ing of cotton cloth, etc., is attracting a great deal of attention from both the scientific and the practical side. A very favorable opinion was lately expressed upon it at the Society of chemical industry. The process consists essentially in electrolyzing a solution of magnesium chloride, thus liberating the active agent of chlorinated lime; and, as it is easy to maintain the solution at constant strength, it is found that the consumption of chlorine is only one-half that on the ordinary system. The fundamental industrial equation of economy shows that the mechanical work represented by 570-horse power spent upon a dynamo-machine will produce the equivalent of ten hundredweight of bleaching-powder ('chloride of lime') per hour, or a 50-horse-power engine would give one ton per day of twenty-four hours.

Since Mr. Castner's paper upon his process for manufacturing sodium and potassium was read at the Franklin institute of Philadelphia (Oct. 12, 1886), several changes have been made in the method of manufacture. These were recently brought before the London section of the Society of chemical industry by Mr. James Maclear. With caustic soda at eleven pounds per ton, the sodium produced costs less than twenty-five cents per pound, the cost of materials and fuel being only seventeen cents. The steel crucibles employed have been used fifty, and probably can be used a hundred and fifty or two hundred times: hence the 'tear and wear' on them amounts to not more than two cents per pound of sodium. Cheap sodium, it need scarcely be mentioned, means cheap aluminium (by Deville's process), which, with sodium at the above price, can probably be produced at four dollars per pound, or one-fourth its present value.

The conditions affecting the distribution of micro-organisms in the atmosphere were the subject of a paper at the Society of arts three nights ago, by Dr. Percy F. Frankland, son of the distinguished chemist. The method of observation was Hesse's, in which a given volume — usually ten litres — of air is slowly drawn through short wide tubes coated internally with a solid layer of sterile gelatine-peptone. The maximum number in the same place observed through the year, occurred early in August. Elevation above ground, and distance from human habitations, decreased the number. In sea-air, for example, at one hundred and twenty miles from land, there was only one organism to ninety-three litres. In considering his paper, the author expressed a decided opinion that it was the chemical side of bacteriology which imperatively demanded attention at present. The chairman, Prof. Burdon Sanderson, adjourned the discussion for a week, when it will be opened by Dr. Alfred Carpenter.

The government, which was recently approached on the subject, has just agreed to make an annual allowance of eight thousand dollars per year to the youngest of English universities, the Victoria, whose headquarters are at Owens college, Manchester. The success of this application will encourage the promoters of government aid to the university colleges throughout the country, now languishing for want of funds.

The Institution of naval architects, and the scientific ship-building industry generally, have just sustained a severe loss by the death of Mr. William Denny of Dumbarton. Throughout his too brief career, the influence upon him of Mr. William Froude, F.R.S., was very marked. The scientific department which he established in his own yard at Dumbarton, on the Clyde, was the first of its kind in a private ship-building yard, and the façade of its great experimental tank (300 feet by 22 feet, with 9 feet of water) was erected to Mr. Froude's memory. Mr. Denny was the first to use mild steel for the construction of transatlantic steamers, in 1879. His most famous paper probably was that on the difficulties of speed calculation, in 1874–75, and his last was in 1884, on 'Cross-curves of stability.' In 1882 he delivered the 'Watt anniversary lecture' at Greenock, on 'The speed and carrying of screw steamers.' W.

London, March 26.

GEOGRAPHICAL NOTES.

Asia.

The latest letters of the enterprising Frenchmen MM. Capus and Bonvalot, who are trying to reach India from Samarkand, are of considerable interest. The latest are dated Jan. 13 and Feb. 23, 1887. They started from Samarkand for Bokhara on Sept. 13. Near Samarkand they traversed the extensive plantations of General Korolkof, who has, by irrigation, brought under cultivation an extensive area of barren country on both sides of the Kara Tepe. Over the difficult passes of Takhta-Karacha and Lahore Murda the travellers reached the valley of the Sangardak. All this district is inhabited by the Uzbegs and Tajiks. After a few days they reached the plain of Hissar. This district produces rice in great quantities and of exceptionally good quality. The town is very unhealthy, and in summer the whole population moves to Karatagh. The travellers then descended the unexplored valley of the Kafirnahan to its confluence with the Amu-Darya. In this valley,

