

Columbia, which possesses the herbarium of Meisner, the last general monographer of the genus, and to this has been added the choicest of the other collections of the country. While Mr. Small has done no small amount of field work on some of the forms, the result appears to be worthy of the facilities he has enjoyed, though, like all monographic essays, its strength or weakness must be tested by practical use. Keys to the sub-genera and to the species under each of these, and plates representing the habit and the more essential details of each species, render the work easy to use, and the anatomy of representatives of the several groups has been comparatively studied and largely illustrated. In appearance the monograph is good, and the plates are clearly drawn and well printed, though a little flat and harsh—a defect that the artist will doubtless overcome in future work.

WM. TRELEASE.

The Geological and Natural History Survey of Minnesota. The Twenty-third Annual Report, for the year 1894. N. H. WINCHELL, State Geologist. Minneapolis, Harrison & Smith, State Printers. 1895. 8vo. 255pp.

This survey has kept steadily on its way for many years, under the able direction of Professor Winchell, who gives us annually a volume in which matters of practical importance to the people of Minnesota and questions of general scientific interest alike find efficient treatment.

In the present volume, after a summary statement of the year's work of the Survey, Professor Winchell, in Part II., discusses the Origin of the Archæan Greenstones of Minnesota. This paper is of the nature of a review of Bulletin No. 62 of the U. S. Geological Survey on the Greenstone Schist areas of the Menomee and Marquette Regions of Michigan, by Dr. George H. Williams, in which the tendency of the conclu-

sions reached by Dr Williams is to refer the greenstones as a body to dynamic metamorphism of massive eruptive rocks, while a sedimentary origin is not denied to a part of them. Professor Winchell skilfully arrays the facts, both megascopic and microscopic, in support of his own view of the origin of these greenstones, and would reverse the main conclusion of Dr: Williams as to the comparative amounts of the two sorts, massive and sedimentary. His conclusions are given in the following words: "We look upon the greenstones in Minnesota as an oceanic terrane having a definite stratigraphic position (the uppermost part of the Keewatin), although probably involving some truly irruptive masses. Its materials, both basic and acid, are interbedded by sedimentation the one with the other, and are sometimes mingled. The decayed condition of these materials is due to the natural action of the Keewatin ocean prior to consolidation, and the crystalline condition of the lower beds is due to later metamorphism which, having its active forces and seat at greater depths, did not permeate the whole formation. It is not attributable so much to dynamic movements as to internal heat. Wherever such movements operated with much violence, the lower Keewatin sediments were fused, producing irruptive felsytes and granite. Such granite is bordered usually by belts of crystalline schist, evidently formed at the time of such fusion."

Part III. is devoted to a preliminary report on the Rainy Lake Gold Region, by H. V. Winchell and U. S. Grant, in which, after an introductory part on the occurrence and associations of gold ores, and a historical sketch of the gold discoveries of this region, the body of the report is devoted to the general features and geology of the area and a more detailed account of individual properties. Most of the gold-bearing rocks of this district belong to the *Keewatin* di-

vision of the Archæan of the Minnesota Survey, which would correspond with the Upper Algonkian of the U. S. Geological Survey. The gold occurs (1) in segregated veins, (2) in fissure veins and (3) in fahlbands.

The segregated veins seem to resemble in all respects the veins which carry the greater part of the gold in the Appalachian region, at least, from North Carolina to Alabama. The quartz of these veins in lenticular masses is disposed in irregular belts from one to ten or more feet in width, which are roughly parallel with the lamination of the enclosing slates, and it is often the case that the gold is also found in the quartzose rock immediately enveloping the lenses. This agrees well with what has been noticed in the Southern Appalachian fields; and in the prospects of the Rainy Lake area as a gold-producing region there is also a close agreement with what has recently been given out as the conclusion of Prof. Becker regarding the Southern Appalachians, viz., that while the winning of the gold will probably never be of the nature of a bonanza, yet it will, if properly managed, yield a good interest upon the money invested. Apart from the gold-bearing veins, the resources of this region most to be counted upon for future development are (1) the excellent farming lands, (2) the large bodies of good timber, (3) the large water power and (4) the probability of the existence of valuable deposits of iron ore.

Part IV. is a well considered paper by W. R. Hoag, on the Advantages to be Derived from a Topographic Survey of the State. In Part V. Professor Winchell gives a historical sketch of the Discoveries of the Mineral Deposits of the Lake Superior Region, including some interesting details of the prehistoric mining in the copper regions. In this sketch attention is called to the important fact that the majority of the metaliferous belts were discovered by official

geologists in the performance of their assigned duties. Among these discoverers the name of Dr. Douglass Houghton stands preëminent.

Part VI., by Mr. Warren Upham, is in continuation of an investigation published in the preceding report of this survey, and relating to the glacial lakes which are now succeeded by the present great Laurentian lakes. The author brings forward evidence to prove the pre-glacial elevation of North America, the late glacial subsidence, and the reëlevation by a wavelike epeirogenic uplift. The measurement of post-glacial time by the recession of Niagara Falls is also fully discussed, the conclusion reached that the estimate of 7,000 years, made by Gilbert in 1886, accords best with the facts observed. The paper ends with a tabular presentation of the epochs and stages of the glacial period, using the nomenclature proposed by Professor Chamberlin.

The rest of the volume is devoted to notes upon some Minnesota minerals, to chemical analyses, lists of rock samples, etc., without general interest, except some notes by Professor Winchell upon the bedded and banded phases of the gabbro of northeastern Minnesota.

EUGENE A. SMITH.

UNIVERSITY OF ALABAMA.

FOLK-TALES.

Le Folklore Dans Les Deux Mondes. Par LE CONTE H. DE CHARENCEY. Paris, C. Klincksieck. 1894. Pp. 424.

Louisiana Folk-Tales. In French Dialect and English Translation. Collected and Edited by ALCEE FORTIER, D. Lt. Houghton, Mifflin & Co. 1895. Pp. 122.

The work of M. de Charencey forms the twenty-third volume of the 'Actes de la Société Philologique,' a society, by the by, which in its various issues presents a great deal of value on American languages. The author, well known for his numerous and erudite writings, here takes up a series of