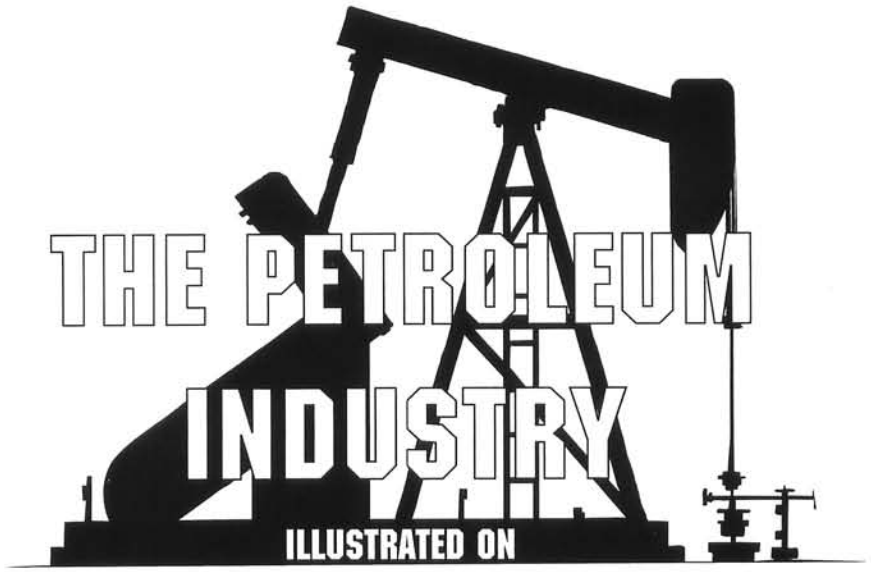


WORLD PAPER MONEY

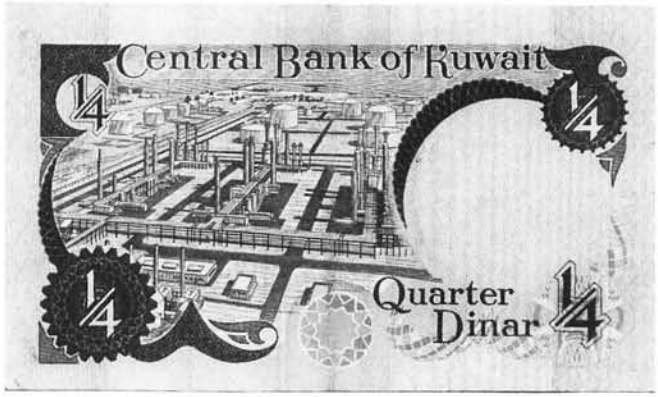
by MOHAMAD H. HUSSEIN

PETROLEUM, commonly called crude oil, crude or just oil, is a flammable liquid fuel found deep underground or occasionally in pools and springs on the earth's surface. The word "petroleum" also covers other gaseous and solid substances, such as natural gas and asphalt, that resemble the liquid in chemical composition. Petroleum is one of the most valuable natural resources in the world. It constitutes the lifeblood of modern civilization. More than 3,000 products are prepared from petroleum by physical and chemical methods. From it are made: gasoline, diesel and other fuels to power automobiles, trucks, trains, ships, airplanes, farm and construction equipment and other machines; fuels to run electric power plants; fuels to generate heat for places to live, work and play; motor oils, grease and other lubricants; candles and other wax products; Vaseline and other ointments, creams and cosmetics; aspirin, nasal sprays, intestinal lubricants, ethers and other medicinal products and anesthetics; insect killers and other exterminatives and insecticides; detergents; disinfectants; fabrics; carpets; curtains; furniture; toys; tools; music recordings; computer disks; materials to cover floors, roofs and roads; wood preservers; paint; dyes; naphtha; sealants; plastic; ink; toothpaste; food additives and thousands of other useful things. It is also used to make explosives and is indispensable in modern warfare. The search for oil goes on tirelessly in all parts of the world. It is found on all continents and under every ocean. The petroleum industry plays a vital role in the economic life of many nations. Symbolizing wealth, industry and other attributes, petroleum themes are depicted as major design features on the paper money of many countries.

