nunciation, more complete, Brinton has added extracts from two manuscript grammars of his own library, — that of the Dominican Benito de Villacañas, who died in 1610; and that of Fray Estevan Torresano, composed shortly after 1753. Cakchiquel possesses a rich literature, consisting of theological and some semi-historical works of native writers, of which but little has ever been printed. A map facing the titlepage points out the location of the principal tribes.

INTELLIGENCE FROM AMERICAN SCIENTIFIC STATIONS.

GOVERNMENT ORGANIZATIONS.

U. S. geological survey.

Publications. — Although advance copies of the third annual report of the survey were issued some time ago, it was incomplete as regards the illustrations. The complete report, bound, has now been received at the office, and will soon be distributed. —— The fourth annual report has been issued, although it is not yet ready for distribution. It contains five hundred and five pages (i.–xxxii., 1–473), and is illustrated with eighty-five plates and fifteen figures. The report of the director presents a *résumé* of the operations of the survey for the fiscal year ending June 30, 1883; and the administrative reports following give a more detailed account of the work. The latter are by Messrs. Henry Gannett, Arnold Hague, G. K. Gilbert, C. E. Dutton, T. C. Chamberlin, R. D. Irving, S. F. Emmons, G. F. Becker, O. C. Marsh, C. A. White, C. D. Walcott, L. C. Johnson, L. F. Ward, Carl Barus, and Albert Williams, jun.

The accompanying papers are by Capt. C. E. Dutton, Mr. Joseph S. Curtis, Mr. Albert Williams, jun., Dr. C. A. White, and Mr. Israel C. Russell.

Capt. Dutton's paper is on Hawaiian volcanoes, and consists of thirteen chapters, covering a hundred and forty pages, in which the geography of the islands, and their volcanic phenomena, are described. The paper is illustrated with twenty-nine plates and three figures. The paper by Mr. Joseph S. Curtis is entitled "Abstract of a report on the mining geology of the Eureka district, Nevada." It occupies twenty-eight pages. A general outline of the district is given. The structure of 'Prospect Mountain' and of Ruby Hill are detailed; and the occurrence and source of the ore, and the future prospect of Ruby Hill, are considered. Three plates present a horizontal section and two vertical cross-sections. Mr. Albert Williams, in fifteen pages, treats of popular fallacies regarding precious-metal ore-deposits. 'A review of the fossil Ostreidae of North America, and a comparison of the fossil with the living forms,' by Dr. Charles A. White, follows Mr. Williams's paper. There are two appendices to Dr. White's paper: viz., 'North-American tertiary Ostreidae,' by Professor Angelo Heilprin; and 'A sketch of the life-history of the oyster,' by John A. Ryder. The whole paper, including the plate explanations, occupies a hundred and fifty-two pages, in which there are forty-nine full-page plates. 'A geological reconnoissance in southern Oregon,' by Israel C. Russell, a paper of thirty pages, with three plates and ten figures, and the index of nine pages, complete the volume.

Bulletin No. 3, 'On the fossil faunas of the upper Devonian along the meridian of 76° 30′ from Tompkins county, N.Y., to Bradford county, Penn.,' by Henry S. Williams, was issued in May. It contains thirty-six pages, four of which are devoted to the index, and is the first of a series of articles on the comparative paleontology of the Devonian and carboniferous faunas. The price of this bulletin is five cents.

Bulletin No. 4, 'On mesozoic fossils,' by C. A. White, is all in type, and will soon be issued. The total number of pages, including the explanations of plates, is a hundred and twenty-four. There are three papers, as follows: "Description of certain aberrant forms of the Chamidae from the cretaceous rocks of Texas;" "On a small collection of mesozoic fossils collected in Alaska by Mr. W. H. Dall;" and "On the nautiloid genus Enclimatoceras Hyatt, and a description of the type species." There are nine woodcut plates.

Bulletin No. 5 is by Mr. Henry Gannett, chief geographer of the survey, and is almost ready to be issued. It contains three hundred and twenty-six pages, and is called 'A dictionary of altitudes in the United States.' Mr. Gannett began the compilation of measurements of altitudes when connected with the Geological and geographical survey of the territories; and three different editions of the results were published by that organization, the last bearing the date of 1877. They related principally to the country west of the Mississippi, while the present work embraces the whole country. The elevations are arranged alphabetically under the states and territories.

Bulletin No. 6, 'Elevations in Canada,' by J. W. Spencer, is in press, and supplements bulletin No. 5.

Bulletin No. 7 is also being rapidly put into type. It is entitled "Mapoteca geologica Americana: a catalogue of geological maps of America (north and south), 1752–1881, in geographic and chronologic order," by Jules Marcou and John Belknap Marcou. This catalogue is modelled on 'Mapoteca Colombiana,' by Uricoechea of Bogota, which was published in London in 1860, and is now out of print, and rare. Besides a list of some thirty numbers relating to maps on the geology of America, in Cotta's 'Geognostische karten unseres jahrhunderts,' published at Freiberg in 1850, the only list of geological maps of America is the 'List of general geological maps relating to North America,' in the 'Geology of North America,'

by Jules Marcou (p. 122), published at Zurich in 1858. When it is remembered how the publication of American geological maps has increased in the past twenty-five years, the importance of this catalogue will be appreciated.

