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FOG AS A SOURCE OF WATER SUPPLY.

[Dated: Washington, D. C., Mar. 20, 1916.]

The following communication has been received by the editor from Mr. William Gardner Reed:

Referring to the article by Paul Descombes entitled "Reforestation and occult condensation" in the December, 1915, number of the REVIEW (43:617-618) it may be of interest to note the effect of the summer fogs of the California coast region. As is well known the region is one in which measurable precipitation does not commonly occur between early June and late September. The result is that herbaceous vegetation dries in the summer and the brown of the dry grass (practically standing hay) is characteristic of the region, except where the surface cover is forest or chaparral (brush). There is apparently a close relation between the occurrence of summer fog and the distribution of the redwood (*Sequoia sempervirens*) in California. In addition, a result of the fog is easily seen wherever there are single trees, such as is the case on the Berkeley Hills of the Coast Ranges which are in process of reforestation. During the summer fogs the small trees are dripping with moisture, although the ground away from the trees is perfectly dry. As a result the grass beneath each tree remains green throughout the year. Away from the immediate vicinity of the tree the grass is brown and the earth dry and powdery, while beneath the tree the ground is kept moist to a considerable depth. \* \* \* Whether this moisture has any important effect on the growth of the tree may well be questioned, but it is certainly sufficient to make an important difference in the growth of the grass.

A SIMPLE WIND VELOCITY INDICATOR FOR USE WITH THE ROBINSON ANEMOMETER.

By BENJAMIN C. KADEL, in charge of Instrument Division.

[Dated: Weather Bureau, Washington, D. C., May 27, 1916.]

An attachment for the Robinson anemometer that will indicate in a convenient manner the velocity of the wind when desired, without the expense of installing and maintaining a continuously operating register, has recently been devised by Benjamin C. Kadel and described in an appendix to Circular D, of the Instrument Division, Weather Bureau.

Six pins on the first or worm wheel in the train of gearing have been so arranged that an electrical contact is made and a circuit closed during a brief interval for each one-sixtieth mile of travel of the wind, thus sounding an electric buzzer or door bell at the location desired. The fraction of a mile selected is such that the number of times the buzzer sounds in one minute is equal to the wind velocity in miles per hour, thus obviating the use of explanatory tables. A switch placed in the circuit saves battery and sparking of the contact when the buzzer is not in use.

When the velocity of the wind is desired, it is required merely to close the switch and to count the impulses for one minute.

In actual practice it is found that the variation in the time between impulses is a pretty good guide to the gustiness of the wind as well, a fact of some interest to aviators.

The device will probably be of use to aviators, rifle-range officers, fire wardens, and others who wish to know

the wind velocity only at a particular time, and who do not care to go to the expense and trouble of providing and maintaining an automatic register.

THE DIURNAL VARIATION OF UNDERGROUND TEMPERATURE.<sup>1</sup>

By S. SATO.

[Reprinted from Science Abstracts, Sect. A, Mar. 25, 1916, § 237.]

The usual method of measuring earth temperatures is by hanging a mercury thermometer at the required depth in a metal tube sunk in the ground. In the present paper the temperatures recorded in a tube of this type are compared with those obtained by means of an electrical resistance thermometer buried in the soil. As the mercury thermometers ordinarily used were not of sufficient sensitiveness for a satisfactory comparison, an electrical resistance thermometer was used in the earth tubes in place of the mercury ones. It was found that conduction of heat along the walls of the tube, and convection and conduction of the air column in the tube, caused the diurnal variation of the temperature in the metal pipe system, to differ considerably in phase and amplitude from the curve of actual temperature changes in the soil at the same depth. Further, the error does not tend to vanish with increase of depth, but rather to increase. The ratio of the diurnal amplitude in the metal pipe system to the true amplitude at the same depth is given in the following table, together with the error in the phase angle:

Depth.	30 cm.	40 cm.	50 cm.
Ratio of amplitudes.....	1.88	2.18	2.62
Phase difference, in hours.....	7.5	10.25	13.5

Thus at 50 cm. depth the amplitude given by the metal pipe system is more than 2½ times the true value, and the maximum and minimum temperatures occur 13½ hours before the times of the corresponding extremes in the soil at the same depth. The absolute error in temperature commonly ranges up to between 0.5 and 1.0° C.—*J. S. Dines*].

ALEKSANDR IVANOVICH VOEIKOV, 1842-1916.

The Novoe Vremia (Petrograd) of January 30/February 12, 1916, announces the death of the eminent Russian meteorologist and geographer, Aleksandr Ivanovich Voeikov (Woeikof), at Petrograd on January 28/February 10, 1916, from inflammation of the lungs.<sup>2</sup>

Voeikov, or, as he was accustomed to transliterate his name, Woeikow, was born in Moscow in 1842 of a family that had already given Russia a number of writers. While still young he traveled not only in western Europe, but also in Syria and Palestine, and no doubt thereby developed his love for geographical studies. After passing his student years at German universities, particularly at Göttingen, he returned to Russia, became, in 1866, a member of the Imperial Russian Geographical Society, and from that time on devoted himself to meteorological studies. In 1873 and 1875 these researches led him to travel,

<sup>1</sup> Proc., Math. phys. soc., Tokyo, Dec., 1915, 8:328-336.

<sup>2</sup> Tohoku Univ. Sci. Rep. 4, No. 5, 1916, pp. 393-405.

<sup>3</sup> Note by Semenov Pian-Chanskii, abstracted by Émile Haumont, in Annales de Géographie, No. 134, 15 mars, 1916, 23:150-151.