which is everywhere covered with an efflorescence of salt, there are many settlements of the Uzbegs, which are situated on the rich alluvial ground at the bends of the river or on its islands. They followed the Amu-Darya, and, after having made some excavations at Termez, crossed it at Chushka Guzar into Afghanistan. Here they were made prisoners, and, after being detained for twenty-five days, sent back across the frontier. They resolved to return to France, but, on learning that caravans starting from Kashgar go sometimes in winter to Ladak or Le, they decided to take this route. They intend to cross the Pamir, starting from Gulcha. After having reached the Kara-Kul, they will follow the river Akbaïtal, and endeavor to reach Kunjut. Though the passage of these deserts — which are at an elevation of from thirteen to sixteen thousand feet — in winter is very difficult, they will at this season avoid being hindered in their progress by the inhabitants.

Africa.

Rev. George Grenfell, the successful explorer of the Kongo basin, has ascended the Kwango in the Baptist missionary steamer Peace, and reached Kikunji Falls, the place where von Mechow, who came from the south, was obliged to turn back. About six miles from the junction of the Kasai with the Kwango he found another large tributary, the Juma, entering the river from the east, which presented so large a volume of water that it was a matter of uncertainty which was the larger stream. Probably this river is identical with the Kulu of the maps. He ascended the great bend of the Kwango, which comes back to its northerly course at latitude 4° 30′ south. The Kikunji Falls are about three feet high, and, though insurmountable for the Peace, are said by Mr. Grenfell to be no obstacle to communication by canoes and small craft (*Proc. Roy. geogr. soc.*, April, 1887).

The last number of the *Antananarivo annual and Madagascar magazine* (Christmas, 1886) consists, besides a reprint of Mr. A. R. Wallace's chapter on the fauna of Madagascar, mainly of papers on linguistic topics and on Malagasy folk-lore. M. Grandidier's paper on the channels and lagoons of the east coast of the island is translated, with some interesting remarks by Mr. Sibree appended. Mr. Sibree points out that it would only require about thirty miles of canals to connect all these lagoons, and so create a safe and extensive internal water-way of the greatest commercial value. The Rev. W. Montgomery contributes a paper on the Malagasy game of 'fanerana,' in many respects resembling chess (*Nature*, March 24).

America.

The field-work of the geological survey of Newfoundland in the year 1886 included a survey of the Bay of Exploits, which was made by James P. Howley. Of late years the services of the survey have been devoted chiefly to blocking off land for agricultural purposes. Most of its geographical work is still in manuscript, and has never been published at all. It includes surveys of Notre Dame, St. George's, and Port a Port bays, surveys of all the principal rivers of the islands, and triangulations of the larger lakes.

Fontana has published a report on his expedition in eastern Patagonia. Soon after his appointment as governor of the territory of Chubut, the Welsh colony in the lower valley of the Chubut River, invited by reports of the fertility and gold-mines of the Andes, organized an expedition for exploring the valleys of the Andes, and offered the leadership to Fontana. The party ascended the river Chubut, which flows through the desolate plains of eastern Patagonia. As its upper course runs almost parallel with the Andes, they ascended the Charmate, one of its tributaries, and then struck west. After a ride of a few days they reached the fertile valleys of the Andes, and came to the Rio Corcovado, which runs west to the Pacific Ocean. As the confluence of the Chubut and Charmate is only 1,800 feet above sea-level, and the point where they reached the valley of the Corcovado 1,600 feet, it is evident that the Andes do not form a continuous chain of mountains, but that they are intersected by deep valleys. Farther south the Strait of Magellan, the Rio Santa Cruz, Rio de los Huemules, and Rio Aysen indicate valleys that cut across the whole width of the mountains. As the land was so heavily timbered as to hinder the progress of the party, they returned to the Charmate. From here they went south, and passed the watershed between the Senguel and the Chubut. After having reached the Senguel, they ascended it, and it is here that Fontana made his most important discovery. In latitude 45° south, close to the source of the Rio Aysen, he found a large lake, through which the Senguel flows. He was prevented from following its upper course, as the woods were too dense. He therefore returned, following the Senguel, which flows through a swampy valley, bordered on its southern side by desolate hills, on its northern side by volcanic mountains, the colors of which are as manifold and glaring as those of the Painted Desert. This expedition will probably lead to the establishment of a colony on the Corcovado, or Lake Fontana, as the newly discovered lake has been called, by the enterprising Welsh

colony of the lower Chubut (*Deutsche geogr. Blätt.*, 1887, No. 1).

