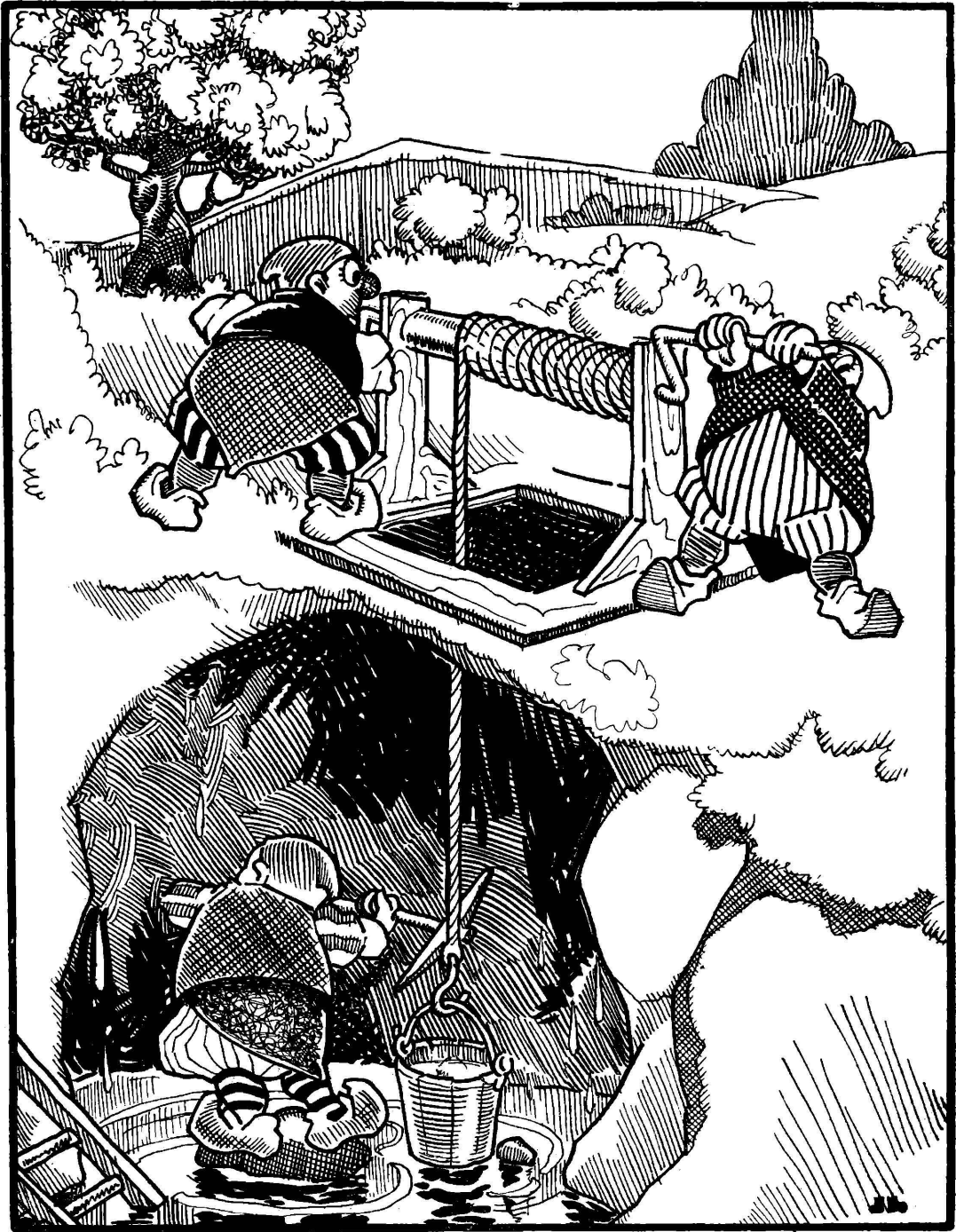


MYSTERIES OF MINING

This is the eleventh in a series of features describing various interesting phases of mining and the mining industry.



*Primitive power consisted chiefly of elbow-grease, as this illustration (adapted from *De Re Metallica*). The need for power to dewater mines was one of the factors which brought about the development of steam power and, later, modern Diesel engines.*

P O W E R

One of the most important contributions of the mining industry to the world has been the development of mechanical means for generating power. As soon as the early miners started to dig deep into the earth in their search for valuable minerals, they discovered that surface and underground waters seeping into their workings interfered seriously with their work. An English engineer, Captain Savery, patented a coal engine in 1698 which was used to pump water from the tin mines of Cornwall. From that simple beginning the development of power engines has been tremendous.

But what is "power", anyway? The engineer would define it as energy under human control and available for doing mechanical work. For the layman, power may be defined as the rate of doing work. The common unit for work is the "horse-power", which was defined by James Watts in 1783 as the equivalent of 33,000 ft. lb. of work per minute. This is about ten times as much work as can be done per minute by a laborer working eight hours per day.

There are five principal sources of power. The muscular energy of men and animals was the first to be used, and is still very essential; the coolies of China and the carabaos of the Philippines are good examples. The kinetic energy of the winds and streams is used to propel sail boats. The potential energy of water at high levels, of the tides, and of waves, is useful in the

generation of water power and in the transmission of water and other liquids over long distances. The heat of the earth and of the sun are a tremendous, but comparatively uncontrolled source of power; volcanic power or natural steam has been used in Italy.

Heat derived from the combustion of fuels is the most common source of power. The first locomotives received their power from the burning of wood in steam boilers. Then came the introduction of coal, and soon coal boilers were providing steam for power and heat. Petroleum, with its many derivatives has become the modern source of power. Gasoline engines give remarkable speeds to airplanes, automobiles, boats, and trains. Fuel oil has revolutionized marine power; today most of the ocean liners and huge freighters have oil engines.

The mining industry, of course, has benefitted considerably from the improvements in power machinery. Great power plants make it possible to send compressed air to the depths of the earth for drilling, to light underground workings, to haul millions of tons of ore to the surface, and to treat them economically.

Most of the mining plants of the world today receive their power from Diesel engines, which use fuel oil. The constant search for greater economy, greater efficiency, and greater compactness in power plants has reached its height in the Diesel engines of today.

A modern Diesel engine plant. This view shows three 500 horsepower Allen Diesel engines, of the type used in the Marsman plants in the Philippines.

