made of the fibres of the agave. The men and the women live in separate houses, and are never allowed to be in one room. The man takes his meals on a stone, between his house and that of his wife. They eat little meat, but live principally on vegetables, which are grown in small gardens. Though many of them have become Christians, they still adhere to their old religious feasts and dances, which they perform at the celebration of the saints of their villages. Each tribe has its peculiar dances, which are accompanied by two kinds of flutes, marimbas, and rattles. Sievers states that they believe a woman, by the name of Inhimpitu, to have been the mother of the ancestors of their gentes. These ancestors created the earth, the houses, the sun, — which formerly was buried in the ground, — the moon, and the stars. Takina is their principal place of worship. Here rows of stones are found, with interplaced granite bowlders. A wizard watches this place, which no Spaniard is allowed to visit. In a small temple, and two huts which stand near by, various utensils used in the worship are kept, — drums, flutes, masks, rattles, and tripods made of wood. Under one of the large bowlders is the grave of a wizard, to whom they give offerings. The wizards cause disease by throwing spiders, scorpions, or lizards into the bodies of their enemies, and cure the sick by extricating the cause of the disease. They are not allowed to eat any salt. During the great festivals, which are celebrated in January, the Indians must abstain from the meat of domesticated animals. At Masinga, on the upper Manzanares, there are large ruins of a temple, and long, remarkably straight roads leading to it. Ancient roads are found in many parts of the Sierra, and are frequently used for the construction of modern roads. A grammar of the language of the Arhuaco, the Köggaba, has been published by R. Caledòn ('Gramatica de la lengua Köggaba,' Paris, 1886).

E. T. Hamy believes that the sinuous line which is found on one of the monuments of Copan, in Honduras, is identical with the Chinese Taï-Ki (*Journ. anthrop. inst.*, February, 1887). Though these figures closely resemble one another, both consisting of two semicircles lying in opposite directions and touching each other, this is no proof of a common origin and identical meaning. The Chinese symbol represents two opposite principles, — the active and passive spirits, the masculine and feminine, light and darkness. The conclusion drawn from the similarity of ornaments occurring in widely separated regions, upon the identity of their symbolic meaning or their common origin, is fallacious.

Chaffanjon, who is exploring the upper Orinoco, found at Ature, in a cave of the Cerro de los muertos, the burial-place of the Piaroas. The corpses and those objects which had been most valuable to the deceased are put into a kind of basket, or into a cylinder made of twigs arranged in parallel lines round the body and tied together. Most of them are covered with stones to keep them from being disturbed. In the cave of Arvina, in Cerro Saloajito, Chaffanjon found vases differing in style from those which Dr. Creyaux found at Maipure. On the rocks of Cerro Purtado he found large sculptures. From his observations on these inscriptions he concludes that extraordinary means and a long time were required for making them. These petroglyphs seem to be of frequent occurrence in those districts. Recently A. Jahn found several in the Loma de Maya, west of Caracas. One of them is figured in the *Zeitschrift für Ethnologie* (1886, p. 371). The commission for determining the boundary between Brazil and Venezuela found others on the left bank of the Guainia, between Solano and Buena Vista. Similar rock inscriptions are found below Maroa, near San Gabriel, Itapinima, and at other places, and, according to W. Sievers, on the upper Manzanares. Chaffanjon studied the dialects of the country he traversed, and collected extensive vocabularies of the Baniba, Piaroa, Guahiro, Puinabe, Piapoco, and some of their grammatical elements. All of these belong to the same stock.

GEOGRAPHICAL NOTES.

Europe.

The government of Roumenia plans a triangulation of that country. As the basis of the present maps is founded on the reconnaissance made by the Austrian army during the occupation of Roumenia in 1855, a thorough survey is very desirable for completing our knowledge of the topography of Europe.

Asia.

