ENGINEERING

Claude's Ocean Power Plant Connected to Deep Sea Pipe

Experiments Should Show Whether Criticism Made by Engineers of Practicability of New Method is Justified

By PROF. GEORGES CLAUDE

Matanzas, Cuba.—Our third tube was made in two months by Daime, launched by Vazquez, and sunk by me the seventh of September. The submarine connection was only completed on Monday, September 15, on account of the roughness of the sea. With it have now obtained a rate of 4,000 cubic meters per hour of water at 13 degrees Centigrade (56 degrees Fahrenheit) against 10½ degrees (52 degrees Fahrenheit) corresponding to a depth of 650 meters. Except that the warming is a little too extreme we are well satisfied.

THIS IS the dramatic description Prof. Georges Claude gives in a special cable to Science Service of the success of his third attempt to harness the cold waters of the sea bottom for operating a power plant. The whole big pipe was assembled on land, and laid like a gigantic snake on a narrow-gage railway track from which it was to be pulled into the water.

A series of floats held the end of the tube in place for the divers to insert the final segment near shores. Another series of floats steadied the pipe at the point where it drops sharply down into deep water. M. Claude's son, with two trusted workmen, were successful in launching the big tube, where a crew of sixty or more excitable Cubans failed earlier in the summer. The tube is made of corrugated steel five feet, eight inches in diameter, and 2000 yards in length.

New Plant for Commercial Use

M. Claude explained to a Science Service writer who visited Matanzas that the present plant will never be used for the production of commercial power. It is, in fact, the same 50 kilowatt plant which he used at Ougrée in Belgium, to conduct experiments of a similar nature on the Meuse River. After experiments are completed in Matanzas, the whole plant will be abandoned and M. Claude will build another plant for further experiments elsewhere in Cuba.

Although some engineers have criticized the Frenchman's novel apparatus as being impractical and point to serious difficulties to be overcome, they admit that his theory is sound.

The apparatus resembles closely the usual steam power plant that uses a fire to make its steam. But in the plant at Matanzas, there is no place for a fire. The highest temperature of any of the apparatus will be that of the incoming water from the surface of the ocean at about 80 degrees Fahrenheit. This enters the boiler or steam generator after passing through a de-gassing tank which removes the dissolved atmosphere and gases.

Water which comes from deep in the ocean and is 30 degrees cooler than that which enters the generator is brought to the condenser at the other end of the sysetm. As in the ordinary steam power plant, it is used to condense the steam after it has passed from the generator through the turbine. This continuous process of condensation lowers the pressure in the boiler and causes more water to evaporate into steam and flow through the turbine into the condenser, to be changed into water again.

Pressure in the usual steam boiler is measured in hundreds of pounds, while that in the Claude boiler will be less than the pressure of the atmosphere outside. Even this low pressure of the boiler will be higher than that of the condenser, because the steam must flow from the boiler through the turbine to the condenser in order to turn the blades of the turbine and produce power.

And this is where engineers accustomed to conventional power plants direct most of their criticism. Because the process involves relatively small changes of temperature and pressure, unusually large quantities of cool condensing water and warmer boiler water will be required. Will not a prohibitive amount of auxiliary power be required to pump this water? it is asked.

How Large Must It Be?

Also, because of the slight pressure differences on which the turbine operates, large quantities of steam must pass through it to produce a reasonable amount of power and the turbine will have to be unusually large to take care of this steam.

On the other hand, M. Claude's record of achieving what others have called impossible should not be overlooked. He invented the first successful process for making liquid air and for liquefying other gases; he pioneered in the field of making liquid ammonia out of the atmosphere; and he is the inventor of glowing red neon lights that shine on our streets at night.

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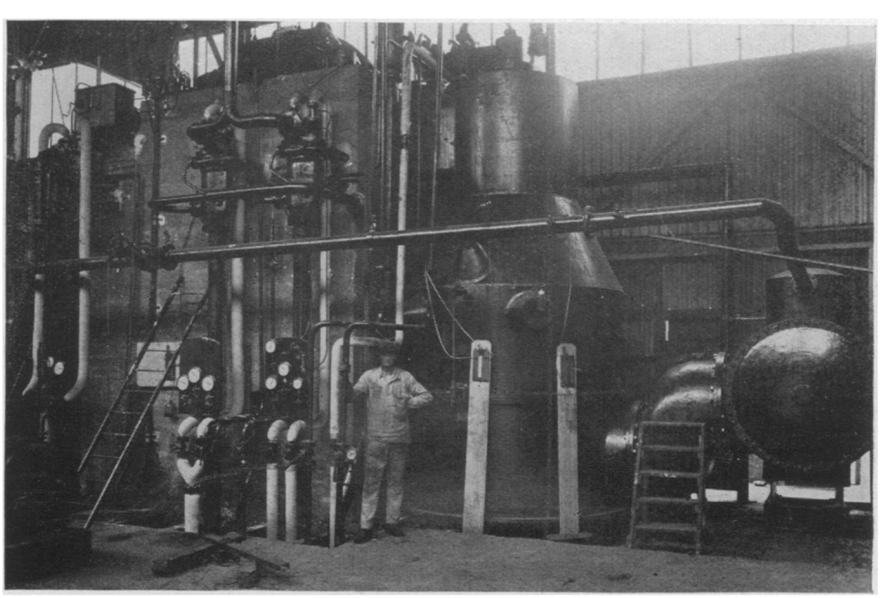

STEAM AT ORDINARY TEMPERATURES

Comes from this plant. Left to right—turbine, steam generator and de-gasser