some Moquivitares Indians for guides. They are the neighbors of the Guaharibos, who occupy the district of the sources of the Orinoco. The latter are very much feared by the whites, as they murder everybody who tries to enter their country. Chaffanjon hopes through the help of his Moquivitares friends to be able to gain their confidence and accomplish his purpose. On his way to San Fernando he made interesting linguistic and archeological researches.

Oceania.

It is stated by *Nature* that the lake district in New Zealand is showing signs of fresh disturbances. Tremors have been felt at Rotorua, and Tarawera has emitted dense volumes of steam. The Wahanga Peak appeared most active. No fire was visible, and after this outburst everything quieted down again.

On the 15th of January a new volcanic eruption took place on Hawaii.

Oceans.

The Proceedings of the Royal geographical society for December, 1886, contain an interesting paper by J. Y. Buchanan on 'Similarities in the physical geography of the great oceans.' The author mainly discusses three important oceanographical problems, — the equatorial current, the equatorial counter-current, and the rising of cold water near the coasts of continents. Buchanan describes the influence of the evaporation which takes place in the region of the dry and warm trade-winds and monsoons. The water which gets warmer but more concentrated sinks under the colder layers of less concentrated water, and thus becomes a medium of transportation of heat into the deeper strata. As this warm water is moving west, it reaches its greatest depth in the western parts of the oceans. As corals are confined to regions of warm water, they principally live in the same area. While the region of the equatorial current has water of great density, the equatorial counter-current has lighter water, and wherever the velocity of the eastern current is increasing, its density is decreasing. Buchanan does not give an explanation of the origin of the counter-current. His observations on the density agree with the well-known fact that the current lies beyond the belt of trade-winds which effect a rapid evaporation. The mechanical cause of this current remains still doubtful, though it seems probable that the equatorial current is its principal cause. Buchanan's remarks on the rising of cold water near the coasts of continents are of great interest. Formerly the existence of cold water was considered a sufficient proof for the existence of cold currents. Recent researches, however, make it probable that in such places cold abysmal water rises from the adjoining depths. Buchanan shows on a map that the cold water is principally found on windward coasts of the oceans, where the currents are flowing from the continent. The loss of water in these regions is made good by the rising cold water. The January number of the *Annalen der hydrographie* calls our attention to the fact that wherever a current is deflected from a coast, it attracts the adjoining water. It depends on the configuration of the ocean whether the abysmal water or that of the adjoining surface takes the place of the water that is carried away by the current. The rotation of the earth is the principal cause for the deflection of the currents and the consequent rising of the cold water. Every coast-current in the northern hemisphere is deflected to the right, in the southern to the left, and in all these places cold water may be observed.

General.

The February number of the *Scottish geographical magazine* contains a paper by John Murray on the total rainfall of the globe, and its relation to the discharge of rivers, accompanied by a map showing the distribution of annual rainfall. According to Mr. Murray, 2,243 cubic miles of rain fall annually on areas with inland drainage. Such areas extend to 11,486,350 square miles. The land draining directly to the ocean has an area of 44,211,000 square miles. If from this quantity we subtract all areas having less than 10 inches of annual rainfall, we get 38,829,750 square miles. The mean discharge from this area into the ocean is 6,569 cubic miles annually. The total weight of substances carried by this means to the ocean is rather more than 5,000,000,000 tons each year.

NOTES AND NEWS.

THE cholera epidemic is now declining in the Argentine Republic, having entirely disappeared from Cordoba. It still prevails in Montevideo, and has recently broken out at Frey Benitos, where the Liebig company has its slaughter-houses and factories for the preparation of the extract of meat. The La Plata River is closed to navigation on account of the epidemic. Although cholera has declined in the interior of the Argentine Republic, there is no change in the city of Buenos Ayres. There is no news from Paraguay, but it is learned from the Brazilian province of Matto Grosso that cholera is doing great havoc there. At Corumbá the people are terror-stricken and have fled into the interior. Fear is now enter-

tained that these refugees may spread the cholera into Goyaz and possibly into the Amazon region and to Pará.

