out, without a conscious analysis of individual letters. Messages can be flashed from the rigging of ships with almost the rapidity of telegraph messages over ordinary wires. Take, for example, the message "The uniform of the day will be clean blue." This sentence of only nine words, if sent at the rate of nine words per minute according to the regular navy code, could be read by about one officer out of ten. Few officers can read that fast. The average speed of signalling, then, by the "wigwag" system is probably less than nine words per minute. It ought to be more. Mr. Edison has suggested an adaptation of his train telegraph system to the use of ships at sea. If a sufficient area of insulated metallic surface could be exposed somewhere, either on deck or aloft, it might be possible to telegraph from ship to ship by electrical induction without the use of connecting wires, just as Edison in a moving train takes messages from the wires along the track. We know of no experiments in this direction as yet, but the field is certainly an interesting and promising one.

AN ELECTRIC LOCOMOTIVE. — Will trains eventually be run by electricity? The electrician is met by this question almost daily, and his only reply is that they will if the problem of their commercial success be finally solved. Of course, running machinery of any kind from primary batteries is commercially out of the question. Every one with even the most rudimentary knowledge of the science realizes that it takes a certain consumption of zinc or other metal to liberate a certain amount of energy, and that this method is altogether too expensive to be practicable. However, there is now being constructed at the locomotive works, Rome, N.Y., an electric locomotive which is the first engine, we believe, attempted to be run on regular railroad-tracks from storage-batteries. The ordinary rotary type of electric motor will not be employed. Suction-magnets are to be located on either side of the piston, and the current supplied from storage-batteries in the fire-box. The locomotive is smaller than the usual type, and has driving-wheels of less diameter. In a few days the trial trip will be made, and *Science* will give its readers the result. The question will be asked, "How is it possible to utilize the energy of storage-batteries at such a great loss from the original energy of coal, and still be as economical as the steam locomotive?" That is the fact that remains to be proved. It should be remembered, however, that it may be possible to generate electricity by means of large economical compound condensing engines with a final loss at the motor not much greater than that which is found in that great wasteful gormandizer of coal, the steam locomotive.

NOTES AND NEWS.

THE Rev. Mr. Frizelle of Bushmills, England, narrates, in *Science Gossip*, that he witnessed a trial of a rook by his comrades for the act of stealing sticks from other nests. The other rooks assembled round the culprit, and cawed for a considerable time, when the unfortunate bird was condemned to suffer the penalty, and he was then and there set upon and pecked to death. Two magpies were present, who appeared seemingly as witnesses.

— The University of Jena is going to hold autumn courses for teachers in the various sciences. The course, commencing Sept. 23, is to last a fortnight, and comprises the following subjects: psychological principles of education, instruction in chemical experiments, the same in physical science, botanical observations and morpho-physiological experiments, animal biology, school hygiene, physical geography, and colonization.

— Any one who takes a walk abroad in the rural parts of France, when farming operations are going on, says J. W. Slater in *Science Gossip*, will often see small children following the plough armed with small pitchers, into which they put all the white, fat grubs of the cockchafer which are turned up. In England the rooks do this work, without young children being withdrawn from school or from play. But the French sportsman has nearly extirpated these useful birds. A recent iniquity, according to a contemporary, is the systematic destruction of the swallows on their return from Africa. Emissaries of the Paris *modistes* fix up on the shore, about the points where the birds usually land, long wires connected with powerful electric machines. The wearied swallows perch on the wires, and are struck dead by scores. Their bodies are then sent off to Paris to ornament women who are a disgrace to humanity. The saddest feature is that our contingent of martins and swallows arrive by way of France, and will doubtless be cruelly decimated.

— Professor Beal finds that the peculiar markings in bird's-eye maple do not occur in young trees up to about three inches in diameter, nor very high up in trees which are very much pitted at the base. A specimen taken fifty feet above the ground, *Garden and Forest* states, showed no trace of bird's-eye, while another from near the base of the same tree was very strongly marked. If the cause of these formations could be discovered and used to produce the marks, it would add greatly to the market value of the timber, for the wood of this maple and of other trees somewhat similarly marked is comparatively scarce and in great demand for veneers.

— F. W. Galton, the famous writer on the subject of inherited qualities, proposed to the Congress of Psychological Physiology to issue in the form of a document a series of questions intended to draw from scientific observers the world over the results of their experience touching the inheritance of acquired habits, mental, scientific, or social. He laid before the congress a first-rate conundrum. He told of an aquarium divided into two parts by a plate of glass perfectly transparent, and therefore invisible to the fish. In one division there was a pike, in the other a gudgeon. Every time the pike saw the gudgeon, he rushed to seize him, but every time he was stopped by the plate of glass. He did not learn soon, but for several months made this rush, and bruised his nose against the glass. Finally he came to understand that for some reason inscrutable to his intelligence he could not seize the gudgeon, and then he gave it up. He now swam about, seeing the gudgeon constantly, but paying no attention to it. Then the plate of glass was removed. This made no difference, the pike did not attempt to take the gudgeon. He had acquired the habit of leaving the gudgeon alone. The conundrum was, would his descendants inherit that habit, or possess the original impulse of their kind? Illustrations of this kind, or showing the operation of the principle of acquired inheritance, are what Mr. Galton wants.

