When Frank Otto asked me to deliver the after-dinner remarks to CALICO '91, a flash from the past crossed my mind's eye and I almost said no. The standards were simply too high. They had been established by the likes of Minnie Kenny, whose energy and creative vision got the Congress of the United States to put some money behind this improbably intersection of high technology and lowly language learning; by the likes of Mike Bush, a visionary pilot in a higher sense of the word, who was making virtual realities a reality long before anyone even though of the term; and by the likes of Whitney Reed, who almost certainly put the national security in jeopardy as hundreds of agents scoured the sources for the best combination of after-dinner jokes and a hymn of praise of the art of teaching. Very hard acts to follow. Why? Perhaps because they're all combinations, combinations of principle and wit, vision and action, high technology and lowly language learning.

The people in this room, of course, know that language learning is far from lowly. But that opinion is not always shared by the rest of society.

Those of us who have been in teaching for any length of time remember with dismay the glee with which modern language requirements were trashed back in the late sixties and early seventies. Colleagues who appeared otherwise more or less rational and civilized went out after language with incredible animosity. As a graduate student, I had kept myself in gin-and-tonics over the long, hot Baltimore summers by tutoring German equally impoverished graduate students from other departments. I think the market allowed $5 an hour or some similarly princely sum in those pre-OPEC days. I have often theorized that those very tutees, as soon as they had proper faculty jobs, used their newly won clout to erase forever the unhappy memories of gin-and-tonic-less, long, hot Baltimore summers. It might help explain why they seemed so angry at foreign languages.
The whole truth of the matter is probably a lot more complicated. It has, no doubt, in part to do with life in a culture that pretends to be monolingual. We alone are endowed with the gift of speech, they can only babble. To babble, as they do means to be foreign, and who on earth would want to be foreign? Foreign is, by definition, "other," alien. Not being "other" is what makes us us. Some of you have had the experience of watching a monolingual American speak English louder to an alien on the assumption that he would thus be better understood. I'm not even sure I haven't done it myself. One does not really want to investigate too closely the assumption behind that speech act.

The possibilities of confusion and misunderstanding are limitless, even when languages are well understood. Those possibilities can change history or just relieve a heavy afternoon of debate in a world forum. The story is told that German Counter-Intelligence in the waning years of World War II had intercepted a message planning an allied conference at Casablanca. The German operator assumed that the name was a clumsy attempt to conceal the real and usual location for conferences, the White House—and let the message get lost on the desk.

On an occasion a few years later, at the United Nations, a simultaneous interpreter for Russian, translating the speeches of a British delegate on combatting plagues of rhinoceros beetles in East Africa, caught the word "rhinoceros" (in Russian, nasarog) but not "beetle" (zhook). The soviet delegate therefore interrupted to ask how the natives were equipped to resist invasion by innumerable rhinoceros. He was told the "indigenous personnel" were given brooms and pails of chemicals. This seemed to the Soviet representative not only insufficient weaponry to combat charging hordes of rhinos but also evidence of colonists unwillingness to distribute guns for self-protection from rampaging beasts. "Also" queried the Soviet delegate, with more than a trace of ecological righteousness: "there are only a few hundred rhinoceros left in Africa; why should they be exterminated?" To this the British delegate replied, "Oh, no! There are many millions of them. Each spring they fly down from the north in great swarms and eat the bark off the trees." By this time the discussion had become so complicated that the session had to be suspended until the word for "beetle" was located and finally appended to "rhinoceros" (Charles Berlitz, Native Tongues, New York: Grosset & Dunlap, 1982, pp. 154-55).
All the preparation in the world will not prevent that kind of accident. The episode does, however, remind us that machine translation is not alone in producing the occasional howler, and warns us that hostility to language learning will only compound confusions.

In these days, however, the pendulum seems now to have swung back in favor of language learning. Requirements in general are still not very popular. But some kind of understanding that learning languages is important (and that it is hard work) seems to have reached the young, the learners, and at least some educators and policy makers. One is reminded of that splendid cartoon in which mama mouse barks loudly—and with the desired result—at the then terrified cat and tells the children, "See, it's always good to have a second language."

What this audience has known for a long time—that a second language can be very handy, maybe even a third or a fourth—is slowly impressing itself forcefully on others as well. One of those languages had probably better be English, but English alone will not suffice. Ask anyone who has recently crossed our borders north or south or our shrinking moats east or west. The pressure is still being felt chiefly from below, from our students, who have a better than vague intuition that languages are important, that there's a great big world out there, and that not all of it speaks English.

