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An Achilles heel for agricultural research

One of the most exciting and promising scientific developments of the 1980s will be found in the field of genetic engineering. Progress made in our understanding of genetics in the twenty years following Watson's and Crick's unraveling of the mysteries of the structure of DNA has been truly impressive. These two decades of basic research in genetics laid the groundwork for the great applications we hope to see in solving some of the difficult problems in agriculture and medicine in the next few decades.

In agriculture we expect to see new plant varieties that will resist the deprivations of pests and diseases, tolerate higher levels of soil salinity, grow normally with less water, convert more of the sun's energy into carbohydrates, and utilize nitrogen that has been transformed from the gaseous form in the atmosphere to forms absorbed as fertilizer. Livestock health will be improved, the reproductive capacity of food animals will be under greater control and will be more predictable, and the yield of meat per unit of feed consumed will be increased.

This promise of utopia for agriculture has stimulated the enthusiasm of the agricultural scientist and the producers of agricultural products alike. It has also stimulated the interest of the investment community and spawned a number of new commercial ventures that will utilize the controlling mechanisms of genetically manipulated strains of microorganisms in the production process. The success of these new companies will depend, however, on a series of new scientific discoveries and the subsequent protection of these new discoveries by patents.

The primary source of the scientific thought necessary for these fledgling companies to develop has so far resided in our universities and agricultural experiment stations. These circumstances have resulted in a veritable raid on the university-based scientific community by private enterprise, which seeks to establish exclusive rights to various genetically controlled products of great potential value to society in general.

There is nothing new about the link between science in universities and its development and application by private industries. Indeed, this relationship is as it should be. However, for university-based agricultural scientists the rapid development of commercial interest in their research findings and the inducements being offered to

them to channel their knowledge and scientific discoveries into exclusive commercial ventures create an unfamiliar environment in which to work.

University faculty have long acted as consultants to commercial enterprises, a defensible practice, particularly when no question of conflict of interest is involved. However, some of the new relationships that seek to exploit for profit the products of individual research have given rise to concerns about the role of the publicly supported agricultural scientist in this burgeoning commercial enterprise.

The rapid strides made in scientific knowledge depend on a free exchange of the discoveries within the scientific community. Hardly anyone disputes the right of private enterprise to exploit for profit the products of scientific inquiry. Indeed, if we are to restore our national industrial productivity, this process must be supported and encouraged. However, storm clouds are gathering, clouds that could coalesce to bring a storm of public criticism down upon our university community unless we plan carefully to protect the integrity of free inquiry and unrestricted exchange of scientific information. Questions of ownership of the discoveries arising out of publicly sponsored research programs must be addressed and resolved. The role that patents play in providing incentives for capital investment to develop ideas and discoveries into useful products must be clearly defined and understood. An equitable distribution of the benefits to all parties with a vested interest in such developments must be attained. Furthermore, there is need to determine who the parties of vested interest are before formulating policies to guide these relationships between public and private entities.

Questions of conflicting interests must be laid to rest. But above all, we need to develop policies that will preserve freedom of intellectual inquiry and subsequent free exchange of information without compromising the rights of individuals or the integrity of their institutions.

These are not easy questions to resolve, but they are urgent and demand immediate attention. If they are not attended to and answered satisfactorily, we may find that the very character of publicly supported agricultural research will change and the resultant change might not necessarily be in the public interest.