NOTES AND NEWS.

IN August, 1891, a meeting of the Congrès International des Sciences Géographiques will be held at Berne, Switzerland. Societies, or their members individually, are invited to take part in the congress, and to communicate their views on the subjects that should appear in the programme. The management is in the hands of the Geographical Society of Berne.

—A thunder-storm is generally believed to be a bad thing for a dairy. An Italian *savant*, Professor G. Tolomei, has made some experiments on the relation of electricity to the souring of milk. He found, according to *The Boston Medical and Surgical Journal*, that the passage of an electric current directly through the milk not only did not hasten, but actually delayed acidulation; milk so treated not becoming sour until from the sixth to the ninth day, whereas milk not so electrified became markedly acid on the third day. When, however, the surface of a quantity of milk was brought close under the two balls of a Holtz machine, the milk soon became sour, and this effect he attributes to the ozone generated.

—The Caucasus papers relate an interesting case of globular lightning which was witnessed by a party of geodesists on the summit of the Böhul Mountain, 12,000 feet above the sea. About 3 P.M., as related by *Nature*, dense clouds of a dark-violet color began to rise from the gorges beneath. At 8 P.M. there was rain, which was soon followed by hail and lightning. An extremely bright violet ball, surrounded with rays which were, the party says, about two yards long, struck the top of the peak. A second and a third followed, and the whole summit of the peak was soon covered with an electric light, which lasted no less than four hours. The party, with one exception, crawled down the slope of the peak to a better-sheltered place, situated a few yards beneath. The one who remained was M. Tatosoff. He was considered dead, but proved to have been only injured by the first stroke of lightning, which had pierced his sheepskin coat and shirt, and burned the skin on his chest, sides, and back. At midnight the second camp was struck by globular lightning of the same character, and two persons slightly felt its effects.

—A study of five years' thunder-storms (1882–86) on the Hungarian plain has been recently made by M. Hegyfoky, says *Nature* of Sept. 4, 1890. The following points in his paper (communicated to the Hungarian Academy) may be noted. The days of thunder-storm were those on which thunder was observed, and they formed 16.4 per cent of all days from April to September. The air pressure on those days sank about 2 millimetres under the normal, morning and evening. The less the pressure, the greater the probability of thunder-storm. The temperature (estimated by the maximum thermometer) was higher than that of all days of the season indicated; and the moisture and cloudiness were similarly in excess. The wind blew about mid-day more softly, and in the evening more strongly than usual. It went round, as a rule, from the south-east by the south to the west and north-west. The clouds came oftener than usual from the south-east and south-west quadrants, so that the centre was generally north af the station. Nearly half of the season's rainfall was on days of thunder-storm. Hail fell on 11 days, on one of which there was no thunder-storm. There were most thunder-storms in June (59 out of 199). The June of 1886 had as many as 26. The commencement of a thunder-storm (first thunder) occurred most often from 2 to 5 P.M. Towards the end of the season the thunder-storms tend to come later in the day. When the pressure falls under the mean of the season (752.4 millimetres), the thunder-storms last longer than when it is above the mean. The path was in most cases from south-west or west, and in most cases coincided with that of both lower and upper clouds, but in several cases only with that of the lower or upper. After the first thunder the meteorological elements are usually subject to great changes, most marked as the storm nears the zenith: rain falls; wind rises, and alters quickly in direction; temperature and vapor-pressure fall; relative humidity, cloud, and pressure increase. As the storm withdraws there is a return to the normal. Various other points are considered. The author accepts Sohncke's theory, that the electricity of thunder-storms is due to friction of water-drops on ice.

—Dr. G. W. Barr writes, in the *Therapeutic Gazette*, that iced tea has none of the physiological action of theine if it is kept ice-cold for a short time. He says that he has known a man of nervous temperament, who is kept awake all night by a single cup of tea, to drink a half-gallon of iced tea during the evening, and sleep soundly at his usual time of retiring. Others, made very nervous by hot tea, have been able to drink large quantities of iced tea with no appreciable effect. If the tea-grounds are allowed to remain in the liquid, the iced tea is usually kept long enough before drinking to dissolve more tannin than is usual in hot tea: hence the tea should be strained as soon as removed from the fire.

