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## The race between education and doomsday

The population of the world rose by 82 million people in the past year, to approximately 4.7 billion. It was the greatest 12-month leap in history.

At a recent conference of the National Academy of Sciences, W. David Hopper, Vice President of the World Bank, speculated that world food production can keep pace with this tremendous growth for the next 10 years, if there is an adequate investment in biological and chemical technology. It appears, however, that within 30 years there will not be enough food to feed the world's burgeoning population unless major breakthroughs occur in the development of new crop varieties and new agricultural production systems.

We've all heard predictions of doom before. And we've become accustomed to the fact that modern science can overcome seemingly insurmountable obstacles to head off Malthusian disasters. Even now, rapid developments in biotechnology and genetic engineering suggest that we may be on the threshold of major technological accomplishments that will allow us to push back that 30-year doomsday for a few score years.

I, too, am confident that these new frontiers of knowledge can provide the technology that will enable us to continue to feed the world and maintain a quality environment, provided we make wise use of one essential resource — the human factor. Without it, there can be no conversion of knowledge to technology, no translation of technology to productivity, and no application of productivity to an improved quality of life.

In a recent publication by the National Association of State Universities and Land-Grant Colleges, called "In The National Interest," we're reminded that knowledge, skill, and imagination alone hold the key to solution of vexing problems that now seem insoluble. Our greatest pool of these qualities is the young people of our country who are today enrolled in our public

school system. The scientists we rely on to push back an impending age of hunger 30 years from now are already in the first grade. The scientists who will have to stave off a crisis in 10 years are already graduating from high school and entering college.

A recent report of the National Science Board reveals that students in the United States go to school fewer days than those in England, the Soviet Union, West Germany, or Japan. Less than 40 percent of our high school students take three years of science and mathematics, compared with almost 100 percent in the Soviet Union, West Germany, and Japan. Further, over a million of the elementary- and secondary-school teachers responsible for teaching mathematics, science, and technology are not fully qualified to teach such subjects. Only 75 percent of our young people graduate from high school, as opposed to 94 percent of Japanese youth.

And so it goes. Everyone knows the statistics. Everyone knows the concern. Here in California we've dropped from a position in public education that brought wealth and prominence to the state to one of embarrassment.

Governmental leaders seem to recognize the critical nature of the problem, and they're beginning to try to do something about it. But when we remember that tomorrow's scientists are already well on their way to completing their public education, it's obvious that change will be too slow for many. My appeal to all of us concerned about science in agriculture and the future of our vitally important human resources is that we all recognize our own responsibility for improving the system. We must encourage government to do everything it can to provide more resources to help correct present shortcomings, and we must look for every opportunity to assist those presently trying to do the job in our public school system.