term 'caldera' is proposed and used as a general name for volcanic orifices of the Hawaiian type. As the column of lava gradually melts away the enclosing rocks, the caldera is enlarged by the falling-in of the surface, and it is not in any case due to explosions. Mauna Loa and Kilauea are clearly independent volcanoes; and we have no reliable indications that their activity is diminishing. The vast antiquity of the Hawaiian volcanoes is plainly shown, not only by their magnitude, but also by the wonderful progress of the agents of erosion, especially in those islands where the volcanic fires are now extinct. This is one of the principal topics discussed in the chapters on Maui and Oahu.

The abstract of the report by Mr. J. S. Curtis on the mining geology of the Eureka district, Nevada, supplements that by Mr. Arnold Hague on the general geology of the same district in the preceding volume. It is accompanied by sections of the principal workings, and discusses exhaustively the characteristics and probable origin of these singular ore-deposits, which had yielded sixty millions of dollars up to the close of 1882.

Following this is a short but useful chapter on popular fallacies regarding precious metal ore-deposits by Mr. Albert Williams, jun. Dr. C. A. White's review of the Ostreidae of North America, with an appendix by Mr. Heilprin, and thirty-eight plates, describes in simple yet scientific language all the known fossil species and the single living species of the Atlantic coast. A second appendix by Mr. Ryder, with eleven plates, is devoted to an interesting sketch of the life-history of the oyster.

The volume concludes with Mr. I. C. Russell's geological reconnaissance in southern Oregon, with two maps and sixteen small sections. This is a short but highly interesting account of the extreme northern part of the Great Basin, which is shown to possess the same structural and climatic features as the basin of Lake Lahontan, which bounds it on the south, and was described by the author in the annual report for 1881–82.

GEOGRAPHICAL NOTES.

Missionary maps. — The establishments of Les missions catholiques at Lyon, France, have issued an atlas containing data collected by the Catholic missionaries in various parts of the world. Beside the general maps, which resemble those of any good elementary atlas, there are some thirty detailed maps which have appeared from time to time in the organ of the missionary bodies. Numerous important additions to geography have been made by the missionaries; and, in bringing them together in convenient form, the atlas meets a real need. They appeared first in German, with explanatory text by Father O. Werner, and have been translated into French, with additions, by Valerien Groffier.

A newly discovered affluent of the Kongo. — The despatches from the Cape of Good Hope state that the expedition under Lieutenant Wissmann has discovered a new affluent of the Kongo, which will have an important bearing on the opening-up of the lower Kongo basin. Wissmann is on his way to Europe with the details. The new river is a powerful stream, over five hundred miles in length, between the equator and Stanley Pool. It is eight miles wide at its mouth, and quite deep. There were no obstacles to its navigation and the Pogge Falls, in the Tapende country, latitude 6° south, and longitude 22° east. Lake Lincoln, to be found on some charts, does not exist: the only lake encountered was Lake Leopold II., near the Kongo. The journey was made in large canoes constructed by the expedition, and a way was forced through the territory of savage cannibal tribes, who, if armed with guns instead of arrows, would have prevented their passage. In a single day as many as five conflicts took place, and several of the party were wounded, though none were killed. The journey was accomplished by Lieutenants Wissmann and Müller, a physician, artificer, and forty-six natives. The ferocity of the natives is accounted for by the fact that they had never seen white men or fire-arms. More details will soon be accessible. Meanwhile it seems more likely that the river is one of those which have been known only by report, rather than an entirely new discovery. The country is reported to be fertile, producing palm-oil, sugarcane, rice, and other tropical products.

Explorations in Central South America. — De Brettes sends a short note on his recent travels in the unexplored part of the southern district of the Gran Chaco, which began last March, and lasted forty-four days. He discovered a large salt lake (along which his party travelled nine days, and the west shore of which is estimated to be one hundred and thirteen miles long), also three rivers, running in a northerly direction, supposed to be tributaries of the Rio Vermejo. The south Chaco is flat, covered with thorns, mimosas, and tall herbage. The natives are hypocritical and cruel, and live in utter barbarism. After penetrating two hundred and twenty miles into the unknown region, the explorers were obliged by fever to retrace their steps to Corrientes. A new expedition was in contemplation.

