of 'supercomputers' such as the ILLIAC IV and the STAR-100."

- The UNIVAC 1100 was a transistorized, plated-wire memory, mainframe. It employed 36-bit words and had 131,000 words in two banks. It had Fastrand drum storage. Input was by punched cards with limited teletype access. It occupied 400 square feet of floor space.
- The Honeywell 6000 series was the GE 600 series, renamed after the 1970 sale/purchase. It also employed 36-bit words. It was originally the GE-635, what I think of as the "Multics machine." The GE-600 was probably the first machine built with a symmetric multiprocessing platform. Depending on the configuration, it occupied several (or many) racks.
- ILLIAC IV was a total failure; STAR-100 (from CDC) was an early vector processor that was a great disappointment. Honeywell sold its computer business to Bull. Remington Rand, which bought UNIVAC in 1950, merged with Sperry in 1955, and Sperry Rand merged with Burroughs in 1986, to form Unisys.

But "the successors of small, stand-alone minicomputers" sit on and under our desks, live in our telephones, and get carried about in backpacks and briefcases.

(I need to admit that in 1976, when I was working via an acoustic modem connection at 110 baud between my DECWriter II and an IBM 360, I would never have fantasized something like my current laptop or my desktop. But I wouldn't have imagined that I could have a cellular phone with more power than that 360, either.)

There was no way the authors of 1976 could have foreseen the TRS-80 (announced in August 1977), the Commodore PET (delivered in September 1977), or the Apple II (June 1977). Though they talked about computer networks, stating "We believe that, between now and 1985, there will be significant growth in computer networks," they continued, "but we do not believe that they will become the predominant way of life in that time period. We expect remote-access facilities to grow at a much faster rate than computer networks."

Later, the authors state that they believe that "remote access" can be of value to "applications programmers."

In *So This Is 1984*, Douglas Parkhill believes we should "[e]xploit our new computer communications technologies in such a way as to ensure unrestricted universal access to the myriad services that are now becoming possible." (1984 saw the beginning of Prodigy, a sort of mega-BBS; but Usenet had been around since 1979.)

R.E. Lyons—a few essays later—complains that "society has so far failed to use computer communications technology effectively." On the other hand, Carl Hammer thinks, "As a whole, *1984* does a very respectable job of technology forecasting." Yet Paul E. Green, Jr., points out that "the key reason for the failure of the trend toward to-

talitarianism was the enormous effect exerted by messages . . . using . . . electronics communications technology."

But my favorite remarks are by Philip Hughes, co-founder in 1969 of Logica and unsung software hero: "I believe . . . the next 40 years will see much more dramatic change than the past 40 years." Hughes itemizes some of the advances:

- Optical fibre
- Communications satellites
- Electronic mail
- Video communications
- Mobile phones

Not at all shabby. In fact, I think Hughes is the only one in these two books who lands in the gold.

But I think it's important to realize just how poorly we do at forecasting the future.

I've been hearing more and more about the "intelligent" home for the past 15 years. Yet every living room I've been in over the past year has a "blinking" VCR/DVD player. I can't enumerate the number of cars I've been in with the wrong time. If folks can't set/fix these, what good will more advanced features be?

When I was at Penguicon, I was asked how come I knew "this stuff" when "my parents can't send email? And you're older than they are." I don't know. But I know that Bill Gates' recent talk about intelligent home appliances was just that: talk.

Heinlein talked of his work as "future history." We're making that history . . . but we don't know what it will be.

Note: I went to my first USENIX Conference in Toronto in 1979. I've been writing in *;login:* for 20 years. This will be my last history column. Thanks for all the fish.