It is not only in the respect that society does well to look to the young but also in respect to technology. On a TV panel discussion within the last year or so, some old style (Paul Fussell) and new style (Tom Wolfe) intellectuals were debating the merits of high technology—as though there was still a question as to a free choice in the matter. John Sculley, CEO of the Apple Corporation, noted in passing that there are thirty million Nintendo games out there, and as their players passed through the schools and their careers, they would demand no less technology in the world around them and would master it as sovereignly as they do their present-day toys—whether anyone approved or not. If there were any doubters left, they should surely have been persuaded during the late Gulf conflict, when the missiles seemed politely to inquire as to the accuracy of the address before delivering their payloads.

Of course there will always be some in the stodgier institutions of society who will never yield: "if God had meant us to fly, he would never have invented the railways," "I have risen to status and power without this stuff, and I don't see why they want it." Five hundred years ago, as the art of printing was rewriting all the rules, there was a new curriculum rising from the South. It encompassed poetry, history, law, and eloquence and is known as "humanism." The old curriculum chiefly beat theology, debate, and logic into the ground; it was known as "scholasticism." (Let's be fair and
call it "late scholasticism"). The princes turned to the universities saying, "We do not need one more theologian, and we don't care how many angels can dance on the head of a pin. We need well-rounded lawyers and orators in our civil service, eloquent, educated types, who know how to deal with the Italians." Guess what the professors said: "You want humanists? You pay for them. But don't let them teach here; they can teach somewhere else, off-campus, at court, anywhere but here." The old university, in fact, never accepted the new curriculum. (James H. Overfield. Humanism and Scholasticism in Late Medieval Germany, Princeton: Princeton University Press, 1984.) When the Reformation, propelled by the art of printing, turned the old university on its head and shook it, as it did every other European institution, the renewed universities, in both halves of now-divided Europe based themselves on the new curriculum. But it took a convulsive political and social revolution to make the change.

Those in the room from such institutions will recognize the condition. It makes you pioneers: "How can you tell the pioneers? They're the ones with the arrows in their chests." This room is filled with people with metaphorical arrows in their chests. We have to ask ourselves the question: why do we do it? some of the answers are straightforward enough. The technology is fun. I think that's what irritates the late scholastics so much. It drives them wild when we say: "did you get a chance to play with that program?" "I was fooling around with hmm, and you know, you can get it to hmm... ." The technology is, or can be, one of those wonderful intersections where work and play become one. The great philosophers of our tradition have always understood the centrality of play in any creative act. It's not just learning the rules; it's trying out the possibilities within those rules. If the possibilities are not beyond imagining, the game soon loses interest. It's the incredible number of possibilities in any really great game that fires the imagination, lets fantasy loose with all its choirs, and starts the novice down the road to the next creative act.

There are risks, dangers, pitfalls. Technology can be dehumanizing, alienating, destructive. But it doesn't have to be. By itself, technology is value-neutral. It depends entirely on those who use it. Gutenberg didn't make books better, he just made them cheaper. What was done with the cheaper books was the decision of people, and of peoples. As to alienating, I am astonished by the diversity of professions my preoccupation with technology has made me meet: computer scientists, mathematicians, physicists, psychologists, historians of science, business administrator types, management, sales people, engineers. Who would have thought it? And who would have thought we had things in common? A few
years ago I met a colleague in biomedical engineering in the parking lot. He had heard about our work in character set generation: "What are you doing about the representation of Chinese and Hebrew? We need to know, we've got the same problems in scientific notation."

On the downside, a mass of problems emanate from experience with the technology, but most of these are not particularly technological. They are psychological, sociological, and political. And how many of us are equipped to deal with them?

Psychological: Has anyone prepared us to deal with the teacher who takes one look at a keyboard and freezes, fearing to set off an MX missile and World War III with the first keystroke?

Sociological: How do we deal with the attitude, "the secretary uses computers, therefore I don't," or conversely, "Why does Smith have a computer and Jones none?"—whether either of them need one or not?

Political: How about the movement of resources (and clout) around an organization, away from certain people and toward others? It is one of our weaknesses as a species to watch that movement with great trepidation, especially if the movement is away from us and toward someone else. Good and persuasive reasoning is usually far from sufficient to deal with that. And who has trained us in the wisdom required to shepherd those reallocations with a minimum of pain?

The title of this talk, "Press Any Key to Continue: Technology and Fantasy for the Rest of the '90s" takes its inspiration from the fabled naive user who is supposed to have said, upon reading such a command on the screen, 'I've looked: my keyboard doesn't have an 'Any' key.' We may rebuke the user for being literal-minded, but only because the computer is literal-minded in another way. The title, however, also suggested a common starting line with lots of alternatives for moving on to the next stage. CALICO has been, over these few years of its existence, one of the best places to look at what the alternatives are: VAX, Mac, Amiga, IBM, Pilot, IconAuthor, Linkway, Quest, Hypercard, Toolbook, Tandberg, Sony, Pioneer; enthusiasts for this, experimenters for that. "Press Any Key to Continue."

