ENGINEERING

Tides Yield Continuous Power In English Experimental Plant

Unique Storage Method in Which Water is Heated By Friction Supplies Energy at Flood Tide

AN EXPERIMENTAL power plant which generates electricity continuously from the ebb and flow of the tides has been constructed and successfully operated at the Avonmouth Docks, in the Bristol Channel.

The plant is the invention of Paul Shishkoff, formerly a Russian subject. It includes a novel method of storing the excess power produced at low tide so that a continuous supply of energy can be obtained at all times. The capacity of the installation is three hundred horsepower.

Water for operating an ordinary turbine is caught within a dock at high tide. Then, as the tide recedes, the water is allowed to run out of the dock through a vertical pipe at the foot of which is the turbine, or water wheel. This wheel is connected by a vertical shaft to an alternating current generator.

A working difference of level between the inside and outside of the dock of from seven feet at high tide to thirty-two feet at low tide is thus made available. The plant is so designed that when this working head of water is at its greatest more power is produced than the generator can take care of.

Excess Power Stored

At these times a water brake on the shaft with the driving wheel is used to store the excess power. This brake really churns water and thus heats it. The water, heated to 390 degrees Fahrenheit, enters a large vessel called an "accumulator," where it is kept under 200 pounds per square inch pressure until the direct power supply from the water wheel falls off.

The superheated water from the accumulator is now released under reduced pressure to form steam. Heat necessary to produce vaporization is derived from the remaining water, which is slightly reduced in temperature.

This steam drives a turbine connected to a generator. Thus power is available even when the low tide level can not be used directly. The exhaust steam from the turbine is condensed and returned to the brake where it is again heated at times of maximum power.

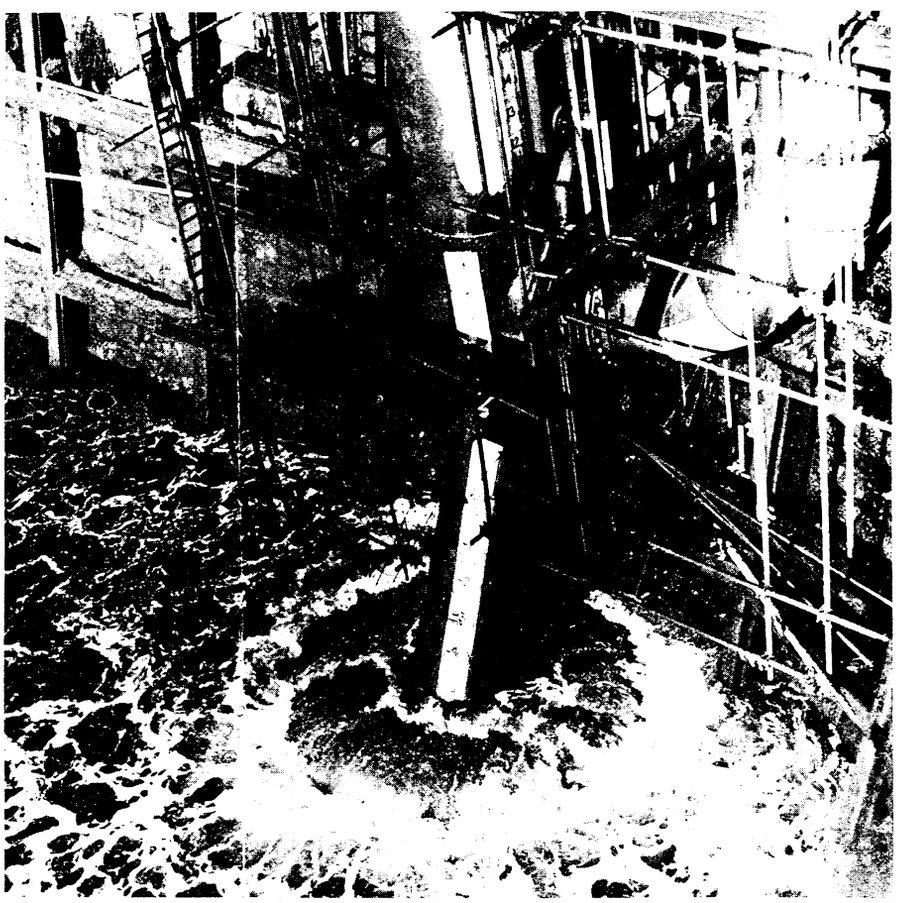
The pumping of water to a higher level by means of excess power is the only other practicable means of storing power. Apart from the use of this new scheme in connection with the tides, it is of great interest in that it provides possible answer to the important engineering problem of storage.

Mr. Shishkoff has proposed that a larger model of his system be constructed in the Severn river. An artificial basin of 12½ square miles is planned to make available enough water for generating 160,000 kilowatts at peak load. This development, it is claimed, would not interfere with the tidal flow or with navigation in the Severn.

It is claimed that electricity at forty-four hundredths of a cent per kilowatt could be made by such an installation, which compares favorably with a coal-burning plant of the same capacity.

