

CHEMISTRY

Serious Petroleum Shortage Predicted in Near Future

GASOLINE prices are going up in a few years. And when they go up they will stay up.

When that happens, it will be only the symptom of a very serious underlying situation, which will carry with it real danger to the United States, from both the economic and the military sides. The American Chemical Society made public a warning to this effect on the eve of its national meeting at San Francisco.

Difficult industrial adjustments involving investments totaling billions, a radical shift in auto styles toward light, cheap cars, and new and onerous duties for the Navy in protecting trade routes to the foreign oil fields on which we shall have to depend when our own petroleum supply runs low, are among the unpleasant realities we shall have to face less than half a generation hence, the warning stated.

On the naval side, the report said:

"Increasing petroleum imports will result in greater dependence upon our navy and air force to prevent the serious dislocation of industry which would result if such imports were to be interrupted. The manufacture of substitutes, such as shale oil or oil made by the hydrogenation of coal, could not possibly be developed quickly enough to be of importance in a national emergency such as war, which would be settled one way or another long before any large part of our gasoline demand could be supplied from the auxiliary sources.

"The amount of our reserves is fairly accurately known and is believed to be ten to twelve billions of barrels," the report continued. "Although this would be equivalent to about twelve or fourteen years' supply, producing fields rapidly decline but continue to produce small amounts of oil by pumping for many years. Shortage will accordingly be experienced many years before exhaustion.

"The magnitude of the oil reserves in foreign fields is not known as accurately as is our own, but much of our petroleum requirement will, within a few years, come from South America and possibly Russia and Persia."

The authors of the report, Dr. Benjamin T. Brooks, consulting chemical engineer, and L. C. Snider, geologist of Henry L. Doherty and Company, do not place much reliance on the proposed use

of power alcohol to eke out the gasoline supply. They declared:

"Alcohol as a motor fuel is a question of politics and farm subsidies, not an economic question. The Federal Oil Conservation Board has clearly shown that alcohol is not an economic substitute for gasoline except at price levels for gasoline about five times the refinery cost of gasoline during the last five years. Advocates of alcohol and Diesel motor fuel seldom take into account the distribution and filling station cost and taxes on gasoline."

The era of scarcity and higher prices in petroleum products will come long before the total exhaustion of continental American oil fields, in the opinion of Dr. Brooks and Mr. Snider.

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Fears of Petroleum Shortage Held Greatly Exaggerated

FEARS of an imminent gasoline shortage in the United States, with skyrocketing prices, are held exaggerated by Government economists, statisticians and petroleum specialists.

Commenting in response to Science Service inquiries, they said they could not agree with Dr. Benjamin T. Brooks, chemical engineer, and L. C. Snider, geologist, both of New York, who predicted before the American Chemical Society meeting in San Francisco that a serious petroleum shortage will arise some time between 1940 and 1943.

The prevailing opinion among persons conversant with the petroleum industry is that while America will undoubtedly be faced with a shortage of natural petroleum at some time, it will be a great deal further in the future than five years.

According to figures of the U. S. Geological Survey, the known petroleum reserves of the United States, excluding unproven areas and unknown potentials, are about $13\frac{1}{4}$ billion barrels. Since the normal rate of consumption is roughly one billion barrels a year, this supply would last at least 13 years, if no new fields were discovered.

CHEMISTRY

Butane, Propane Useful When Made Into Liquids

BUTANE, propane and other petroleum-gas names now unfamiliar may soon become parts of common speech and consciousness. They are now rather neglected by-products of petroleum refining, but when turned into liquids they can be put to a considerable range of uses, W. Z. Friend and T. W. Legatski of the Phillips Petroleum Company told colleagues at the meeting of the American Chemical Society.

These gases are so versatile, they said, that a single supply may first be used as a solvent, then as a refrigerant, and finally consumed as a fuel either for heating or in internal combustion engines.

They pointed out that the consumption of liquefied gases increased 71 per cent. during the year 1932-33, and 73 per cent. in the year 1933-34, and prophesy that under the stimulation of further applications their use will be increasingly common in the future.

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New oil fields are now being discovered, giving an addition of approximately 600,000,000 barrels each year. This, to be sure, is not enough to supply our demand without tapping our reserves, but it is enough to make our reserves last a great deal longer than 13 years.

Consumption may rise, of course. The Petroleum Administrative Board's estimates for the month of July and August reveal that it will probably reach an all-time peak for the history of the United States, with about 42,000,000 barrels consumed each month. Consumption is usually higher in the summer months, however, and there will be a dropping off with the approach of winter.