— The great chart of France, showing the geological formations of the country on a scale of 1:500,000, has at length been completed, and a copy deposited with the Academy of Sciences at Paris. It is over fifty years since MM. Dufrenoy and Elie de Beaumont published a geological map of France on the same scale, and since that period the rocks of the different provinces have been more intimately studied. In 1882 the new general map was begun under the superintendence of the Commandant Prudent, and published by the depot of fortifications. It has just been finished, and, according to the *Scottish Geographical Magazine*, is an example of the most accurate cartography. Local geologists have contributed to the work as well as the government surveyors, and the scale of 1:500,000 has been adopted in deference to the wish expressed at the geological congress of Bologna in 1881, so that different countries can more easily compare the map with their own. The scale of colors recommended at that congress has also been followed,— that is to say, the sedimentary series is represented by the colors of the spectrum in their regular order. Thus the trias is colored violet, the Jurassic blue, the cretaceous green, and the tertiary yellow. Each of these general colors is subdivided into shades, which are deeper according as the rocks are more ancient. This is the first time the method has been employed on a large work, and it has given every satisfaction, since it allows the systems of rocks and their different gradations to be readily recognized. The eruptive rocks have been colored in different shades of red, and the crystalline schists in carmine. As for the primary rocks, on which the congress came to no decision, the authors of the map have been guided by the same principles in choosing their tints. The Silurian has therefore been colored a flesh pink, and the Devonian a red brown. The carboniferous, according to old habit, has been colored black and deep gray, while the Permian is represented by a yellowish gray. No fewer than fifty shades are employed; but all are easy to distinguish.

— The number of students attending the principal German universities amounts to 29,491, of whom 6,060 study theology, 6,835 law, 8,883 medicine, and 7,713 philosophy and natural sciences. It is of interest to know that 314 of these are Russians.

— A commission representing the various German railway companies has published a report detailing the results of observations made during six years on the durability of steel rails on their lines. According to this report, it appears that the duration of a steel rail may be reckoned on an average at thirty-five years.

— The Prussian minister of education is turning his attention towards the study of the history of medicine, which seems to have been slowly dying out. There used to be a chair for this subject at every German university, but they have all become vacant with the exception of the one at Berlin, occupied by Professor Hirsch, the Nestor of the historians of medicine. To counteract this, it has been ordained that every newly appointed professor of hygiene should give lectures on the history of medicine as part of his work.

— The American Public Health Association will hold its next annual meeting at Brooklyn, N.Y., Oct. 22–25, 1889. This association comprises over eight hundred members, all devoted, officially or otherwise, to its declared purpose, the advancement of sanitary science and the promotion of organizations and measures for the practical application of public hygiene. In the furtherance of this purpose it has met annually, during the last sixteen years, in different cities of the United States and Canada, and has in every instance had the effect of greatly stimulating public effort in the promotion of health and measures for its maintenance. With the hope of still further magnifying this interest and effort, it is the purpose of the association, through its local committee, at the forthcoming meeting, to provide an exhibition of every thing available adapted to the promotion of health. The exhibits will be classified as follows: Division I. The Dwelling, including models and designs for sanitary dwellings; foundations, drainage, drainage tiles, etc.; bricks, tiles, floors, cements, etc; devices and appliances for furnaces, stoves, water and steam-heating apparatus; ventilation and lighting; domestic water supply, purification, filters, water fittings, etc.; traps, sinks, water-closets, baths, etc.; domestic garbage destructors, garbage receptacles, etc.; and sanitary furniture, refrigerators, wall-paper (non-arsenical), floor coverings, etc. Division II. Schools and Education, including plans and models for improved school buildings; heating, ventilation, lighting; furniture and fittings; improved books, printing, etc.; gymnastic apparatus; and works on sanitary topics. Division III. Factories and Workshops, including designs and models for improvements in factories and workshops, life and health saving devices, and special devices for removing dust and effluvia and preventing injuries from them. Division IV. Clothing and Dress, including improved materials and garments, etc. Division V. Food, including selected displays of unprepared animal and vegetable substances used as food or in the preparation of food; prepared vegetable substances used as food, including canned and prepared, and preserved fruits and vegetables, prepared cereals, meals, flour, biscuits, bread, etc., and sirups, sugars, etc.; canned, smoked, salted, preserved, and prepared animal foods; products of the dairy; alcoholic and non-alcoholic beverages, tea, coffee, cocoa, chocolate, etc.; food for infants and invalids; articles and devices used in the preparation of food; cooking-stoves, ranges, etc.; vessels for preserving food, etc.; adulterants and adulteration. Division VI. Sanitary Engineering, including plans for sewerage and sewage disposal, plans for drainage, plans for water supply, purification, filtration, etc. Division VII. Public Health Administration in Cities and Towns, including treatment of contagious diseases; plans for hospitals; vital statistics, blanks, etc.; disposal of waste, garbage destructors, odorless apparatus; antiseptics, disinfectants, and disinfection; and reports of local and State boards of health. Division VIII. The Laboratory, including instruments of precision in meteorology, thermometers, barometers, hygrometers, etc.; general chemical apparatus for health laboratory; microscopes, etc.; biological apparatus, cultures, etc. Division IX. Red Cross Section. The exhibition will be held in the hall at the north-west corner of Fulton and Pineapple Streets, one block from the Brooklyn Institute, where the sessions of the association will be held, and but three blocks from the bridge. It will be opened to the public on Oct. 22, at 1 P.M., and will continue open until Dec. 1. Admission free. Applications for space may be made to any member of the committee on exhibits, accompanied with details as to name and character of articles proposed, space required, and the name and address of applicant. To cover the necessary expenses of the exhibition, each exhibiter will be charged ten dollars, allowing him twenty square feet of floor space, and thirty cents per square foot for additional space, to be paid on the second day of the exhibition. All proposals for exhibition and applications for space are subject to the approval of the committee on exhibits, and should therefore be made as promptly as practicable. At the close of the exhibition the association will award diplomas to exhibiters of specially meritorious articles, based upon the judgment of experts. E. H. Bartley, M.D., of 21 Lafayette Avenue, Brooklyn, is the secretary of the association, and J. H. Raymond, M.D., 173 Joralemon Street, is chairman of the executive committee.

