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Research for Survival

IT IS DIFFICULT to measure the value of research to an industry. However, the value of research to the California agricultural industry is unquestionable. Without a continuous flow of new ideas from public and private research organizations to agricultural and food processing management, California could not compete against other areas with more favorably located markets, water supplies, and labor availability. Farming in California is expensive. The only way to stay in business is by producing food and fiber of higher quality that will sell for more per unit, or at lower unit costs through producing more per acre. The only way to continually stay ahead of our competitors in both quality and unit costs is through research.

As an agricultural engineer I am hurt and a little frightened by the fact that thousands of aero-space engineers in California, plus many more thousands of possibly less well-educated but equally needful employees are also out of jobs in this industry.

Some of the reasons usually given for this industry being in California include politics, our fine climate, the long coastline, or closeness to the Pacific wars. The real reason is because of the thousands of small manufacturing plants in electronics and related fields that have developed around the research activities in the engineering and physics department of California's exceptional public and private higher education institutions—including the University of California's many campuses, Stanford University, University of Southern California, and the California Institute of Technology at Pasadena. It is not important which came first—the small electronics industries or the giant missile and aviation industries—the important point is that neither would be in California were it not for the ideas generated by the tremendous research efforts at these institutions (much of which is supported by Federal funds).

Agriculture is an even bigger industry. When all of the related businesses—food processing, transportation by truck, railway and air, container manufacturing, advertising, storage, machinery manufacturing, and irrigation and water con-

veyance systems construction, management and operations—are included, there are 1,700,000 California jobs dependent upon agriculture. Over half of these jobs are in Los Angeles and San Francisco. The payroll is over eight and one half billion dollars. This is indeed a huge industry. And even more than the airplane and missile industry in California, it is dependent upon continuing research.

I do not mean problem-solving research. No one ever kept ahead in a fiercely competitive situation by solving problems. To stay ahead you must continually inject new ideas into the system. These are the fuel for progress in industry. And these ideas come through what is usually known as "basic" research (mission oriented).

Both the Agricultural Experiment Station and the Agricultural Extension Service will receive another cut in support funds next fiscal year. This is because the University will not receive a budget increase and research funds must be diverted to teaching, operation, and maintenance.

I have had the theory of the expanding universe explained to me by analogy with a loaf of raisin bread rising in the warming oven—each raisin, as the loaf expands, moves away from its neighbor at a rate which leaves the relative positions the same. We have had this situation in the Agricultural Experiment Station in the past. However, now this loaf is baked (stabilized) and the raisins are being moved around from our spot in the loaf to increase the raisin density in another spot.

What is the best use for the raisins (dollars) left to us? Many people have worked days to make this budget reduction less painful to all concerned—the staff and the people of California. Some researchers had to be let go. What should those left emphasize in their work?

My hope is that in the great rush to solve the problems at our doorstep we do not forget the necessity for new ideas for the future. Basic research *must* go on, and a way must be found to continue it. Far more than the economic welfare of 53,000 farmers is involved. The 20 million other people in California are the ones who should worry!