he found everywhere a large and appreciative constituency, while his own almost boyish pleasure in whatever he saw that was novel was charming to see. On his homeward voyage he met with an accident which was thought by many to be the beginning of the end. Up to the time of his death, which occurred about a year later, he continued, but not very actively, to direct the great institution for original research, in which, by the wisdom of an appreciative government, he had found full scope for his powers. His interest in the important work done at the Chicago Congress continued through this year, and one of the few long letters he wrote had reference to its proceedings. On the 8th of September, 1894, he died, and on the 13th he was buried at Charlottenberg, princes and peasants alike mourning his loss.

Von Helmholtz occupied so large a part of the scientific horizon and for so long a time that we have not yet become accustomed to his absence. But it is not too soon to agree that the following admirable lines which appeared in the *London Punch* a little more than a year ago express in some measure our judgment of the man and his work:

"What matter titles? *Helmholtz* is a name
That challenges alone the award of fame!
When Emperors, Kings, Pretenders, shadows all,
Leave not a dust-trace on our whirling ball,
Thy work, oh grave-eyed searcher, shall endure,
Unmarred by faction, from low passion pure."

T. C. MENDENHALL.

CURRENT NOTES ON PHYSIOGRAPHY.

THE TEMPERATURE OF LAKES.

A CAREFUL study of the temperature of lakes, leading to important economic results in connection with water supply, has lately been completed by Desmond Fitzgerald, of the Boston Water Works (Trans. Amer. Soc. Civil Engineers, xxxiv, 1895, 67–109). Many of the observations have been taken with the thermophone (see Amer. Meteorol. Journ., xii, 1895, 35–50), thus gaining much accuracy and saving much time. It appears from the numerous diagrams and tables in the essay, as well as from the text, that small water bodies, such as Lake Cochituate, one of the chief supplies for Boston, are generally in stable equilibrium. During the winter, when small lakes are frozen, the surface water to a depth of about ten feet is colder and lighter than the great body of deeper water whose temperature is that of maximum density. All through the summer, stability and stagnation again prevail, the surface water to a depth of thirty or forty feet being then warmer and lighter than the bottom water, which remains between 40° and 45°. During this summer period of stagnation, and after the oxygen dissolved in the water has been used in the decomposition of sinking organic substances, they accumulate for the remainder of the season; the water then becomes darker and darker, until by October it is very yellow and generally of a disagreeable smell. But in April, and again in November, the temperature of the lake is essentially constant from top to bottom; the water body is then in indifferent equilibrium and is easily overturned by the wind. In November particularly this overturning brings all the impure bottom water to the surface; infusoria and diatoms begin to grow in enormous numbers, because of the supply of food thus provided. While the degree of impurity of the stagnant bottom water varies in different lakes, it may in some become a serious annoyance; and it is suggested that, where possible, the bottom water should there be drawn off from reservoirs and 'wasted' before the November overturning arrives.

WINDS INJURIOUS TO VEGETATION AND CROPS.

UNDER the above title, the late Prof. Geo. E. Curtis contributed to the International

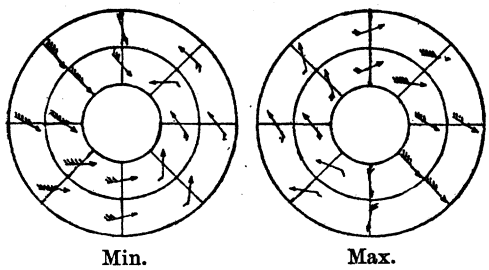
Meteorological Congress at Chicago in 1893 an essay lately published, with much other material in the second part of the report of the Congress, and issued as Bulletin II. of the United States Weather Bureau. Injurious winds are classified as violent, cold and desiccating. The first class includes the hurricane, the tornado and the thunder-squall (*derecho* of Hinrichs). The second class includes nocturnal winds, descending mountain valleys; these being quoted as injurious to the vine and limiting its area of cultivation in certain parts of Europe, but not yet known to be harmful in this country. Cold waves, blizzards and northers also belong in the second class. The deforestation of Michigan is said to have given more ready access to cold waves, hence 'the peach crop has nearly disappeared' from that State. The desiccating winds are more fully described, especially the hot southwest winds of the Plains, to which Curtis had previously given special attention (7th Bienn. Rept. Kansas State Board of Agriculture, 1891, 162–183; see also essay by Cline, Amer. Meteorol. Journ., xi, 1894, 175–186). The statistics of ten counties in Kansas in 1888 showed a loss of 21,000,000 bushels of corn alone, due principally to hot winds. These winds are chiefly of daytime occurrence, their temperature reaching over 100°, even to 109°, while their relative humidity is probably not over 20 or 25%. When the ground has been thoroughly dried, then one or two days of hot winds wither and shrivel up the crops beyond possibility of more than partial recovery. Destructive hot north winds occur in the valley of California. Timber belts are recommended as the best protection against both cold waves and hot winds.

DROUGHTS AND FAMINES IN INDIA.