— The *Russian Gazette* has received some disturbing intelligence on the subject of the rivers of Russia, which play such an important part in the internal communication of the country. The Dnieper has become so shallow that navigation is difficult at even the deepest parts, such as between Kiew and Catherinoslaw. Small boats can only pass now where vessels sailed formerly. The Volga itself is not much better, and the river steamers are unable to reach Nijni Novgorod. In consequence of these facts, a strenuous measure of river-dredging and stricter regulation for the control of the navigation of the greater rivers, such as the Don, the Dnieper, and the Volga, is being advocated, and it is believed that the minister of ways of communication has the subject under his serious consideration.

— An instance of the progress made in electro-technical science is furnished by the installation just completed for lighting and transmission of power in the south of France at the neighboring towns of Dieulefit and Valréas, situated twenty-one kilometres apart, and having their common electrical source of supply at Béconnes, situated fifteen kilometres from Valréas, and six kilometres from Dieulefit. The supply of electrical power, according to the London *Electrical Review*, is excellent in both places. The lighting installation has been effected by an electrical firm in Lyons, and the apparatus manufactured by the Edison Company of Paris. The motive power is water, of which some three hundred horse-power are at disposal, but as yet only a part is required. In Switzerland, too, two waterfalls are to be used as motive power for transmission of electricity, namely, at Klus, on the river Aar, and at Lartze, by a company from Zurich. At the Hotel Bernina, at Samarten, in the Engadine, which has for some time been lighted by electricity furnished by a neighboring waterfall, the proprietor has hit upon the ingenious idea of utilizing for cooking the force wasted in the day. Other experimental cooking apparatus has been constructed, containing german-silver resistance coils, which are brought to red heat by the electric current, and all the ordinary cooking is now being done in a range fitted with a number of these coils.

— The commissioner of agriculture of Texas, in his first annual report, presents a statement of the aggregate cotton crop of that State for 1887 by counties. In many parts of the State the season was an unfavorable one for this crop, drought and worms very much reducing the yield per acre. An estimate of the damage done by worms, compiled from the first annual report of the commissioner of agriculture of Texas, by Mr. B. W. Snow, assistant statistician to the department, is presented for each county, ranging from nothing in many counties to a loss of fifty per cent of the crop in others of large production, and an even heavier loss in some counties where the crop is of little importance and insecticides are not made use of. For the whole State the amount of damage done averaged about twenty-one per cent of the crop. According to this return, the total number of bales gathered was 1,125,499, while, had there been total exemption from insect damage, the farmers of Texas would have gathered a crop of 1,422,948 bales. This would make the aggregate loss from worms equal to 297,449 bales. The value per bale of the crop which was made at the place of production averaged slightly over forty dollars. Pre-

suming that an increase of less than half a million bales in the aggregate crop would have made but little difference in price, the actual money loss to the farmers of Texas in one year from the cotton worm alone was $11,897,960. It is not claimed that these figures are absolutely accurate, but they are undoubtedly approximately correct, and will give some idea of the enormous tribute levied upon American agriculture by injurious insects. In that year Texas produced but twenty-one per cent of the cotton crop of the country, and the cotton caterpillar and boll worm were active in all sections of the cotton belt. The injury elsewhere may not have been so heavy, but it would swell the aggregate loss in one crop to startling proportions.