CALICO has been a first-rate common starting line. And a remarkably high number of predictions made from its podiums have come to pass.

The common GUI (graphic user interface) is pretty much a reality, be it the prototype first seen on the Xerox star, or on the Mac or NewWave or XWindows or "Open
Look" or GEO or MS-Windows. The new user is gradually being presented the same look no matter what machine that user turns on first.

The importance of images in general and video in particular has started to spread out across the educational field. There is surely not a library at any school in the country that isn't getting more requests for "media" than it can handle, where "Audio-Visual" isn't putting a real dent into print. At recent language and technology conferences we have heard, if once then a dozen times, "I don't introduce my textbook until the fourth week of class." "We use print just for reference." The textbook-less language course is a reality in some places. Whether this kind of development is laudable is another matter, but it may be inevitable. Any textbook publisher who isn't making contingency plans will have a lot to answer for to the stockholders.

And what about the "virtual realities" we have been promised at these meetings for five or six years? Every time the presentations are just a bit smoother, a bit less expensive, a bit more user-friendly. Does that tell us anything? The Intel Corporation is talking about a 100MHz 486 chip, something that would be fast enough to pass through audio, video, graphics, data without the computer caring about the difference. Hewlett Packard has just announced an Optical Drive Developer's Kit (Infoworld, 13, 13, [1 April 1991], p. 28): "A collection of software to aid developers who support optical drives and optical disc library 'jukeboxes.'" The HP Optical Development Software speeds the time to market for third-party developers by reducing the number of steps needed to develop optical device support. The software consists of a C-language program, which controls the rewritable optical disc library, optical systems architecture, and a media manager. The software will be available free under a license agreement with HP on April 15. (303)350-4940."
Does that mean that we are about to get affordable, manageable optical storage which can hold audio, video, graphics, data without the storage device caring about the difference? If so, goodbye to the interactive video tower (CPU, Videodisc, Videotape, audio source, speaker, text monitor, video monitor, all) mounting higher and higher backed up by a spaghetti junction that would give Mr. Olivetti indigestion, every strand of which is an invitation to disaster. When that disappears, multimedia will be as accessible as your word-processor. When? Maybe not this year; but it is not that far out.

And what are we going to do with it? Well, it will be a game with a playing field as wide as sight and hearing, where tone, word, and image; rhythm, structure, and motion, action and interaction are going to be one and the same. It’s going to be the best game ever invented. And the playful among you will find the most wonderful expansion of imagination available to you, to those you teach, and to those who teach you.

The recent SCOLA meetings which some of you here attended, closed with a video prepared by Jack Dunn of the Lincoln, Nebraska Planetarium. It presented a living collage: a computer journey across the glowing hot sulfurous surface of Venus built out of data from the Magellan Venus overfly, the indescribably beautiful water blue earth, curves and all from Apollo and Columbia. It was a poem, it was song, it was dance. It was reality and imagination combined, it was fantasy let loose with all her choirs.

While they weren’t looking, the monopoly of artists on art has fallen away. I used to think that when scientists called a proof "elegant" or a law "beautiful," they were usurping a privilege that belonged to high art alone. I wondered when they used those lofty terms if they weren’t being defensive, trying to protect themselves against those who think them hacks and drones, who think Math is calculation alone and that science is rigor, method, and experiment alone. I have had to rethink those prejudices over time. The definition of imagination, creativity, and the beautiful itself need expansion to encompass everyone who built the great medieval cathedral, from the ambitious bishop who had the first idea, to the fund raiser, architect, stone mason, sculptor, painter, engineer; likewise, today, to the programmer, screen-, course-, educational designer, to the writer of the dataset and the techies who hold the cables together and can notice: "I see why this doesn’t work! The six and the nine pins are reversed!" They have all to be artists in the new definition.

Back in 1987 Ray Clifford, Provost at DLI in Monterey, gave the keynote address to CALICO. He coined a
nice phrase: Computers will not replace teachers, but teachers who use computers will replace teachers who don't. Sooner or later this reality will spread across our schools and colleges and there will be few exceptions left. As wonderful as their skills were, there are relatively few scribes and manuscript illuminators left around anymore.

What we have to expect, encourage, demand are those artists among you, who will make the new technology as imaginative, as human, as humane, as inspiring, as elegant, as beautiful as the work of the hands of those dedicated monks. We have every reason to envision that day, and to look forward confidently to its coming.