

carried on in the climatic conditions which render other modes of communication difficult, if not impossible, the experiment is surely worth trying.

Other possible applications of this system of telegraphy might be enumerated, but it can scarcely hope to come into general use until one difficulty at least has been overcome, that is, to ensure that a message is received by the person to whom it is sent and by no other. Electric waves are thrown off in all directions from their generator, so that if a man sets up a station all his messages can be read by any one who cares to put up a precisely similar station within the limits to which the waves travel. Two principles may be employed to remove or lessen this inconvenience. Electric waves, like light waves, can be reflected and intercepted; hence a station could prevent the emission of waves in every direction but the one in which lay the station with which it wished to communicate, and thus reduce the possible eavesdroppers to those lying on the line along which the waves were directed. The other principle is that of sympathy. Just as one tuning fork will vibrate in sympathy with another provided they are in tune with each other, and not otherwise, so one electric circuit will respond to the oscillations taking place in another, if they are in tune, but will be unaffected if they are not. Two stations therefore cannot telegraph across space to each other unless their apparatus is syntonized; hence by adopting differences of tuning a certain degree of secrecy may be arranged for. It remains to be seen whether the application of these two principles will suffice to provide a solution of the problem.

CURRENT NOTES ON METEOROLOGY.

PHYSIOLOGICAL EFFECTS OF HUMIDITY.

RUBNER and Von Lewaschew have recently been conducting laboratory experiments with a view to determining the

effects of different degrees of atmospheric temperature and humidity on the human body (*Archiv. f. Hygiene*, Vol. XXIX). The individual on whom the experiments were made was placed in a closed chamber, into which air of varying known degrees of humidity was admitted. The separate tests lasted from four to eight hours each, and one hour before every test the same breakfast was eaten, while no food or drink was taken during the experiment. The body and the clothing were weighed before and after each trial, so that the amount of moisture given off or absorbed might be known. It was found that at low temperatures (57° – 59°) dry air is pleasanter than moist; between 75° and 84° dry air seems cooler than moist when the change is made from one to the other. The last-named temperatures are easily borne if the air is dry. Visible perspiration was first noted at 84.2° and 22% relative humidity. Moist air (96% rel. humid.) made the temperature of 75.2° unbearable for a long time, and the experiment was possible only when there was no muscular movement whatever. At this temperature and humidity there was no considerable perspiration, although thirst was felt. Respiration decreased in dry air and increased in moist air. These experiments are interesting, but they do not give us the actual conditions that prevail in the outside air, as usually experienced by the human body. The movement of the air, which is a very important factor in its effects on the sensible temperature, and the varying amounts of heat lost by conduction, radiation and evaporation, according to the temperature and proximity of surrounding objects, are controls which do not come into play in the laboratory.

ELECTRIC SEARCH LIGHTS AS WEATHER SIGNALS.

THE *Monthly Weather Review* for February contains a note on the use of electric search

lights for the purpose of disseminating weather forecasts. The search light of the U. S. S. *Maine*, which was at the time nearly completed, was, in February, 1895, loaned by the Navy Department to the Weather Bureau for temporary use in Chicago, in experiments designed to test the efficiency of such a means of distributing warnings of coming important weather changes. The light, which had a lens 30 inches in diameter and whose candle power was estimated at about 100,000, was erected on the roof of the Auditorium Building, in Chicago, at an elevation of 270 feet above the level of the street. It was used but once, on February 28, 1895, in giving a warning of a coming cold wave, the light being slowly revolved at the rate of one revolution in five minutes. The night was dark and cloudy, and the signal was seen at a distance of 20 miles. A number of experimental trials were also made, and it was concluded that search lights are not useful for the purpose of disseminating forecasts except under the most favorable circumstances. The compiler of these *Notes* recalls that a number of years ago a similar attempt was made during one summer to flash weather forecasts from the summit of Mt. Washington, in New Hampshire (6,279 feet). This was a private enterprise, in the nature of an advertisement, but was fairly successful as far as the distribution of the forecasts was concerned.

CIVIL SERVICE EXAMINATIONS FOR POSITIONS IN THE WEATHER BUREAU.

It is pleasant to learn, from a note by Professor Abbe in the *Monthly Weather Review* for February, something of the Civil Service Examinations set for candidates for positions in the Weather Bureau. Since 1893 all the positions, except those of Chief and Assistant Chief, have been in the classified service, and therefore a special system of examinations has been arranged.

The examination for the position of Observer in the Weather Bureau embraces the following subjects, besides spelling, arithmetic, etc., with the respective weights as given, viz., practical questions in meteorology, 40; an essay on a practical subject in meteorology, 20; geography of the United States, 10, the total number of points being 100.

FALSE DEW.

AITKEN's theory that much of what is ordinarily called dew does not come from the water vapor in the air, but from within the plants on which moisture is seen, has received further experimental confirmation at the University of Nebraska, where Professor C. E. Bessey has been carrying on investigations along the lines suggested by Aitken's own observations (*Monthly Weather Review*, March). These studies show that, when the soil is moist and warm, the leaves of plants exude water, which forms in drops on the plants when evaporation from the leaves is checked by the cooling and the consequent increase in the humidity of the air. In cases of unusually active plants, drops may be forced out in dry, warm air. These drops form what is known as 'false dew,' and the process is known as 'guttation.'

NOTES.

FROM the *Meteorologische Zeitschrift* for April we learn that a bibliography of Italian meteorology is being prepared by the librarian of the Observatory of Moncalieri, near Turin, the list to include all books, pamphlets and articles bearing on meteorology which have been published in Italian.

Among noteworthy recent articles is the following: J. HANN: *Ueber die Reduktion kürzerer Reihen von Niederschlagsmessungen auf die langjährige Reihe einer Nachbarstation*. Met. Zeitschr., Apr., 1898, 121-133.

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