Restoration of Lake Moeris. — The investigations of Mr. Cope Whitehouse in regard to the

site of the ancient Lake Moeris in Egypt have been so fruitful that the Egyptian government has taken the matter in hand, and it is believed, that, by a small expenditure, the surplus waters of Bahr Yussef can be directed into the now dry depression. Preliminary surveys are in progress to determine the practicability and expense of restoring a state of things very exactly described by Herodotus, Strabo, and Pliny, as having existed in past ages.

Ancient Arabic inscription in the Sahara.— Le Chatelier furnishes an account of what may prove to be an important inscription in an artificial cavern at Timissao, near the wells and on the right bank of the wady of the same name, in the Sahara. The wady, coming from the south, turns here toward the west. Its banks are of conglomerate, in two horizontal beds, separated by a bed of gray schist in vertical layers. These schists have been dug out for a distance of over two hundred feet, forming a sort of gallery fifteen feet wide and six or seven feet high. The inner wall of the gallery is occupied by an inscription in Tifinakh lettering, the characters incised, and painted with red ochre. A more modern inscription in Arabic is simply painted on the roof. At the further end are some archaic incised figures on the wall, including those of five horses. The accounts seem to be truthful, though derived from the natives; and, if so, the deciphering of the inscriptions would be of great interest.

ASTRONOMICAL NOTES.

Eclipse of the sun, 1886, Aug. 28–29.—A bill has been introduced in congress, by Mr. Thomas of Illinois, to enable the secretary of the navy to fit out an expedition to observe the total eclipse of the sun which occurs on the 29th of August next. The sum of ten thousand dollars is appropriated for defraying the expenses of the expedition; and the secretary is authorized to detail a naval vessel to transport the party to a point near Benguela, on the west coast of Africa, almost the only seaport which is near the central line of totality. The bill was introduced in the house of representatives on the 11th of January, but has not yet come up for consideration A similar bill introduced in the senate has been favorably reported by the committee on naval affairs. It will be remembered that this eclipse is of rather more than ordinary interest on account of the long duration of totality, — $4^m\ 41^s$ near Benguela. Another interesting circumstance has been noticed by Dr. Herz of Vienna, in the fact that at totality two stars, 47ρ Leonis and 49 Leonis, are close to the sun, the latter within the corona. It is suggested, that, by means of measurements upon these two stars, something may be learned in regard to the refracting power of this peculiar atmosphere of the sun. The total phase will be visible in the West Indies; but the sun will not be in a good position for observation. According to *Nature*, at Carriacou, the largest of the Grenadine Islands, totality commences at $19^h\ 11^m\ 45^s$ local mean time, and lasts $3^m\ 21^s$; the sun's altitude being 20°.

Comet 1886 . . . (*Barnard*). — According to an ephemeris published by Mr. H. V. Egbert of the Dudley observatory, we may look for this comet to become quite a bright object during the early morning-hours in the latter part of May. Mr. Egbert's calculation shows that the comet on the 20th of May will be 360 times as bright as it was when discovered by Mr. Barnard, Dec. 3. Its position will be R. A., $2^h\ 53^m$; decl., + 20° 26′; that is, it will appear above our horizon about an hour before the sun.

ST. PETERSBURG LETTER.

THE last number (9) of the Journal of the Russian physico-chemical society contains an elaborate paper, by K. Kraewitch, on the relation between the elasticity and density of the air in a rarified condition. His experiments on the velocity of sound show, that at a temperature of 17.5° C., the velocity decreased from 330 metres, at a pressure of 761 millimetres, to 171 metres, at a pressure of 2.6 millimetres. At a pressure of 280 millimetres, the velocity is about the same as the mean air pressure; but it diminishes rapidly below 280 millimetres. He concluded that gases below this pressure do not obey the Boyle-Mariotte law.

At the general meeting of the physico-chemical society in December, the coming eclipse of Aug. 18, 1887, was discussed. Prof. S. P. Glasenap showed a map on which the path of the total eclipse was marked. As it traverses an immense extent of Russia from Kiev to south-eastern Transbaikalia, and appears also on the shores of the great ocean at Possiet harbor, and as a total eclipse will not appear in Russia for thirty-six years after 1887, he concluded that the best use should be made of the opportunities offered by the eclipse to study different problems relating to solar physics. Prof. N. G. Egoroff followed with a communication on the corona and the opportunities offered by the eclipse for its study. The last paper was by Prof. A. Woeikof, on the meteorological side of the question. Observations on the amount of cloud prevalent in the region show a cloudiness of about 51; that is, half the sky is