—The process of electric welding invented by Professor Elihu Thomson, which has been so widely used in its application to numerous manufactures pertaining to the arts of peace, has now been applied to the production of certain munitions of war in a very remarkable manner. The problem in making a shell for armor-piercing purposes, says *Engineering* of Aug. 29, has been to select a grade of steel with a view to its possessing the hardest point for armor-piercing purposes consistent with a chamber whose walls shall not be so hard as to crumble on striking a heavy mass. The metal selected for such purposes has been very naturally the result of a compromise in the endeavor to procure a metal which would give as hard a point as feasible under the circumstances; and yet the limitations of all materials are such that neither object has been perfectly accomplished, and the excessive hardness of the inside of ordinary cast-steel projectiles renders the work of clearing out the interior of the chamber very expensive. This application of the electric welding process to the production of shells has reached very satisfactory results, entirely beyond those achieved by methods of manufacture hitherto carried on. The armor-piercing point of the shell is made of hard steel, shaped in the conical form suited for such a purpose. To this is attached a tube of mild steel, forming the chamber. The plastic state of the metal when the two pieces are pressed together in the act of electric welding forms a slight enlargement without cutting away any of the walls of the chamber. The butt of the projectile is made of a piece of mild steel, which is somewhat harder than the cylindrical walls of the chamber, and is shaped to a cup form by hydraulic forging. The slight exudation of the metal at the walls on the inside produces an interior ring, which is a material increase in the strength of the projectile. For Shrapnel, the thin metal screen between the charge and the bullet-case is placed in position before the head is welded to the cylindrical chamber of the projectile, and readily joined in place in the act of welding. This new application of the electric-welding process was invented by Lieut. W. M. Wood of the United States Navy, who has received a year's leave of absence from the government, and is in the mean time associated with the Thomson Electric Welding Company. It is stated that the United States Government is ready to contract for a very large supply of these electric shells as soon as the machinery can be made for their manufacture.

—A new process of bleaching by electricity has been devised for the textile trades. By its use the need of bleaching powder is done away with. The process, as described in *Engineering*, is as follows: the current is taken direct from an engine and dynamo to electrodes placed in a wooden tank containing a solution consisting of 64 pounds of calcined magnesia, 357 pounds of hydrochloric acid, specific gravity 1.16, and 300 gallons of water, which solution has no bleaching properties; in other words, no chlorine is present. After passing an electro-motive force of six volts, and a current of 120 ampères, for 100 hours, the solution contains .25 of one per cent of fixed chlorine, which bleaches yarn and tow in as many hours as it now takes days, without impairing the strength of the material. The electrodes used consist of three cathodes of sheet copper, each 27 inches by 18 inches. These are connected to the negative terminal of the dynamo. The anode employed is "lithanode," a peroxide of lead, which is specially adapted for this particular purpose, all other metals being attacked by chlorine, which disqualifies them for all purposes of electrolysis where chlorine is evolved. The anodes are 7 inches by 4 inches, and are seventy-two in number, and are connected to the positive terminal. These electrodes are ranged along the sides and bottom of the tank, and are protected from the yarn to be bleached by a wooden framework. What chemical re-actions take place during the 100 hours required for charging the solution cannot be accurately determined; but that the system is regenerative there can be little doubt, owing to the fact that bleaching is performed by the fixed chlorine, and consequently there can be no loss of free chlorine, as is the case with bleaching-powder.

—An Italian correspondent writes to the *Lancet*, "An occurrence as strange as it is tragic is just reported from Sicily. At Milazzo, a seaport of that island, a bark had put in after a voyage from Genoa, having in her hold, by way of ballast, a number of wine-butts, which, incrusted on their insides with tartrates, had, to give them the necessary weight, been filled with salt water. On coming into harbor, these butts had to be emptied before refilling them with wine; and for that purpose one of the crew, having raised the trap door admitting to the hold, went down to tap them and run their contents through the drain-holes into the sea. No sooner had the bungs been knocked out than forth rushed a poisonous gas, which took the man's breath away and made him fall, a corpse, into the escaping salt water. In ignorance of what had happened, a second mariner, then a third, and finally a fourth, went below; each, in turn, to be asphyxiated instantaneously, and to fall headlong into the salt water, now of some depth in the hold. As the butts continued to empty, the poisonous gas increased; and the captain, wondering that none of the four men re-appeared, went, out of curiosity, to the trap-door, only to receive a tremendous rush of the gas in his face, and to fall below, asphyxiated and drowned. The cabin-boy, the sole survivor out of a crew of six, seeing what had happened, shouted wildly for help to the bystanders on the quay. Assistance soon came; and the stifling fumes, by this time escaped or so diluted as to be innocuous, admitted of the new-comers looking down into the hold. There were the five men, quite dead, floating in the water. The corpses were hoisted up with ropes; and the medical officers, who had now arrived, pronounced them past recovery." We give this story for what it is worth.