Australasia.

Admiral von Schleinitz, governor of the German possessions in New Guinea, is continuing his explorations on the coasts of New Guinea and the neighboring islands. In October, 1886, he explored the coasts of Huon Gulf, where he found several navigable rivers. The coast consists of archaic and metamorphic rocks. In November the coast from Iris Point to Cape della Torre was surveyed. The results of these observations have been published in the *Nachrichten aus Kaiser-Wilhelm-Land und dem Bismarck Archipel*, 1887, Nos. 1 and 2.

Mr. Vogan, the curator of the Auckland museum, intends to cross south-eastern New Guinea from Freshwater Bay to Huon Gulf as soon as the rainy season is over (*Proc. Roy. geogr. soc.*, April, 1887).

Oceans.

The methods and results of Lieut. J. E. Pillsbury's researches on deep-sea currents in the Straits of Florida (Appendix 14, *Coast and geod. surv. report for* 1885) are very interesting. They were carried out on the steamer Blake, at five stations between Gun Key and Cape Florida. By an ingenious arrangement, Pillsbury contrived to anchor at a depth of almost five hundred fathoms, and was thus enabled to measure the currents by a revolving meter. For a description of the apparatus we refer to the original paper. As the time allotted to the work was not long enough to make exhaustive researches, and the state of the weather was frequently too bad for anchoring in deep water, the observations are rather irregular. The results are very valuable, and we are glad to learn that the researches will be continued. The strength of the current is influenced by the tides; and the principal maximum, which occurs about four hours before the meridian passage of the moon, is very distinct. The fluctuations of the curve are so irregular, however, that it is hardly possible to plot the observations for determining the axis of the current and its strength in various depths. It appears that the greatest intensity of the surface current is near the west shore, while the current at a depth of a hundred and thirty fathoms is strongest in the middle of the strait.

Lieut. A. de Gueydon has constructed an apparatus similar to that used by Lieutenant Pillsbury, but far more complicated, which he has tested by measuring the currents of the Bosporus. It is described in the *Revue maritime et coloniale*, November, 1886. The results of his observations confirm those obtained by Makarof (*vide Science*, ix. 301). He found during calms and prevailing north-easterly winds a surface current of ninety feet depth setting from the Black Sea to the Sea of Marmora. At Constantinople a smaller arm branches off, which sweeps along the south side of the Golden Horn, and forms an eddy, returning on the north side, and again reaching the Bosporus at Top Hane. This current reaches to the bottom. Sudden changes in its velocity are very frequent. Under the main surface current, Gueydon found the well-known undercurrent running from the Sea of Marmora to the Black Sea.

In the *Annalen der Hydrographie*, 1887, No. 3, G. Karsten discusses the observations on the ice of the harbor of Kiel, the most important station of the German marine in the Baltic. During the thirty-eight years over which the observations extend, the harbor was frozen up seventeen times, the mean duration of the ice-sheet being thirty-four days; the maximum, seventy-one days. The ice forms most frequently in January. In the beginning of winter the warm concentrated water of the German Ocean, which enters the Baltic, delays the formation of ice, though the temperature of the air may be low. As soon as an easterly wind sets in and carries less concentrated cold water of the Baltic into the bay, an ice-sheet is formed.

General.

The publication of the *Zeitschrift für wissenschaftliche Geographie*, which was discontinued some time ago, has been resumed by Dr. J. I. Kettler. The first number for 1887 contains, among other papers, an article by O. Krümmel on surface temperatures of the ocean, and one by H. Reiter on the Antarctic question.

NOTES AND NEWS.

THE chemist of the Massachusetts state board of health has recently analyzed a large number of so-called temperance-drinks, and has found that all of them contain alcohol, one of them containing as much as 44.3 per cent. Several of them contain more than 40 per cent, and a very large proportion more than 20 per cent. One of these is said by its manufacturer to be "a purely vegetable extract, stimulus to the body without intoxicating." "Inebriates struggling to reform will find its tonic and sustaining influence on the nervous system a great help to their efforts." This preparation was found to contain 41.6 per cent of alcohol.

— The Boston *Medical and surgical journal* contains the history of six cases of poisoning from the arsenical wall-paper of a single room, extend-