The word petroleum is derived from two Latin words meaning rock and oil; since it was first found as oil seeping up from the ground through cracks in rocks. Today, raw petroleum is simply referred to as oil and is generally found in deep deposits. Chemically, petroleum is composed of extremely diverse and complex combinations of hydrogen and carbon compounds called hydrocarbons. It also contains varying small amounts of sulfur, nitrogen, oxygen and metallic elements. Crude petroleum from different fields differ widely in color, odor, weight, viscosity, and other physical characteristics and chemical properties. The color may be black, brown, red, amber, or yellow; some fluoresce green or purple in reflected light. It may smell sweet and pleasant, bad and foul, or be odorless. It may be lightweight gas, slightly heavier "wet" gas, light volatile liquid, thick tarry liquid, semi-solid, or solid. Some may be mostly gasoline and others contain none, wax may be found in some and absent from others, similarly with lubricating oils and other compounds.

It is believed that petroleum was formed from residue of organic plant and animal material deposited in enormous amounts in sediments (mud, sand and other soils and fragmented rock) millions of years ago. As the sediments became buried deeper and deeper in the ground, complete oxidization and decomposition of the organic material were prevented while under the tremendous pressure and heat it was partially distilled forming oil and gas. Over time, gas and oil moved (under water pressure or squeezed by the weight of earth and rock above it) through the cracks and tiny holes into a type of porous and permeable rock called a reservoir. The petroleum eventually rises to the surface and escapes, or collects in underground traps within impermeable layers. The most common types of traps are anticlines, faults, stratigraphic traps, and salt domes. Before about 1900, petroleum prospectors looked for pools of oil on the ground surface and relied mostly on luck to find oil underground. Modern exploration is an advanced science that utilizes complicated instruments and complex technology. Today's prospectors are likely to be specialized oil geologists and geophysicists. Experts estimate the world's oil reserves at about 1 trillion barrels (42 trillion gallons) which is about 30 to 40 times the annual world consumption. The Middle East has about two-thirds of the world's oil, mostly around the Arabian Gulf. Saudi Arabia alone has about 25% of the world's recoverable oil. Latin America has about 10% of the world's total. Western Europe, Africa, the Far East Pacific region and North America each has approximately 5% of the world's oil reserves.

People have known and used petroleum in many ways for thousands of years. Earliest records indicate that petroleum was an important commodity used by the Egyptians, Babylonians, Assyrians, Persians, Chinese, Greeks, Romans and others. Petroleum was used by the ancient Egyptians to embalm their mummies and for many other purposes. The streets of Babylon were paved with asphalt. Ancient colonies around the Caspian and Black Seas used oil found in surface pools for heating and cooking. The Chinese drilled for oil using bamboo piping centuries ago. Persia had an oil industry at the time of Cyrus the Great. The American Indians have used oil for medicine and other purposes since ancient times. The Tower of Babel was built with bricks and petroleum slime. Noah waterproofed his Ark with petroleum pitch. Moses' mother daubed his basket in petroleum slime and pitch before she laid it by the river's brink. Ancient artists and artisans used petroleum in their work. Fireballs and other petroleum-based destructive weapons were used in ancient wars. The mystical flare at a gas seepage burning for years must have been one of man's earliest objects of awe and adoration. The fire-breathing Chimera in Greek mythology must have been such a seep.



Modern civilization depends heavily on petroleum; in fact it is difficult to imagine living without it. Today, more products are made from petroleum than perhaps any other substance. The discovery of obtaining kerosene from petroleum by the Canadian Abraham Gesner in the 1840s and the invention of the kerosene lamp in 1854 were the major breakthroughs in modern petroleum usage. The start of the modern oil industry on a large scale is traced to August 27, 1859 when Colonel Edwin L. Drake (a retired railroad conductor) discovered oil at a depth of about 70 feet near Titusville in Pennsylvania while drilling with an old steam engine for the Seneca Oil Company. It was the first well intentionally drilled for commercial purposes. Within three years, so many wells were drilled in the area and so much oil was obtained that the price of a barrel dropped from 20 dollars to 10 cents. Drilling for oil rapidly spread across the United States. By the 1880s commercial production had begun in California, Illinois, Indiana, Kentucky, Ohio and Texas. In 1901 a well at the Spindletop field near Beaumont, Texas sprayed about a million barrels in the air before it was brought under control. Major early discoveries include the East Texas fields in 1930 and at Prudhoe Bay, Alaska in 1967. In Canada oil was produced in Ontario in 1867, New Brunswick in 1879 and Alberta in 1915. By 1918 Mexico was the second largest producer of oil in the world. Oil was discovered in Iran in 1908. In 1927 one of the largest oil fields in the world began production in Kirkuk, Iraq. In Saudi Arabia oil was dis-

