The unfortunate end of the Marquis Antinori is known. His successor, Count P. Antonelli, more happy, has returned to Rome, and has recently given an account of his investigation of Shoa, in south-eastern Abyssinia, to the Italian geographical society. This society is publishing the results of the Italian expedition. An interesting account of the fresh-water fishes of Shoa has already appeared. Soleillet, the French explorer of Shoa, appears from his reports to be living *en grand seigneur*, under the protection of his Shoan Majesty, King Menelik II., having been appointed to a feudal office somewhat between a baron and a justice of the peace. Bremond's report of his scientific and commercial expedition from the French colony of Obock to Shoa has recently been printed in *L'Exploration*. This region, though but a few years since untrodden by civilized men, offers rich rewards to traders; and the privileges of trade have lately been the object of lively competition between the commercial explorers of several nations. W. H. DALL.

GREEN MOUNTAIN RAILWAY, MOUNT DESERT ISLAND.

THE Green Mountain railway on Mount Desert Island, Me., is intended for pleasure-travel. It was operated for the first time during the last summer season. It is in a great measure a copy of the railway up Mount Washington, New Hampshire, built some thirteen years ago. These two lines, and the Mount Righi railway in Switzerland, are the only ones employing the central cog-rail as a means of surmounting steep gradients. The trip for tourists from Bar Harbor to the summit of Green Mountain is made, first, by wagons or stages, two miles and a half to Eagle Lake; thence by steamer on the lake two miles; and finally by rail sixty-three hundred feet, in which latter distance the ascent is twelve hundred and seventy feet to the summit, fifteen hundred and thirty-five feet above the sea. While the grade averages about a foot rise in four feet and a half distance, in some places it is as steep as one in three.

Surveys were made, and the work of clearing and grading was begun, in the winter of 1882–83. In April a large force of men was employed, and the road was completed by July 1. The track is not raised on trestle-work, as is the case at Mount Washington: much of it, especially on the heaviest grades, is constructed on the solid ledge. Where the longitudinal timbers, or stringers, rest directly upon the rock, iron bolts one and a quarter inches in diameter, six feet apart, are driven through them into holes drilled in the ledge. Where it is necessary to raise the stringers above the surface in order to make a regular inclination, bed-ties are used every six feet, secured against slipping by two or three one and a quarter inch iron bolts firmly fixed in the rear of each tie. All longitudinal timbers required to bring the line to grade are fastened to the bed-ties with iron bolts of the same size. The timbers and ties in contact with the rock were carefully hewed, and fitted to place. The spruce timber needed for this portion of the work was obtained from a forest-growth on the mountain itself.

The sleepers or ties, six inches square and six feet long, are laid upon the stringers at a distance of two feet from centre to centre, and two seven-eighth inch iron bolts are driven into the stringers, immediately in the rear of each tie, in grooves in the tie, which serve to prevent lateral motion. Upon the ties lie 'T'-rails, joined by fish-plates and bolts, and spiked in the usual way. The rack or cog-rail in the middle of the track is made of two angle-irons which have between them cogs of one and a quarter inch iron accurately rolled to uniform size. This cog-rail is secured to the ties by two lag-screws, five inches and a half long, in every tie, and additional ones at each joint. The rack was manufactured by the Atlantic iron-works, East Boston.

The engine weighs ten tons, and embodies all the improvements suggested by the operation of the White Mountain road. Its entire mechanism is double, — four cylinders, two cog-wheels, and two driving-shafts. Intermediate gearing between the crank-axles and cog-wheels reduces the speed, and increases the tractive force. The cog-wheel axles carry ratchet-wheels with pawls; and either one of these ratchet-wheels, in case of accident to the engine, will hold the train on any grade. In addition, two band-brakes on the smaller shafts may be instantly applied by the engineer. The ascent is made by steam-power; and the engine, when backing down the mountain, is still kept in forward gear, that is, with valves set to go ahead, so that it is constantly pumping air into its boiler; and this air, allowed gradually to escape, exerts an upward tractive force, thus easing the descent.

The floor of the passenger or observation car is adjusted so as to be level on the average grade, and the sides are open to admit of an unobstructed view. The car is always pushed ahead of the engine, and is provided with double hand-brakes, two cog-wheels, ratchet, and pawl, which will easily control the car in descending. CHARLES E. GREENE.

ANTHROPOLOGICAL PAPERS IN PETERMANN'S MITTHEILUNGEN FOR 1883.

IN order to keep pace with the growth of knowledge respecting the natural history of man, one must not neglect the geographical journals. The files of *Petermann's mittheilungen* for the past year will be found quite rich, especially in ethnographic information. The following summary will guide to the most important contributions.

Upon the subject of the variation of climate in the region of the southern Mediterranean and northern Sahara, Professor Fischer of Kiel holds, that, in this locality, a diminution of precipitation has taken place, the influence of which on health, population, and the means of living, is easily conjectured (pp. 1–4).

The subject of marshes, *instabilis terra nec navigabilis aqua*, begetter of pestilence, precursor of fertile