

regular operation since the middle of September, making daily ascents whenever the air was clear enough to enable the movements of the balloon to be followed with the Quervain theodolite. The information thus obtained regarding the direction and velocity of the upper air currents is published on the Aachen daily weather map. It has been found possible to follow the flight of the balloons to a distance of 12 kilometers and to an altitude of 8,000 meters.

GOCKEL'S "DIE LUFTLEKTRIZITÄT."¹

A comprehensive survey of modern ideas regarding atmospheric electricity—a branch of physics that has been revolutionized during the past decade—has been badly needed; and such a work has now been published by Dr. Albert Gockel, professor of physics at the University of Freiburg, Switzerland. In five chapters the author discusses (1) the electrical conductivity of the atmosphere, (2) the electrical field of the earth, (3) electrical currents in the atmosphere, (4) the earth current, and (5) factors producing the ionisation of the atmosphere.

An extended review of this work, by E. Lagrange, appears in *Ciel et Terre* of November 16, 1908, and another, by Prof. W. J. Humphreys, of the United States Weather Bureau, is to be published shortly in the *Astrophysical Journal*.

METEOROLOGY AT THE NINTH INTERNATIONAL GEOGRAPHICAL CONGRESS.

The Ninth International Geographical Congress was held at Geneva from July 27 to August 9. One of the sections was devoted to meteorology, climatology, and terrestrial magnetism, the president of this section being Professor Hellmann, of Berlin, and the secretary, Dr. Alfred de Quervain, Zürich. Various reports were presented to the section, and M. Maurer, the director of the Central Meteorological Institute of Zürich, exhibited a new rainfall map of Switzerland, which completed that of the late M. Bilwiller published in 1893. A report was also presented on the work published by the Geographical Society of Portugal, entitled "Elements of Nautical Meteorology." Professor Hellmann described a new method of determining the average rainfall of a district, and Dr. Polis of Aix-la-Chapelle spoke of weather forecasting and the use of wireless telegrams. Professor Kassner described the uses of his meteorological globes, and Professor Gautier read a paper on the climatology of the Grand St. Bernard.—*Quarterly Journal of the Royal Meteorological Society*, October, 1908.

SCIENTIFIC MEETINGS AT THE BRITISH METEOROLOGICAL OFFICE.

Meetings for the discussion of important contributions to meteorological literature, principally those of colonial or foreign meteorologists, are held at the British Meteorological Office, 63 Victoria street, London, on alternate Monday afternoons from October to March, inclusive, at 5 o'clock. Attendance is not limited to the staff of the office; outsiders interested in meteorology are welcome, and are allowed to take part in the discussions. The meetings for this year opened October 19, with an account of the work of the meteorological service of Australia, by its chief, Mr. H. A. Hunt, and a discussion of the rainfall of the Transvaal, by the director of the meteorological service of that colony, Mr. R. T. A. Innes.

METEOROLOGICAL BREAKFAST AT THE BRITISH ASSOCIATION, DUBLIN, 1908.

The annual meteorological breakfast, founded by Mr. Symons and revived in 1901, took place [this year] in exceptionally favorable surroundings. Thanks to the initiative of Sir John Moore, the leading meteorologist in Ireland, the Royal College of Physicians of Ireland placed their fine hall at the disposal of the meteorologists and rainfall observers present at the meeting, and no less than forty-eight sat down to breakfast at 9 a. m. on Tuesday, 8th September. Sir John Moore presided. Sir John Moore said a few words of welcome to the

meteorologists visiting Dublin, and thanked the president of the Royal College of Physicians of Ireland for the kindness of the college in granting the use of their hall for the occasion. He congratulated Section A [the physical section of the British Association] on having as its president Dr. Shaw [director of the British Meteorological Office] who combined the highest mathematical powers with profound meteorological knowledge, and referred to the foreign and imperial meteorologists who were present. Appropriate replies were made by M. Teisserenc de Bort, who spoke in French and was very heartily received; Prof. A. Lawrence Rotch, of Harvard University; Dr. W. N. Shaw, president of Section A; Dr. Gilbert Walker, the head of the meteorological service in India, and Captain Lyons, director of surveys in Egypt.—*Symons's Meteorological Magazine*, September, 1908.

INTERNATIONAL KITE AND BALLOON ASCENTS IN 1909.

Professor Hergesell, of Strassburg, president of the International Committee on Scientific Aeronautics, has notified the institutions taking part in the international upper-air investigations that the following dates have been chosen for kite and balloon ascents during 1909: January 11, 12, and 13 (small series); February 4; March 4; March 31, and April 1 and 2 (small series); May 6; June 3; June 30, and July 1 and 2 (small series); August 5; September 2; October 6, 7, and 8 (small series); November 4; December (great series, dates not yet decided).

