

of the foot become badly disorganized. It is this type of fault that leads to disorders of the main arch along the inner border of the foot.

When the first metatarsal bone is short, this affects the foot especially in active functions such as walking or running, when the foot is used as a lever. Such a foot can be identified by its appearance, because, for one thing, the second toe is invariably longer than the great toe. Another common sign is the pressure of callus on the sole of the foot, just behind the second and third toes.

There is no such thing as an anterior metatarsal arch. It is an erroneous concept we have inherited from the past century. The pains and calluses that have been blamed upon a "falling of such an arch" are really due to the uneven distribution of body weight upon these bones we have been mentioning.

In order to reestablish normal function in such cases it is necessary to know the nature and position of the underlying fault. Efficient care has been given to such cases by the prevailing methods of treatment which include strapping, arch supports, rest periods, and special exercises. But from these studies there has been a new and very simple method developed which applies directly to a correction of disordered weight distribution. This is simply an extension on a light insole that forms a platform under the first metatarsal bone. It raises the supporting surface of the ground to a level that makes the bone perform its normal duties, and by so doing relieves the strain of uneven weight distribution and inhibits the growth of painful callus.

This new method of treatment has been used on many cases as part of our scientific investigations during the past ten years. The research work on which it is based has only recently been published in completed form, in *The Human Foot* (Columbia University Press).

*Science News Letter, October 10, 1936*

There are waltzing rats, as well as waltzing mice.

## ● RADIO

October 13, 3:15 p.m., E.S.T.

SOIL AND SOCIOLOGY—Prof. Paul B. Sears of the University of Oklahoma.

October 20, 3:15 p.m., E.S.T.

SCIENCE AND HOUSE PLANTS—W. R. Beattie, Senior Horticulturist, U. S. Bureau of Plant Industry.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.

### CHEMISTRY

# Power-Alcohol Plant Now In Commercial Production

AMERICA'S first power alcohol plant is producing new fuel for motor cars. Two batches of anhydrous ethyl alcohol made from corn, totaling 2,000 gallons, have poured from the stills of the Chemical Foundation-sponsored plant of the Bailor Manufacturing Company, Atchison, Kansas.

Officials expressed themselves as pleased with the performance of the new plant and predicted that in a month the capacity of 10,000 gallons a day would be realized.

Alcohol-blended gasoline under the name of agrol will be on sale shortly in seven midwestern states at prices that will compete on a quality basis with straight gasoline fuels. The production of power alcohol from surplus farm products in this plant is being watched by leaders in agriculture, the oil industry and other fields, including government, because it is a practical demonstration of the Farm Chemurgic Council's thesis that crops from American soil can be utilized for manufacture of industrial materials.

The Atchison plant also produces butyl as well as ethyl alcohol and as a valuable by-product dries the spent mash into a protein feed for stock. The butyl alcohol is used in connection with the ethyl alcohol production.

The ethyl alcohol, the same stuff that gives the kick to liquor, is used blended with gasoline to produce motor fuel. The whole output of the Bailor plant is being taken by the Chemical Foundation of Kansas for distribution at a price not to exceed 25 cents a gallon.

At the plant the alcohol is denatured and then blended with an equal volume of a petroleum to make what is called "agrol fluid." This blend will be used by filling station operators to make three grades of agrol gasoline, known as agrol 5, agrol 10, and agrol 15. These numbers indicate the quantity of alcohol in each of the standard blends when 60 octane gasoline is taken as the base fuel. If the filling station uses higher octane gasoline, less agrol fluid is needed, and if lower octane gasoline is the base, more agrol fluid is blended.

The oil industry is quite naturally watching closely the operation of the new plant and the distribution experience. In an article in the current *Oil*

and *Gas Journal*, W. T. Ziegenhain tells how the economies of power alcohol-gasoline blends will work out. The anti-knock value of base fuel, he explains, is raised one number for each one per cent of alcohol added to the 60 octane base fuel. Mr. Ziegenhain explains how an Omaha distributor might figure his relative cost. He pays 25 cents a gallon for the alcohol at the Atchison plant in the form of agrol fluid, and adds one cent freight charge. The present delivered cost of 60-octane refinery gasoline at Omaha is about seven and a quarter cents. If nine parts of this fuel are blended with one of alcohol, the resulting 70 octane blend costs nine and one-eighth cents. Regular 70-octane refinery gasoline is selling at Omaha for about eight and one-half cents. Large quantities of gum-solvent refinery gasoline is selling in the same area for one cent premium. The alcohol blend would fall in this classification and Mr. Ziegenhain believes that "the marketer might be attracted to the alcohol blend and the potential competition made real." The Atchison plant is believed by its officials to be the only commercial alcohol plant that has attempted to produce both butyl and ethyl alcohols and protein feed commercially in its initial operation.

*Science News Letter, October 10, 1936*

### CHEMISTRY

## Agriculture Department Studies Power Alcohol

MORE research upon the possibility of making power alcohol from farm products is being undertaken by the U. S. Department of Agriculture as the result of the Midwest's increasing interest in practical aspects of converting corn and other surplus or waste agricultural materials into stuff that will help run autos.

P. Burke Jacobs, formerly in charge of the Bureau of Chemistry and Soils' industrial farm products research laboratory at Ames, Iowa, is investigating intensively power alcohol production.

The new inquiry is a part of the general research on agricultural by-products being conducted by the Bureau of Chemistry and Soils.

Department of Agriculture scientists