— The following sensational and untrue paragraph (dated St. Louis, Sept. 11) has been going the rounds of the press, evidently in the interest of the producers of Ceylon tea, who are trying to make a market in this country for their tea, says the *American Grocer:* "G. E. Martin, who is a resident of Ceylon and an extensive coffee-planter there, owning, with his brother, two of the largest estates on the island, was interviewed here to-day, and confirms the report of the failure of the coffee-crop. He said, 'I cannot explain how, but coffee will no longer make a good crop in the Far East, not only in Ceylon and Arabia, but also in the other coffee raising districts. I have just received a letter from my father, in which he informs me that our estate must immediately be put into tea and fruit, as there is no longer any chance of making a profitable coffee-crop. We shall lose fifty thousand dollars this year on our crop, and it is generally so throughout the coffee-growing districts. In South America, which I visited before coming to this country, the same situation prevails. The crop will not grow. I can see no other result than that we must stop drinking coffee. We can no longer raise it, and the countries where it will grow are already exhausted.'" A few facts will show the utter fallacy of the statement, the only part of which that is true being the fact that Ceylon is out of the race as a producer of coffee. It is true that in Ceylon the industry has declined, the exports of coffee decreasing from a maximum crop from which 995,493 hundredweight were exported in 1873, to 86,440 hundredweight in 1889, the decrease being due to a disease which destroyed the trees. In 1873, when the Ceylon crop was the largest on record, the production in Brazil permitted exports of about 150,000 tons, against an average annual export for the five years 1885–89 of 319,281 tons,—an increase in production of over 100 per cent. In Sumatra the crop of recent years has been below the average. In Java the supply does not increase, the crop varying, as it does in all countries, above and below an average yield, which for the eleven years permitted an average annual export of 1,167,009 piculs. The production of the world in 1888–89 was estimated by W. Schoffer & Co., high authorities in Europe and this country, at 12,831,600 centners, or 631,489 tons,—quite an advance over 1879, when N. P. Van Den Berg of Batavia estimated the production at 483,087 tons; which, in turn, was a large advance over the 324,787 tons produced in 1860. Coffee-plantations are being extended in Mexico and the different countries of Central and South America, because there is at present, and has been for several years, an immense profit in coffee-culture, high prices placing a premium on the extension of the industry. In a few years more we look for a production far enough ahead of the world's requirements to again inaugurate an era of low-priced coffee, notwithstanding the Ceylon estates are no longer productive.

—We learn from *Nature* that countless swarms of rats periodically make their appearance in the bush country of the South Island, New Zealand. They invariably come in the spring, and apparently periods of about four years intervene between their visits. In a paper published in the new volume of the "Transactions and Proceedings of the New Zealand Institute," Mr. Joseph Rutland brings together some interesting notes on the bush-rat (*Mus maorium*). In size and general appearance it differs much from the common brown rat. The average weight of full-grown specimens is about two ounces. The fur on the upper portions of the body is dark brown, inclining to black; on the lower portions, white or grayish white. The head is shorter, the snout less sharp, and the countenance less fierce, than in the brown species. On the open ground, bush-rats move comparatively slowly, evidently finding much difficulty in surmounting clods and other impediments: hence they are easily taken and destroyed. In running they do not arch the back as much as the brown rat. This awkwardness on the ground is at once exchanged for extreme activity when they climb trees. These they ascend with the nimbleness of flies, running out to the very extremities of the branches with amazing quickness: hence, when pursued, they invariably make for trees, if any are within reach. The instinct which impels them to seek safety by leaving the ground is evidently strong. A rat, on being disturbed by a plough, ran for a while before the moving implement, and then up the horse-reins, which were dragging along the ground. Another peculiarity of these animals is, that, when suddenly startled or pursued, they cry out with fear, thus betraying their whereabouts,—an indiscretion of which the common rat is never guilty.

—In a paper recently read before the Vienna Academy, says *Nature* of Aug. 28, 1890, Herren Elster and Geitel gave the results of a year and a half's observations of atmospheric electricity on the north side of Wolfenbüttel (bordering an extensive meadow). They used a stand carrying a petroleum-flame, and connected by insulated wire with an electroscope. A marked difference was found in the phenomena of spring, summer, and autumn, on the one hand, and winter on the other. In the former the daily variation of the fall of potential showed a distinct maximum between 8 and 9 A.M., as Exner found at St. Gilgen, and a distinct minimum between 5 and 6 P.M., whereas Exner found a maximum about 6. In winter there is great irregularity; but a weak minimum occurs about 11 A.M., and a more decided maximum about 7 P.M. It appears to the authors that other factors than humidity, with which Exner seeks to explain the variations, are concerned in the case. When the temperature goes below zero, cold mist being then generally present, there is often a rather sharp rise in the values, the aqueous vapor having then less action. Rainfall in a neighboring region lowers the fall of potential both in winter and summer, and a disturbance of the normal course will announce a coming change in places still unclouded. Snow, it seems, rather raises the values. It has been shown by Linss that the course of the fall of potential is inversely as the coefficient of dispersion of the air for electricity; which, again, depends not only on the dust and aqueous vapor present, but also, according to Arrhenius's theory, on a sort of electrolytic or dissociative action of the sun's rays on the atmosphere (thus it has been shown that electricity escapes from a conductor under the influence of ultra-violet rays). The authors find their results support this latter view. They consider that the electric processes during formation of precipitates are the chief cause of the disturbance of the normal condition.