by Dr. A. C. Peale. The extinct volcanoes of the Rocky Mountain and Cascade ranges will form the subject of continued study by Capt. C. E. Dutton, U.S.A., assisted by Messrs. Diller and Van Hoesen.

Economic geology. — The commissioner of Indian affairs having requested, and the secretary of the interior having directed it, an examination of the coal-lands of the Great Sioux reservation in Dakota will be made by Mr. Bailey Willis and assistants. In Colorado, especially in the Kokomo, Silver Cliff, and Denver districts, work will be continued by Mr. S. F. Emmons, assisted by Messrs. Cross, Dun, Eakins, Hillebrand, Rodgers, and Schonfarber.

District of the Pacific. Topography. — This work, which has been in progress for two years, will be in charge of Mark B. Kerr, assisted by Messrs. Ricksecker and Ahern. The topographical and geological survey, carried on under the auspices of the Northern Pacific railway in Montana and Washington Territory by Prof. R. Pumpelly, having been discontinued, the maps, field-notes, and material have, at his instance, been turned over to the U. S. geological survey. These explorations, covering some forty-two thousand square miles, will thus be utilized and made public on the standard scale of the survey.

Geology. — Dr. Becker, assisted by Messrs. Melville, Raborg, and Turner, will continue the geological exploration of the cinnabar deposits of California.

(General work of the survey.)

Statistics and economic geology. — Last year Mr. Albert Williams, jun., collected a large amount of mining statistics, which were issued under the title of the 'Mineral resources of the United States.' No volume published by the survey has been more eagerly sought for, or given more general satisfaction. It is proposed to issue one of these volumes yearly, thus bringing the mining statistics annually up to date.

Paleontology. Vertebrates. — The vertebrate paleontology of the north-west will be further investigated by Prof. O. C. Marsh, assisted by Messrs. Williston, Bostwick, Hermann, and Barbour. Invertebrates. — Dr. C. A. White, assisted by Messrs. J. B. Marcou, L. C. Johnson, and Frank Burns, will carry on investigations among mesozoic and tertiary forms. Mr. C. D. Walcott, with the assistance of Messrs. Cooper Curtice and J. W. Gentry, will investigate the paleozoic fauna. The work on the fossil lamellibranchiata, begun by Professor James Hall, will be promoted by the assistance of the survey. Paleobotany. — Dr. Newberry will continue his work on the fossil flora of the north-west, and Prof. W. M. Fontaine his researches on mesozoic botany; while general paleobotany will be in charge of Mr. Lester F. Ward, assisted by Mr. O. C. Ward.

Chemistry. — Since the organization of the laboratory of the survey, its work has grown enormously, almost precluding original investigations by the mass of economic questions demanding solution. The work will continue to be directed by Prof. F. W. Clarke, assisted by Messrs. Chatard, Gooch, Barns, Hallock, Manners, Whitfield, Erni, Chase, and Howard.

Forestry. — The work of mapping the forest districts of the United States will be continued under the direction of Mr. George W. Shutt.

Publications. — Mr. W. H. Holmes will continue to supervise the preparation of the illustrations of various kinds for the survey publications, on the satisfactory and artistic character of which so much depends. He will be assisted by qualified collaborators.

RECENT PROCEEDINGS OF SCIENTIFIC SOCIETIES.

Academy of natural sciences, Philadelphia.

July 15. — Mr. Thomas Meehan remarked that in many composite flowers the pollen is ejected from the apex of the staminal tube, and it became a matter of interest to ascertain the mechanism by which this is accomplished. The flowers of Compositae are much frequented by pollen-collecting insects, honey-gatherers seldom resorting to them. It is difficult, therefore, to watch the flow of pollen in the open air, as it is collected by the insects as fast as it appears. Some flowers of Helianthus lenticularis Dougl. were gathered, and, for the purpose of study, placed in saucers of water in a room where insects could not disturb them. In this way it was observed, that, after the corolla tube had reached its full length, very early the following morning the staminal tube commenced to grow beyond the mouth of the corolla, and by about nine A.M. had extended to a distance of one-fourth the whole length of the latter. The pollen then commenced to emerge through the upper portion of the staminal tube, which, the stamens narrowing, left the apices free. During the day the pollen continued to pour out, until by nightfall a large amount had accumulated at the apex of the tube. The morning of the second day the arms of the pistil emerged, and commenced to expand; and at once the staminal tube commenced to descend. At the end of the third day the staminal tube had retired entirely within the tube of the corolla, and, with the pistil, had begun to wither. A careful examination shows, that, through the whole course, the column of united anthers remains entirely of the same length, the filaments only being elastic. These stretch fully one-half their length. They are attached to the tube of the corolla at the inflated portion, a short distance above the akene, and extend to about midway between this point and the end of the tubular portion at the base of the limb; but, when the anther-tube is extended, the filaments occupy the whole of the space. Thus pollen could fall on the stigma of the previous day's flower; but, as this is

already covered by its own, such a supply is hardly likely to be of much service: we may therefore say that the arrangements favor self-fertilization.

