

What's New In Science And Technology ?

by Norbert Yasharoff

Scientists at the Los Alamos (New Mexico) Scientific Laboratory (LASL) have created an experimental, manmade geothermal well system in volcanically heated granite three kilometers deep in the Jemez Mountains of New Mexico.

Water, injected from the surface, was circulated between two wells drilled in the west flank of the Valles Caldera, 32 kilometers west of Los Alamos. Following 20 hours of pumping measurements indicated the water had been heated to 128 degrees Celsius by the hot underground granite.

LASL's system involves two holes drilled approximately 75 meters apart. Water under high pressure is injected into the holes to create a system of cracks in the hot granite bedrock, a process called "hydraulic fracturing". The fracturing exposes a large heat-exchange surface between the two wells. Cold water is then pumped down one hole at 63 to 70 kilograms per square centimeter pressure and is retrieved from the second hole after circulating through the cracks and being heated.

Future hot dry rock geothermal systems based on the concept being developed at Los Alamos, may supply substantial quantities of energy sometime after the year 2000, according to the U.S. Energy Research and Development Administration (ERDA) which sponsors the LASL project.

"The achievement is a major step in our efforts to extract energy from the deep, hot dry rock which makes up most of the earth's crust," said Dr. James C. Briscoe, Director of ERDA's Geothermal Division.

Dr. Harold M. Aenew, Director of LASL stated: "We have proven that we can create a geothermal well using adaptations of oil field drilling techniques without the use of explosives, that we can recover the water in order to ultimately create a system suitable for generation of electricity and other industrial and domestic uses, and that we are ready for the next step in the study."

The next step involves connect-

ing two heat exchangers to the manmade system to determine if the temperature can be maintained and to see what problems might be encountered from the deposit of minerals, mostly silica, in the system. No electricity will be generated in this test system scheduled for completion in September 1977.

If the present manmade geothermal system continues to show promise ERDA plans to create a system ten times more productive by drilling into hotter granite which is deeper—about 3,750 meter in this case. Because of the higher temperatures of the circulating water under pressure, a power plant producing 10 megawatts of electricity could be operated on this larger system.

The first commercial geothermally driven power plants with a capacity of 50 to 100 megawatts could be operating in the 1990's.

NEW THEORY ON CAUSES OF MONGOLISM

Seasonal changes in women's hormone levels may be the underlying cause of Down's syndrome. (Continued on page 6)