PERSONAL

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Head of Davison's fertilizer research believes great advances are coming, especially in processes

G. L. Bridger

Director, ag chemical research, Davison Chemical Co. Born Memphis, 1911; B.S., Rice, 1933, A.M., 1935; Ph.D., Iowa State College, 1938; Instructor, Rice 1938–39; project leader, chief of process development, Tennessee Valley Authority, Wilson Dam, Ala., 1939–47; Head, Dept. of Chem. & Mining Eng., Iowa State, 1947–55. Smith-Mundt Appointee to New Zealand, 1951. Chairman, ACS Division of Fertilizer and Soil Chemistry, 1956.

G. L. BRIDGER, recently appointed director of agricultural chemical research for Davison Chemical, has a good formula for success—though he probably will not admit it. A study of his work at Iowa State College and TVA, where his groups developed processes for fertilizer manufacture that have had widespread industry impact, shows this creed—get out and do things first hand, and never accept "impossible" as an answer.

Like many scientific men, Bridger had not decided on his life's work when he left college in 1933. Armed with a B.S. in chemical engineering from Rice Institute he faced the depression, ready to take any scientific job. Fortunately, Shell Oil in Houston, Tex., had a plant operations job available. The job meant shift work, and since he was doing part-time graduate work at Rice, he had to skip classes frequently and make them up. He later worked on gasoline fractionation studies in the research lab.

Two years of this work-study program resulted not only in a loss of sleep but also in an A.M. degree in physical chemistry and a fellowship offer at Iowa State where, in 1938, he received a Ph.D. in chemical engineering. His dissertation was on agricultural waste products, and here his interest in fertilizer processes began.

Having a desire to teach, he became an instructor at Rice, but the following year, feeling a need for more industrial experience, he accepted a TVA position to work in phosphate fertilizer manufacture.

Here two of his main contributions were developed. The continuous mixing process for triple superphosphate was announced in 1947 and is widely used today as its product is far more economical than that of the old batch mixer. Earlier, his group developed a fusion process to make fertilizer with rock phosphate and olivine. As sulfuric acid is unnecessary, this method has advantage in sulfur-lacking areas.

In 1947 Bridger moved to Iowa State as head of the chemical engineering department. As his experience and interest were in fertilizer processes, many of his students were motivated to this line, and today Iowa State is a leader in the field.

Part of his staff duties involved work at the Ames AEC installation—separating monazite sand into thorium and the various rare earths by liquid-liquid extraction. Bridger feels this may someday be a practical method of rare earth separation. He successfully extracted uranium from phosphate fertilizers, but it was not an economical process.

Bridger had long been interested in dicalcium phosphate fertilizer and knew that thermodynamics indicated that it could be made by treating phosphate rock directly with acid. Many people agreed this was desirable as it saved acid but felt it was impossible. Unwilling to accept this, Bridger and his graduate students worked feverishly to develop the resulting two-step process (AG AND FOOD, April, page 331). More work must be done on the process, but several companies are interested.

New Davison Department

Last year Davison created a new department of agricultural chemical research and invited Bridger to direct the operation, which includes both fertilizers and agricultural chemicals. It is currently housed in cramped quarters in the Curtis Bay plant, but Davison is building a $2 million research center between Baltimore and Washington for 160 employees, including Bridger's 25 technical people.

Soon after his Davison association began, Bridger lived up to his reputation for getting things done. Examining a new continuous process for granulated fertilizer before it was installed in several branch plants, Bridger modified the process so it could utilize cheaper raw materials.

Some of Bridger's more interesting work has been in the consulting field. While he has acted in this capacity for more than 12 companies, his work abroad holds the interest spotlight. He spent the summers of 1948 and 1950 in Africa studying phosphate deposits in Southern Rhodesia, where lack of sulfuric acid made the TVA fusion process ideal. A pilot plant set up in 1950 showed that fertilizer could be made. Despite the low grade deposit and wild country, operations would be economic with a minimum of 100 tons per day production, but because of location difficulties the project has been deferred.

In 1951 the State Department sent Bridger to New Zealand to help normal superphosphate manufacturers there circumvent the sulfur shortage. After visiting eight plants and studying long-range hydroelectric resources, he advised New Zealanders to use the TVA fusion process. A two-year government study proved it feasible, but by that time the sulfur situation had improved, and the changes were never made. But Bridger thinks New Zealand, having no sulfur locally, would benefit from the change.

Bridger has high hopes for the future of chemical fertilizers and feels past technical developments are only forerunners of advances to come. He feels the major technical improvements will come in better and cheaper methods of manufacture. Especially proud of his former graduate students who have gone ahead in the fertilizer field, he says that technical training was never more important. Companies will keep on expanding their research and development facilities and will spend more for industry-sponsored basic research in the universities. It's good business, and Bridger is one who should know.