

Most Powerful Naval Radio

A vacuum tube transmitter 80 times as powerful as the ordinary transmitter in a broadcasting station has just been installed in the Chollas Heights naval radio station, San Diego, Calif. This sending vacuum tube radiates 80,000 watts of electricity and is said by naval officials to be the most powerful tube transmitter in the world. It is four times as powerful as any other United States naval sending station.

This broadcasting device was not designed for telephone use, but will be employed for radio-telegraph communication, using dots, dashes and spaces, at a rate of 100 words a minute.

Chollas Heights is a remote control station, used by the navy for sending purposes only. The messages leave antenna strung on three masts which, 600 feet in height, form a triangle 1,100 feet on each side. The "cross arms," or platforms at the top of the masts, are 60 feet long and contain a bridge on which electricians may work. The actual sending is done from the Pt. Loma naval radio station, 11 miles distant across San Diego and the bay by air line. The Pt. Loma key works the Chollas Heights sender, while receiving is handled at Pt. Loma.

Six transmitters are employed in the station. The 80,000-watt tubes replace 200,000-watt arc transmitters. Under the new arrangement the station will be able to communicate with American ships in any part of the world during the night, when the station has a sending range of 12,500 miles; during the day it can span the continent to eastern points to a total of about 3,000 miles.

The set is operated from an alternating current commercial power supply, by means of six 50 kw. rectifier tubes which can deliver up to 150 kw. at 15,000 volts. Included is a 20,000-volt master oscillator which excites eight 20,000-volt amplifiers. The approximate antenna current is 300 amperes.

The significance of this station is found in the declaration of radio officials connected with its construction and operation that, if it proves completely successful as they predict it will, tube transmitters will replace all large arc transmitters such as are employed by the navy at Washington, D. C., Honolulu and Cavite.

The Chollas Heights set is one
(Just turn the page)



WILLIAM DAVID COOLIDGE

X- and Other-Ray Expert

To Dr. W. D. Coolidge, the distinguished assistant director of the General Electric Company's Research Laboratory at Schenectady, shown here in a characteristic mood, the SCIENCE NEWS-LETTER is glad to extend congratulations, not only upon the award of the Howard N. Potts Medal of the Franklin Institute, as described elsewhere in this issue, but also upon his birthday.

He was born upon the 23rd of October, 1873, in Hudson, Mass., and so far as he is aware is not related to the other prominent bearer of his name. But as they both came from the same part of the country, there may be some distant connection.

After graduating from the Massachusetts Institute of Technology in 1896, he studied at the University of Leipzig, taking his Ph.D there in 1899. Then he taught at his Boston alma mater until 1905, when he began physico-chemical research in the General Electric Company's laboratory, becoming assistant director in 1908. There his principal researches—on ductile tungsten, the Coolidge X-ray tube, and now, the new cathode ray tube—have been accomplished, while others which will doubtless prove equally important, are still in progress.

Science News-Letter, October 23, 1926

A star recently discovered appears so faint that it cannot be seen without a telescope, and yet is said to be 10 million times brighter than the sun.

Science News-Letter, October 23, 1926

Relics in Ancient Cave

Twenty baskets full of broken clay jars and bowls, found in a cave near the village of Heraklion, have been pronounced the most important discovery in recent years in the culture of the New Stone Age.

These valuable fragments of prehistoric pottery were unearthed by the University of Cincinnati's archaeological expedition to Nemea, where excavations into old Greek ruins were being made. The unexpected find of the cave and the significance of the pottery, which has not yet been fully studied, is reported by the director of the excavations, Prof. Carl W. Blegen, in a recent issue of *Art and Archaeology*.

A native farmer's excavations for a new threshing floor revealed bits of pottery which led the scientists to investigate the site, he explains. They were rewarded by finding a large natural cave, the roof of which had fallen in to fill the cave hole completely, and in this old home of prehistoric cave dwellers were bones of sheep and other animals and a great quantity of primitive dishes.

Pottery from this period of man's early development has never been plentiful, and the value of the cave's contents is increased by the fact that the clay fragments have been stored away in boxes according to the depth of earth in which they were found. When the soft, fragile bits have dried out and hardened they can be better studied, and Prof. Blegen believes that they will provide important stratigraphic evidence in tracing the development of pottery in the Neolithic Age.