Philosophical society, Washington.

May 24. — Mr. H. H. Bates read a paper on the physical basis of phenomena. —— Professor Thomas Robinson spoke of the strata and timbering of the east shaft of the water-works extension. As an incident to the engineering-works for the increase of the water-supply of Washington, a shaft has been sunk through the superficial deposits in the vicinity of Howard university. Professor Robinson presented a complete record of the formations pierced by the shaft, and discussed, also, the peculiar method of timbering.

June 7. — Mr. G. K. Gilbert presented a plan for the subject-bibliography of North-American geologic literature; and Major J. W. Powell presented a slightly different plan for the same purpose. These plans proposed to establish at the outset a limited number of divisions of the subject-matter of the literature, and to simultaneously prepare a bibliography of each, the total number of bibliographies being about seventy-five. A long discussion ensued, in the course of which the plans were vigorously criticised by Dr. Billings, who maintained that any classification would be found to require continual modification, and would be ultimately unsatisfactory. He advocated the adoption of the subject-index method, and the accumulation of a large body of references before classification was attempted.

NOTES AND NEWS.

WE have much pleasure in presenting the readers of *Science* with a few facts relating to some of the more prominent members of the British association, who are expected to be present at the Montreal meeting.

The permanent general secretaries (honorary) are Capt. Douglas Galton and Mr. A. G. Vernon Harcourt. The former has held office for many years; and, in addition to a wide scientific culture, possesses a special knowledge of every thing relating to sanitary science, and hence has been much engaged in promoting the International health exhibition. He is a cousin of Mr. Francis Galton. Mr. Harcourt is a near relative of the home secretary of state, and is professor of chemistry at Christchurch college, Oxford. He has devoted special attention to the chemistry of gas-lighting. The secretary, and general executive officer of the association, is Prof. T. G. Bonney, who is now president of the Geological society of London. For many years he was fellow and tutor of St. John's college, Cambridge, but at present fills the chair of geology, etc., at University college, London. He is distinguished rather as a petrologist and mineralogist than as a paleontologist. The treasurer, Prof. A. W. Williamson, the distinguished chemist, is unable to attend this meeting; but his functions will be discharged by Professor Burdon Sanderson, Waynflete professor of physiology at Oxford, and one of the scientific advisers of the government. The president of the association for this year is the Right Hon. Lord Rayleigh, an account of whose life is given on another page.

Among the twelve vice-presidents are the Right Hon. Sir Lyon Playfair, Sir J. D. Hooker, and Prof. E. Frankland. Sir L. Playfair has been nominated as the president of the association for the Aberdeen meeting in 1885. Born in 1819, he very early took great interest in chemistry, and in 1858 was elected professor thereof in the University of Edinburgh, which he now represents in parliament. He rendered great services as special commissioner in charge of juries at the International exhibitions of 1851 and 1862. In 1873–74 he was postmaster-general, and from 1880 to 1883 was deputy-speaker of the house of commons, and chairman of committee of ways and means. A great authority on all educational questions, he is one of the very few members of parliament who are eminent in science. Sir J. Hooker, the director of Kew gardens, so famous for his investigations of the laws which govern plant-distribution, was president of the Royal society from 1873 to 1878, and of this association in 1868. In 1877 he accompanied the U.S. survey parties in Utah and Colorado. Dr. Frankland, born in 1825, was president of the Chemical society in 1871, and for many years has been connected with the government teaching of chemistry, his present office being that of professor of chemistry in the Normal school of science, South Kensington. Much of his work has been in connection with the Rivers' pollution commission.

Coming now to the presidents of sections, mathematics and physics (section A) will be under the guidance of Sir W. Thomson, who has been professor of mathematics in the University of Glasgow since 1846, at which time he was twenty-two years of age. His famous researches in thermo-dynamics and in magnetism, and his practical work in submarine telegraphy, scarcely need a reference here. He was knighted in 1866, on the successful completion of the Atlantic cable, and was president of the association in 1871. Chemistry (section B) will be presided over by Prof. H. E. Roscoe, who, since 1858, has been professor of chemistry in Owens college, Manchester. He is president of the Literary and philosophical society of Manchester, and vice-chancellor of the new Victoria university. He is also one of the Royal commission on technical instruction, and will be knighted for his services in that capacity. He was president of the Chemical society in 1880, and the first president of the new Society of chemical industry in 1881. Geology (section C) will have for its president Mr. W. T. Blanford, the secretary of the Geological society of London. Section D (biology) will be guided by Prof. H. N. Moseley, who made his scientific reputation as one of the naturalists of the Challenger deep-sea surveying expedition, and eventually succeeded Professor Rolleston in his chair at the University of Oxford. Gen. Sir Henry Lefroy, a distinguished scientific officer of the Royal artillery, will preside over section E (geography). He has recently pub-