

RADIO

Transocean Radiophone

Hard times are in store for any transatlantic gossips who might wish to indulge in a little eavesdropping on the new overseas radiophone service which opened for public use on Friday, January 7. Officials of the American Telephone and Telegraph Company state that although absolute secrecy of the transatlantic telephony is not guaranteed, it will be difficult to listen in because a special transmitting system is used. This is the suppressed carrier method, by which the voice is sent through the ether without a carrier wave. In the ordinary receiver, an unintelligible jumble is all that one hears, but when a receiving set is used that restores the missing carrier, it is fully understandable.

Another difficulty of listening in, at least so far as the United States is concerned, is that the signals from London are so faint. It was in order to get them as loud as possible that the telephone company placed the receiving set at Houlton, Maine, 700 miles of long distance lines away from New York, so that at best, an interloper would only be able to hear one side of the conversation.

For the present, it is only possible for connections to be made between New York and London, although, experimentally, points as far away as Chicago have been connected with England, and there are no difficulties foreseen in possible connections with San Francisco. If there is sufficient demand, it was stated, other parts of the United States will be given the service. Even now, it is possible to connect any of the one and a half million telephones in New York with any of the half million in London, provided the subscribers wish to pay the rates. The charges for the service are \$75 for the first three minutes or less, and \$25 for each additional minute, the maximum time allotted being twelve minutes if any other calls are waiting. At present, it is only possible to have one conversation across the Atlantic at a time, but by the use of additional wave lengths, with additional equipment, more channels for conversations may be made in the future.

One improvement that has been made, since the first experimental tests a year ago, in the interest of conserving the limited number of available wave lengths has been to transmit both directions on the same wave length. Previously, a different one was used between England and the United States from the one used to

carry the conversation eastward. In order that the speaker may not hear his own voice coming back to him through the receiver, voice operated relays are used which connect the receiving circuit only when the person at the other end is talking. A similar device is already in use in long distance land cables to prevent echoes by the reflection of the currents at ends of the circuit.

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ASTRONOMY

Sun Laziest Now

Although the shortest day of the year was the beginning of winter, December 22, the sun now gets up over the eastern horizon a few minutes later than on that day.

This apparent laziness of the sun is due to the fact that earthly clocks keep their time by what astronomers call the "mean sun" rather than by the true sun and that therefore the sun is directly on the meridian at high noon on any day of the year except about April 15, June 15, August 31, and December 24. The late rising of the sun is compensated for during these January days by the even later setting of the sun so that the daylight period is actually lengthening. The time of earliest sunset occurred sometime between December 2 and 14.

The irregularity of the true sun is well realized by those who rely on sundials for their time. The difference in time between that kept by the true sun, recorded on the sundial, and the mean sun, by which clocks are set, is called the equation of time. The necessity for this equation of time is due to two factors, the eccentricity of the earth's orbit about the sun, and the obliquity of the ecliptic or path in which the sun appears to move around the earth. This path does not encircle the sky directly over the earth's equator, but is at an angle of $23\frac{1}{2}$ degrees from the celestial equator. These two factors combined make the sun seem to be "slow" at this time of the year.

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A French inventor announces that he has been able to take motion pictures at the rate of 300 a second.

Two ore crushers just built weigh 1,000,000 pounds each and are said to break the record for size in such machinery.

Examination of American soldiers during the war showed for the first time the distribution of goiter through the country.

MINERALOGY

Opal Weighs Over Pound

Half as big as a brick, pitch black but shot through with green and peacock blue fire, the largest known gem opal is now residing in the U. S. National Museum. The big opal is a simon pure "made in U. S. A." product, having first seen light of day in Virgin Valley, Humboldt County, Nevada. It came to the museum as a part of the famous mineral collection of the late Colonel Washington A. Roebling, just presented to the Smithsonian Institution by his son, John A. Roebling.

The finest opals are generally considered by experts to come from Australia, but this huge gem that weighs over 18 ounces avoirdupois is surpassed by few in quality and beauty. The region around Virgin Valley, where gem opals were first found in 1908, is largely desert. The opals occur, according to Dr. W. F. Foshag, mineralogist in the National Museum, in beds of volcanic ash associated with petrified wood. Sometimes the chinks and cracks of a piece of petrified wood are completely filled up with opaline flashes of blue and red. Occasionally one finds a whole opal twig, while the University of California mineral collection contains a spruce cone completely changed to opal, Dr. Foshag said.

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ANTHROPOLOGY

Age of Man in America

Dr. Ales Hrdlicka, President of the American Anthropological Association, subjects to sharp criticism the frequent reports appearing in the newspapers of finds of the remains of fossil man in America. The stories of the discovery of bones of prehistoric dwarfs or giants are obviously absurd and even the plausible of such announcements lack substantial foundation. The sensational report by a curator of a western museum of rock carvings of man in company with extinct lizards and elephants was wholly erroneous, Dr. Hrdlicka declares. The row of teeth found in a slab of hard rock of Eocene Age and pronounced by one of the foremost dental journals to be human were found on closer scrutiny to be those of an ancient horse. There is no decisive evidence of the existence of man in America as early as the Glacial epoch or even of the arrival of any men, except the Indian and Eskimo, coming from other continents before Columbus, he claims.

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