A LECTURE ON THE GLACIAL PHENOMENA IN THE UNITED STATES. By Prof. G. Frederick Wright. Given before the Western Reserve Historical Society, in Case Hall, Cleveland, Ohio, Nov. 27, 1882.

This is an effort to ascertain the significance of the glacial phenomena of the State of Ohio, and in a second paper, that of Indiana and Kentucky. The publication is interesting to other than citizens of those States, for it gives a glimpse of glacial action throughout the Northern hemisphere, and conveys an impression of "the irresistible power and grandeur" of this operation of nature. The theory is that many ages since, during an epoch of intense cold, the whole of the northern portion, not merely of this continent, but of Europe, was buried under thousands of feet of snow and ice—in other words, was one immense glacier. This ice sheet on this continent extended upon the Atlantic coast as far south as Long Island and New York, included northern New Jersey, part of Pennsylvania, nearly the whole of Ohio, part of Kentucky and Indiana and Illinois, then stretching away northwestward touched the Pacific on the southern border of British Columbia. The lecturer dwells upon the fact that a glacier has a forward motion, which in this case was generally southward, and acted like an immense plane or scraper, cutting down even mountains, filling valleys, scooping out "kettle-holes," pushing out rocks and grinding them up to pebbles and sand and silt, and leaving along its course an immense amount of detritus, sometimes in beds, and again in terraces along the streams. The writer cites as signs of glaciation, 1. Scratches upon the rocks; 2. The existence of *till* or boulder clay; 3. Transported boulders and the terminal moraine. He traces this terminal line in its zigzag course, determined by local temperature and the lay of the land, and clearly marked by the presence or absence of drift and boulder. Then in concluding he gives the subject a practical turn by presenting some economic considerations. 1. The glacial period, and the interests of agriculture and health. He shows how the pulverizing of rocks and mixing of soils has tended to the advantage of the agriculturist, and advises "if one is to buy a farm in Ohio, he should pray that it be either in a river valley, or north of the terminal moraine." 2. Its relation to archæology. The discovery of paleolithic implements shows the probability of the existence of man on this continent "when the ice and climate of Greenland extended to New York harbor." 3. The date of the glacial period. We have here data for its determination, but the problem is not yet worked out. 4. Centers of glacial dispersion. "As a matter of fact," the author observes, "ice flows like cold molasses or half-hardened lava." The forming of moraines and transportation of boulders can hence be accounted for. So also the bursting through of mountain barriers and laying of prairie levels. He claims finally that the ice period of North America is no longer a myth, but a reality. The line of its furthest advance, and then of its retreat, can be traced, while an estimate can be formed of the remarkable debris it has left, and the changes it has wrought. Indeed, much of the configuration of the land, the trend of the hills, and the course and terraces and bottoms of the rivers can be most plausibly accounted for on the theory of the learned lecturer, that the northern part of this continent was covered with one immense glacier.