In previous years the "great series" or "international week" of simultaneous upper-air observations all over the world has been carried out in summer; in the series held last summer special attention was paid to the exploration of the air over the intertropical regions. The selection of a winter month for the next "international week" was the result of suggestions made at the jubilee meeting of the German Meteorological Society in Hamburg last September.

WEATHER FOLK-LORE OF THE TYROL.

Quaint superstitions and customs relating to the weather that prevail among European peasants, especially in the Tyrol, form the subject of a highly readable article by Mrs. Herbert Vivian in the November number of the *Wide World Magazine*. There are several photographic illustrations, showing such objects as the "storm crucifix," the "hail cross," the "storm candle," potent to drive away hail-storms, a talisman that protects its wearer against lightning and tempest, and an ancient "letter of protection" that insures safety from a multitude of ills, including all the baneful influences of the atmosphere.

AN ELEMENTARY METHOD OF DERIVING THE DEFLECTING FORCE DUE TO THE EARTH'S ROTATION FOR WEST-EAST MOTION.

By Prof. W. H. JACKSON. Dated Haverford College, Pa., October 22, 1908.

The shape of the earth is not spherical but deviates from that shape in such a way that the surface is everywhere normal to the *apparent* direction of gravitation.

To find how air moving freely over the surface would be deflected relatively to the circles of latitude, it is sufficient to find what would be the difference between the accelerations of a point moving with uniform velocity v in a small circle and a point at rest relatively to the earth.

Let P be any point on the earth's surface, and let E be its projection on the earth's axis of rotation.

This difference is seen from fig. 1 to be—

$$EP \cdot \left(\omega + \frac{v}{EP} \right)^2 - EP \cdot \omega^2 = 2\omega v + \frac{v^2}{EP}.$$

If we neglect v in comparison with $\omega \cdot EP$, the velocity of P due to the earth's rotation, this is simply $2\omega v$; its direction is along PE . Resolving along the earth's surface, we obtain the

¹Gockel, Albert. Die Luftelektrizität. Methoden und Resultate der neueren Forschung. Leipzig: S. Hirzel. 1908.

component $2\omega v \sin \varphi$, where φ is defined astronomically. The component is toward the north or south according as v is positive or negative, that is as v is in the same direction as ω or not.

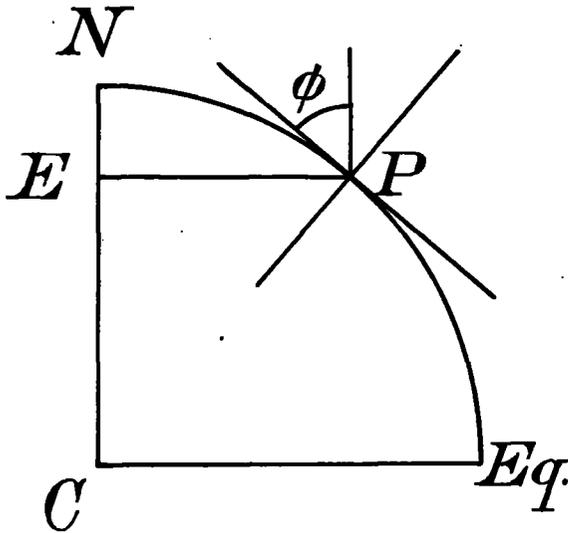


FIG. 1.

Finally, if no force acts, the air moves relatively to the circles of latitude with acceleration $2\omega v \sin \varphi$ to the south or the north according as v is from west to east or from east to west. The deflection is always to the right in the Northern Hemisphere where φ is positive.

TITLES OF PAPERS READ BEFORE THE GERMAN METEOROLOGICAL ASSOCIATION.

The Meteorological Association held its eleventh general meeting, celebrating twenty-five years of its existence, at Hamburg September 28–30, 1908. In addition to the business and social features and the visits made on the 1st of October, after the close of the session, to neighboring meteorological stations, including the kite station at Grossborstel, the readers of the MONTHLY WEATHER REVIEW will be specially interested in the scientific addresses and papers. Following is a translation of the titles.

Monday, September 28.

- Doctor Hellmann, of Berlin: On the beginnings of meteorology.
 Professor Doctor Köppen, of Hamburg: The interaction of maritime and land meteorology in their historical development.
 Vice-Director A. Steen, of Christiania: Cloudiness and daylight.
 Director Jensen, of Hamburg: The problems at present associated with the study of atmospheric polarization.
 Professor Doctor Schubert, of Eberswald: The precipitation on the Annaburger Heath.

