NOTES AND EXTRACTS.

YELLOW SNOW IN MICHIGAN.

The following is from the daily journal for Grand Haven, January 27, 1902:

From 3:40 to 5 p. m. occurred the unusual phenomenon of a fall of snow of a dull yellowish tint, which covered the ground to a depth of one-fifth of an inch. High but gradually diminishing westerly winds prevailed at the time. On melting the snow, a thin film (powder-like) covered the surface of the water and the sides of the vessel, but there was no sediment at the bottom of the vessel. It is reported that this yellow snowfall extended eastward of the station about twelve miles and northward about the same distance to Muskegon, but none was observed to the westward between the sand hills and the lake shore.

Prof. C. D. McLouth, of Muskegon, made a critical examination of samples collected at that place, and found that when isolated from the snow the coloring matter was a deep shade of yellow orange, and consisted of irregular powder-like opaque or translucent grains, from $\frac{1}{2000}$ to $\frac{1}{200}$ inch in diameter, that became semipasty when wet and would sink in water. The principal constituent was an infusible substance, probably silica; iron was plainly indicated, there was but little organic matter, the material changed color distinctly in hot flame, and the specimens collected at different places were quite similar. Professor McLouth confirms the statement of the observer at Grand Haven that the deposit of yellow snow was slight on the west slope of the sand dunes. It was observed on the trunks and branches of trees, and on the upper landing of the high school tower, 105 feet above the level of the lake. The sand dunes are from 100 to 200 feet high.

From a single determination the amount of coloring matter per square foot was found to be 1.855 grains, or about 5.59 tons per square mile.

From the Grand Haven Daily Tribune we learn that Dr. Lane, the State Geologist at Lansing, was sent a sample of the yellow snow.

He pronounced the substance *loess*, a fine clayey sand found in Wisconsin and Iowa. In all probability, says Dr. Lane, the sand was picked up by a windstorm as it traversed Wisconsin and after being carried across Lake Michigan was precipitated with a light fall of snow.

Colored snow has been previously discussed in the MONTHLY WEATHER REVIEW[1] and the conclusions of Dr. Lane agree with those there given. The high wind prevailing over Lake Michigan had no doubt brought with it fine sand from the plains to the west or southwest.

It has already been shown in the MONTHLY WEATHER REVIEW for September, 1901, p. 422, that a wind of this character is liable to cause a snowfall in winter on the windward shore of the lake, "because winds blowing toward it (the shore) from the water meet with great resistances and turn upward as they surmount the sluggish air near the ground." The moisture in the air might use the sand particles as a nuclei about which to condense and form snowflakes, and these falling flakes might bring other sand particles down with them. Hence the peculiar color of the snow.—*H. H. K.*

[1] See Vol. XVII, p. 89, Vol. XXIII, pp. 15–19, and Vol. XXIX, p. 465.

BARTHOLOMEW'S PHYSICAL ATLAS. METEOROLOGY.

The third volume of this atlas is devoted to meteorology and has been prepared by Bartholomew and Herbertson, and edited by Alexander Buchan. It presents all parts of the world with equal fairness. Its scope is as follows:

The four hundred maps in the atlas are comprised under two heads—Climate and Weather. The climate maps summarize the observational data and form a basis for the study of the climatology of the globe. These deal with the mapping of temperature, pressure, winds, cloud, sunshine, and rainfall, and show the distribution of these factors of climate, first for the world generally, and then on a larger scale for the separate countries where numerous observations supply more detailed material. The weather maps, together with the seasonal and storm charts, show meteorological conditions over certain regions at given periods, and represent all the most characteristic weather types.

The text, descriptive and explanatory of the maps, directs attention to their prominent features and touches upon the cause and effect of special phenomena. In the appendices the list of meteorological services with their stations and publications has been compiled from direct statistics supplied by their directors. A critical bibliography gives a list of the more important books and papers of special value for reference. A glossary of meteorological terms, comparative tables, and an index have also been added.

Throughout the atlas the metric system has been systematically employed in conjunction with the usual English scales, thus affording a ready means of comparison.

An American edition of this volume is announced by J. B. Lippincott Company, Philadelphia. The price is about the same as for the English edition, or $12.50 to public libraries that are entitled to import books duty free.—*H. H. K.*

THE HURRICANES OF THE FAR EAST.[1]

The author of this work has endeavored to so arrange our knowledge of the typhoons of the far East as to render it available for the use of sailors who navigate the seas in that part of the world. He acknowledges his indebtedness to the writings of Viñes, Eliot, and Doberck, and especially to those of Algué, whose Baguios ó ciclones Filipinos forms the basis of this book.

The general style, while somewhat disconnected, is on the whole very creditable, but the translation is not free from Germanisms and errors that at times obscure the meaning.

The book is divided into four sections. The first of these is devoted to a general discussion of tropical cyclones, particularly those of the far East. Horizontal and vertical sections of typhoons are shown in plates 1 and 2; these sections are divided into quadrants and zones, and the characteristics of each are represented graphically, and also described in the text.

Typhoons or baguios are divided into three groups; (1) those of the four winter months, December–March, (2) those of the intermediate months, April, May, October, and November, and (3) those of the summer months, June–September.

The place of origin is shown to change slightly for each group, being farther south and farther east in winter than in summer.

The author maintains that the primary cause of the origin of these storms is an area of barometric depression, but the rotation of the earth and the latent heat liberated by condensation of vapor are the forces that give it the tremendous energy that is developed later.

The chapter on the "Movement of the atmosphere in cyclones" is nearly all to be found in Viñes's "Investigation of the cyclone circulation and translatory movement of West Indian hurricanes," pp. 7–12. Washington, Weather Bureau, 1898.

The movement of the barometer during the passage of tropical cyclones is divided into three periods, corresponding to the three zones of the storm. In the first, or outer, zone the barometer falls slowly, and the distinct daily fluctuations are not effaced. In the second, or middle, zone there is a distinct fall which effaces the daily fluctuations, while in the third, or inner, zone the fall is very rapid. Tables have been pre-

[1] By Prof. Dr. Paul Bergholz. English translation revised by Dr. Robert H. Scott, F. R. S. 271 pp., 31 plates. Bremen, 1899.