FIG. 1.—Plan of circuit for the Kadel indicating anemometer.

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 THE CHINESE WEATHER BUREAU.

By CO-CHING CHU, A. M.

[Dated: Harvard College, Cambridge, Mass., June 22, 1916.]

first, to the United States, then to Mexico and Yucatan, and, finally, to South American countries. Each of these voyages he undertook without any governmental aid; each was an opportunity to him for the acquisition of several new languages; in fact, it was incomprehensible to him how a language could be difficult for anyone.

While in the United States Voeikov spent some time in Washington, where he made the acquaintance of the members of the recently organized national weather service, of Joseph Henry, and other scientific leaders. In 1882 he qualified as privat-docent at the University of St. Petersburg. Two years later he published his great work, "The Climates of the World," which brought him universal renown as soon as its translation into German, in 1887, made it available to the European scientific world. An English translation of this work from the Russian was at once prepared by Dr. Alexander Ziwet (Ann Arbor) under the encouragement and supervision of Prof. Cleveland Abbe, and revised by Voeikov in 1900, but no publisher has yet been found for the work. In 1885 he was appointed professor of physical geography at his university and, later, director of the meteorological observatory there. This permanent appointment to a professorship marked the beginning of a new series of publications, which at first revealed the meteorologist and then the ideal geographer. As examples, one may cite his study, in 1904, on the rôle of the Pacific Ocean in the world's affairs, a very remarkable article in the *Novoe Vremia* on the regeneration of Russia, and a French work, "Le Turkestan russe." Somewhat against his will, Voeikov had come to be a vegetarian, and he also contributed studies on vegetarianism.

Among his meteorological papers, those appearing in the *Meteorologische Zeitschrift* have had the most interest for American students; but they have numbered more than 100, and it is not necessary to give a full list of his works here. Many of them, perhaps some of the most important, deal with the relations between the temperatures of air, ground, oceans, and lakes. His meteorological work finally culminated in his handbook, "Meteorologia," a work of 719 pages, published in Russian in 1904, and the present leading meteorological text in that language.<sup>3</sup>

He had been one of the editors, and certainly the leading contributor to "Meteorologicheskii Věstnik," the meteorological monthly published by the Imperial Geographical Society. His many communications to geographical journals of various countries on most diverse subjects indicate the extent of his knowledge and the originality of his perception. The readers of the *REVIEW* will recall a number of his contributions to these pages.

His Russian biographer remarks that, in his private life as in his scientific career, Voeikov always showed a rare degree of modesty and was thoroughly unselfish. Very simple, almost Spartan in his tastes, he closely resembled his friend, the celebrated Russian chemist, Mendelief. While we did not all have an opportunity to enjoy the simplicity of his greeting, the rarity of his free and lively spirit, or the singular charm of his conversation, certainly we may join his French friends in regret at the loss of an illustrious scientist.

With the establishment of the Chinese Republic and the adoption of a constitution by the first Parliament in the years 1911 and 1912, a national weather bureau was officially instituted under the Board of Agriculture, with branch stations in various Provinces. Owing, however, to the lack of funds and men the organization has not progressed as we wished.

At present, there are two meteorological observatories in Peking. The one under the Board of Agriculture is located in the Central Agricultural Experimental Station. The other is called the "Central Meteorological Observatory" and belongs to the Board of Education. The latter observatory has already issued several bulletins, besides publishing a monthly magazine. The magazine had its start in the Fall of 1913, articles on astronomy, seismology, and earth magnetism have been published, as well as meteorological treatises. Each issue contains about 60,000 words (in Chinese).

In many other provinces besides Chili, of which Peking is the capital, Weather Bureau stations are maintained in connection with the Agricultural Experimental Stations, usually in the provincial capitals. The instruments used there are not of the first class, and in most cases have never been standardized. It is evident, then, that any work on forecasting is out of the question at the present stage of development of the governmental stations.

With the passing of Yuan's régime, we hope President Li and the new Parliament, which will be called together soon, will be more generous in their support of the weather bureau and other scientific enterprises.

NOTES.

*Robert Frederick Stupart* (b. Toronto, 1857), since 1894 director of the Meteorological Service of Canada, was among those honored by the King of England on the royal birthday celebration June 2, 1916. Sir Frederick is now a knight bachelor. (*Nature*, London, June —, 1916.)

*Robert Henry Scott*, M.A., D.Sc., Foreign Secretary of the Royal Meteorological Society, died at London, June 18, 1916 (b. Dublin, Jan. 28, 1833). Dr. Scott was Director of the Meteorological Office from 1867 to 1877 and Secretary of the Meteorological Council from 1877 to 1900.

He was the author of what is perhaps still the leading English textbook on Meteorology.

Dr. Scott's career is briefly outlined in this *REVIEW*, February, 1900, 28:68.<sup>1</sup> An appreciative notice by W. N. Shaw also appears in *Nature*, London, June 29, 1916, 97:365-6.

*Prince Boris Borisovich Galitzin*, Director of the Meteorological Service of Russia since 1913 (b. St. Petersburg, 1862), member of the Imperial Russian Academy of Sciences and Professor of Physics in the University of Petrograd, died May 4, 1916 (N.S., or Gregorian).<sup>1</sup>

<sup>3</sup> See notice of this work by S. Hanzlik in the *MONTHLY WEATHER REVIEW*, December, 1904, 32:554.

<sup>1</sup> *Great Britain. Meteorological Office. Meteorological office circular. No. 1* [London], June 20, 1916. 80.