The bulk of the sherds belong to perfectly plain vessels without decoration, Prof. Blegen states. Many of these are almost coal black in color; others are buff, and some appear to be red. Another kind of ware is described as being decorated in red paint, mostly with simple geometric figures, often filled with parallel lines or cross-hatching.

"The small area uncovered by our pit seems to be merely a sort of antechamber to the real cave itself," he concludes. "The complete exploration of this latter, which will be a large undertaking, will have to be resumed in the next campaign at Nemea, and may be expected to yield results of very great archaeological and historical value."

Science News-Letter, October 23, 1926

Have You A Few Friends

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As a subscriber to the most unusual scientific magazine of the hour you are, we hope, enthusiastic. We know you appreciate obtaining scientific news months before it can possibly be printed in book form.

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SCIENCE SERVICE
21st and B Sts.
Washington, D. C.

Wrens feed entirely upon insects.

Eskimos dislike salt, explorers say.

The Japanese use cormorants to catch fish.

The first X-ray pictures were made 30 years ago.

Many insects that cannot fly still possess wing scales.

Stone age sculptors often made Venuses without legs.

Ostrich feathers were worn in the hair by men in ancient Egypt.

Weather reports are being received from weather stations in Greenland.

A single dandelion blossom produces about 365,000 grains of pollen.

The mental age of an idiot is about equal to that of a child of two years.

A method of making artificial silk was patented in 1884 by a Frenchman.

Amber was a favorite ornament worn by prehistoric man of the Stone Age.

A fire extinguishing paste containing carbon dioxide is on sale in England.

The life of uranium, the parent element of radium, is about eight billion years.

Chinese soldiers stationed at Hsueh-chow planted 21,000 trees on Arbor Day this year.

The ocean contains enough salt to cover all the land on earth with a layer 1,000 feet deep.

Because of the radium in the earth, this planet may be really getting hotter instead of cooler.

Science News-Letter, October 23, 1926

Most Powerful Naval Radio

(Continued)

of three built recently by an American company. A second was constructed for the Japanese government, like this in essential details though differing in some minor points. It has been shipped to Japan but no information is had on it after it left the Pacific Coast. A third was built for use in South America, but it is reported lack of funds has caused it to be stored at New York, where it had been sent for shipment.

The 20,000-watt tube used at Chollas Heights is the largest vacuum tube yet constructed for commercial use. It is so large and becomes so hot under ordinary conditions that the copper plate used is water cooled. Twenty-two volts of electricity are required to light the filaments in these tubes. The plates take from 7,500 to 15,000 volts.

The new transmitter cost \$80,000. Chollas Heights station was originally constructed in 1914 on contract at a cost of about \$350,000. At that time there was considerable discussion concerning the location of the station, some maintaining that it should be located at Riverside, 75 miles further north from the Mexican border. It is now located on a hill ten miles from the center of San Diego, with a view of both mountains and Pacific Ocean. The heavy towers are capable of withstanding a horizontal safe pull of 20,000 pounds.

Amateur broadcasting fans suffer no interference from the station, according to navy officers, even when in the immediate vicinity of the station.

Among other interesting facts, 50 gallons of water are required every minute to keep the tubes cool. The plate transformer weighs four and one-half tons, and the total weight of the set when packed is 58,500 pounds.

Science News-Letter, October 23, 1926

STUDY HELPS FOR SCIENCE CLASSES

(These articles will be found to be especially useful in class work.)

GENERAL SCIENCE

Naked Eye Sunspots, p. 49. Bead Treasure, p. 49. Jupiter Changes Aspect, p. 57. Anniversaries of Science, p. 63. Articles marked with * in classification below.

HYGIENE

Latest Researches to Protect America's Public Health,* p. 53. Dishes and Germs,* p. 59. The Efficiency of Bones, p. 61. Goat Serum for Measles, p. 63.

CHEMISTRY

The Catalysis of Coal,* p. 49. Dishes and Germs,* p. 59. Sun Injures Silk, p. 63.

BIOLOGY

Views Rubber with X-Rays, p. 57. Animal Experiments Open, p. 59. Nature Ramblings, p. 59.

PHYSICS

Crystals Glow with "Cold Light" Under Cathode Rays,* p. 51. Most Powerful Naval Radio, p. 55. Views Rubber with X-Rays, p. 57.

(This will fit on a 3 x 5 card.)

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