— Following a period of apparent stagnation, due to the final arrangements as to site, programme, details of building, and the laying-out of the grounds, advices from the headquarters of the directors of the Paris jubilee of railways state that activity now prevails on the grounds, and that the palace and equipment will be ready for the opening in May.

— Messrs. Ticknor & Company announce for publication, on Friday, Feb. 25, 'The life and works of Giordano Bruno,' a new volume of the English and foreign philosophical library; 'The course of empire,' being outlines of the chief political changes in the history of the world, arranged by centuries, with variorum illustrations, by C. G. Wheeler, author of 'Familiar allusions,' with twenty-five maps; and 'Familiar allusions,' a handbook of miscellaneous information, including the names of celebrated statues, paintings, palaces, country-seats, ruins, churches, ships, streets, clubs, natural curiosities, and the like, by William A. Wheeler and Charles G. Wheeler.

— At a late meeting of the New York academy of medicine, Dr. J. H. Girdner read a paper on the methods of detecting and locating metallic masses in the human body by the induction balance and the telephonic probe. He referred to the apparatus which had been constructed by Professor Bell for the purpose of locating the bullet in the case of President Garfield, and said that it had failed because at the time the patient was lying on a metallic mattress, which interfered with the working of the instrument. Now we have an apparatus which will detect and locate any piece of metal, wherever situated in the human body. In the construction of the induction balance a bichromic battery is used, with six cells, and an ordinary interrupter, the interruptions being about six hundred to a second. The exploring coils were put in a framework of wood, which Professor Bell called the 'explorer,' while to the others the name 'adjusting coils' was given. Thus in the primary current were two coils, in the secondary current were also two coils, and in the circuit was a telephonic receiver. When the exploring coil was not in relation to a metallic substance, there was silence in the telephonic receiver; but, as the explorer approached or receded from the metallic mass, the balance was disturbed, producing a musical tone in the receiver. The sound is distinct six inches from the metal, if located in the human body. The telephonic probe consists of a telephonic receiver and two wires,—one terminating in a long, slender steel probe; and the other with a steel plate laid over the surface of the body in the neighborhood of the metallic mass, as determined by the induction balance. The steel probe being now plunged into the body, as soon as it reaches the metal a distinct click is heard. The practical working of the instrument was shown by locating a bullet in the chest of a soldier wounded during the civil war. A piece of lead was also recognized in the centre of a piece of beef.

— Sir J. William Dawson will prepare a volume for the International scientific series on the subject of the development of plants in geological time.

— The article by Prof. N. S. Shaler of Harvard, on 'The stability of the earth,' in the March *Scribner's*, will be accompanied by very numerous illustrations, which throw light upon the subject of earthquakes and other movements of the earth s crust.

— The persistence with which surgeons continue to employ chloroform as an anaesthetic in surgical operations, notwithstanding the overwhelming evidence of its danger, is beyond comprehension. We have called attention to this subject whenever deaths have resulted from this cause, and the number of such events has been considerable. Another has just occurred in Philadelphia. A lion-tamer in the service of Forepaugh had one of his fingers bitten by a colored man, and in the course of his treatment chloroform was administered. It is said that he died upon the table while still under the anaesthetic.

— Lieutenant Emory will sail early in March, in command of the Thetis, one of the Greely expedition relief-ships, for the Alaska coast.

— The U. S. fish-commission steamer Albatross is being fitted with new boilers, and will sail in the spring for her work on the Pacific, where, among other questions to be solved, will be that of the fish-bearing properties of the huge Kiu Sawa or Black Stream of Japan, which, crossing the Pacific in a high latitude, modifies the temperature and climate of Alaska and the Aleutian Archipelago in very much the same way that the Gulf Stream does the climate of England and the Shetland Islands.

— Dr. Gabriel E. Manigault of Charleston, S.C., has accepted the invitation of the geological survey to write a descriptive account of the incidents and effects of the earthquake of Aug. 31, 1886, for the forthcoming report on that subject. Dr. Manigault is an accomplished naturalist, and is curator of the museum in Charleston. He was in

the city at the time of the earthquake, and has since made a careful investigation of its incidents.

