CHEMISTRY-ENGINEERING

Chemists Debate Value of Alcohol Blend for Car Fuel

Advocates of Blended Fuel Believe Problem Linked With Agricultural Salvation; Others Fear Competitor

THE long-impending battle over the use of alcohol as a blending agent for gasoline in motor fuel reached a climax at the meeting of the American Chemical Society, in Kansas City, Mo.

Through a maze of technical phraseology, chemical symbols, and graphs, five speakers spoke more than 20,000 words —not counting discussion—concerning how and by whom the motor fuel of America's trucks and automobiles shall be supplied.

Three camps were distinctly apparent in the conflict. On one side was the powerful petroleum industry. At the opposite extreme were those led by the Chemical Foundation, working to demonstrate that a blend of alcohol and gasoline is a perfectly good and practical fuel for motor cars.

Midway between these groups were those men who are concerned with the scientific sides of the problem only and not the vast economic aspects which constantly hovered in the background.

The petroleum industry sees, in the rise of alcohol blends of gasoline, a potential competitor which will cut gasoline consumption. The millions upon millions of dollars invested in oil fields, wells, refining plants and enormous distributing systems are at stake.

Advocates of alcohol fuel blends see the problem intimately linked with the agricultural salvation of the nation, for behind the drive for alcohol-gasoline blends as fuel is the hope that this alcohol will be made from farm crops. And that the American farmer will thereby have another outlet for his crops over and above use for foodstuffs.

Legislative Problem

For months in the legislatures of the Midwest the alcohol fuel blend problem has been a topic of discussion. At the chemists' meeting the petroleum industry fought back.

"Proposals for compulsory blending (of alcohol and gasoline) can only be regarded as an indirect and inefficient type of subsidy to certain agricultural groups at the expense of the general public," declared Drs. Gustav Egloff and J. C. Morrell of the Universal Oil Products Co., Chicago, Ill.

The U.O.P. Co. is the holder of basic chemical patents for certain cracking processes in gasoline making. These patents are licensed to various oil companies.

Speaking for the alcohol blend side of the picture was Dr. Leo M. Christensen, formerly of Iowa State College and whose researches are now financed by the Chemical Foundation, who said:

"The scientific literature is replete with reports on the characteristics of such fuels (alcohol-gasoline blends) but an economic analysis based solely upon these data is certain to be inadequate. The influence of this development upon employment, improvement in farm practice, freedom from the vagaries of international trade, provision for an imminent petroleum deficiency and other factors must be given the full consideration due them."

To Increase Employment

What Dr. Christensen is saying is simply this. The use of alcohol blended with gasoline should increase employment, improve the status of the farmer, remove the American motor fuel situation from what may happen when a great foreign oil company decides to cut prices, and provide a way out when America's natural sources of petroleum are diminished in the future.

Point is given to the drive that the Chemical Foundation is making for alcohol-gasoline blends from farm products, by its new plant for making alcohol from corn, just going into production at Atchison, Kansas, as a practical large-scale demonstration.

The plant will produce 10,000 gallons of anhydrous alcohol daily from 4,000 bushels of corn. Thirty-two tons of protein cattle feed will be a by-product. Other farm products, such as low-grade oats, barley, wheat and potatoes, can also be utilized for alcohol production. The material employed at any given time will depend on the crop conditions.

The ethyl alcohol produced by the operators, the Bailor Manufacturing Company, will sell for 25 cents a gallon and the final blend of alcohol and gasoline sells for the same price as a premium straight gasoline of comparable octane rating. Standard approved denaturants will be used to make the alcohol unusable for beverage purposes.

Treading the middle-of-the-road path between these two extremes is a difficult task scientifically or otherwise. One scientist who did it successfully in the motor fuel symposium was Dr. Oscar C. Bridgeman of the National Bureau of Standards in Washington, D. C. Shying sharply from any touch of the economics of the problem, Dr. Bridgeman analyzed the vast amount of technical findings already available and showed, as a major contribution, why there are such widely different claims with regard to how well blended gasoline and straight gasoline work in an internal combustion engine.

Claims Differ

Just as a sample of how these claims differ, Drs. Egloff and Morrell declared:

"The increased fuel consumption of a 10 per cent alcohol-gasoline blend is four to five per cent higher than gasoline based on both road and block tests."

By contrast Dr. Christensen said: "It may be concluded, however, that the substitution of alcohol blends containing not more than 25 per cent of ethyl alcohol by volume for gasoline . . . will result in no decrease in power output or increase in specific fuel consumption."

Dr. Christensen added that there may even be less fuel consumption in everyday driving practice because the effect of adding alcohol to gasoline is to create a fuel which corresponds to a leaner carburetor mixture. Since many people drive with a carburetor mixture just a bit too rich for economical operation, the change to a blended gasoline may thus bring about less fuel consumption in their cars. A 10 per cent alcohol-gasoline fuel, said Dr. Christensen, has all the advantages of ordinary straight gasoline in a purely technical sense, and in addition, on the economic side, it has the merit of providing the farm with a new, untouched market for low-grade farm products which are now so nearly valueless that it is almost unprofitable to remove them from the fields. And the poorer a given crop may be for food purposes, he pointed out, the greater is the yield of alcohol from it.

Dr. Bridgeman in his middle-of-the-road discussion brought out clearly that the results obtained from fuel tests and power outputs depend greatly on how the tests were done.

If you take your own automobile, whose carburetor is adjusted for the best gasoline consumption, and try an alcohol-gasoline blend in it you may get a lower mileage. Dr. Christensen claimed that some drivers will find a greater mileage, and Dr. Bridgeman agreed with this finding in part. But, on the average, for all cars tested the different mileage is quite negligible; two ten-thousandths of a gallon of fuel per mile of travel.