The following notes on the work of the Indian survey are taken from *Petermann's Mittheilungen*. Besides the regular reports, the annual report for 1884 and 1885 contains the results of expeditions made in the countries adjoining India. Col. R. G. Woodthorpe visited the western head waters of the Irawadi, — the Nam Kiu. He followed the Dihing, a tributary of the Brahmaputra, to its sources, crossed the Phungan Mountains at the Chaukan Pass, and reached, south of the farthest point reached by Wilcox in 1826, the Nam Lung, which he descended to its confluence with the

Nam Kiu. After a visit to Padao, the capital of the Bor Kamti, he retraced his journey, following the Turong, which is the principal source of the Kyendwen. The map showing the results of this journey is contained in the January number of the Proceedings of the Royal geographical society. The amount of rain falling in the mountains crossed by Woodthorpe explains the enormous quantity of water carried by the Irawadi. Col. H. C. B. Tanner tried to enter Tibet, but was prevented from carrying out his intention by the Tibetan boundary post at Purang Jong. He explored some parts of Bhutan, and had the foot of the Kinchinjinga surveyed. The Indian survey plans the publication of maps showing the countries adjoining India. These 'Trans-frontier of India sheets,' which will be on a scale of an inch to eight miles (1 : 506,880), will consist of four parts: 'North-western trans-frontier,' including Beluchistan, Afghanistan, Turanian states; 'Northern trans-frontier,' including East Turkestan and western Tibet; 'North-eastern trans-frontier,' including eastern Tibet as far as Yun-Nan; and 'South-eastern trans-frontier,' including Burma and western Siam. These maps will embrace the Indian surveys, the results of which have not been made public, on account of political reasons, and a critical review of the whole available material. It is proposed to extend the work to western Persia, Asia Minor, and Arabia.

Africa.

G. A. Krause, whose arrival at Mosi was announced a few weeks since, has proceeded by the way of Duensa to Safaram on the upper Niger. He intends to follow the river to Kabara, the port of Timbuktu. As Krause travels undisguised, as a Christian, he expects to find some difficulties at Massina on account of the fanaticism of the Fulbe.

Upon his return to Berlin, a reception was tendered to Dr. Junker by the geographical and anthropological societies. Junker gave a brief sketch of his six years' travels in Africa. In January, 1881, he went from Suakin to Khartum, whence he ascended the Nile by steamer to Meshera. From there he travelled to Ndorumo, where he established a station in May, 1881. He described his explorations south and west of Ndorumo, in the unknown district drained by the Welle and its tributaries. He made large ethnological collections among the Mang-Battu (Schweinfurth's 'Mombuttu'), which he sent by his companion Bohndorf to the Bahr-el-Ghazal. Unfortunately these were lost. The progress of the Mahdi prevented Junker's return, so he went to Ladò to Emin Bey, expecting to meet a steamer going north. The Emir Karam had sent them notice of the capture of Lupton Pasha, governor of the province of Bahr-el-Ghazal, and in January, 1885, they learned of the loss of Khartum. Later on, the Mahdi attacked Emin Bey, and took Amadi, which is only five days distant from Ladò. For some unknown reasons, however, he retreated. Dr. Junker then returned to Europe, starting from Wadelai.

America.

The proposed field-work of the Canadian geological survey for the coming season includes an extensive topographical and geological survey of the upper Yukon, of which Mr. George M. Dawson will be in charge. It is proposed that one branch of the expedition shall proceed through the valley of the Stakeen River, cross the summit of the Rocky Mountains, and ascend the Liard River. Here they will pass the watershed between the Yukon and Mackenzie, and descend Pelly River. At Fort Selkirk, where the Pelly River joins the Yukon, they will meet the other branch of the expedition, which will proceed from Chitlkat Inlet (Lynn Fiord) to the head waters of the Yukon. From Fort Selkirk, short expeditions will be made up the branches of the Yukon, on both sides, and down the main stream. W. Ogilvy, who will be in charge of this branch of the expedition, will remain in the district during the winter of 1887, but Dr. Dawson will return next fall by the route of Lynn Fiord. We are indebted to Dawson for his explorations in Vancouver Island, Queen Charlotte Islands, and the Rocky Mountains of British Columbia; and we may expect that the proposed exploration, carried on under his skilful management, will be successful, and glean valuable results in the vast unknown north-western territories. It must be regretted that a survey of the boundary between Canada and the possessions of the United States cannot be undertaken at the same time, as both expeditions would help and further one another.

The French hydrographical office has published a map of the Cape Horn Archipelago and the Beagle Channel, from the surveys made by the steamer La Romanche during the years 1882 and 1883, when a polar station, according to the international plan, was established in Orange Bay. The map contains many important corrections of the coast-line.