Bulletin No. 8, 'On enlargements of mineral fragments in certain rocks,' by Roland Duer Irving, is also in press. It will be illustrated with one woodcut plate, five chromolithograph plates, and four woodcuts.

Bulletin No. 7 begins the second volume. A number of other bulletins are in course of preparation, and will soon be sent to the printer. —— Monograph No. vii., 'Silver-lead deposits of Eureka, Nev.,' by Joseph Story Curtis, is all in type with the exception of the index. It has a hundred and ninety-three pages, and will be illustrated with sixteen plates and ten figures. —— Monograph No. viii., 'Paleontology of the Eureka district,' by Charles Doolittle Walcott, is also in press, and is being rapidly put into type.

RECENT PROCEEDINGS OF SCIENTIFIC SOCIETIES.

Society of arts, Massachusetts institute of technology.

May 22. — A paper by Mr. J. M. Batchelder was read by the secretary on the electro-deposition of iridium on engraved copper plates. A process had been used by Mr. Batchelder over twenty years ago; but it did not seem to have become known, and was presented as comparatively new. The solution was prepared by fusing iridium and osmium with three times their weight of nitrate of potassium for about one hour at a bright-red heat. A fused mass was broken into small pieces, and treated with nitric acid, in a glass retort with a condenser. The osmium was separated out, and the iridium which remained was treated with chlorhydric acid, after removing the nitrate of potassium by crystallization. The solution contained about one-eighth of an ounce of iridium to a gallon of water, to which about one-quarter pound of sulphuric acid should be added. The plate is to be immersed, and connected with the battery, as usual, and, when removed, will be found coated with iridium, closely resembling the common steel plates. Such plates, coated with iridium, were very durable, and possessed many other advantages. A plate was shown which had been exposed twenty-seven years without protection; and its surface was still brilliant and uninjured. It is more easily wiped than a copper plate, the surface being, in this particular, about the same as a steel plate. —— Mr. S. H. Woodbridge read a paper on the heating and ventilation of the new Institute building, and the special principles involved. The building had not been planned with special reference to any accepted system of ventilation, and only the circumstance of hollow walls rendered the introduction of such a system possible. Some of the more prominent features of the heating and ventilation system adopted are: the reversal of the ordinary custom of subordinating ventilation to economy in heating; basing the quantity of air required on determined requirements rather than on cubic capacity simply; the use of large areas of air-passages, and low velocities; making the outlet areas smaller than the inlet areas, and some peculiar features of the flues; heating by large air volumes at low temperatures instead of by small volumes at high temperatures; some modifications in the construction of the fan, increasing the efficiency; the method of controlling the temperatures of the coils; the method of determining the rate of condensation, and the daily aggregate condensation as a means of critical study, and of determining the cost of the heating and ventilation; and placing the ventilation and the temperature of each room under control of the engineer. The building measures about 150 by 90 feet, is 75 feet high, and contains some forty rooms, from 3,000 to 60,000 cubic feet in capacity. In determining the requisite air-supply, regard was had to the maximum number of occupants, and the character of their work. Ordinary lecture-rooms receive 1,500 cubic feet per hour for each person; physical laboratories, where some gas-flames are used, get 2,000; ordinary chemical laboratories, 3,000; the organic chemical laboratory, 4,000; and libraries, 2,000. The total capacity of the rooms is about 741,000 cubic feet, and the mean total air-supply about 3,535,000 cubic feet per hour, corresponding, with a uniform distribution, to a change of the entire air every twelve minutes. In the chemical laboratories, however, the air is changed every six or seven minutes. There are 79 flues, three feet by one foot, with a total area of about 230 square feet; and nearly one-half of these had to be located in the outside walls, notwithstanding the objections to such an arrangement. The finish of the flues is rough brick. Each inlet flue connects with but a single room, and the inlet is at about the middle of the height. The outlets are at the top and bottom of the room; the former being used only in hot weather, while the latter are always open. There are three valves or dampers on the outlet flue, — one at the top, a check-valve at the bottom to prevent a reversal of the draught, and one at the top outlet of the room. The inlet flues also have three dampers. The flues terminate in a sub-basement four feet high, under the whole building, with a concrete floor. The air enters through large windows, and, after passing through the main coil, passes through the fan into the fan room, open on three sides, to the sub-basement. The fan is twelve feet in diameter, with twelve floats, and has a free delivery over its entire circumference. The power it requires is very small. Calculation showed that the cost of heating the new building would be much greater than that of heating the old, on account of thinner walls, and other sources of loss, besides the greater quantity of air supplied. The