— Major Powell, director of the geological survey, in a statement which he has furnished for publication, says that there is no present likelihood of iron ore being exhausted in this country; but the remedy for prospective exhaustion is still further exploration for the mines to which the geologist points in various parts of the country.

— Commissioner Colman of the department of agriculture has issued a circular relating to the so-called 'Australian rabbit.' He says that the name is a misnomer, the animal being the common rabbit of Europe, which has been introduced in Australia. He recites its ravages in that country, and says that the introduction of the European species would be an unnecessary and hazardous experiment. He suggests that congress pass a law conferring upon the commissioner of agriculture the power to prevent the landing of any animal, bird, or other pest, in any port of the United States that in his opinion would be injurious to agriculture, in the same way that cattle infected with contagious diseases are now prohibited from entering our ports. He cites the case of the English sparrow, to show that it is unwise to transplant species which crowd out the native ones.

— We learn from the *Sidereal messenger* for February that Chicago may lose its astronomical observatory. The Dearborn observatory is the property of the Chicago astronomical society, but is upon ground leased to it by the now extinct University of Chicago, and may be required to vacate upon sixty days' notice. The society has received a request to transfer its instruments and library to an institution of learning outside of Chicago, but an effort is being made to obtain another site within the city.

— Another small comet was discovered by Barnard on the evening of Feb. 16. It is visible in a three-inch telescope. The great southern comet seems to have vanished as suddenly as it came. Though careful search has been made for it, we believe it has not been seen in the northern hemisphere.

— Nine comets passed the sun in review during the year 1886. One was a well-known periodic comet returning at the appointed time; and two of the new-comers appear to be moving in elliptic orbits, one of them identical, possibly, with De Vico's lost comet of 1844, or at least belonging to the 'same family' as the latter. Olbers' comet of 1815, which was expected at perihelion in December, 1886, has not been detected, but, as an uncertainty of over three years exists in the time of revolution, it may be picked up during the coming year. It is the only periodic comet expected in 1887. Two out of the nine comets were discovered in 1885, one in 1887, leaving six for 1886. Three were visible to the naked eye. Three belong to Barnard, three to Brooks. Two were found by Finlay, and one by Fabry. Comet 1886 IX. was picked up by three observers independently on three successive mornings in October, showing what a careful watch is kept for these little wanderers. Mr. Warner has paid eight hundred dollars in prize-money for the captures.

— As a result of the attempts to bring to pass an earlier publication of the Proceedings of the American association, the Proceedings of the Buffalo meeting held last summer were published during January of this year. Heretofore the Proceedings have not been published much within a year after the date of meeting. This promptness in publication has resulted partly from the reduced volume of the Proceedings, and partly by obliging the authors of papers to furnish abstracts prior to the time of reading them. Several of the addresses and reports were in type and stereotyped before the meeting, and others were held in type ready to be incorporated in the order of printing.

— The annual meeting of the Davenport academy of sciences was held in that city Jan. 26. The past year was one of unusual activity in the society, and large accessions were made to the collections.

— In the *Boston medical and surgical journal* we find an extract from the *Annales d'hygiène et médecine légale* which gives the observations of a French physician, Dr. Masson, on the footprints which are sometimes found at the scene of a murder, and the aid which they furnish in the detection of the perpetrator of the crime. The point which was especially studied was whether the marks discovered were made by one and the same foot, and so by one person only. He found that the same foot would give footprints with very different dimensions, according as it was used in standing or walking, corresponding with the two essential functions of the foot, as an organ of locomotion and of support. It appears to Dr. Masson impossible that two human footprints should closely resemble each other unless the same foot has made them. The impression made by a foot discloses such clear characteristics, the distinctive marks under different conditions are so numerous, the footprints of the same foot are so alike under dissimilar circumstances, that an attentive expert, having good footprints to study, ought to arrive at clear and precise conclusions. The toes, the great toe especially, leave marks that

should be examined attentively. These, and the outline of the digito-plantar depression, the line which defines the plantar arch, are the data for diagnosis. The conclusions which Dr. Masson draws, are, 1°, the dimensions and the shape of footprints made by the same foot vary with the attitudes taken; 2°, the two extreme and characteristic types are represented by impressions made by the foot in walking and in standing; 3°, the expert called to study the matter of footprints should always take impressions of the foot of the accused in the act of standing and of walking, and should compare only those which correspond with the same attitude; 4°, in connection with the measurements made, one should always consider the points which throw light upon the individual characteristics of the foot.