The Instituto geografico Argentino has issued the first sheets of the 'Atlas de la Républica Argentina,' edited by Dr. A. Seelstrang. The basis of the atlas are the surveys of the land-office, railroads, and boundary commissions. It will consist of thirty sheets, each province being represented on a scale of 1 : 1,000,000.

Polynesia.

The eruption of Mauna Loa has almost entirely ceased, although steam is still issuing from fissures along the mountain-side. The activity in the crater of Kilauea, more particularly in Halema'uma'u (*vide* map in *Science*, ix. 181), is constantly increasing.

Polar regions.

The well-known Scotch whaler David Gray of Peterhead, who tried to find a new whaling-ground in the sea surrounding Franz-Josef Land, has failed to reach those islands, as the pack-ice extended far south, and was so closely packed that he was unable to enter it.

Mr. Alexander McArthur has returned from his 'trip to the north pole,' after having reached York Factory, and has given up his plans of proceeding by the Hudson Bay route.

NOTES AND NEWS.

The Journal of the science college of the Imperial university of Japan, the first part of which has just made its appearance, may be regarded as a continuation of the scientific memoirs which have been from time to time published by the Tōkyō university. This journal is intended to be the journal through which the world at large may receive Japan's own contributions to the progress of science. One unique feature which will be apparent at once has regard to the language or languages in which the various papers are to be presented. Each contribution must be written in one of the three languages, English, French, or German, the choice being left entirely to the author. The necessity for this tri-lingual character springs, of course, from the very peculiar but well-known condition under which science has been cultivated in Japan and by the Japanese. The appearance of this journal is a strong commentary on the advance in culture in Japan, which, from being a country depending on the culture of foreign parts, is now beginning to return the debt.

— Our readers who are interested in astronomy will find an excellent guide for first explorations of the constellations in an illustrated article by Mr. G. P. Serviss ('Astronomy with an opera-glass — the stars of spring'), contributed to the *Popular science monthly* for April.

— A state board of health has just been organized in Vermont, making twenty-nine states which now have state boards.

— The *Medical record* quotes Dr. Mackenzie as being of the opinion that American catarrhs are largely due to the dust, and says that it is not unreasonable to believe that the tremendous clouds of unsterilized earth which are driven into the faces of our city's population during this season have something to do with the excess of coughs and colds and the high mortality-rate during this period, which in some years is exceeded only in the hot months of summer.

— An experimental passenger-train, lighted throughout by electricity, and heated by steam from the engine, now runs between New York City and Boston. Each car is illuminated by eighteen 16-candle glow-lamps, the current being derived from storage-batteries hung beneath the floor-timbers, charged for ten hours by dynamos. Both light and heat are said to be ample; and danger from fire, in case of accident to the train, is much lessened, if not almost wholly done away with.

— Messrs. Estes & Lauriat, Boston, announce for early publication, 'Key to North American birds,' third revised edition, by Elliott Coues; also 'Key to North American birds,' sportsman's and tourist's edition.

— Among recent numbers of the Van Nostrand science series, we note the following: 'Petroleum, its production and use,' by Boverton Redwood, a reprint from the Journal of the Society of arts, London, with the omission of such portions as would seem to be of little or no interest to American readers; 'Leveling, barometric, trigonometric and spirit,' by Ira O. Baker, prepared originally as a part of the author's lectures on geodesy, given in the University of Illinois; 'Analysis of rotary motion, as applied to the gyroscope,' by J. G. Barnard, a reprint of the analytical exposition of the motions of the gyroscope, written by General Barnard in 1858 for the *Journal of education;* 'Beams and girders, practical formulas for their resistance,' by P. H. Philbrick, which aims to deduce general formulas for the resistance of beams and girders, applicable to all cases, and to set forth truly practical formulas so far as seemingly required in the use of existing forms and sections; 'Compressed gun-cotton for military use,' by John P. Wisser, a translation of the work of Lieutenant von Förster, with additions giving an outline of the present process of manufacture and a summary of the properties of the best form now produced.

— The fish commission will send the steamer Albatross to the Pacific coast next fall, to remain several years, and will make a thorough investigation of all matters relating to food-fishes. The cod, halibut, and other food-fishes are caught in the Pacific; but little is known of their distribution, and the fisheries have not been developed. The Albatross will also make investigations in the Gulf