



POWER FROM THE TIDES

Artist's drawing of finished tide-power plant near Eastport, Maine, for which Congress has just appropriated \$10,000,000. When completed two and one half years hence it will cost \$37,000,000. With five dams holding back waters of Cobscook Bay, after the phenomenal high tides in the Bay of Fundy fill it, the tide power plant will generate 200,000 horsepower. The drawing was made for the U. S. Army Engineers

ENGINEERING

Bay of Fundy's Record Tides To be Harnessed by Five Dams

Water, Double Area of Manhattan Island, 40 Square Miles, To be Stored in Huge Project to Get Power From Sea

FIVE great dams, totalling more than 14,000 feet in length, will be needed to utilize the world's record high tides of the Bay of Fundy to create electric power from the sea, Army engineers explained in discussing the new "Quoddy" project at Eastport, Maine, for which Congress has just appropriated \$10,000,000 for initial operations.

The tentative figure for the final cost of the project is \$37,000,000 which, it is hoped, will be completed in about two and one half years.

The five dams which will keep back the waters of Cobscook Bay, as the giant Fundy tides sweep up Passamaquoddy Bay into Cobscook, will vary in height from 35 to 140 feet. About 40 square miles of water—twice the area of Manhattan Island—will be stored in Cobscook Bay. All five dams will be well within the international boundary, thus making the entire Quoddy project an American undertaking.

Capt. Hugh J. Casey, U. S. Army Engineer, explained that generators totaling 200,000 horsepower will be installed at these five major dams to generate power when the waters of Passamaquoddy Bay rise five feet above those in Cobscook Bay. From this minimum working water level difference the generators will function until the water reaches its peak difference of about 20 feet and then returns to the five-foot difference level.

Below five-foot level differences the power plant will be shut down and as the Passamaquoddy waters recede the dam gates will quickly empty Cobscook Bay to its low tide level. Power, Capt. Casey explained, will be generated only on incoming tides.

Because the tides vary in time of day, with the season of the year, and are generally irregular, the Army engineers will also construct the important auxiliary project, Haycock Reservoir.

A dam 4,000 feet long and 130 feet high will hold back the waters of this reservoir, whose area is about 20 square miles.

Haycock Reservoir will be filled by pumping water from the nearby sea with power generated at the Quoddy plants thirteen miles away. Pumps rated at 180,000 horsepower will raise the water over the 130 foot dam. Thus the irregularly spaced power peaks of the Quoddy plants will, in part, store up water for further use.

Provision For Slack

As plans now stand, Capt. Casey outlined, a 60,000 horsepower generator at Haycock Reservoir will supply the power during the slack periods at the Quoddy plants. Thus a more even power generation will be possible.

Major Philip B. Fleming, U. S. Army Engineer, will be in charge of the Quoddy project having just been transferred from his post as Acting Deputy Administrator of Public Works in the P.W.A.

A general order just issued transfers Maj. Fleming and Capt. Casey, among others, to Eastport, Maine, and establishes a river and harbor district at Eastport under the supervision of the North Atlantic Division. The Eastport district, the general order states, "will include all works in the St. Croix River, Cobscook Bay, Machias River and the tributaries thereof."

The \$10,000,000 now appropriated for the Quoddy project will make possible the preliminary borings and other details necessary for the construction of the great dams.

Army engineers will have to place these dams on a firm clay bottom which overlies red shale some 150 feet below water level. Cofferdam technique will be used to build the dam foundations.

Six-Knot Tides

With a tide moving in and out at approximately 6 knots, the cofferdam engineers will have their hands full.

Ever since a small tide mill was built on the River Tamar in England in 1790 (said to be still in operation) man has dreamed of using the ups and downs of ocean tides for generating power.

At Avonmouth Docks on the Severn River at Bristol, England, is a small 300 horsepower tide-power generator which today is the largest plant of its kind. The American Quoddy project, with its plans for 200,000 and 60,000 horsepower generators, will dwarf this British plant.

The Avonmouth plant consists of a combination hydro and steam generator.

Water stored in a reservoir flows over a water wheel at low tide and turns an electrical generator, as in the ordinary hydroelectric plant.

The novel trick is to store up the excess power created during the peak production by having the water-wheel shaft revolve against a brake band against which water flows. The heat of friction is sufficient to raise the water temperature to 390 degrees Fahrenheit, corresponding to 200 pounds gage pressure of steam.

