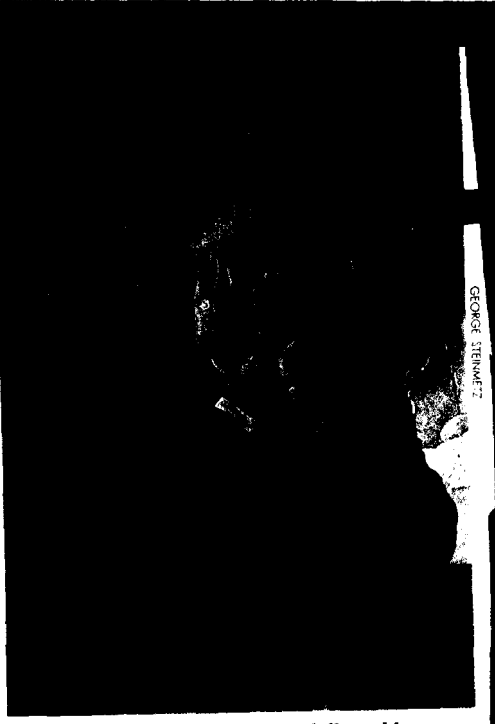


IDEAS FOR THE 1990s

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The high end of the Japanese manufacturers' lines is in jeopardy in the same way as that of IBM and DEC. But the Japanese companies have all those other businesses. They've got all those engineers and they'll say, "I'll make a great switching system or I'll make a fiber-optic system so that I'll be in communications," which they already are. So they can substitute a lot, or start making high-definition TVs.



LOUIS FRIEDHOFF—AP/WIDEWORLD
GEORGE STEINMETZ

Gordon Bell: Incredible forces, dull machines

Arno Penzias of AT&T's legendary Bell Labs: new hope for the overstressed, overmpeetinged, and overjogged

any decade, because it's so goddamn exciting. All those machines we've been dreaming of making are starting to be made.

And then I see these goddamn companies. I see IBM sitting there building these incredibly dull machines based on the past, doing nothing that a user wants. To me, that's the big gap—between the technology and what the guys with those enormous resources should be doing. We've got on the one side incredible forces changing, and then on the other side these guys are plodding along like nothing is happening, and I simply don't see a way out of that.

In the next decade there's got to be a massive restructuring of the industry. The downsizing of IBM, the downsizing of DEC. Something really fundamental is shifting. It's a level-of-imagination shift. Intel is going to be a substantial computer manufacturer. The Intel 860 microprocessor, I believe, configured in a \$10,000 to \$20,000 workstation, will probably

do at least half as well as a \$1.5 million processor that goes into the Cray Y-MP super-computer. Those microprocessors are so goddamn fast.

Those guys at IBM and DEC haven't figured out how to use the new technology and keep their higher-priced products. The only way you do that is by providing enormous amounts of computing power for the same money, for the same revenue that you were getting in the past. Well, they haven't done that. I think they are going to fly both of those companies into the ground. If I were IBM I would have a 360 or 370 [mainframe] replacement on a chip. And then I'd stuff a hundred or a thousand of those chips into the biggest mainframe you've ever seen and the thing would be selling for anywhere from \$10 million to \$20 million.

Who's going to take their place? Well, Silicon Graphics, for example, is taking over the scientific base that DEC used to be so predominant in. Users are beginning to get the picture of what's happening. They see that as long as they stay in those proprietary architectures running old code, they are going to pay a tremendous premium for computing. And the premium is like a factor of 50. The Macintosh is the only one, by the way, that I'd pay a premium for.

GORDON BELL

THE DOWNSIZING OF IBM AND DEC

■ *The irrepressible Bell, 55, developed DEC's VAX computers and is now chief scientist at Stardent Computer in Newton, Massachusetts. He spoke with Gene Bylinsky.*

As a technologist I'm looking forward to the decade as I've never looked forward to

continued
End G. Bell