



**SOLAR BATTERY** — A one-third increase in the efficiency of the Bell solar battery has been made. Here Gerald L. Pearson, a co-inventor of the battery, uses X-ray equipment to check the atomic structure of an ingot of silicon. The improved battery has an efficiency of eight per cent, comparable to that of steam and gasoline engines. (See SNL, May 1, p. 278.)

## ENGINEERING

## Underground Fires Raise Oil Well Production

► PETROLEUM ENGINEERS have learned to ignite underground fires in dead oil wells to increase production in the area.

Dr. Rodman Jenkins, chemical engineer, told a conference on petroleum recovery in State College, Pa., that the Magnolia Petroleum Company has learned to use heat to "melt" some of the thick crude that ordinarily cannot be extracted easily from oil-bearing deposits.

He said an electric heating element is lowered into an abandoned well to start the fire. Air is pumped into the shaft. The oil-bearing rocks ignite and burn, throwing off heat which thins the crude in the deposit. This causes the crude to flow more easily toward nearby wells where it can be extracted.

The "injection well," at which the fire is started, may be 500 feet from a producing well. The fire is ignited and fanned with air until a temperature of several hundred degrees Fahrenheit is attained about 300 feet from the injection well.

Lower-temperature heats spread to nearby producing wells, raising them to temperatures of 150 to 175 degrees Fahrenheit after one to five years of burning, he said.

Dr. Jenkins was one of the top ten winners of Westinghouse Science Scholarships in the 1944 Science Talent Search. (See SNL, March 18, 1944, p. 179.)

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## GEOGRAPHY

# Russians Dry Up Caspian

A non-intentional by-product of agricultural progress caused by vast irrigation and power projects, shrinkage of the sea is serious threat to Soviet national economy.

► THE RUSSIANS are drying up the world's largest lake, the Caspian Sea.

A non-intentional by-product of Russian agricultural progress, it causes serious economic headaches and is seriously injuring the Soviet national economy.

George A. Taskin, lecturer in Soviet geography at Fordham University, New York, has reported to the American Geographical Society the shrinkage of the 169,000-square-mile salt-water sea.

The problem has so concerned Communist economists and scientists that there is reason to believe that plans for the construction of the Volga-Ural canal have been cancelled, Mr. Taskin told SCIENCE SERVICE.

The vast irrigation and power projects built in the Caspian Basin to step-up agricultural and industrial expansion in recent years have been blamed.

In effect, the Russians are draining off the water from the rivers and streams that replenish that normally lost by the Caspian through evaporation. Principal among these is the Volga River, which estimates show supplies the Caspian Sea with 70% of its new fresh water.

In the past 50 years, Mr. Taskin reports in the *Geographical Review* (Oct.), the sea has shrunk almost 14,000 square miles, an area the size of Massachusetts and Connecticut combined.

However, he stated, it has been within the last two decades that unnatural causes have hastened this shrinkage.

Natural causes such as winds and weather

are a prime factor in the receding phenomenon, but the change is more rapid because of technological progress.

The shrinkage has seriously hampered the northern Caspian fishing industry which was at one time the richest in Russia. It has also hampered the transportation problems faced by the Soviet oil industry on the shores of the Caspian. Russia's richest deposits are found there.

The fishing industry has steadily declined. Evidence from behind the Iron Curtain is that up until 1953 nothing was being done to aid the situation.

The transportation of oil on the Caspian Sea to the Volga River and hence to other parts of Russia accounted for more than half of the entire Soviet maritime turnover.

"Maritime transportation on the Caspian," Mr. Taskin reports, "is already inconvenienced by the fall in sea level, and will be still further handicapped by a continued drop."

Railroads can absorb this changing transportation headache, but railroads are more expensive than sea freight.

Still another problem is the resettlement of fishing villages, dockyards, piers and warehouses to keep pace with the receding shoreline.

On the other hand, it is not as yet known whether the land reclaimed from the sea is arable, and even if it is, what crops could be raised on land that had been submerged under salt water for centuries is unknown.

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## TECHNOLOGY

## Rubber Roads Tested

► HIGHWAY RESEARCH experts are trying to learn whether rubber roads will stretch the taxpayer's dollar. The answer today is neither "yes" nor "no."

Highway physical research engineer J. York Welborn said he and Richard H. Lewis, senior chemist at the physical research branch of the Bureau of Public Roads, have been testing 14 types of rubbers on three typical asphalts since 1950. The asphalts are widely used on the East Coast, in the Midwest and on the West Coast.

In two cases reported in *Public Roads* (Oct.), test results indicate that the asphalt may withstand cracking better in cold weather. This is a dollar-stretching quality in winter when heavy trucks would be rolling over them. In most cases, rubbers also seemed to improve the material's resistance to blazing noontime suns.

The "give," or elasticity, of one asphalt was raised by the tested rubbers. This is a desirable quality because highways are sometimes stressed severely.

Harry M. Rex and Robert A. Peck, also of the Physical Research Branch, have tried out ways of mixing rubber into the paving material.

When the rubber was blended with hot asphalt before being poured over the aggregate, the surface was more easily compacted and was more stable than mixtures containing powdered rubber.

A combination of Ottawa sand, pre-blended asphalt and natural rubber yielded a material more resistant to abrasion. Mr. Rex interpreted this as meaning that snow chains may not do as much damage as on less-resistant surfaces.

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