

THE OBSERVATION POST

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Farming for Feasts, Fuels, or Factories I

THE BUSINESS of producing an abundance of food in the United States is relatively easy. We are blessed with a wide expanse of fertile soils. Equally important are the contributions of agronomists in conserving soils and improving farm practices, of entomologists and plant pathologists in protecting crops against insects and diseases, and of plant breeders in developing higher-yielding and disease-resisting varieties. In support of those scientists, we have a large and rapidly expanding agricultural chemicals industry which supplies plant nutrients, pesticides, defoliant, and other chemicals essential to efficient and profitable farming.

In this country, financial incentives in the form of price supports are sufficient to catalyze the production of an exportable surplus of food, feed, and fiber. Such a catalyst would, however, be of doubtful efficacy were it not for the incessant research and technological contributions of the organized groups of scientists—to whose service the *JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY* devotes much of its effort. Barring a calamity, we can plan for recurring feasts. Our people can continue to enjoy balanced and nutritious diets. Because we are well fed, our workers excel labor in lands where a deficient diet prevails. And there are many such places.

The Problem of Surpluses: Chemurgy

Stemming from our fortunate capacity to produce are the problems of preventing or disposing of agricultural surpluses. Man has a relatively inelastic stomach. Even American repetitive advertising cannot compete successfully with the dictates of fashion or the warnings of physicians regarding the virtues of girth control.

From the viewpoint of national management of our agricultural economy, one of the problems of the Secretary of Agriculture is to ensure an abundance and thus obviate the contingency of famines or short supplies and accompanying high prices. But so long as we have

problems of weather, insects, plant and animal diseases, and the like, it is difficult to plan for a mathematical sufficiency without running the risk of realizing surpluses.

This is the striking difference between farm and factory production. Because of this situation, many persons, including Secretary of Agriculture, Ezra Benson, have concluded that the solution to our surplus problem, depends on "the development of new industrial uses of farm products." This is chemurgy.

Chemurgy may be defined as a working philosophy having as an object the development of new industrial uses for agricultural products and the establishment of new, nonfood farm crops through the aid of scientific research and technological development. Such a philosophy, when implemented in a practical manner, is good. Much progress has already been made in this field and some of the more notable achievements will be discussed in the next issue. It is to be emphasized that our giants in the chemical and petroleum industries also owe their stature to research and development.

Counter Chemurgy

From the viewpoint of a healthy agriculture, emphasis on chemurgy is needed as a matter of self preservation. Concurrently with the development of new nonfood uses for farm products, many new materials of mineral origin have invaded traditional agricultural markets. A few of the outstanding examples are synthetic fibers, detergents and drying oils, as well as synthetic alcohol and glycerol. These synthetics contribute to the stabilization of prices, the enrichment of our economy, and the security of the national defense.

Control of Surplus Stocks

We now have large carryovers of butter, corn, wheat, and cotton. A number of proposals have been made for the disposition of our excess supplies. These may involve outright gifts to build up international good will, which may be a good investment. Some pro-

posals relate to questionable chemurgic practices which must be weighed against the contingency of curtailed or inadequate future production. Our particular interest was drawn to two suggestions to use grains (or other fermentable materials) for the production of power alcohol and antiknock motor fuels. One proposal calls for the uncontrolled production and use of replenishable agricultural materials as an end in itself. The other has as an objective the salvaging of surplus grains. In both cases supplies of grain would be burned as alcohol.

Proposal No. 1

In a recent volume, a leading proponent of the idea of raising crops to produce motor fuels states: "When once we cast off the curse of the greedy [petroleum industry] who strive against chemurgy and farm industry, we shall manufacture alcohol from farm products at less than 10 cents per gallon."

Just at present about one half of our industrial ethyl alcohol is being synthesized directly from ethylene at a little less than 25 cents per gallon. "But this is no more than a further step in burning our un-renewable resources and constitutes a crime against chemurgy and nature."

How Sound Is It?

To be remotely competitive, corn must be available at 40 cents per bushel. Since 2.5 gallons of alcohol are obtained therefrom, the raw material cost is 16 cents per gallon. To this must be added malt or enzyme costs of 6 cents and manufacturing costs of 16 cents per gallon. From the gross cost of 38 cents per gallon a deduction of 11 cents is made for the net income from by-product feeds. But, the effective parity price (March 15, 1953) for corn is \$1.77 and the support price about \$1.50. Thus legal and economic problems appear. The corn farmer, or any starch-producing farmer, expects returns comparable to other types of agricultural pursuits. He also wants to prosper.

The farmer is interested in chemurgy only to the extent that it will enable him to sell his produce to new or more profitable markets.

(To be continued in next issue.)