covered at Dammam in 1936. Two years later oil was found in Kuwait. Significant production of oil in Africa started in the 1950s; major areas include Libya, Algeria and Nigeria. Oil production began in Australia in 1964. Large discoveries were found in the North Sea along the British-Norwegian boundary in 1970. The Soviet Union was the world's largest crude oil producer in 1974. The United States produced 2,000 barrels in 1859 which rose to 64,000,000 barrels in 1900 and 2,500,000,000 barrels in 1993. The United States annually consumes about a fourth of the world oil production.

The world's first refinery was established in Romania in 1857. Today, Petroleos de Venezuela's refinery in Judibana, Falcon, Venezuela and Amoco Oil Company's refinery in Texas City, Texas are among the largest in the world, each producing close to 500,000 barrels per daily. A 2-inch diameter, 5-mile long pipeline carried 80 barrels per day in the fields near Titusville, Pennsylvania in 1863. Today, the 2,350-mile long Interprovincial Pipe Line spans North America from Edmonton, Alberta to Montreal, Quebec in Canada through Chicago, Illinois with 82 pumping stations to maintain the flow of more than 1.5-million barrels of oil each day. The 8,670-mile long TransCanada natural gas pipeline transports more than 2,000 billion cubic feet of natural gas per year. The Alaska oil pipeline runs 800 miles from Prudhoe Bay to Valdez with a capacity of about 2 million barrels per day. It was built at a cost of 9 billion dollars.

The world's largest oil storage tanks are owned by ARAMCO in Saudi Arabia. There are five tanks each measuring 386 feet in diameter and 72 feet in height with a 1.5 million barrel capacity.

Jahre Viking is the largest oil tanker (and the largest ship of any kind). It measures about 1500 feet in length, 225 feet in width and has a draft of 80 feet and a deadweight of more than 600,000 tons. Shell Oil Company's "Auger" and "Mars" offshore production platforms in the Gulf of Mexico are each almost 3,000 feet tall from seabed to surface.

On average, 14 million barrels of oil from 10,000 accidental spills are discharged into the environment each year. A blowout beneath the Ixtoc-I drilling rig in the Gulf of Mexico in 1979 produced a slick that reached 400 miles. It was capped eight months later after a loss of more than 500,000 tons of oil. On March 24, 1989 the Exxon Valdez oil tanker ran aground on Bligh Reef in Prince William Sound, Alaska, spilling more than 10 million gallons of crude oil. The slick spread over a 2,600 square mile area. It was the largest such accident in United States history. The oil contaminated hundreds of miles of coastline including a national forest, four national wildlife refuges, three national parks, five state parks, four state critical habitat areas, and a state game sanctuary. In 1991 Iraqi forces occupying Kuwait pumped 8 million barrels of crude oil into the Arabian Gulf. On July 6, 1988 a gas leak triggered explosions that blew up the Piper Alpha oil platform in the North sea, killing 170 workers onboard. The Piper Alpha Oil Field tragedy resulted in the largest ever marine insurance loss of about 850 million dollars.

The invention of the kerosene lamp led to the establishment of the first American oil company, the Pennsylvania Rock Oil Company in New Haven Connecticut on December 30, 1854. Early in the 1900s the internal-combustion engine made petroleum one of the most valued and essential substances in the world. Today, millions of people work directly, or indirectly, in the petroleum industry's myriad branches all over the world. In the United States the petroleum industry is one of the largest private employers, with over 1.5 million employees and 330 billion dollars in capital investment. There are about 45,000 companies related to the petroleum industry in America; however, the eight largest companies handle about half the business. Nationwide there are more than 200,000 gas stations, most of which are independently owned and operated. The oil industry is the single largest tax contributor in the nation. In fact, it is estimated that it generates more tax money than the next two or three largest industries combined.

