ity, are plentiful, and 'sanitary plumbing' is the unvarying advertisement. Implicit faith in either class is ill advised. The skill of the one and the handicraft of the other may safely be questioned and criticised. The easy conscience of the contractor, no less than the ignorance of the owner, makes poor plumbing-work possible, for much of it is hidden from sight. Smoothly wiped joints, with brass and plated fixtures, do not always insure sound and honest workmanship. The complexity of this plumbing problem in the great cities, with their crowded populations, must be solved through the agency of general legislation, and the authority of inspection must be derived from stringent laws. The state boards of health were organized with this end in view, and their conclusions are influential with the law-making powers. Sanitary science includes so much, and affects all to the degree that *men* have no monopoly in its results. Mrs. Plunkett is right in contending that *women* should master these problems to aid in procuring compulsory legislation. Her little tilt at the doctors on the titlepage is very much softened in the final paragraphs of her book. The millennium is not quite at hand; and as the doctors discovered the causes that brought sanitary science into existence, and have done all that has been done thus far in formulating it, and as they must be the final court of appeal in all questions that arise before sanitary science is rounded out and complete, the medical profession will probably see several generations before its 'occupation's gone.'

NOTES AND NEWS.

THE following short account of a tornado at Aden, reported by Commander Merrill Miller, U.S.N., commanding the U. S. steamship Marion, is interesting from the fact that it is the first violent storm that has visited Aden since the English occupation. On June 1 and 2 the weather at Aden was sultry and threatening, with moderate easterly breeze and sea. The sailing-directions give no accounts of storms in this locality. On the morning of June 3 the wind was moderate from north-west, with heavy and increasing swell from south-east. The sky was dark and threatening. At ten A.M., June 3, the wind increased to a gale, with squalls of hurricane force from the northward, and rain in torrents, and very heavy seas from southward and eastward. The sea broke over the rail of the English flagship, which was battened down. The barometer fell to 29.60. At three P.M. the barometer began to rise, when the wind shifted to the southward and eastward, and the gale moderated. Heavy rain-squalls continued at intervals all night. The gale was of the nature of a tornado, and apparently passed up the Gulf of Aden in a westerly direction. Vessels arriving from the Indian Ocean and the Red Sea report having encountered heavy weather.

— Mr. I. C. Russell's reconnoissance in the northern part of the Great-Basin region, where it extends into southern Oregon (U. S. geol. surv., 4 ann. rep.), has furnished him with a quantity of interesting facts concerning this little-known part of the wide west. Its rocks are largely volcanic, spread out in great sheets of lavas that once formed a broad, smooth tableland; but in later times it has been broken by faults, so characteristic of the Great-Basin region, and thus divided into long, narrow blocks, stretching north and south, and tilted by very recent displacements, so as to expose fresh precipitous scarps that have not yet sensibly worn back from the fault-lines. In the Warner valley, for example, the orographic blocks of dark volcanic rock, miles in length, are literally tossed about like the cakes of ice in a crowded floe, their upturned edges forming bold palisades that render the region all but impassable. The faces of the numerous branching fault-cracks present naked precipices without system, that combine to make a region of the wildest and roughest description. The depressed areas were occupied, during quaternary time, by numerous lakes of considerable size. Some overflowed to rivers that reach the ocean, like the Klamath, that escapes westward through the Cascade Range; others contributed to the supply of the irregular basin of Lake Lahontan, farther south; and some had no overflow, their influx being counterbalanced by evaporation, thus indicating that the precipitation of the time was not excessive, and that their waters were saline. At present the waters have retreated from the terraces and benches that mark their former levels, and remain in greatly diminished volume. Some have altogether disappeared, or appear only in the wet season; others are relatively permanent sheets of very saline water, like Summer and Abert Lakes, which may possibly inherit part of their dissolved salts (soda and potash) directly from their larger ancestor; but the most numerous are those which are now essentially fresh, although occupying basins from which the quaternary lakes had no outlet (these are therefore not to be considered remnants left by the incomplete evaporation of the quaternary lakes whose basins they occupy, as in that case they should be densely saline). Their freshness is best explained by Gilbert's hypothesis that the quaternary lakes have been completely dried up, and their saline contents so well buried under playa-mud, that the waters subsequently accumulating in the basins did not take them into solution. Mr. Russell finds no evidence of either local or general glaciation in the region he examined, and thus differs in his conclusions from those reached by LeConte. The report is illustrated by several maps, showing fault-lines, quaternary and existing lakes, by numerous cuts illustrating the peculiar displacements so characteristic of the region, and by a sketch of Abert Lake, in which the tilted blocks that form its basin are shown. It is a valuable and most inter-

esting chapter to add to the physical geography of our country.

— The Portuguese explorer, Serpa Pinto, has found considerable coal-beds south of the Rovuma. The Rovuma flows into the Indian Ocean, south of the German possessions on the east coast of Africa, on the old caravan track from Cape Delgado to Lake Nyassa. These coal-beds were claimed by the sultan of Zanzibar; but, as they lie south of the Rovuma, the Portuguese have taken possession of them.