As for a rise in prices due to shortage of petroleum, and its predicted effect of less consumption of gasoline, and small, low-powered automobiles, government statisticians have not been able to discover any link between gasoline consumption and price, or between petroleum supply and price.

Prices in the gasoline field are strictly competitive prices, and not based directly on supply, demand or anything else. Furthermore, there appears to be no re-

lation between price, including state and federal taxes, and petroleum consumption per car, which is roughly 18½ barrels per car each year. For example, in Alabama, the taxes on gasoline are in the neighborhood of nine cents a gallon, and yet there has been no drop in gasoline consumption in that state.

What about synthetic gasoline?

Undoubtedly, at some time in the future the motor cars of the United States will be driven by motor fuel that is at least partly the result of chemical skill.

"Sooner or later a substitute for natural petroleum as the principal source of motor fuel must be found, but what it is, or when it will be commercially practical we don't know," said a member of the Petroleum Administrative Board who refused to be quoted personally.

Shale oil has been mentioned as a possible substitute for petroleum. The prevailing opinion is, however, that while oil distilled from shale is a great potential source of motor fuel, there is no technical process at present capable of recovering it in sufficient amounts and at a cheap enough cost to be practical.

Step number one in providing a substitute for petroleum will be the large-scale synthetic production of gasoline by hydrogenation of coal, it is believed in government circles. A number of successful processes for coal hydrogenation have been developed, notably the Bergius process at present being used on a large scale in Germany, and are now being experimented with in America.

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In one week in July the New York State Department of Health distributed enough typhoid vaccine to give a first injection to 38,000 persons in the flooded areas of the state.

MEDICINE

Cancer Treatment Advance Awaits Better Lead Compounds

Patients in Hopeless Stage of Disease Apparently Cured By Heroic Treatment With Colloidal Lead Phosphate

CANCER, one of the most dreaded of mankind's foes, will have to take a major defeat if research chemists can develop new types of lead compounds that will be less toxic to normal body tissue and more certain to concentrate in rapidly growing cells.

This is the opinion of Drs. A. E. Osterberg, J. A. Bargen, and B. T. Horton of the Mayo Clinic, Rochester, Minn.

Dr. Osterberg pointed out that encouraging results in the treatment of cancer have already been obtained through the use of one lead compound already available, namely colloidal lead phosphate.

In a series of eighty-five cases of cancer in the hopeless stage, treatment with colloidal lead phosphate produced apparent cures in at least seven cases. Seven additional cures occurred in the group, but these patients had received other treatment in addition to lead therapy and the cause of recovery could not be definitely assigned.

In explanation of the failures which have been met by other experimenters with lead therapy, Dr. Osterberg stated that enough lead must be administered to cause obvious poisoning. If this is not done, the concentration of lead in the cancerous cells, despite their tendency

to collect it, is not sufficient to cause their necrosis or deterioration.

The patients are later cured of the lead poisoning by the administration of calcium, which facilitates deposition of the lead in the bony structures of the body.

Dr. Osterberg believes lead therapy holds out definite promise in cancer treatment, but is certain that more nearly ideal lead compounds are yet to be found.

Favorable results have been obtained on all types of cancer.

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BIOCHEMISTRY

Synthetic Cortin to Pave Way for Disease Conquest

IMPORTANT information concerning the chemistry of substances closely related to cortin, the secretion of the outer layer of the adrenal glands, was reported by three representatives of the Mayo Foundation, Drs. E. C. Kendall, H. L. Mason, and C. S. Myers, to the American Chemical Society.

They expressed the hope that the knowledge they have gained from these related compounds, one akin to a complex glucose, another akin to glycerine and the third a crystalline alcohol, will aid in determining the chemistry of cortin itself and bring closer the day when this valuable hormone will become available at reasonable cost for medical therapy.

It was pointed out that adequate supplies of cortin provide one of the most hopeful means of alleviating the fatal Addison's disease. Also, glaucoma, a common cause of blindness in the aged, can be successfully treated by injections of the glandular substance containing cortin. Even that type of near-sightedness known as progressive myopia, long considered incurable, is helped by the administration of the hormone. The scientists said:

"Vast possibilities for the eventual cure of many of man's illnesses will be opened up when cortin can be successfully manufactured by the commercial chemical industry."

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NEW PLANE IS QUEER-LOOKING, BUT SAFE

The bureau of aeronautics, U. S. Department of Commerce, continues its search for a low-priced, safe airplane suitable for everybody's use. The newest specimen, with no tail, rudders on the wing-ends, and a "pusher" propeller, is a very queer-looking craft, but is said to be a good flier and extraordinarily stable and safe.