Or, said another way, if you drove a car 5,000 miles with alcohol-gasoline fuel it would take one more gallon of fuel than if you used straight gasoline.

Another Test

Still another way to test the two types of fuel is based on the octane rating of the fuels. Adding alcohol will increase the octane rating of the fuel slightly. Octane rating is a measure of the bumpiness of fuel explosions and is linked with smoothness of engine performance. In this test special engines designed to take advantage of the fuel characteristics are used.

Dr. Bridgeman reported on this third type of test:

"Equal or better power and acceleration per gallon of fuel consumed may be obtained from blends when comparing a gasoline and the same gasoline blended with ethyl alcohol, within the range of present-day gasolines."

But returning to the economics of the alcohol-gasoline blend. The petroleum industry is represented by the statement of Drs. Egloff and Morrell:

"The cost of alcohol-gasoline is much higher than gasoline alone and there is nothing in prospect which would decrease this cost to make it competitive with gasoline at the same price level."

The slightly higher cost, in the opinion of the people advocating the alcohol blend, would be worth while in terms of the improved agricultural conditions.

For the future, however, when gasoline resources dwindle, as they must do some day, alcohol blend fuels or some substitute for gasoline undoubtedly will come still more to the forefront of the economic picture. Throughout the world where alcohol is blended with gasoline one finds that the nations without adequate resources of petroleum are the greatest users of the blend. Such a day will sometime come for the United States and then either a gasoline substitute or a blended gasoline will be used. The question still unanswered by the current survey of the problem is: "Shall it be now or later?"

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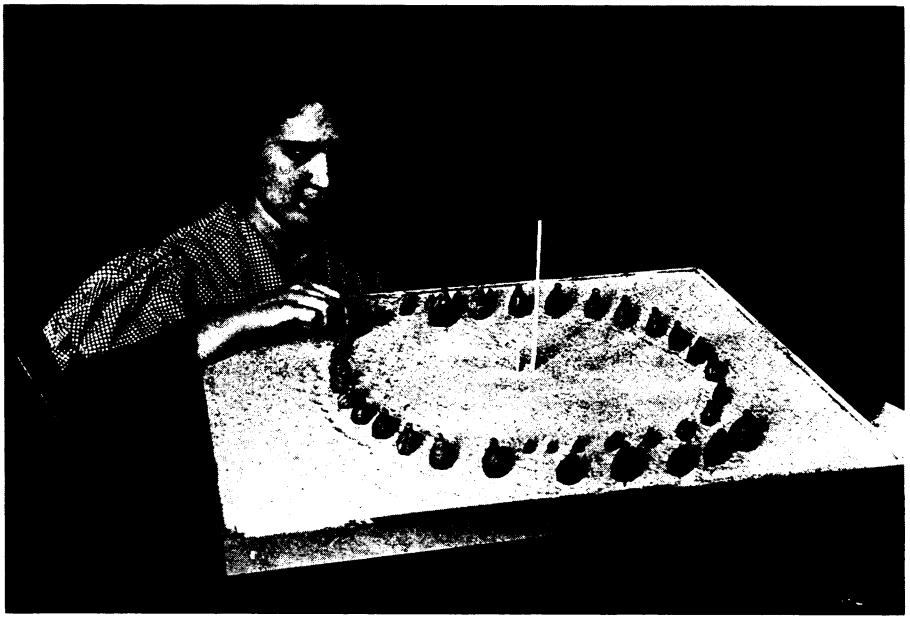

MOST PRIMITIVE GAME

A most primitive game of a most primitive people living in Venezuela, the Yaruro Indians, is being manipulated by Miss Ernestine W. Singer, of the staff of the University of Pennsylvania Museum. The stick put up in the sand represents the center of the world and of all things. Around it dance the people. In the inner circle are the men led by the "shamen" or priest; in the outer circle the women, led by the priestess. The figures are of clay and crude differences exist between the male and female figures.

MEDICINE

Prehistoric American Indians Suffered From Syphilis

SYPHILIS, blackest of plagues to modern humanity, was also a scourge to Indians who lived on this continent long before the coming of the white man. Such is the conclusion strongly indicated by evidence offered before the meeting of the American Association of Anatomists in Durham, N. C.

The evidence consists of disease-marked bones found by a joint expedition of Duke University Medical School and the University of Alabama, in ancient burials at Moundsville, Alabama. Archaeological conditions in the mounds make it practically certain that these burials are of pre-Columbian date.

Syphilitic lesions, as nearly unmistakable as can be judged from the examination of bones alone, mark many of the skeletal remains laid out in the exhibit viewed by the anatomists. These consist largely of thigh bones, but include skulls and other bones as well. They have the swollen, overgrown, loose-textured, "rotten" appearance characteristic of bone syphilis in an advanced stage. There are one or two other bacterial infections that can have somewhat similar effects on bones, but a number of medical specialists who have examined these specimens agree that the weight of evidence points toward the diagnosis as given.

Other diseases also shortened and made unhappy the lives of these long gone early Americans. One skull, apparently of a man in the prime of life, had on its lower jaw a terrible outgrowth of bone, an osteoma or bone tumor, which must have been the cause of its victim's death. Other bone-diagnosed afflictions included rickets, osteomyelitis, arthritis, and fractures. What ills the flesh of these Indians was heir to, we can only guess, since nothing but their skeletons remain. But if the bones form a fair sample, life in ancient Redskin America was probably far from idyllic.

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