system for the United States, Canada and the West Indies; a discussion of the vapor tension observations throughout the United States; a study of wind velocities and fluctuations of water level on Lake Erie, and of eclipse meteorology and allied problems.

The 'Report' also contains, besides the usual tables, tables showing the highest and lowest temperatures recorded at Weather Bureau stations for each month of the year, from the beginning of observations until the end of 1901 (with charts); the monthly and annual mean relative humidity for all Weather Bureau stations (with charts), etc.

SIMILAR BAROMETRIC VARIATIONS OVER LARGE AREAS.

SIR NORMAN LOCKYER and Dr. W. J. S. Lockyer, in England, and Professor F. H. Bigelow, in this country, have lately been investigating the similarity of curves representing many solar and meteorological phenomena. Several papers on this subject have already been published. In *Nature* for January 8, Dr. Lockyer presents some of his latest results. The curves showing the variations in pressure at Bombay, Colombo, Batavia, Mauritius, and Perth Adelaide and Sydney, Australia, are strikingly similar and indicate that the same kind of variations are in action over the whole region. The curves for Cordoba, Mobile, Jacksonville, Pensacola and San Diego, and the *inverted* curve for Bombay are also very similar to one another. Here, then, are two large areas indicating similar barometric variations from year to year, but one showing an excess while the other displays a deficiency. Professor Bigelow has also come to the conclusion (*Monthly Weather Review*, XXX., 347) that the same pressure variations prevail over very large areas, but that they vary from one district to another. Dr. Lockyer points out that the two investigations agree as to the following points: (1) The close connection between solar activity and barometric pressure; (2) the great extent over which very similar pressure variations exist, and (3) the presence of two large areas, the pressure variations over which are the reciprocal of each other.

WINTER ARIDITY INDOORS.

THE dryness of the air in furnace-heated houses is attracting more and more attention. In SCIENCE for March 23, 1900 (N. S., Vol. XI., 474), reference was made in these Notes to some observations of relative humidity made by the undersigned in his study during three weeks of November, 1899. In the *Journal of Geography* for December last, Professor Mark S. W. Jefferson, under the title 'Winter Aridity Indoors,' presents a simple mathematical treatment to show the actual quantities of water demanded in connection with a heating and ventilating plant to preserve a healthful humidity within doors in winter. Professor Jefferson concludes that, under the average conditions of temperature and humidity indoors during the three weeks referred to above, about two gallons of water per individual should be evaporated to humidify the daily supply of air. Such observations as these naturally suggest a useful line of work in connection with giving the air from our furnaces a proper supply of moisture.

NOTES.

THE rapid advance of balloon and of kite meteorology is evidenced by the fact that a new meteorological station has been established at Viborg, in northern Jutland, for the express purpose of carrying on the investigation of the free air by means of kites and balloons. This station is maintained through the cooperation of French, Swedish and Danish meteorologists. The location is an admirable one, being in a district where storms are frequent. Twenty-eight persons constitute the force at the new observatory, in whose establishment Messrs. de Bort, Hildebrandsson and Paulsen have been chiefly concerned.

R. DEC. WARD.

ELECTRICALLY UTILIZED POWER AT NIAGARA FALLS.

RECENT Consular Reports include one from Consul H. W. Brush, at Niagara Falls, Ontario, Canada, on the development of hydraulic power from the great falls. The original development of 50,000 horse-power on

the American side is now to be supplemented by an equal amount, the constructions for which are well under way. It is expected that about 50,000 horse-power will become available on the Canadian side toward the end of the coming summer, and contracts already signed contemplate a total of not less than 110,000 horse-power in units of 10,000 horse-power each, double the first unit, then considered a tremendous experiment. A new company, the Ontario Power Company, on the Canadian side, contemplates a plant to deliver 50,000 horse-power at the start and 150,000 ultimately. This, like the original corporations on both sides the gorge, is largely backed by capital from the United States. A new company will probably be presently authorized by the Canadian government, which will presumably, at the start at least, be wholly Canadian. This will mean the further development of 100,000 horse-power. About 350,000 horse-power may thus be expected to be soon supplied, and it is computed that it will result in the influx of about $7,000,000 annually as rental. Within ten years, it is prophesied that a million of horse-power at least will be developed at Niagara Falls.

Efforts have been made to observe the effect of the present maximum draught of water from the falls; but the most careful measurements and observations are reported to have failed in indicating, much less measuring, any effect when the power is turned on and off. The effect of a wind blowing up or down channel is, on the other hand, very observable, and a heavy blow may alter the level of the water at the entrance to the Niagara River and at the head of the rapids by several feet; but its effect at the falls is too slight to be readily observed, except by those who are familiar with the river in all its aspects.

The horse-power of Niagara is a somewhat uncertain quantity, and is variable with every wind and with every change of season. The first survey, made with the object of measurement of the power available at the falls, was, if the writer is not misinformed, that of Mr. L. M. Wright, a quarter of a century ago, or more, who employed the famous ferryboat, *Maid of the Mist,* driving her stem up under the cataract as closely as the swift current would allow, and securing measurements of rate of flow at that and other cross-sections of the river. He allowed the writer to make extracts from his notes at the time.

He found the section thirty yards below Chippewa Creek to measure 6,667 feet across, with a depth of 15 feet. He estimated the minimum power of the total fall as 11,363,636 horse-power, and the maximum as a third greater; the variation being due to the action of the winds on the Great Lakes. These figures are probably too great. A number of estimates have been since published, usually much less. The Lake Survey gave, for example, as reported, about 280,000 cubic feet, per second, as the flow at the falls; while the pioneer observer gave 500,000. Taking the two as extremes, it is perhaps safe to assert that the extinction of the falls, either by diversion into industrial power or by their cutting back to the upper lake, may be expected to be not likely to prove a burning question with this generation.

And yet, with a third of a million horse-power already practically preëmpted, with our forests disappearing, with a corner in the coal market already, and other strikes to come, and with the brink of the falls retreating with accelerated rapidity, it is possibly unwise to bank heavily upon that expectation. But, however this may be, the Falls of Niagara will surrender hundreds of thousands of horse-power in the current decade, and all this power will be distributed electrically and much of it employed in electrical processes of manufacture. R. H. T.

SCIENTIFIC NOTES AND NEWS.

THE Desmazières prize of the Paris Academy of Sciences has been awarded to Professor Roland Thaxter, of Harvard University, for his study on the parasitic fungi of American insects.

THE Carnegie Institution has appropriated $4,000 to the Yerkes Observatory, to be expended under the direction of Professor George E. Hale, for certain researches in astronomy