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PETROLEUM ENGINEERING

Outline and Reasons for the Course

By E. V. O'ROURKE, *Department Mine Engineering*

HE art of mining in the broadcast sense of the word consists of the processes by which the useful minerals are obtained from the earth's crust." * "The Production of Petroleum is a highly specialized branch of mining."**

For the first time, the Mine Engineering Department of Ohio State University, is offering a course in Petroleum Production Engineering. The work of the course is essentially an application of the fundamental elements of engineering and geology to the exploration, production, and transportation of Petroleum and Natural Gas.

The demand for petroleum products, brought about by the increasing use of the internal combustion engine, and by the use of fuel oil has started a world wide search for new oil reserves. The petroleum bearing rocks in any prospective field cover a very small area compared to the total land. Some of the modern oil companies explore their holdings very methodically to be able to select the most likely location for a test.

Foreign and Domestic exploration for petroleum on a large scale is given consideration and students review the methods used at the present time in prospecting operations. The use of core testing drills, pits, diamond drills and geophysical methods of prospecting are all studied in the present course.

Twenty-six per cent of the total completions of drill holes for petroleum and natural gas during the first six months of 1925 were "dry." With petroleum engineering and geological knowledge more widely disseminated, it is our belief that the percentage of failures in drilling due to errors in location of holes can be considerably reduced.

Special emphasis is placed upon the subject of increasing the oil output of present producing wells. Assuming that a well has been properly completed in a productive oil sand, oil enters the well because of the difference in pressure between the reservoir rock and the space within the well. In some cases the fluid rises in the hole until it overflows at the surface, in many cases a mechanical pumping device is necessary to aid in bringing the oil to the surface. After a number of years the pumping is no longer effective because the reservoir rock pressure is not great enough to cause the fluid to flow into the bottom of the well. Means of increasing the rock pressure must be resorted to or the well is abandoned. In the past most of the wells have been abandoned. Now, processes of increasing the rock pressure by means of flooding the sands with water, the introduction of air and gas pressure into the reservoir rock, are beginning to be used extensively. Figures given by the American Petroleum Institute state "it is estimated that after pumping and flowing there will remain in the area now producing and proved twenty-six billion barrels of crude oil." The development of old and new processes to aid in the partial recovery of this enormous amount of crude oil are given consideration in our present course. Many author-

ities believe that in a few years, actual mining operations of petroleum sands will be carried on extensively. The mining of oil shale has been started in California.

It is probably that the reader will wonder why the State of Ohio should be interested in the problem, as this State's day of being a leading oil producer is long past. The total petroleum production of Ohio to date has been five hundred and six million (506,000,000) barrels and if we apply the figures of the Marland Oil Company economists, found in Nowata and Rogers Counties, Oklahoma, that only 17 percent of the oil in the Bartlettsville sand had been extracted by the ordinary producing methods. We have possibly left in the oil sands of Ohio over two billion barrels of petroleum.

The Petroleum engineering course is designed to give the members of the mine engineering senior class an opportunity of further broadening their technical education in the winning of valuable material from the earth's crust. It is also hoped that students in geology or civil engineering whose intent is to follow petroleum work will be enabled to take this opportunity to study the problems of Petroleum Production engineering.

The opportunities for the technical engineer in Petroleum work are many. Not many months ago Mr. Phillips, Vice-President and General Manager of the Phillips Petroleum Company, said "the industry needs scientifically trained men for every phase of the business from finding oil to refining the crude." Mr. George of Oklahoma University stated "according to a recent survey made by him only five schools in the United States were giving adequate courses in petroleum engineering and that nearly all of these were one-sided."

* Sir C. L. N. Foster.

** F. M. Smith.