'long-shore lagoon), banks (in the N. C. sense of a sand reef, and also in the fisherman's sense of fishing grounds on a shallow sea floor) whaleback and horseback (Me.). The list might be extended still further.

MORAINES OF SOUTH DAKOTA.

THE account of the 'Moraines of southeastern South Dakota and their attendant deposits' by Todd (U. S. Geol. Surv., Bull. 158, 1899) is another example of those remarkable correlations between glacial action and existing topography by which so much light has been thrown on modern physiographic study in recent years. The outer (Altamont) moraine marks the border of an irregularly lobate glacier lying between Missouri and Big Sioux rivers, whose advance was retarded where preglacial hills (outliers of Cretaceous and Tertiary strata) stood in its way; here the moraine rises in an interlobate upland which terminates inward (towards the glaciated area) in a strong cusp, as in Turtle and Turkey hills; the rim of the upland is incised by broad channels of glacial waters which flowed from the ice, and the axis of the upland is trenched by the trunk stream that resulted from the confluence of these ice-water branches. The broad lobate glacier seems to have invaded the preglacial course of the Missouri, which therefore rose as a lake (Old Red lake) just above the entrance of White river from the western plains; the lake level being recorded by a large delta built by this river. The outlet of the lake was along the southwestern margin of the ice where a new channel has been cut from the mouth of White river to that of Niobrara river. At a later stage, a second moraine (Gary) was formed around a reduced ice lobe, whose area is roughly marked by the space between the James and Vermillion rivers. The floor of the ice lobes is now a smoothly undulating plain of till or silt, free from buttes and incised by narrow stream channels.

BULLETIN OF THE AMERICAN BUREAU OF GEOGRAPHY.

E. M. LEHNERTS, of the State Normal School, Winona, Minn., with nine associate editors, has lately issued the first number of a quarterly bulletin with the above title, as an aid to the teaching of school geography. A report of a committee on lantern slides, illustrated with small prints of thirty views, is the most original feature of the issue, which is otherwise largely occupied with general articles on time-honored subjects. Four writers treat of the 'Educational value of geography,' 'What to teach in geography,' 'Geography as a basis for correlation' and 'Concrete geography.' Physiography has four articles by Collie, Tarr, Kümmel and Moore, containing some specific suggestions regarding equipment and some illustrative examples, along with generalities. An article on a special topic, the 'Points of the Compass,' is at fault in neglecting the sun's noon culmination as the simplest means of determining the local meridian and the cardinal points, and in asserting that "the north star is thus the only satisfactory, because the only fundamental starting point for determining direction." A committee on exchange of products, with Philip Emerson of Lynn, Mass., as chairman, promises to be a practical aid to isolated teachers.

W. M. DAVIS.

THE STUDY OF ELECTRICAL PRESSURE.

PROFESSOR JOHN TROWBRIDGE, of Harvard University, contributes the following account of his work on electricity to the *Harvard Graduate Magazine:*

The remarkable development of the practical employment of electrical phenomena has put physical laboratories at a certain disadvantage; for the electrical engineer and the assistants in the great electrical companies have it in their power to experiment with electrical currents of far greater strength than it is possible to obtain in a university laboratory. While the college professor might perhaps employ a hundred horse-power and its equivalent in electrical energy, the electrical engineer has at his command many thousand horse-power. He can study the effect of tremendous currents in breaking up chemical compounds and in forming new compounds. He can investigate the phenomena of electro-magnetism on a great scale. There is, however, one field in which the college professor can enter the electrical field on more than equal terms as regards

practical resources with the electrical engineer. This field is that of great electro-motive force, and I, therefore, thinking that it is important at this stage of the development of electricity to take advantage of the many practical improvements in dynamos and electrical circuits for the furtherance of the study of electrical pressure, have had installed in the Laboratory the most powerful apparatus for this purpose in the world.

The plant consists of 20,000 storage cells giving 40,000 volts or electrical units of pressure; and this can be augmented to 3,000,000 volts. In the construction of this powerful plant it was found that this limit of 3,000,000 of volts could not be exceeded as long as the apparatus is situated in a building, for the inductive action of the walls and the floors is so great that a serious loss results. In order to obtain the full effect of 3,000,000 volts the apparatus should be placed in the center of Holmes field and should be raised at least thirty feet from the ground. This great electrical plant opens a wide field of scientific inquiry. It enables one to study by spectrum analysis the effect of intense heat on gases and the vapor of metals; for by means of this battery one can produce the highest degree of instantaneous temperature yet attained. I am at present investigating the spectrum of hydrogen in the hope of obtaining some clue to the conditions of temperature in the stars. The plant also furnishes the ideal method of producing the X-rays. A Crookes can be made to glow with perfectly steady light giving out the X-rays with intense brilliancy and affords strong contrasts which have long been desired. For surgical purposes a steady source of these rays is of the utmost importance. All the methods in present use produce the rays by a more or less fluctuating process, whereas the method I have adopted is by the use of a steady current of electricity from a battery constantly in one direction. This current can be regulated to any desired degree. The result has never been accomplished before.

The interesting fact that a steady current at 40,000 units of pressure or volts is so efficient in producing the X-rays leads me to believe that a plant similar to the one in the Jefferson Physical Laboratory, but of much smaller dimensions—having the same number of cells but smaller ones—may be a desirable adjunct to a great hospital.

THE NEW YORK STATE COLLEGE OF FORESTRY.

The College of Forestry of Cornell University has made provision, as has been already stated in this Journal, for a course of lectures on 'Fish and Game Protection and Fish Culture' as a regular part of the curriculum, and Dr. Barton W. Evermann, Ichthyologist of the U. S. Fish Commission, has been selected as special lecturer to give the course. The instruction will consist of laboratory work and field excursions, together with lectures upon the life-histories of food and game fishes, their artificial propagation and protection; the relation of the forests to the streams and lakes and their inhabitants; the proper care of streams and lakes with reference to forestry, logging, lumbering, milling, mining and irrigation operations; and the value and protection of the mammals and birds of the forest.

Dr. B. E. Fernow, the Director of College of Forestry, properly considers that the forester should know not only how to care for the forest proper, but that he should understand that the protection of the denizens of the forest and the streams and lakes within the forest, and their inhabitants, also, constitute a legitimate and important part of his work.

The graduates of the College of Forestry are the men who will be called to the management of the National Forest reservations and the large private forest properties, and it is gratifying to know that they will enter upon their work with the broad and rational view of their duties and their opportunities.

This course was first given to the juniors and seniors of the present year at Axton, N. Y. (where the State College Forest is located) during the second and third weeks in May. Hereafter the course will be considerably lengthened in time and made more comprehensive in character.

Dr. Fernow will receive the thanks and congratulations of all persons interested in the preservation of our forests and the protection of the inhabitants of the forest and the forest