

cesses employed, the book is well supplied with authentic illustrations, although some of them are not very clear, — a fault doubtless due to imperfections in the original photographs.

SOME STATE GEOLOGICAL REPORTS.

MINNESOTA is not only the centre, but it is also the summit of the continent, in the sense of being the starting-point of the three most important systems of drainage in North America. But, notwithstanding its geographic position, the mean altitude of the state is less than thirteen hundred feet, and its surface configuration presents the simplicity and monotony of a level and thoroughly glaciated region; while the geological structure of the greater portion of the state is hopelessly buried under a thick and almost unbroken mantle of drift. These circumstances greatly diminish the labors of the geologist; and it is at first a matter of surprise that ten years should have elapsed between the inception of the survey and the completion of this first volume of the final report. But this is readily explained by the very economical administration of the survey, the geological corps consisting of the director and one assistant, and, during a considerable part of the time represented by this volume, of the director alone.

The introductory chapter is an extended and admirable historical sketch of explorations and surveys in Minnesota and the adjacent states, from the times of Champlain, Duluth, Hennepin, and La Salle, to the present survey. This historical introduction is, in its extent and general interest, unique among American geological reports. It is illustrated by several good reductions of the earlier maps of the north-west, and must prove a valuable compilation to students of history and geography as well as of geology. The account of the general physical features of the state in this volume is brief, and yet adequate, considering the topographic uniformity. But we look in vain for any generalized statement of the geological formations of the state below the drift. It is probable, however, that this chapter is reserved for a later volume; for, as stated in the preface, this volume is intended to be mainly descriptive, — a repository of facts, with only such generalizations as are self-evident or generally admitted.

The popular demand for early practical results is well met in the excellent chapter on the building-stones, which constitute, at present, the most important field of the economic geologist. The descriptions are plain and simple, with the condensed statements of the microscopic characters in fine print. The use of 'syenite' as a name for hornblendic granite is, however, antiquated, and without the sanction of the leading lithologists of this country and Europe. The table in which the descriptions of forty-one of the most important building-stones are condensed and compared would be a model of its kind, if the mineralogical composition of the stones were included. It shows at a glance, that, in crushing-strength and durability, the building-stones of Minnesota are probably not surpassed by those of any state in the Union.

The main part of this volume (about five hundred pages) is devoted to detailed accounts of the geology of the state by counties. Of the eighty counties in the state, twenty-eight, including nearly all that part of the state south of the Minnesota River, are here mapped and described, two-thirds of this work being credited to Mr. Upham. In some instances the descriptions of several counties have been combined; and, if this plan had been more generally adopted, much needless repetition might have been avoided, and the monotony of this part of the volume greatly relieved.

The two annual reports of the state geologist of Indiana contain comparatively little in the way of original contributions to the geology or natural history of the state. The most important sections of the reports are those on the paleozoic corals, and the subcarboniferous fossils of Spergen Hill, by Professor James Hall; the paleozoic flora, by Professor Lesquereux; and the fauna of the Indiana coal-measures, by Dr. C. A. White. These papers consist of short specific descriptions, with seventy-one plates of figures. Very few of the species are new to science, or peculiar to Indiana, while a considerable number are not found in that state. These articles are really compilations from the reports of other states and more general sources; and, although doubtless of some value as reference-manuals of the paleozoic fauna and flora, it is a question to what extent such publications are really germane to the purposes of a geological survey. Each volume contains several short county reports, and in these and other chapters the economic features have special prominence. But the treatment is not always impartial, for there is a manifest tendency in some parts to

The geology of Minnesota. Vol. i. of the final report. By N. H. WINCHELL, assisted by WARREN UPHAM. Minneapolis, State, 1884. 13+697 p., 1+31 pl. 4".
Indiana. Department of geology and natural history. Twelfth and thirteenth annual reports. JOHN COLLETT, state geologist. Indianapolis, State, 1883, 1884. 400 p., 38 pl. (4) maps; 16+186 p., 39 pl., map. 8".

unduly extol the good features of the state and the importance of the geological survey. The report for 1882 contains a catalogue of the flora (789 species) of the Alpine or central-eastern portion of the state.

NOTES AND NEWS.

IN an appendix to Professor Dexter's 'Biographical sketches of the graduates of Yale college,' Prof. H. A. Newton has given some figures showing the mortality among the graduates of the early years of the college. The graduates considered are those of the years 1702-44, 483 in all. To avoid irregularities, the results have been grouped in sets of ten years. The actual numbers of deaths are compared with the numbers computed from the American and combined experience tables.

