

ascertained laws." "All religions, all philosophies, all parties, have sought to establish an eternal camp at some mile-stone of progress, but all have failed. It is difficult to grasp the full force of this idea—the individual. . . . Men of lower races are much of one pattern. Civilization is an individualizing process; so in turn men of intense character have done most of the propelling that has constituted civilization." "The first need of a plant is precisely the first need of an animal; and that of man is the same. This common need of all life is to find out facts,—facts about what is not itself,—and then to adapt itself to what it finds out." "Nowhere in nature has there been as much parasitic life as among human beings. It takes a large degree of wit to live idly, and off your neighbor's industry. But some vegetables learned to do this before man did it; and many animals have done the same. The result has been degeneration, loss of structure, loss of faculty, and, as a rule, final helplessness and degeneration of the whole being." "But it is not simply at the height of national existence that this impulse for self-preservation responds to the mimicry of lower life. You will observe its operation in our social customs and common propensities; for it is a fact that not any thing is more dreaded or shunned by average human beings than originality,—that is, unlikeness to others. It has always been dangerous. It is even yet likely to secure for its possessor a great deal of annoyance." "Strange views break out all over the globe by apparent spontaneity. . . . Darwin, and Wallace, and Haeckel, without intercommunication, propounded simultaneously the hypothesis of evolution. It is as when three mountain-tops of equal height catch the morning sunbeam at the same moment."

Sixth Annual Report of the United States Geological Survey (1884-85). J. W. POWELL, director. Washington, Government. 4°.

ALTHOUGH on account of the tardy appearance of this volume, for which the management of the survey does not appear to be responsible, the administrative portions have lost some of their freshness and interest, the work as a whole fully sustains the splendid reputation of its predecessors. These annual reports are admirably designed, when promptly issued, to place the Geological Survey *en rapport* with the general public: for they consist of, first, the report of the director, which is devoted to the organization, new features, and general operations of the survey; second, the short administrative reports of the chiefs of divisions, showing in greater detail the progress made in every department of the survey during the year; and third, and most important of all, the scientific papers or monographs completed during the year. The monographs are also published separately, and appear in the annual report *in extenso* or in abstract form, as convenience or their general interest may demand. The bulletins of the survey are shorter but more technical papers, which are not represented in the annual report; the object being to include in this volume only the results of most general interest, with the view of making it a somewhat popular account of the doings of the survey, that it may be widely read by the intelligent people of the country.

The report is accompanied by the following monographs: 'Mount Taylor and the Zuni Plateau,' by Capt. C. E. Dutton; 'Driftless Area of the Upper Mississippi Valley,' by T. C. Chamberlin and R. D. Salisbury; 'The Quantitative Determination of Silver by Means of the Microscope,' by J. S. Curtis; 'Seacoast Swamps of the Eastern United States,' by Prof. N. S. Shaler; 'Synopsis of the Flora of the Laramie Group,' by Prof. L. F. Ward.

The last-named paper has already been noticed in the pages of *Science*, and several of the others are of such great importance and general interest as to demand fuller comment than it is possible to accord them in this preliminary notice.

The force of the survey is now, and must be for several years to come, largely devoted to the construction of a topographic map of the United States; and the director's report begins with the plan and progress of this work, and illustrations of the lettering and conventional signs to be used on the map. The scale of the map is approximately one mile, two, or four miles to the inch, according to the character and prospective needs of the country; the map is constructed in contours, with vertical intervals of 10, 20, 50, 100, and 200 feet, varying with the scale of the map and the magnitude of

relief features; and, finally, the map is to be engraved in sheets, of which the unit is to be the square degree, i.e., one degree of latitude and one of longitude. An area of 57,508 square miles was surveyed in the year 1884-85, at an average cost of about three dollars per square mile.

The organization of the survey is more fully explained here than in any of the previous reports. Besides the large topographic corps under Mr. Henry Gannett, it includes the following divisions, each chief or head of division being provided with a strong corps of assistants: 1. Glacial geology, in charge of Prof. T. C. Chamberlin; 2. Volcanic geology, in charge of Capt. Clarence E. Dutton; 3. Archæan geology of the Appalachian region, including all the metamorphic or crystalline strata, of whatever age, extending from northern New England to Georgia, in charge of Prof. Raphael Pumpelly; 4. Archæan geology of the Lake Superior region, in charge of Prof. Roland D. Irving (it is not proposed at present to undertake the study of the crystalline schists of the Rocky Mountain region); 5. Areal, structural, and historical geology of the Appalachian region, in charge of Mr. G. K. Gilbert; 6. A thorough topographic and geologic survey of the Yellowstone National Park is in the charge of Mr. Arnold Hague. When the survey is completed, Mr. Hague's field will be extended so as to include a large part of the Rocky Mountain region. The general geologic work relating to the great areas of fossiliferous formations is very imperfectly and incompletely organized, and this must continue to be the case until the topographic survey approaches completion.

The paleontological work of the survey is carried on in five laboratories, as follows: vertebrate fossils, in charge of Prof. O. C. Marsh; invertebrate fossils of quaternary age, in charge of Mr. William H. Dall; invertebrate fossils of cenozoic and mesozoic age, in charge of Dr. C. A. White; invertebrate fossils of paleozoic age, in charge of Mr. C. D. Walcott; and vegetable fossils, in charge of Mr. Lester F. Ward.

The chemical laboratory, with a large corps of chemists, is in charge of Prof. F. W. Clarke. There is a physical laboratory in the survey, with a small corps of men engaged in physical researches of prime importance in geology. A large corps of lithologists is engaged in the microscopic study of rocks. Besides the division of mining statistics, economic geology is represented by two parties, in charge of Mr. George F. Becker and Mr. S. F. Emmons, engaged in studying various mining districts in the West.

The survey also comprises a division, in charge of Mr. W. H. Holmes, organized for the purpose of preparing illustrations for paleontologic and geologic reports. Illustrations will not hereafter be used for embellishment, and, so far as possible, will be prepared by relief methods, and held permanently for the use of the public at large in scientific periodicals, text-books, etc. The large geologic library and the bibliographic work of the survey are in charge of Mr. C. C. Darwin.

The remaining topics discussed by the director are the publications, appointments, and finances of the survey, and the relations of the Government and State surveys.

Elementary Text-Book of Physics. By Profs. W. A. ANTHONY and C. F. BRACKETT. 3d ed. New York, Wiley. 8°.

THIS is the first appearance, in a complete form, of a long-expected text-book from two well-known American physicists. It is designed to furnish what is necessary and sufficient for that part of a well-adjusted college course which is devoted to the study of physics, and it is the only college text-book of that science which has appeared in this country for several years, aside from revisions and new editions of old works.

Many institutions have hitherto made use of English books, or of translations from the French which have come to us through English hands. This volume is offered as a substitute for such works, and it is little enough to say that it will be found in general to be a very acceptable one. In some respects the book is almost unique. When compared with those largely in use at the present time, it illustrates in a very striking manner the great progress in college instruction in physics during the past decade.

In its plan there is a distinct recognition of the competent instructor with a well-stocked cabinet at his command. Pictorial representations of apparatus are entirely wanting, and the illustra-