U. S. Authority Sees Ample Motor Fuel for Long Future

HARRY H. HILL
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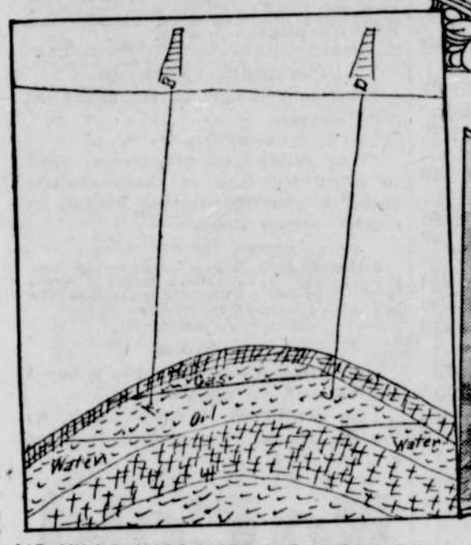
WORKERS IN GAS MASKS AT AN OIL WELL



MR. HILLS IMPROMPTU SKETCH OF AN OIL DOME

EXPERIMENTAL OIL SHALE REDUCTION PLANT

The U. S. Bureau of Mines is confident that motor fuel supplies will be ample for many years to meet all needs of the country's millions of automobiles. Harry H. Hill, chief petroleum engineer of the Bureau, here tells the reasons for this conviction, and sketches the advances in industrial methods which justify his opinions.

By HARRY H. HILL
Chief Petroleum Engineer, United States Bureau of Mines

ONE reason why there is no reason to worry greatly about motor fuel for a long time ahead is that people are worrying about it. Interest in such a question at the right time, is the best insurance against disaster. The President and the Federal Oil Corporation Board have done what was needed, at the right time.

We know that most petroleum has come from rather limited areas and that even from these only a small proportion has been taken out. Oil produced by gas pressure capable of lifting it to the surface when we drill holes is but a small proportion of all the oil contained in the sands. Even from the best pools recovery by the old methods is small, perhaps one-half in the most favorable conditions, oftener one-sixth, or one-seventh, or one-tenth. But a considerable part of what still remains in the ground can be recovered by methods now established as technically and economically practicable.

Producing oil from coal and shales and by mining the oil bearing sands is entirely possible. Experiments are going on in these directions, and if we ever have to fall back on these resources we will be ready. For a long time, however, the present methods of exploration and drilling, with improving processes to assure larger recoveries, are likely to suffice.

An Oil Dome Illustrated

I am no draughtsman, but maybe I can draw something that will help explain. Here's a rough drawing of an oil dome. The shaded part at the bottom is a deposit of oil bearing sands—with an impervious rock stratum above. A wild-catter drilled the hole A-B and gas pressure caused oil and gas to flow. After a while the gas pressure wasn't sufficient to keep up the flow and they pumped until ultimately even this ceased producing.

Nevertheless, most of the oil was still left sticking to the sand grains. Then the operator drilled the well C-D, which flowed for a time, but most of the oil was still down there in the sand. If the gas pressure could be restored more would flow. So the operator injects gas into one well, restoring the pressure and causing the oil to resume flowing from the other. After a time the flow will stop again, but still much of the oil will be left. In some fields it has been possible to obtain additional amounts of oil by introducing water in some of the wells and forcing the oil to others. The addition of a chemical such as soda ash to the water may assist in removing the oil from the sand grains, but neither plain water nor water containing chemicals should be introduced into an oil sand except as a last resort, for it is likely that the water, which travels faster through the sand, will get to the open wells ahead of the oil and when the flow is resumed under pressure water will come out.

Everything Saved Nowadays

The gas escaping from an oil well carries with it a proportion of gasoline, which in the old days was lost. Nowadays it is extracted from the gas and saved, while the dry gas can be forced back into the ground to maintain pressure.

One of the menaces to most oil pools is the inflow of subterranean water. Water flows through the oil sands faster than oil, and by surrounding the bottom of the well keeps the oil out. How to shut off the water and permit the oil to run out is a problem with which the engineers have long worked. They have made great progress and so increased recoveries.

In earlier times most oil producers carefully guarded all information about their wells and experiences, but latterly there is co-operation in these matters. Geologists and petroleum engineers, once derided by the "practical" oil men, are more and more accepted as guides and mentors. New knowledge is constantly increasing recoveries.

As to Mining for Oil

In Lorraine they have dug shafts down to the oil sands and actually brought the sands out, like coal from a mine. But it's costly.

Another mining process is to sink a shaft to the oil sands and from its bottom drive tunnels in all directions through the sands. From these tunnels small perforated pipes are driven into the sands, which drain the oil out of the sands. It flows to larger pipes back at the foot of the shaft and thence is pumped out. This requires installing an expensive plant, but in some fields the high recovery that is assured might justify the cost. I understand the process is about to be intsalled in a few fields in this country, some companies being convinced it is practicable and profitable.

Oil can be distilled from coal, and much work is now being done along this line. But more appeal has been made by the plan of extracting oil from shale. The shales of Scotland have been worked for three-quarters of a century, and they are almost unlimited in this country, richer in oil than those of Scotland. Kentucky, Ohio, Colorado, Utah, Nevada, Wyoming and California are particularly rich in shales. It is just a question of the cost of extracting the oil. Congress has given $180,000, with which the Bureau has installed a plant near Rulison, Colorado, to distill oil from the Colorado River Shales. It is calculated that the shales mined at Rulison will produce about a barrel of oil to the ton.

The Use of Oil Shales

In Scotland they are working shales that produce about twenty-five gallons of oil per ton. The seams are from three-and-a-half to eight or ten feet thick. In Colorado are seams many times as thick and containing much more oil per ton. Reduction of shales involves an enormous mining operation, and after the oil is extracted the vast tonnage of refuse must be disposed of. So it is expensive compared with producing oil from wells.

Ben E. Lindsey of the Bureau of Mines Experiment Station at Bartlesville, Okla., is confident that exploration, better recoveries, better utilization and deeper drilling would furnish enough oil to meet all requirements for at least twenty-five to fifty years, if it could be extracted in that time. But as a practical matter this will not be possible. Within that period there will be times of shortage, when oil from shales will be needed to supplement the oil from wells, etc.

Meantime federal and state governments and the industry are co-operating in an astonishing range of investigations and studies. These activities cover such a wide field that even an enumeration of them would run into tiresome detail.

Salaries of regular professors in Russian universities have been increased to $90 a month.

It is estimated that about seven matches are used daily for every person in the United States.

A seat on the New York Stock Exchange sold recently for $175,000, a record price.

New England led the country in savings during 1926, with nearly $500 per capita, the nation's average being $165.

The Egyptian government is working out a plan designed to reduce cotton acreage in that country by one-third.

It is estimated that sixteen billion dollars worth of new life insurance was written during 1926.

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