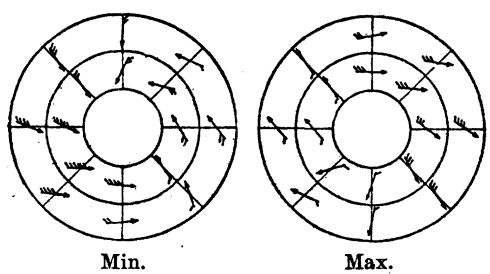
John Eliot, of the Indian meteorological office, contributed a paper of much value to the Chicago Congress under the title given above. After a general account of the climate of India, in particular of the winds and rainfall, the author shows that the famine districts are all in areas of moderate or light rainfall, between 20 and 35 inches. One such area enters the southeastern coast of the peninsula and extends northwestward over the Deccan; another forms a V-shaped belt, pointing eastward and enclosing the arid desert area of the lower Indus. A late beginning of the rainy season, a prolonged break in its continuance, scanty rainfall during the period, or an early cessation of the rains, result in famine. In northern India famine is usually due either to the failure of two half-year crops in succession, to the complete failure of one crop after a succession of poor or bad seasons. In the Deccan famine follows a failure of the summer rains, after one or more bad seasons. A list of twenty-four famine years is given, beginning with 1769. Of these eight were 'intense famines,' while six were only 'severe scarcities.' The Orissa famine of 1865–66 caused a loss of life estimated at one million, out of three million population, and a loss to the State of £1,500,000. The Behar famine of 1873–4 caused an expenditure of £6,000,000, in providing relief to the distressed people; consequently the loss of life was small.

METEOROLOGICAL ELEMENTS IN CYCLONES AND ANTICYCLONES.

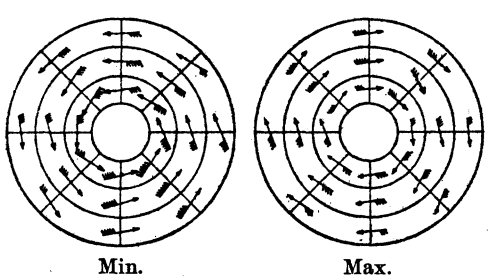
A valuable study of the distribution of meteorological elements around areas of low and high pressure at Vienna and at Thorshavn, Sweden, has been made by Åkerblom (Svenska Vet.-Akad. Handl., xx., 1895, Bihang, No. 3). The diagrams for surface winds and for cirrus clouds are here reproduced. It is noticeable that while the cirrus clouds over a cyclonic area show but a moderate deflection to either side of their mean course from W. 6° S., those over an anticyclonic area are deflected



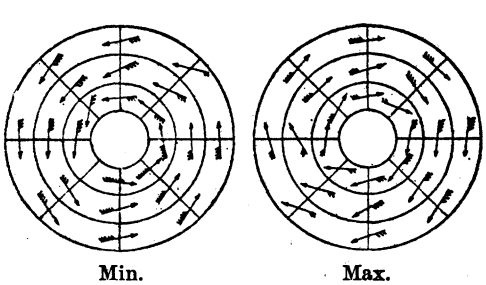
Direction and Velocity of the Wind at Vienna. (Winter.)



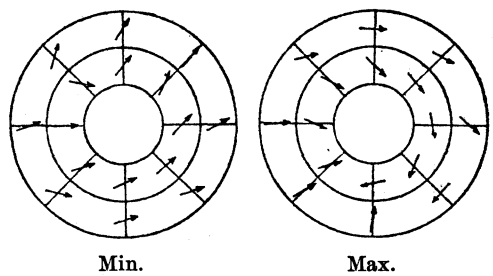
Direction and Velocity of the Wind at Vienna. (Summer.)



Direction and Velocity of the Wind at Thorshavn. (Winter.)



Direction and Velocity of the Wind at Thorshavn. (Summer.)



Motions of Cirrus Clouds in Central Germany.

into a rather well marked right-handed whirl. It may be added that as far as the movement of the cirrus is concerned, it would suggest that inward baric gradients prevail aloft over cyclones and that outward gradients prevail over anticyclones, and that this is on the whole more favorable to the driven than to the convectional theory of atmospheric whirls in temperate latitudes.

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SCIENTIFIC NOTES AND NEWS.

ASTRONOMY.

IN our issue of January 10th we called attention to Dr. See's announcement of a possible perturbation of the motion of the visible components of the binary star 70 Ophiuchi by an unseen companion. The *Astronomical Journal* of January 9th contains another article by Dr. See, in which he presents his views more at length and with much painstaking care. Yet after reading his elaborate paper, we cannot see that he has established anything more than a probability in favor of the existence of the supposed body. His strongest argument is, of course, the error of five degrees found by the American observers in Prof. Schur's ephemeris. But at the time of making his calculations Dr. See was unaware that nearly contemporaneous European observations were at variance with the American ones. If we take the mean of all the observations that have come to our knowledge we get a result in very fair accord with the ephemeris. Dr. See also bases a strong argument on the measures of distance, which were not used by Prof. Schur for the well-