The petroleum industry plays vital roles in the economic lives of developed and developing countries. Aside from providing fuels and other essential materials, employment and revenues, the oil industry is considered of utmost importance to the national security of many nations. Symbolizing wealth, industry, political power and self-reliance, many countries depict scenes from the petroleum industry on their coins and paper money. Popular scenes on notes include refineries, oil well derricks and offshore platforms. The table lists 33 coun-

COUNTRY	DENOMINATION	DATE	DESCRIPTION, PICK NO.
Albania	1000 leke	1949	Oil well derricks on face, P.27A
Angola	120 kwanzas	1987	Offshore oil platform on back, P.120
Bahrain	1/4 dinar	L.1964	Oil well derricks on back, P.2
Bolivia	500 bolivianos	L.1945	Oil well derrick on back, P.143
	100 bolivianos	L. 1945	Oil refinery on back, P.147
	5 centavos	ND (1987)	Petroleum refinery on back, P.196
Canada	10 dollars	1971	Oil refinery on back, P.76
Central African States	500 francs	(19)94	Petroleum industry scenes on face, P.4
Cuba	50 pesos	1961	Petroleum pumps at right on back, P.98
Czechoslovakia	50 korun	1964	Petroleum refinery on back, P.91
German Dem. Rep.	50 mark	1971	Oil refinery on back, P.30
India	1 rupee	1981	Offshore drilling platform on back, P.78
Indonesia	100 rupiah	1968	Petro-chemical plant on back, P.110
Iran	100 rials	ND (1971)	Abadan oil refinery on back, P.91
Iraq	1/2 dinar 1 dinar	ND (1971) ND (1971)	Petroleum refinery on face, P.57 Oil refinery on face, P.58
South Korea	1 dollars AMPCC 5 dollars AMPCC	ND ND	Oil refinery on back, P. M29 Natural-gas tank on back, P. M30
Kuwait	1/4 dinar	L.1968	Oil rig on face, refinery on back, P.11
Libya	1/2 dinar	ND (1981)	Petroleum refinery at left on face, P.43
Mexico	10,000 pesos	1981	Oil facilities complex on face, P.736
Myanmar	45 kyats	ND (1987)	Oil field derricks on back, P.64
Netherlands Antilles	500 gulden	2.1.1962	Curacao oil refinery on face, P.7
Peru	50 intis	3.4.1985	Offshore drilling rig on back, P.130
Qatar	50 riyals	ND (1976)	Offshore drilling platform on back, P.4
Qatar & Dubai	1 riyal	ND	Oil derrick at left on face, P.1
Romania	25 lei	1966	Large petroleum refinery on back, P.90
Saudi Arabia	10 riyals 5 riyals	D.AH1379 (1977) D.AH1379 (1983)	Offshore oil drilling platform on face and oil refinery on back, P.18 Oil refinery on back, P.22
Singapore	500 dollars	ND (1977)	Petroleum refinery on back, P.15
South Africa	2 rand	ND (1990)	Petroleum refinery on back, P.118
Sudan	50 pounds	25.5.1984	Modern oil tanker on back, P.29
Swaziland	10 emalangeni	ND (1986)	Petroleum refinery on back, P.15
Trinidad & Tobago	1 dollar	ND (1985)	Oil refinery on back, P.36
Tunisia	10 dinars	20.3.1986	Offshore oil complex on back, P.84
United Arab Emirates	1 dirham	ND (1973)	Oil well derrick at left on face, P.1
Venezuela	20 bolivares	9.3.1929	Oil field on face, P. S177
Vietnam	5000 dong	1987	Offshore oil platforms on back, P.92

tries with notes depicting petroleum themes as major design features. All notes are referred to by Pick Numbers to the *Standard Catalog of World Paper Money* by the Krause Publications, Inc. The illustrations include examples of notes from several countries. Researching and collecting world paper money depicting different aspects of the petroleum industry is a fascinating, educational and rewarding endeavor. ■