FROM MEXICO

Geothermal steam plant

The Mexican Federal Electrical Commission is constructing a geothermal power plant—claimed to be the largest of its type in the world—in Cierro Prieto, Baja California.

The $22.4 million plant will begin to function in 1970, initially providing 75,000 kilowatts, an output considered sufficient to convert the Mexicali Valley desert into a rich agricultural zone and provide power for the Baja California peninsula and Sonora.

Power output will be boosted to at least 150,000 kilowatts by 1973, according to engineer Luis F. de Anda, who heads the Mexican Geothermal Energy Commission.

"According to soundings we have made in the Mexicali Valley," de Anda says "there is a 100-square-kilometer area with enough geothermal energy to produce up to 500,000 kilowatts."

The 150,000 kilowatts will provide for the needs of the entire Baja California peninsula, Mexicali and Sonora until 1990, according to the Federal Electrical Commission.

Apart from the Cierro Prieto geothermal compound, embracing 30 square kilometers, Mexico has located 106 geothermal sites throughout the republic. Geothermal plants in Ixtlan de los Hervores (Michoachan) are programmed for early construction. A smaller plant has been functioning for several years at Pathé, Hidalgo.

At Cierro Prieto, in the heart of Mexicali Valley, engineers have completed drilling 10 of the 15 wells required.

They hit boiling water pools between 3,608 and 4,920 feet. Subsoil steam vapors have been recorded at a pressure of 350 pounds per square inch.

The tremendous force of the pressure was shown by an accident during the drilling of well No. 8 in September (1966), when seven workers were injured. The steam column rose to a height of more than 492 feet, and tossed off a five-ton valve as though it were the cork of a child's toy rifle. The column of vapor was visible for 13 miles. Noise produced by the shooting column of steam was deafening a quarter of a mile away. It took 28 days to bring this well, considered the most powerful in the world, under control.

The use of subsurface steam in volcanic regions is not new. First to harness geothermal energy were the Italians, who have four geothermal-electric power plants producing 358,000 kilowatts. Mexican engineers working in Baja California made special trips to study their functioning. New Zealand also has two geothermal power plants producing 192,000 kilowatts. A small plant is in operation in California, but U.S. investors seem to have little interest in the process. *Emil Zubryn*

AUSTRALIA

Rapid wool-dyeing

A new method of dyeing wool is many times faster than processes commonly used. Dyeing takes only about five minutes, making it possible to develop compact and inexpensive equipment for the continuous dyeing of wool before it is spun into yarn.

Researchers in Australia's Commonwealth Scientific and Industrial Research Organization found that a concentrated solution of urea in water is a good dye solvent and swelling agent. Swelling of the fibers enables dye to penetrate them rapidly. Commonly used as a nitrogenous fertilizer, urea is readily available, cheap and convenient to use since it is not corrosive or toxic like other wool swellers.

The other properties required for rapid continuous dyeing can be imparted to the urea solution by the addition of small amounts of acid and a wetting agent.

The acid increases the attraction between the dye and the wool fibers. The wetting agent must cause the solution to wet the fibers immediately and thoroughly, displacing the air between them.

The wetting agent must cause the formation of strong films of liquid that stretch between the fibers to hold them together and achieve an even distribution of dye. Without the use of a suitable agent, the solution congregates mainly at points where fibers cross, as well as in beads on individual fibers. This would cause "skittery" or uneven dyeing in a rapid process.

In conventional processes, wetting agents that interfere with and delay the attachment of the dye to the wool are often used. The dye diffuses within the fibers and distributes itself evenly, but at the expense of a longer dyeing time. In addition to increasing the possibility of damaging the wool by subjecting it to high temperatures for a long time, slow processes require large and costly equipment.

The prototype equipment by CSIRO can dye 300 to 1,000 pounds of wool per hour, depending on the type of wool and the shade of dye.

With some exceptions, dyes of all classes may be used with the new technique, the dye fastness being similar to that obtained with conventional methods. Since the steaming times are short, damage to the wool and yellowing are minimized, allowing brighter shades. *F. C. Livingstone*