A rival scheme designed by a Swiss engineer, Huguenin, would require the building of a large dam and would use two-way flow turbines. It is still in the theoretical stage.

Science News Letter, July 18, 1931



IT HEATS WATER BY BEATING IT

That is the novel way the experimental tidal power plant has of storing power at low tide when it is plentiful, for use at high tide, when it is hard to produce.

ARCHAEOLOGY

Killing Kinsmen Possibly Practised in Mid-Europe

KILLING all of the chief's kinsmen and servants so that they might go with him into the afterworld as retinue, a custom hitherto known only in southern Russia and the Near East, may have been practised far up the Danube valley in Europe, if finds in a recently excavated Bronze Age mound near Jois in Austria have been interpreted correctly.

The principal skeleton in this tumulus was that of a man, stretched out full length, with skull intact. Above it was the skeleton of a woman, and nearby that of a child with a bronze bracelet on its arm. Clustered round were the bones of about a dozen other persons, all adults, and all with their skulls caved in as though by blows of clubs or heavy stones.

Dr. Alexander Seracsin, Vienna archaeologist, who reports the find in the German scientific journal *Forschungen und Fortschrite,* thinks that these battered skeletons may be those of the chief's wife and son, and of members of his household, who chose (or were chosen) to follow their dead master into the underworld.

Dr. Seracsin reports the excavation of two other burial mounds of later date in the same neighborhood. These belonged to two different periods in the Iron Age. Nearby there is also a very old churchyard of medieval and modern times; so that in this small area there is a continuous record of life, death and burial from Bronze Age times down to the present.

Science News Letter, July 18, 1931

ARCHAEOLOGY

Scientist Studies Abandoned Mexican Cities on Cliff

TWO ANCIENT Indian cities never before visited by archaeologists have just been explored by Eduardo Noguera of the Mexican Department of Pre-Spanish Monuments.

These two sites, Toluquilla and Ranas, some twenty miles apart in the Sierra Gorda mountains of Queretaro, are veritable fortress cities built on precipitous cliffs whose only approaches are defended by double and triple walls of enormous thickness. The abandoned cities, now covered with a dense vegetation, once dominated extensive regions. They are near no modern cities or towns, but because the explorations have revealed that they are probably among the most important ruins in the country, the Mexican government is preparing to clear the site.

The exploration and excavations made by Senor Noguera indicate that these are probably Toltec cities, built by a race which antedated the Aztecs who dominated middle Mexico before the Spanish Conquest. The Toltecs flourished centuries before Columbus discovered America, and were the conquerors of the famous Mayas of Yucatán a thousand miles away.

Toluquilla has two great "ball-courts," rectangular areas enclosed by massive walls of stone, typical of the Toltecs, and found wherever these people once imposed their culture, a most famous example being the Maya city of Chichen Itza which has its Toltec ball-court. Toluquilla's sister-city of Ranas has two such ancient playgrounds.

Although cornices, facades, and other architectural details of the buildings of these two cities are distinctly Toltec, there is also evidence of the Totonacs, a people who lived on the coastal plain of Vera Cruz and the Panuco River basin. Such is the discovery in Toluquilla and Ranas of stone "yokes" beautifully sculptured, and typical only of the Totonac culture.

The use of these yokes, known in the Vera Cruz region, has always been a mystery to archaeologists. They resemble yokes of oxen, and some archaeologists think that these great horse-shoe shaped stones might have been hung over the victim's neck to weight the head in human sacrifice. The presence of these typical Totonac objects in an otherwise largely Toltec city suggest that this was the meeting-ground of the two cultures. Early chronicles say that the Toltecs came from the Panuco region, and settled in middle Mexico a while before they ventured south to conquer the Mayas, perhaps some early relatives.

Science News Letter, July 18, 1931

ANCIENT PERFUMER

The head-shaped object pictured above is an incense burner typical of those used by the Toltecs, the race of Indians which flourished centuries before Columbus discovered America. Found in the region of the newly-explored cities, Toluquilla and Ranas, the incense burner is expected to be of value in tracing relationships between these Toltec municipalities.

MEDICINE

Ordinary Decay of Teeth Is Controlled by Proper Diet

DENTAL CARIES, a disease in which the teeth decay and cavities form, can be controlled by suitable diet, it appears from the report to the American Dental Association of Dr. R. W. Bunting, Dr. Philip Jay and Dr. Dorothy Hard of the University of Michigan School of Dentistry.

These investigators carried on an experiment in caries control for one year with three large groups of children in public schools and orphanges. The children were given a varied diet, fortified by one quart of milk and some green vegetables and fruit for each child every day. They were given neither cod liver oil nor viosterol. They had no sugar on cereals or in beverages, very little sweetened preserves and pastries, and little or no candy.

"The elimination of sugar was made on the assumption that the average child consumes more carbohydrate in this form than is required and that such overconsumption of sugar perverts the appetite for other necessary food factors, thus unbalancing the diet," the investigators reported.