BOYSIE E. DAY
Associate Director
Agricultural
Experiment Station,
Riverside

WHO ASKS THE QUESTIONS?

ADMINISTRATORS like to imagine that the tremendous developments that have characterized American agriculture over the past half century have been shaped by the quality and foresightedness of research planning. However, few of us can define precisely what it is that has made the strategy of agricultural research in the United States so successful —and why there have been so many failures in countries seeking to follow our approach.

Basically, the strategy of agricultural research is determined by questions. Someone asks a question, and the process of agricultural research consists of searching for answers to this question by the methods of science. But who asks the question?

The scientist? He may, indeed, ask the question, but just as often the appropriate question may not be the one asked by the scientist. The scientist asking how Vitamin C works in animal metabolism may not think of his research problem in an agricultural context at all—but purely as a problem in science.

The farmer? His request for help on animal feeding and nutrition may be only vaguely defined in his own mind. He may fail to see the relevance of the scientist's project: the way that Vitamin C works in animal metabolism is an important problem in animal feeding and nutrition.

The politician? Whether his allegiance is to the cattle industry or to the general public, he may press for more research aimed at lowering beef prices and still have no conception of the type of research needed or whether the problem is amenable to scientific solution.

Somewhere, someone—hopefully, the administrator of an Agricultural Experiment Station or a member of a granting agency—must have a conscious recognition of the potential usefulness of research on a particular problem.

Who, then, asks the question? In actuality, no one may have asked the question initially. Various questions were asked by various people. Somewhere along the way, someone was capable of rephrasing all of the questions in a form suitable for an attack on an applied problem.

There are unlimited questions, but only limited resources available to answer them. This means that some questions must always be ignored, for the moment, while our resources are directed toward answering other questions. It also means that probability of success, cost of research, and time required to find an answer to a problem are the primary factors determining our choice of research projects.

All of us, including the scientist who may not have, or need to have, a conscious recognition of the potential usefulness of his research, like to believe that our questions are the most urgent. For this reason, it takes a large amount of faith on the part of the farmer, the politician, the public—and the scientist—not to tamper with the strategy of agricultural research. The failure of agricultural research to match our accomplishments in many foreign countries may have nothing to do with how successfully they have borrowed our research techniques. It may be simply that these countries cannot tolerate a lot of people asking the questions.

Out of the chautauquan-lecture atmosphere of the American hinterland in the mid-nineteenth century, there emerged an undefinable dream and hunger for applied knowledge that gave birth to something new—the land-grant college system, and later the Agricultural Experiment Station and Extension Service. The goals never were as well-charted as some historians would have us believe. The strategy of research that developed was shaped by a rural give-and-take, played like a game of twenty questions, all contributing toward useful answers.

Thus, our strategy of research has been successful. Could it be better? Can we program it for the computer? Surely, we must not lose the human element.