to the little remnant of ice at the foot of the steep slope, as seen by travellers of last summer.

The anatomy of the greatest glacial system of Switzerland, that which forms the Aletsch glacier, is excellently shown in a folded map. The scale is 1 : 50,000 ; contour lines are drawn in blue on the ice and snow every thirty metres ; the moraines are marked in detail ; and the peculiar zigzag bands in the ice, like the grain of wood, so conspicuous in the wonderful view from the Eggischhorn, are carefully represented. This map may therefore be ranked even above the interesting one of the 'Mer de glace' system (scale, 1 : 40,000) on Viollet-le-Duc's sheet of the 'Massif du Mont Blanc,' published about ten years ago.

The question of glacial erosion has always been fruitful of opposite views since it was first given importance by Ramsay ; and we have to regret that the summary of the matter presented by Heim does not go further in reconciling the apparently contradictory facts quoted by the advocates of the contrasted theories. Heim writes, 'Glaciation is a period of rest in valley-making.' Professor Newberry concludes[1] that a great glacial sheet, shod with stones and gravel, "would not only be capable of sweeping away any ordinary barriers that opposed its progress, but would grind down the underlying rock with a resistless and comparatively rapid action."

Neither of these authors gives sufficient indication of the more judicious middle ground taken by James Geikie and some others, to the effect that glacial action may be destructive in one district, and constructive in another ; that glaciers, like rivers, erode chiefly in their upper streams, and deposit the detritus quietly on the flood-plains and deltas of drift near their termination. The great amount of glacial drift undoubtedly affords the strongest argument that can be made in favor of the marked changes effected by glaciers, just as the vast volume of stratified fragmental rocks testifies to the successful persistence of water-action ; and for North America, at least, we cannot accept Heim's conclusion, that pre-glacial weathering afforded the chief part of the drift, while direct glacial erosion gave rise only to fine sand and mud. The occurrence of angular, unweathered, and unworn bowlders, and of drift rich in limestone, forbids such a conclusion, and has been successfully quoted against it. On the other hand, the evidence of the protective, or at least the very moderately destructive, action of the old glaciers near their termination, and the not excessive erosion in any part, is ably stated ; and, to our mind, this leads much nearer to the truth than does the path followed by those who see an argument for glacial erosion in nearly every lake of northern countries and every fiord of western coasts.

[1] School of mines quarterly, vi. 1885, 152.

HOUSEHOLD SANITATION.

IF the author succeeds in winning the audience she desires, she may justly claim pioneership in one direction of the higher education of women. The path indicated is not well beaten. Sanitary science is of late origin ; so late, indeed, that the men who formulated it are still young. Its proposition to prevent disease by removing the conditions that provoke disease, merits the popular approval, and legislation has been quick to help sanitarians put their science to the test. With plenty of money, and in fair localities, it is not difficult to satisfy all the demands of the sanitarians. It will, however, hardly be contended that the sanitarians have formulated insurance against the outbreak of the zymotic diseases for the ordinary householder in any locality where necessity has placed him. And yet this is the very problem which sanitary science is to solve. Much can be done in one home to make it healthful ; but the influences that affect one home are so intermixed with the influences that affect large areas, that state and national interference is demanded by sanitary science. The author has stated the sanitary conditions of healthful homes with accuracy, and with sufficient fulness to make these conditions readily comprehended. She appeals to the women of the land to familiarize themselves with the results of sanitary science, that they may be able to critically examine their own homes, and influence opinion, so that healthful conditions may be made compulsory under the law. This is good work, and the more of it the better. There is an immense chasm between crazy-quilts and sewer-pipes, sonatas and bad drainage ; but it can be bridged by informing the women, and teaching the girls. If rosy children and long-lived husbands are worth the while, this education in what constitutes a healthy home is worth a place in the school curriculum for girls.

Sanitary science is so new, that 'consulting sanitary engineers,' without warrant of author-

Women, plumbers, and doctors ; or, Household sanitation. By H. M. PLUNKETT. New York, *Appleton*, 1885. 248 p., illustr. 8°.

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-