

the difference of temperature between the liquid in ebullition and the condensed liquid. The weight of liquid condensed in unit time is independent of the interior pressure or of the mean temperature during distillation. Analysis shows that the gases have no power of solution on one another. M. Pictet was thus led to an industrial process for rectification of spirits.

GEOGRAPHICAL NOTES

At the meeting of the Geographical Society on Monday, Sir Bartle Frere read what may best be described as a suggestive paper on Temperate South Africa as a route to the Central Equatorial Region. After defining the temperate region as the vast tract of country extending to Cape Frio on the Atlantic coast and to the mouth of the River Tugela on the opposite side of the continent, and giving a brief account of its geography, &c., Sir Bartle addressed himself chiefly to the task of pointing out how it could be made available as a base of operations in exploring the country north of the Zambesi, and suggesting agencies which might be turned to account for the extension of geographical knowledge. These agencies are the traders and hunters, who have a wide acquaintance with many regions otherwise unknown, and missionaries of various denominations. The latter have no less than eighty-four fixed stations beyond the colonial boundaries, manned by 812 Europeans, many of whom are highly-cultivated and intelligent men, and have great opportunities for acquiring geographical information. Sir Bartle Frere also hoped that the Council of the Society might see their way to urging the Government to undertake a proper survey of the coast-line, as well as of the interior of the five colonies.

At the meeting of the Berlin Geographical Society on November 6 the safe arrival of Dr. Lenz at Timbuctoo (by a route not before taken by any European) was announced. Two of his followers were lost in the desert, and two had gone back. Dr. Stecker (who lately went to Massowah with Herr Rohlf's) will, according to circumstances, either push through the Galla regions or to the East coast, or to the Great Lakes. Major v. Mechow reached a town on the Quanza, in the territory of the Hollo, about 200 km. from Malange on July 19, after great difficulties, especially in carriage of the boat. The natives were friendly throughout. A little above the place reached are the two last falls of the Quanza, between which is the mouth of the Cambo. The Major seems to have been the first white to visit these waterfalls. He was going to Löpfung with a view to determine the course of the Quanza. Dr. Pogge and Lieut. Wissmann were also travelling in that region the same month, intending to reach Mussumba, the residence of the Muata Jambo; Dr. Pogge's object is to establish stations in the interior. Lieut. Wissmann will make journeys for topographical and collecting purposes. The Italian traveller, Dr. Matteucci, is seeking to reach Bornu from South Dar-For, going round Wadai and Bagirmi. *Inter alia* the Society resolved to memorialise the German Government to take part in the international project of systematic Polar investigation.

At the sitting of November 19 of the Société de Géographie of Paris M. Zweifel received the palm of Officer of the Academy as a reward for the discovery of the sources of the Niger, in company with M. Marius Moustier. The laureate declining to speak himself, an address was delivered on behalf of him and his companions by Dr. Harmand, the well-known explorer of Cochin China. It appears that MM. Zweifel and Moustier saw a granite rock from which the powerful stream takes its rise; but they were not admitted to the site, owing to the high priest of Tembi Saleh, who inhabits an island situated on a small lake formed by the stream at a very few miles from its source. So something more remains to be done to complete the work begun by Laing, Reade, and Blyden.

SIR ALLEN YOUNG leaves England next month in his yacht, and will visit, among other places, the Canary Islands, a portion of the West Coast of Africa, and St. Helena, extending his voyage as far as the Cape, where he will make preparations and inquiries for a projected expedition of discovery to be undertaken by him to the Antarctic regions. It will be remembered that the *Erebus* and *Terror*, commanded by Sir J. Ross and Capt. Crozier, penetrated in 1841 to 78° 4' S., a latitude which has never been reached before or since.

THE November number of *Petermann's Mittheilungen* has a long paper by Spiridion Gopčević, containing his ethnographical

studies in Upper Albania. A very fine map embodies the important results of Severzov's exploration of the Pamir in 1878, with accompanying text, followed by an account of Lieut.-Col. Pjevzov's journey through Mongolia in 1878-9, to Kuku-Choto and Kalgan. A summary is given of the Arctic work of 1880, followed by the usual monthly notes.

THE first *Bulletin* of the recently-formed International Geographical Institute at Berne consists of a programme of the projected Italian Antarctic Expedition under Lieut. Bone, which is to leave Genoa in March 1881. A sketch is given of what has been previously done in this region, showing that the field is practically virgin so far as scientific work is concerned. The programme of the Italian expedition is very comprehensive, and the ultimate object is to pave the way for the establishment of an Antarctic observing station.

No. 3 of vol. iii. of the *Deutsche geographische Blätter*, the organ of the Bremen Geographical Society, contains the continuation of the unfortunate Dr. Rutenberg's journal in Madagascar, and the lecture given at the Danzig meeting of the German Association by Dr. Neumayer on "Polar Expeditions or Polar Research?" To the latter able lecture we referred last week, the point insisted on being that while the two are perfectly congruous, the former should be subjected to the latter, which must be carried out on the system of Polar observatories advocated by Weyprecht, and to which nearly every civilised nation adheres except England.

THE new number of the Marseilles Geographical Society's *Bulletin* contains a very voluminous account by Messrs. Zweifel and Moustier, of their expedition to the sources of the Niger. This memoir is illustrated by a map showing their route, and supplemented by an appendix containing information as to the natural resources of the country traversed, the races of the interior, &c.

THE last part of *Le Globe* contains a paper (with map) on the Island of Cyprus, by M. Paul Chaix, and some account of recent researches in the Pamir, furnished by M. Veniukoff.

IN the current number of *Les Missions Catholiques*, M. Armbruster has commenced a series of papers on Corea, drawn from information furnished from time to time by the Romish missionaries, the only Europeans who have ever had any opportunity of acquiring a real knowledge of the interior.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—The preliminary examination in the Natural Science School begins on Monday next, November 29. The Final Honour School begins on Monday, December 6.

The Brakenbury Scholarship in Natural Science at Balliol College has been awarded to Mr. William Stroud, from Owens College, for proficiency in physics and chemistry. *Proxime accessit* Mr. A. D. Hall, from Manchester Grammar School. Mr. J. J. Hart, Manchester Grammar School, and Mr. J. E. Marsh of Balliol, are honourably mentioned.

ON A METHOD OF DETERMINING THE CRITICAL TEMPERATURE FOR ANY LIQUID AND ITS VAPOUR WITHOUT MECHANISM*

A PIECE of straight glass tube—60 centimetres is a convenient length—is to be filled with the substance in a state of the greatest purity possible. It is to contain such a quantity of the substance that, at ordinary atmospheric temperatures, about 3 or 4 centimetres of the tube are occupied by steam of the substance, and the remainder liquid. Fix the tube in an upright position, with convenient appliances for warming the upper 10 centimetres of the length to the critical temperature, or to whatever higher or lower temperature may be desired; and for warming a length of 40 centimetres from the bottom to some lower temperature, and varying its temperature conveniently at pleasure.

Commence by warming the upper part until the surface of separation of liquid and steam sinks below 5 centimetres from the top. Then warm the lowest part until the surface rises

* By Sir William Thomson, British Association, Swansea, Section A. Tuesday, August 31.