— We have received the first volume of the publications of the observatory ('History and work of the Warner observatory') founded by Mr. H. H. Warner of Rochester, N.Y., about six years ago, and now well known through its connection with the Warner comet prizes. The volume is published by Dr. Lewis Swift, the director, and gives a description of the observatory (a tower attached to the dwelling of the director) and the instruments, and a list of over four hundred nebulae discovered since July 9, 1883. About two-thirds of the pamphlet are taken up by 'The Warner prize essays.' These are, an essay on 'Comets; their composition, purpose, and effect upon the earth,' by Prof. Lewis Boss of the Dudley observatory; and four essays on the sky-glows, by Professor Kiessling, and Messrs. Clark, Maine, and Bishop respectively. The principal instrument of the observatory is an excellent 16-inch Clark equatorial provided with a filar micrometer and many convenient accessories. Its equipment is to be increased by a spectroscope, to cost $1,000, ordered from the Clarks. The observatory is also provided with a 4½-inch comet-seeker. Dr. Swift has devoted himself almost entirely to the discovery of new nebulae, and the search for comets, a field in which he has had nearly thirty years' training. It would seem ungracious to comment upon any of the shortcomings of the report; we suggest, however, that the usefulness of the observatory as an astronomical institution might be greatly increased if the director were provided with a thoroughly competent assistant, in order that his own work of discovery may be supplemented by careful study and measurement. It should be noted that Mr. Warner has expended more than $4,500 in astronomical prizes since Oct. 10, 1880.

— It seems that professors in Italy are chosen by a method that seems to be purely national. We quote from a recent article by R. Bonghi: — "For those who do not know, I should mention that in Italy the university professors are elected by the system of *concorsi*, for which there seems to be no exact English equivalent, and the particular method adopted has been altered several times, but is now the following: The faculty in which a professor is wanted proposes to the minister five names of ordinary professors of the subject for which a teacher is needed, or of cognate subjects, and if the minister approves of them he appoints them as a committee. To it every native or foreigner who thinks himself adapted for such a chair can send in his *titoli;* that is, his academical degrees and the books he has written. The committee, in a more or less explicit report, judges who is eligible, who not, and who among those considered eligible deserves the first place. Such a judgment presupposes that all the members of the committee should read and ponder carefully the books sent in by the candidates, but the general opinion is that they do not do so. It is commonly supposed that they meet with their minds already made up, and that they are proposed and nominated in such a manner as to insure their coming to the decision which will please either the faculty that proposes them or the minister who nominates them. This may not be true in all cases, but in some it doubtless is. At any rate, the report of the committee is then sent up to the superior council (of public instruction), which has nothing to do but to see that all due forms have been observed; which forms naturally always are observed, unless through some oversight in the drawing-up of the report."

LETTERS TO THE EDITOR.

Left-handedness.

On p. 148 of the current volume of *Science*, mention is made of Dr. Wilson's view as to the cause of left-handedness.

In connection with this, Dr. Thomas Brown's suggestion in his 'Vulgar errors' (London, 1658) may be quoted. It occurs in the chapter, 'Of the right and left hand.'

"And therefore the brain, especially the spinal marrow, which is but the brain prolonged, hath a fairer plea hereto; for these are the principles of motion, wherein dextrality consists; and are divided within and without the Crany. By which division transmitting nerves respectively unto either side; according to the indifferency, or original and nativity prepotency, there ariseth an equality in both or prevalency in either side."

He does not lay much weight on this, for his conclusion is, —

"And thus have we at large declared that although the right be most commonly used; yet hath it no regular or certain root in nature." B.

Lexington, Va., Feb. 21.