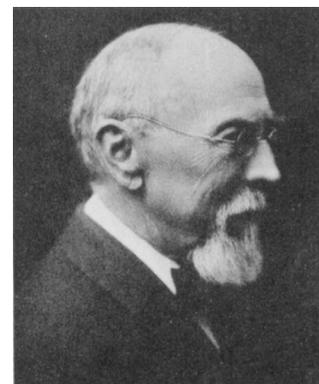


HILGARD . . .

California's First Agricultural Researcher

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ONE HUNDRED YEARS AGO, Eugene Woldemar Hilgard founded the California Agricultural Experiment Station. The University's first researcher in agricultural sciences, he recognized that the scientific method must be applied to agricultural research and that the discipline must be taught scientifically. He wrote: ". . . we do not pretend to teach students the actual operation of plowing and hoeing by making them do that work; they either know how to do that already, or can learn it in a few days when they return to the farm. What we do teach them is, why to plow and hoe at all, and how and when to do it to the best advantage. That is, we teach them the principles on which they must base all their farm work, in order to compete successfully in the hot race that is now on in agriculture."

Hilgard also believed that the university's responsibility to share information extended to people throughout the state: "The correspondence in answer to questions asked . . . shows strikingly the need for just the kind of instruction given to all who care to ask for it."

As a federal land-grant institution, the University of California had offered instruction in agriculture since 1869, but the program lacked land, facilities and proper direction. In 1874, when Hilgard came to the university, he insisted on the need for experiment station work. With the first money (\$250) allotted by the legislature for this purpose, Hilgard began his studies, choosing problems peculiar to California topography and agriculture.

Almost immediately upon his arrival in California, Hilgard had plunged into a study of viticulture. At that time, *Phylloxera*, a root louse, was attacking and destroying many vineyards. Farmers, versed in old cultural practices, were at a loss to combat or even control it. After careful observation and analysis of diseased and healthy vines, he determined three possible methods of control: (1) carbon bisulfide applications, (2) submersion, and (3) use of resistant stocks.

In deciding that the third alternative was most effective and most economical, he arrived at a conclusion that has held true for countless other disease and pest problems.

Other early work led him to conclude that agricultural research was not simply the study of soil chemistry, but the integration of soil chemistry with soil structure and crop type. For this reason, some of his earliest experiments examined the effects of deep versus shallow plowing, and included studies of marls and minerals. Irrigation studies led to analyses of different types of waters—spring, stream, artesian. Scientific research with different soil and water combinations determined which were most productive.

Before money existed for statewide field stations, he analyzed soil samples sent to Berkeley by ranchers from all over the state. To do this effectively, he remodeled an elutriator for better separation of soil particles. Later, field stations established in the Sierras, the Coast Range, the San Joaquin Valley, and Southern California provided the same service for interested parties. All of these procedures, which seem so simple and commonplace in agricultural science today, originated in California with Hilgard.

This work helped Hilgard determine which areas of the state were better suited for which crops. After studies on arid lands were completed, for example, citrus was an obvious choice for the southern portion of the state.

Hilgard made numerous initial discoveries which later enabled scientists in the Division of Agricultural Sciences to build a whole structure of concepts from which to attack problems in various disciplines. He was first to define the nature of alkali soils, to recognize that there were three types, and to discover that the type presenting the most serious difficulties could be neutralized by application of gypsum. Here was a prime example of early agricultural chemistry at work in California agriculture.

In addition to his titles as Professor of Agriculture and Director of the Experiment Station, Hilgard became Dean of the College of Agriculture in 1896. He continued his aggressive campaign to persuade the farming constituency in California, the State Legislature, the university faculty, and the regents of the great importance of the state's agricultural development. Fortunately, for the Division of Agricultural Sciences and for all Californians, Hilgard's talents extended into administration, and he was successful in all these endeavors.

By the time Hilgard retired in 1916, the understanding of chemical and physical properties of soils and plants was expanding rapidly. Over the previous forty years, the farmers and ranchers of California had successfully utilized the information obtained from university agriculturalists, and no longer mistrusted the scientific approach to agriculture. Enrollment in agriculture classes was increasing and experiment stations were being established throughout the nation. Ten years earlier the university had acquired the Davis farm in order to allow more horticultural studies than the Berkeley facilities could sustain.

More important, Hilgard had shaped the basic orientation of the Division of Agricultural Sciences to include instruction of students, basic research, and dissemination of research results to farmers and consumers. He had defined agricultural studies as a proper area for experimental science. He had carried out research in problem areas that were crucial to the development of California agriculture—in viticulture and irrigation, for example. Finally, he had established the University of California Division of Agricultural Sciences as an invaluable arm of the state's economic, scientific and educational structure. The future accomplishments of the division would be built upon the solid foundation that Hilgard created through his great determination, patience, and foresight.