METEOROLOGY IN MAURITIUS

Results of Meteorological Observations taken in 1872 *at Mauritius; Monthly Notices of the Meteorological Society of Mauritius*, 1873; pp. 23 to 53.

THE work of meteorological observation and discussion at this important station continues, as shown by these papers, to be prosecuted under Mr. Meldrum's direction with marked energy and success. The observations at the observatory, which are made five times daily, embrace atmospheric pressure, temperature, humidity, cloud, rainfall, wind, thunder, lightning, and meteors, of which the "Results" present us with a full and carefully prepared summary. We observe with much satisfaction that a barograph is in operation at this important observatory, and very earnestly hope that future annual publications will give meteorologists what is greatly desiderated, viz., the data for the determination of the hourly barometric fluctuations of that region. It is stated that the monthly means of the dry and wet bulb thermometers have been derived from the observations at 6 and $9\frac{1}{2}$ A.M. and $3\frac{1}{2}$ and $9\frac{1}{2}$ P.M.; but those of the barometer from the observations at $9\frac{1}{2}$ A.M., $3\frac{1}{2}$ P.M., and $9\frac{1}{2}$ P.M. The formula employed in each case should in future be explicitly stated. We infer from an examination of the table that the barometric means are derived from the formula $\frac{9\frac{1}{2}+2\times 3\frac{1}{2}+9\frac{1}{2}}{4}$; but as regards the thermometers, we have no means of knowing how the observations at the four hours were combined in deducing the mean temperature, since the means of temperature at these hours are not printed. Considering the hours at which the observations are made, the best formula for the mean temperature would be $\frac{9\frac{1}{2}+3\frac{1}{2}+9\frac{1}{2}+\text{min.}}{4}$. But the most satisfactory course would be to give the averages at the observed hours, leaving it to each to deduce from these the approximate mean temperatures. In all published annual results the simple averages of actual observations ought to be given, and these should in no case be made to give way to averages hypothetically deduced.

The rainfall has long occupied the attention of the Mauritius meteorologists, and a table is given showing the results of the rainfall at thirty-five stations. The annual amounts vary greatly, from an annual average of 33 in. at Gros Cailloux to 146 in. at Cluny. The important bearing of the rainfall on the products and health of the island has been ably pointed out by Mr. Meldrum. It is much to be desired that this very energetic society should establish stations at suitable points over the island, at which observations of pressure, temperature, wind, &c., would be made. The position of the island, its peculiar physical configuration, and variety of vegetable covering, afford remarkable facilities for the investigation of not a few meteorological problems, such as the influence of forests on climate, and the daily march and phases of the pressure, temperature, and humidity of the air as influenced by height, exposure, and the character of the vegetation in the immediate neighbourhood of the instrument.

The paper drawn up by Mr. Meldrum for the Vienna Meteorological Congress regarding the practicability and utility of storm warnings is of considerable value, the subject having long received full and able investigation at Mr. Meldrum's hands, and the correctness of his deductions been abundantly tested by the success attending the warnings issued by him. The chief, and indeed only difficulty, in the way of the complete success of the system of warnings at Mauritius is the uncertainty as to when and where an advancing cyclone may recurve.

But the most valuable article in these papers is the one by Mr. Meldrum "On a rainfall periodicity corresponding with the sunspot periodicity." The article is a fine instance of a broad and comprehensive discussion of the question dealt with through its details, and of an extreme caution in constant exercise in drawing the conclusions. The result arrived at is this:—Whether we take the annual rainfall over the largest possible portion of the globe for short periods, or over a smaller portion for a longer period, we arrive at the same result, viz., an increase of rain at or near the epochs of maximum sun-spot area, and a decrease of rain at or near the epochs of minimum sun-spot area. The exceptions are few and trifling, being only such as might be expected in this as in other questions of physical research, and they all gradually and inevitably disappear from the results as the inquiry is made to cover more extended portions of the earth's surface and a longer interval of time.

Much interest attaches to the prosecution of the inquiry regarding the relations of solar and atmospheric changes into other branches of meteorology, such as the pressure, temperature, humidity, electricity, and motions of the air. Does the temperature fluctuate with the sun-spot period? and if so, is the increase and decrease uniform and simultaneous over the globe, or do the warm and cold periods differ widely in different regions? How is the distribution of atmospheric pressure affected? Are the inequalities intensified or reduced, or does the difference find expression chiefly in a greater or less disturbance of the atmosphere, resulting in an increase or decrease of the daily fluctuation as measured by the observed differences in the readings made, say at 9 A.M. from day to day? In the further development of "the meteorology of the future," these are some of the more important questions that will be first inquired into.

OUR BOOK SHELF

A Manual of Metallurgy. By W. H. Greenwood, F.C.S., Associate of the Royal School of Mines. (London and Glasgow: W. Collins, Sons, and Co., 1874.)

THE author states that the work is "primarily designed" for the use of students preparing for the advanced stage of the examinations of the Science and Art Department. This, the first volume, contains 250 pages, of which 150 are devoted to iron and steel. And it may be observed that as there is an excellent treatise on the Metallurgy of Iron, by Bauermann, in Weale's Series, this part is less needed by students than the second, in which the metallurgy of copper, lead, zinc, silver, gold, mercury, nickel, cobalt and aluminium, will be described.

Mr. Greenwood has availed himself of his notes of Dr. Percy's lectures at the Royal School of Mines, and has spared no pains in gathering materials for the work from original memoirs, as well as from the few well-known French and German metallurgical works. The chapters on fuel and fire-clays are necessarily brief; but those