Table showing the mortality, actual and expected, by decades of years, among Yale graduates, 1702-44.

Ages.	No. of deaths.	Mortality by American table.	Mortality by combined experience table.
14 to 25	28	18.60	17.64
26 to 35	41	36.03	36.17
36 to 45	48	37.73	40.12
46 to 55	71	46.87	54.02
56 to 65	93	68.17	77.02
66 to 75	98	93.52	97.72
76 to 85	65	83.40	79.93
86 to 95	27	51.31	37.72
96 to 103	2	-	-
Total	473	435.63	440.34

The most noticeable fact shown by this table is that below the age of seventy the actual mortality so largely exceeded the tabular, the excess being over twenty per cent of the expected mortality. This mortality experience is decidedly different from that of the persons who have been members of the Divinity school of Yale college (*New-Englander*, April, 1873). For them, between the ages of forty and seventy, the tabular *exceeded* the actual mortality by nearly forty per cent of the former. This enormous difference is quite uniformly distributed, and is evidently not principally due to chance. It cannot be due to great difference in the two groups of men. It must rather be ascribed to a difference in the habits of living in the eighteenth and nineteenth centuries.

— It appears from *Nature* that preparation is already making for the meeting of the British association in Birmingham in 1886. It is stated that the meeting will probably be under the presidency of Sir William Dawson of Montreal.

— Dr. Andrée of Leipzig, according to *Nature*, discussed before a recent meeting of the Anthropological society of Vienna the question whether iron was known in America in pre-Columbian times. Meteoric iron was certainly in use amongst certain Indian tribes and the Eskimo, but Dr. Andrée thinks that they were wholly unacquainted with the art of

forging iron. This conclusion is based on the fact, among others, that while there is ample proof that the Indians [the author under this term is including the Mexicans and Peruvians] knew how to obtain and employ gold, silver, tin, copper, quicksilver, etc., we hear nothing of iron-mines in the history of the civilization of ancient America. The language itself proves this, for there is no expression for *iron*. Some writers, it is true, speak of the word *panilque* as that for iron, but it really means metal in general. Moreover, in prehistoric, or rather pre-Columbian, graves, especially in the rainless regions of Peru and northern Chili, ornaments of all kinds, weapons, and implements are found; but no objects in iron have been discovered, although the Indians placed their most valued articles in their tombs. [Meteoric iron has, however, been found in several mounds in Ohio by Mr. F. W. Putnam of the Peabody museum in Cambridge, both in a natural state and hammered; in the latter form used for the same purposes as native copper, both for implements and ornaments.] Dr. Andrée thinks there is no reason to believe that the tools employed in the great masonry-works of Peru, such as that at Tiahuanaco, were other than those in use in the rest of Peru, which were of *champi*, a species of bronze. The chisels found in Peruvian graves soon become blunted when used on the hard strut; but it is suggested that there was some method of sharpening them easily. Indians certainly have worked a hard stone like nephrite without iron; and there is no improbability, says the writer, in the theory that these chisels were employed, when we recollect the patient temperament of the Indians, who for generations were accustomed to the repetition of the same work, to indolently pursuing a uniform task, and also that *gutta cavat lapidem*.

— Dr. G. A. Fischer, in his proposed journey to Lado on the upper Nile, will start, according to the *Athenaeum*, from Pangani, and endeavor to open up a direct route to Speke Gulf. His movements after arriving in Uganda will depend upon circumstances. It is just possible, that, owing to the proceedings of a German colonization society, Dr. Fischer may not find it easy to recruit carriers at Zanzibar. In a paper which he read at the German geographical congress at Hamburg, Dr. Fischer spoke sensibly against some of the utopian schemes of his countrymen. He pointed out more especially that Europeans cannot become acclimatized in equatorial Africa, except perhaps at an altitude of more than five thousand feet, and that even the interior tablelands are free from malaria only where they are barren, and consequently useless for purposes of colonization.

— Twenty-three maps, fourteen by seventeen centimetres, of excellent execution, clear and not overcrowded lettering, form a most convenient pocket atlas, the twenty-first edition of which, entirely remodelled, has just been issued from the geographical establishment of Justus Perthes in Gotha. For a European tourist, nothing could be more convenient, as more than half the maps relate to that continent, and only three to North America and the United States.