Tuesday, September 29.

- Director Teisserenc de Bort, of Paris: The division of the atmosphere into troposphere and stratosphere, as based on the results of the exploration of the upper air.
 Director Teisserenc de Bort, of Paris, and Prof. A. L. Rotch, of Boston: On the atmospheric circulations in the intertropical and subtropical zones, from the results of three campaigns on the *Otaria*.
 Professor Doctor Hergesell, of Strassburg in Alsace: The warm high layer in the atmosphere.
 Prof. A. L. Rotch, of Boston: The warm layer of the atmosphere above 12 kilometers, in America.
 Dr. Alfred Wegener, of Berlin: Preliminary report on the kite and captive balloon ascensions of the Danish expedition to Greenland.
 Professor Doctor Erk, of Munich: Technical experiences and scientific results from the mountain station on the Zugspitze.
 Doctor Schmauss, of Munich: Simultaneous temperatures on the Zugspitze and at the same altitude in the free air.
 Doctor Coym, of Lindenberg: On absolute measurements of radiation in the free balloon.
 Professor Doctor Schreiber, of Dresden: Application of thermodynamics to the discussion of balloon observations.
 Professor Doctor Möller, of Brunswick: The air waves in the higher strata of the atmosphere depending on the diurnal heating of the whole mass of air lying below them.

- Professor Doctor Börnstein, of Berlin: Report on the German Public Weather Service.
 Professor Doctor Grossmann, of Hamburg: The addition of the change of atmospheric pressure or the barometric tendency to the current weather telegrams.
 Doctor Polis, of Aix-la-Chappelle: The applicability of wireless telegraphy to the dissemination of weather reports.
 Professor Doctor Köppen, of Hamburg: On Guilbert's rules for weather forecasting.

Wednesday, September 30.

- Professor Doctor Assmann, of Lindenberg: Twenty years of work with the aspiration-psychrometer.
 Professor Doctor Kassner: Exhibition of his improved Jacob's-staff, and his improved evaporimeter.
 Doctor Stefan, of Hamburg: Exhibition of new meteorological apparatus and installations.
 Professor Doctor Erk, of Munich: On methods of instruction in meteorology.
 Professor Doctor Köppen, of Hamburg: New graphic psychrometric tables.
 Doctor Less, of Berlin: Exhibition of a new daybook or journal for recording regular and also occasional weather observations.
 Professor Doctor Lüdeling, of Berlin: On the measurements of atmospheric electricity on the Kara Sea by the lieutenants of the Norwegian vessel *Rachlef*.

RELATION BETWEEN THE RANGE OF AIR TEMPERATURE AND THE DISTRIBUTION OF LAND AND WATER.

By M. TSUTSUI.¹

In order to find the existence of definite relations, if any, between the range of air temperature and the distribution of land and water, we have examined the temperature observations of fourteen meteorological stations situated along the coast of the Central Honshu. At first we compared the ranges of temperature within the circles drawn with the stations as their centers and with the radius of 5 ri (20 km.), but we failed to find any relations. Next we examined the land areas within the 2- ri (8 km.) circle and the ranges of air temperatures observed at the centers of the circles, viz, at the meteorological stations, and found that the ranges of air temperatures are related to the amounts of land areas distributed within the circles by the following formula:

$$y = a + bx,$$

where y represents temperature range and x the area of the land distributed in the circle (the area of the circle being taken as 10), a and b are constant.

In the case in which the radius of the circle is 2 ri ,

$$a = 4.6, b = 0.48.$$

In the case

$$x = \frac{2A + B}{3},$$

(where A = area of 2- ri circle and B = area of 2-5- ri circle,)

$$a = 4.55, b = 0.52.$$

For $a = 4.60$ and $b = 0.48$, the values of y differ from the observed values to the amount of ± 0.30 , the maximum difference being 0.8; and for $a = 4.55$ and $b = 0.52$, the differences of the values of y from the observed values amount to ± 0.24 , the maximum difference being 0.65.

Hence we come to the conclusion that the distribution of land and water controls the range of temperature in the area of a circle with a radius of 2 ri , the error being less than 1° in temperature.

M. ISHIDA'S REMARKS ON M. TSUTSUI'S PAPER.

Mr. Tsutsui has shown the relation between the distribution of land and water by the linear equation

$$y = a + bx;$$

but it seems more appropriate to consider the range of temperature as a function of latitude as well as a function of the distribution of land area; hence

$$R = a + bn \cos \varphi,$$

¹ Reprinted from the English abstracts in Jour. Met'l. Soc., Japan, October, 1908, 27th year, No. 10, p. 27-8.