— Professor Forel of Morges continues his reports to the Swiss-Alpine club, on the periodic variations of the glaciers of the Alps, and in his fifth statement, for 1884, confirms the conclusion announced a year ago, that the decrease of thirty-four distinct glaciers has come to an end, and is now followed by a moderate advance. In the valley of Chamounix, the glacier of Argentière crept forward thirty-three feet last year: it had a maximum in 1819, and again in 1854, followed by a minimum in 1883. The Glacier des bois, at the foot of the Mer de glace, shows no change; but that of the Bossons is advancing rapidly, having extended its front about one hundred and fifty feet in the past year; and so with a number of others. Part of the Hôtel des Neuchâtelois, from which Agassiz made his early observations on the Unteraar glacier, has been found twenty-four hundred metres down stream from its position in 1842, giving an average annual velocity of fifty-five metres; but it is curious to note, that as its velocity from 1842 to 1846, when determined by Agassiz, was seventy-three metres a year, its recent velocity must have been about forty metres, to bring the forty years' average down so low as fifty-five. Another peculiar fact found by Forel is that the recent change from retreat to advance is much more common in the western than in the eastern Alps. The observations of the next few years promise to be of special interest in this connection.

— Capt. Downie of the British steamer St. Andrew's Bay, reports that on June 25, in mid-ocean, a meteor resembling a ball of fire two feet and a half in diameter descended from overhead a short distance from his vessel. This occurred about noon. The weather was misty and rainy, but there had been no lightning or thunder. The flash made by the passing meteor was so brilliant that it blinded those who witnessed it. The meteor exploded with a terrific report, resembling cannonading, followed by a noise like the rattle of musketry. Immediately after the passage of the meteor the weather cleared up. The vessel was loaded with iron ore, but there was no play of electricity upon any part of her.

— The third report of the Swiss seismological commission, by Forel, covers the years 1882 and 1883. It gives a list of the earthquakes observed during the two years in Switzerland, with the accessory shocks. The intensity of each earthquake is marked according to the Rossi-Forel scale, and its 'value' computed by the formula adopted by Forel in previous reports, which takes into account the intensity number, the extent of the seismic area, and the number of accessory shocks. These numbers are tabulated, and compared with the mean of the two years 1880 and 1881, and with the separate numbers for those years. The means deduced from the several tables are as follows: —

	1880.	1881.	Mean of 1880–81.	1882.	1883.
Number of earthquakes . . .	–	–	29.0	29.0	15.0
Number of shocks,	–	–	116.0	49.0	19.0
Mean intensity .	3.9	4.2	4.0	3.7	3.6
Mean 'value' . .	10.1	15.1	–	7.4	5.7
Annual sum of 'values' . . .	211.0	574.0	273.0 *	220.0	87.0

* Mean of the four years.

From these figures the author infers that there was a maximum of seismic activity in Switzerland in 1881, which a comparison of the *monthly* values shows to have been in November of that year; and that in 1882 and 1883 the activity was notably diminished, especially so in the latter year, in which only one earthquake (Jan. 8) exceeded a value of 10, and none exceeded 15. In the figures tabulated, no account was taken of twenty-one slight shocks, twelve in 1882, and nine in 1883, which were only reported by a single observer.

— Dr. M. E. Wadsworth has accepted a position as professor of mineralogy and geology at Colby university, Waterville, Me. We understand, that, as at Cambridge, he will continue to give instruction to advanced students in lithology; and there will thus be one more opportunity for those who intend pursuing this growing science to familiarize themselves with the latest methods of investigation.

— The Berlin congress, says the *Athenaeum*, appears to have stirred the Portuguese Commissâo de cartographia into activity. Among a batch of maps recently forwarded to us from Lisbon, we find a capital general map of the province of Angola, compiled by A. A. d'Oliveira, on a scale of 1:3,000,000, which distinguishes salubrious from insalubrious districts, and shows, among other novel features, the recent routes of Capello and Ivens to the east of Mossamedes; a map of the country between Loanda and Ambaca, on a scale of 1:400,000, based upon railway surveys made by Major A. S. de Souza Prado, Major Goyâo, and others, and of much original value; and, lastly, a map of the lower Kongo up to Noki, from recent surveys by L. de Moraes e Souza, C. de Magalhaes, and E. de Vasconcellos. These maps are reproduced from autographs, and their external aspect is consequently not very inviting; but they contain matter which the cartographer cannot afford to neglect. We are glad to hear that maps of the island of St. Thomas, of Angola (on a scale of 1:1,500,000), and of Mozambique, are preparing by the Commissâo de cartographia, under the direction of Senhor Leite.