Passing to a storage tank, this hot water is saved until the power demands exceed the power available from the hydroelectric generator. Then some of the super-heated water is released from the

tank and turns to steam. This steam passes through a common steam turbine and drives an electric generator.

The similarity and differences between the Quoddy project and the British Avonmouth plant are seen at once. Both have a plan to store up energy for future power generation. The British, small scale plant, does it with superheated water and a steam generator. The Quoddy project accomplishes the same thing by pumping water into Haycock Reservoir, from which it can later drive hydroelectric turbines. The difference in magnitude of the two projects accounts for the difference in technique.

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PSYCHIATRY

Common Disease of the Mind Affects the Body Also

A CLUE indicating that the mental derangement schizophrenia is a disease of the body as well as the mind was made known to the American Psychiatric Association by Drs. Isidore Finkelman and W. Mary Stephens, of Elgin, Ill., State Hospital.

Sufferers from this, the most common of all mental diseases, do not regain their physical warmth after chilling as readily as do normal persons.

Given a cold water plunge, the body's ability to warm itself automatically was measured by the amount of oxygen burned in the body shortly afterwards. Healthy persons recovering from such a chilling consumed 41 per cent. more oxygen than usual, while schizophrenics consumed only 21 per cent. more.

For persons who had had so-called sleeping sickness or encephalitis, a mental disease known to have a physical basis in an inflammation of the brain, the increase in oxygen consumption after chilling is even less than for schizophrenics, only 14 per cent.

In the case of the sleeping sickness victims, the disturbance of the heat-regulating mechanism is known to be related to a diseased condition of the nerves. Experiments are now being made to find out where the similar disturbance of the schizophrenic patients is centered.

The evidence points to a physiologic disturbance in the hypothalamic region of the brain, the investigators believe.

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MEDICINE

Scientists Find Fresh Lead On Morphine Addiction Problem

BECAUSE it markedly increases the processes of oxidation in living tissues, dinitrophenol has given scientists a fresh lead on the problem of narcotic drug addiction by showing that dogs which have developed tolerance for morphine handle or maybe even store the latter drug in their bodies in a different way from dogs which have no tolerance for the narcotic. What this difference is

will, when discovered, probably give significant information about the question of tolerance and addiction to morphine.

The research which brought to light this fresh lead was done by Drs. O. H. Plant and D. Slaughter of the State University of Iowa and reported to the American Society for Pharmacology and Experimental Therapeutics. The difference in the way morphine is handled by toler-

ant dogs may be one of the important factors in the development of tolerance, they believe.

Development of tolerance is one of the tests for judging the morphine-substitutes that are being developed in the hope of solving the narcotic drug addiction problem.

Dinitrophenol stimulates oxidation, the process by which the body burns food or other fuel to get energy. Dinitrophenol increased the burning of morphine in the bodies of dogs that had no tolerance for the latter drug, the Iowa scientists found. In morphine-tolerant dogs, the general burning or oxidation process was speeded up by dinitrophenol, but judging from the fact that there was no decrease in the amount of morphine excreted, it appears that the burning of morphine itself was not affected by dinitrophenol in tolerant dogs. Consequently the scientists assume that the dog's body handles morphine differently when it has become used to the narcotic.

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ARCHAEOLOGY

Syria Enters Contest Of Cradles of Civilization

FRENCH archaeologists digging at Ras Shamra, in Syria, have uncovered signs of civilization so old as to rival the famed antiquity of Egypt and Mesopotamia. The discoveries show that Syria was a region of cradle cities as far back as 4000, possibly 5000 B.C.

Efforts of scientists to determine which is older in civilization, Egypt or Mesopotamia, will now have to be made a three-way problem to include Syria in the priority contest.

It has heretofore been supposed that the part of the Fertile Crescent where Syria lies, near the Mediterranean Sea, was lagging in progress, while settlers farther south, in Mesopotamia, along the Tigris and Euphrates Valleys, were founding Tepe Gawra, Ur, Kish, and other centers of civilized life.

The director of the French Expeditions to Ras Shamra is Prof. Claude Schaeffer, of the Museum of National Antiquities at St. Germain-en-Laye.

A great temple to Dagon, father of the god Baal, has been found in a less ancient layer of Ras Shamra. The Philistine god Dagon figured in several Bible scenes, notably in the story of Samson. It was in a temple of Dagon that the blind Samson, with a last burst of strength, pulled down the pillars, killing his Philistine captors.

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