PETROLEUM

Petroleum is a thick inflammable oil, ranging from white to jet black in color, the common variety being green. The name is derived from the Latin "Petro," a rock and "oleum," oil, and means "rock oil" or oil derived from rock. In Germany petroleum is called "erdoel" or earth oil. The French and Italians name it "petrole." It may exist as a semi-liquid or as a solid known as asphalt, bitumen, or naptha. The chief constituents are carbon and hydrogen together with oxygen and nitrogen. Sulphur is found combined with certain kinds of petroleum.

That petroleum has been known for thousands of years is shown by the fact that the "slime" spoken of in the old Testament, as used in the construction of the Tower of Babel, was petroleum partially evaporated. The ruins of Nineveh and Babylon show that it was used in cementing bricks together, about 2000 B. C. The Greek historian, Herodotus, mentions that there were oil springs on the Island of Zante. Bitumen was used as an embalming fluid before the time of Christ, and about the beginning of the Christian era, we find that oil from the springs on the island of Sicily was burned in the temple of Jupiter for the purpose of illumination, and for three thousand years the Persians have worshipped the "Holy Fire" from the naptha and natural gas springs along the Caspian Sea. In America the Indians discovered petroleum centturies before Columbus landed at San Salvador, and many pits, dug for the purpose of collecting oil, are found along French and Oil Creeks in U. S. A. About the middle of the seventeenth century a French missionary discovered the first petroleum in Western New York State, while a second missionary discovered oil in Pennsylvania. In 1858 Col. E. L. Drake drilled an artesian well at Titusville, Pa., and, at a depth of seventy feet, struck oil. This well produced, for a short time, about forty barrels a day. He marketed the oil and received fifty cents a gallon or about twenty dollars a barrel for it. Then there was a rush to engage in the new industry; by 1880 the Bradford Field wells were producing one hundred thousand barrels a day. By 1882 the market had become overstocked, and oil fell to less than fifty cents a barrel. In 1890 the average price, per barrel of forty two gallons, was ninety-four cents.

Petroleum is found free in nature and many theories

and possible causes of its existence have been put forward by numerous geologists and scientists. Some claim that it is formed in rocks by the decomposition of animal and vegetable matter. Others hold the idea, that petroleum is formed by the natural distillation, by interior heat of the earth, of shales and hydrocarbons. It can also be manufactured by the artificial distillation of shales, and, in a second way, by the destructive distillation of animal and vegetable matter.

Petroleum is found in numerous parts of the world, the United States and Russia being the chief oil producing countries. In addition to these crude oil is obtained in large quantities, in Romuania, Germany and Italy in Europe; Borneo, Java, and Sumatra in the Dutch East Indies; India and Japan in Asia; Argentina and Peru in South America, not forgetting the "Land of the Maple Leaf." In Canada the chief oil fields are found in Ontario, Quebec, Nova Scotia, New Brunswick, and especially in the Western Provinces. In the basin of the McKenzie River there are vast petroleum fields; these fields cannot, as yet, be worked, on account of the great difficulty of transporting the oil. But in the near future, when railways will have penetrated the great northern wilderness, Canada will have an invaluable and almost inexhaustible oil supply. In the United States petroleum fields are located in Pennsylvania, Ohio, and West Virginia in the Eastern States; California on the Western coast; and Texas in the South; and the largest wells are located at Jennings, Louisiana.

The method of extracting is very easy. Borings are made until the oil-bearing strata of oil is reached, then, if the oil is under any pressure, it gushes up, or, if it does not, it has to be pumped to the surface in the same manner as water. In 1829 a well was drilled for salt in Kentucky and a large reservoir of petroleum was discovered; the oil flowed out, caught fire, and produced a conflagration on the surface of the Cumberland river for a distance of fifty miles. This well flowed for a few years. Some of the oil was sold for medicinal use, and also for illumination. This oil was found to be unsuccessful as an illuminating oil, on account of the smoke and odour which it gives off. At this time scientists were looking for a good cheap illuminating gas or oil, and the result of continued research

was the process of the distillation of bituminous coal shales. This process gave them the oil, kerosene.

Petroleum is a mixture, and at different temperatures, many different products are liberated. These products are separated into components, which are still mixtures, but differ from the original petroleum The components of lower boiling point come off first when heated, then, as the temperature increases, others come off. Petroleum, ether used in making gas; gasoline and naphtha used as fuels; benzine used as a solvent and kerosene used as an illuminating oil are some of the mixtures obtained from the true petroleum.

The primary demand was for kerosene, and other products of the crude oil were thrown out, but now, with the advent of the automobile, the demand is for great quantities of gasoline, so the crude oil is broken up so as to give the greatest amount of gasoline. The crude petroleum is used as a substitute for coal and is largely used as such by the railways of the United States. The greater number of the steamers built today are oil-burning vessels. The Leviathan and the Majestic, the largest passenger steamers, and the H. M. S. Hood, the largest warship in the world, are oil-burners. This use of petroleum as a fuel for ships is a great asset to the owners, for the boat can load a cargo of oil as fuel, in quicker time and with less trouble, and with less, or rather with no dust or dirt, than if coal were used.

Petroleum is the base of all lubricating oils and some of its products such as naptha and benzine are used in running small motors. Petroleum or vaseline, C-22 H-46 is, as its name implies, one of the products of petroleum. Solid parrafin, another product, is used as a water-proofing cover for paper, to make candles, and to place over preserves. Asphalt, a solid form is found at Trinidad, and is used in road making. More than two hundred products are now obtained from crude petroleum.

The petroleum is carried from the wells to the refineries by a system of pipe lines. The oil is pumped directly from the wells to the large cities, thereby saving a great deal of labour. At the present time pipe lines carry the crude oil from the fields of Pennsylvania, West Virginia, Ohio and Indiana to the large oil-refining centres of New York, Philadelphia, Baltimore and Chicago, etc. In this

way oil can be pumped from Kansas and Oklahoma directly to the Atlantic coast.

Most of the oil shipped abroad is transported in bulk, in large steel tank steamers, which of course use oil as fuel. The modern tankers carry from thirty to fifty thousand barrels of oil per trip, and can make eight or ten trips per year. By this method of transportation there is no time lost in loading or reloading barrels. Lines of pipes run from the oil tanks to the wharf, and, as soon as an oil steamer docks all that has to be done is to connect the line of pipes with the steamer's tanks and pump the oil directly to the oil tanks, situated perhaps a mile from the wharf. This unloading can be accomplished in from ten to fifteen hours.

It has been found that four barrels of petroleum produce the same amount of steam as one ton of coal and the coast is only one half as great.

The use of oil in the past few years has been rapidly increasing, while the use of coal is rapidly decreasing. The oil resources of unexplored regions are vast. Indeed the problem today is not of quantity, but of transportation from remote districts. We may find in the near future a decrease in the use of oil on account of the vast use of hydro-electric.

E. L. M., '28.

PLUCK WINS

Pluck wins! It always wins! though days be slow
And nights be dark 'twixt days that come and go.
Still pluck will win; its average is sure;
He gains the prize who will the most endure;
Who faces issues; he who never shirks;
Who waits and watches, and who always works.

—Anon.

Let us love so well
Our work shall be sweeter for our love,
And still our love be sweeter for our work.

—Elizabeth Barret Browni