— A remarkable instance of the tenacity of old beliefs among an ignorant class lately occurred not

very far from Calcutta. The idea that government always inaugurated every good work with human sacrifice was long current among the lower orders of the Indian people; but it might be supposed that it had died out long ago. It appears, however, to be as strong as ever. The boatmen on the Ganges near Rajmehal somehow came to believe that the government required a hundred thousand human heads as the foundation for a great bridge, and that government officers were going about the river in search of heads. A hunting-party, consisting of four Europeans, happening to pass in a boat, were set upon by the hundred and twenty boatmen with the cry, 'Gulla katta,' or cut-throats, and only escaped with their lives after the greatest difficulty. The men were arrested, and thirty-one of them sentenced to terms of from one to three months' imprisonment.

— The demolition of the oldest Jewish quarter in Europe, dating, it is said, from before Caesar's time, is proceeding rapidly. The archeological commission, which is charged with the exploration and protection of ancient monuments, has applied to the Italian government that measures shall be taken for clearing the temple of Jupiter and the portico of Octavia from the buildings which have grown up around them, and also for putting them in such a state of repair as is necessary for their preservation. The commission also requests that the new streets which are to be laid down over the cleared area shall be so planned that their points of intersection shall coincide with the following ancient buildings, which are now within the Ghetto: the theatre of Marcellus, the crypt of the Emperor Balbus, and the porticos of the Flavian emperors and of the Emperor Philip. There is a supplementary request that these buildings shall be placed on the list of ancient monuments, for the preservation of which a small contribution is annually made by the state.

— The African expedition which will leave England in August next, fitted out at the expense of the Royal geographical society, and commanded by Mr. J. T. Last (who, as a lay agent of the Church missionary society, has done admirable work in the Zanzibar interior), after making up its caravan at Zanzibar, will proceed south to Lindi, to the north of the mouth of the Rovuma River. Thence Mr. Last will proceed to the confluence of the Rovuma and Lugende rivers, and fix the longitude of the junction, — an important geographical point not yet settled. He will then go on in a generally south-westerly direction, and, before reaching the north end of Lake Sherwa, turn southwards, and make for the Namulli Hills, which, with other new features in this region, were discovered by Consul O'Neill in the end of 1883. Here Mr. Last will establish himself, and make a detailed study of the whole region in all its aspects. He will make a complete survey of the surrounding country, its topography, people, botany, economic products, climate, and languages. When this is completed, Mr. Last will enter the valley of the Likugu River, which rises in the neighborhood of these hills, and follow it down to the coast at Quizungu, whence he will travel south to Quilimane, or north to Angoche, and thence to Mozambique. Mr. Last will make a special point of collecting all possible information concerning the country he passes through, its changes, its people, their customs, languages, etc., the climate, its sanitary conditions, and its suitability for the introduction of European and other economic plants. The Lukugu valley is said to be very thickly populated, and must therefore be unusually fertile, and so of interest both to the colonist and the trader.

— The fact that sheet-lead in storage-batteries decays very soon, is a serious drawback to its use; and Dr. Kalischer recently described a secondary battery before the Physical society of Berlin, in which iron was used as the anode, and a concentrated solution of nitrate of lead as the electrolyte. The iron, on being immersed in the lead solution, becomes passive, and resists corrosion in the liquid. When a current is sent through the cell, peroxide of lead is deposited on the anode in a firm mass all over it. When nearly all the nitrate of lead is decomposed, there is a greater liberation of gas at the anode. The development of gas is to be avoided at the beginning of the charge: otherwise the peroxide of lead, or, strictly speaking, the hydrated peroxide of lead, becomes covered with bubbles of the gas. A cathode of sheet-lead is employed; but, to prevent it short-circuiting the cell by sending out lead shreds in charging, Dr. Kalischer amalgamates it, — a precaution which also saves the lead from corrosion by the nitric acid left in the cell after separation of the lead. The electromotive force of this cell is about 2 volts to begin with, but after six hours' discharge it falls off to about 1.7 volts. On leaving the cell at rest for twenty-four hours, it is found to recover some of the electromotive force lost. An attempt to substitute sulphate of manganese for nitrate of lead in the battery did not answer the purpose.

— The German New Guinea company, at the head of which stands Herr Adolf von Hausemann, has received an imperial charter dated May 17. The charter covers the following limits: 1. That part of the mainland of New Guinea under neither English nor Dutch supremacy. This district, called by permission Emperor William's Land, stretches from 141° east longitude (Greenwich) to the point near Mitre Rock cut by the 8° south, stretching thence south and west to where this parallel is cut by the 147° east longitude, then in a straight line north-west to where the 6° south latitude crosses 144° east longitude, and farther in a north-westerly direction to where the 5° south latitude crosses the 141° east longitude, then in a straight line north to the sea again. 2. The islands of this part of the coast of New Guinea, also the archipelago hitherto called New Britain, now to be called the Bismarck Archipelago, and all other islands north-east of New Guinea between the equator and the 8° south latitude, and between 141° and 154° east longitude. The company is made responsible, under imperial supervision, for keeping order within these limits, with right of possession, subject to previous agreements, and treaties with the natives.