— The harsh measures adopted by the Russian Government towards the extirpation of German educational landmarks in the Russian Baltic provinces, have been recorded from time to time. There are now two more such ukases to chronicle. The first and vitally important one is the closing of the Deutsche Lehrerseminar in Dorpat, which has existed for over sixty years, and served the purpose of training teachers for the elementary schools in the Baltic towns. The institution had been developing great usefulness during the last twenty-five years especially. The other ukase forbids the working of the Evangelical-Lutheran Society, which had lately been founded for charitable purposes.

— The French Government has made Professor C. V. Riley a chevalier of the Legion of Honor, as a deserved compliment for his effective studies in economical entomology. His researches have not only been of advantage to the farmers and fruit-growers of the United States, says *Garden and Forest*, but he discovered that the phylloxera was an American insect, and identical with the pest which had proved so disastrous to French vineyards. He also introduced into France the spraying-nozzle which bears his name, and which, with certain modifications, is used in that country to counteract the mildew of the vine.

— Dr. Eduard Bodemann of Hanover has just published the correspondence of Leibnitz, which until now had lain buried in the Royal Library of that town. The author gives a minute description of this great literary treasure, the value of which will be easily understood from the fact that more than 153,000 letters had to be perused and edited, and that the number of persons, scholars, statesmen, and royal personages with whom Leibnitz corresponded amounts to 1,028.

— The commission appointed to inquire into the scheme for making Paris a seaport has now issued its report. In this it is stated that the canal is of a nature to increase the commercial activity of France by bringing Paris into more direct communication with the great producing centres, and would in particular enable the city to compete with Antwerp, the commerce of which, it is said, is increasing year by year, to the detriment of French ports. No insuperable engineering difficulties are to be encountered, and even taking the most pessimistic estimate of the cost, viz., 200,000,000 francs, it is believed that the traffic would be sufficient from the very commencement to earn interest on this. French estimates of the expenses of canal construction will, however, be received with some caution after the gigantic fiasco of Panama. Proceeding, the report goes on to say that the heavy sacrifices made by France in the past few years have not succeeded in meeting the competition of Antwerp, the trade of which has risen in a few years from 1,000,000 to 7,000,000 tons, and affirms that the only chance of doing so now is by rendering Paris accessible to sea-going vessels. It is further stated that in the event of another war it would be impossible to starve out Paris, as in 1871, were the canal made; though it is not easy to see the grounds of this statement, as one would think that the canal could be blocked without much difficulty. The canal would be 180 kilometres long; and a depth of 6.2 metres is proposed for the channel, the breadth of which at the bottom should be half as wide again as at Suez. The spoil from the excavation could, it is said, be advantageously disposed of in raising the level of some low-lying lands along the banks of the Seine. Whether the work will be undertaken by the government remains to be seen; but it is, on the whole, unlikely, as the engineers of the Seine are said to be opposed to the scheme; and, if the government do not take it up, no other body in France will, of that we may be certain.

— School-gardens, i.e., gardens for practical instruction in rearing trees, vegetables, and fruit, are being added to nearly all the public and private schools of Austria. There are now already 7,769 such in existence in the Austrian monarchy alone, Hungary not included. They also comprise botanical museums, and appliances for bee-keeping.

— We learn from *Nature* that a report on the appearance of the Hessian-fly in England, by Mr. Charles Whitehead, the agricultural adviser, has been issued by the Agricultural Department of the Privy Council. The fly was first seen in 1886 in Great Britain, and in that year did some harm to wheat and barley plants in England and Scotland. In 1887 it was noticed in twenty counties in England and ten in Scotland, wheat and barley crops being considerably damaged by its action. The weather during the summer of 1887 was hot and dry, like that which normally prevails in America, and was presumably favorable to the development and progress of the fly. During 1888, when the summer was unusually wet and cold, very little was heard or seen of the Hessian-fly either in England or Scotland; but during the early months of the present year the temperature was high and the rainfall small, and, from the reports received by the Agricultural Department, the infested area has largely increased in England. In Scotland it does not appear to have made so much progress, still it is present in many Scotch counties. The actual amount of injury to the crops is slight, and, so far as can be ascertained, is not in any instance so important as that caused in some cases in 1887. It is most probable that the injurious operations of the insect have been checked by the wet, cold weather which has followed the abnormal heat of May, and the warmth and dryness of June. When a cycle of hot summers occurs, it may happen that the ravages of the Hessian-fly may be general and calamitous. Mr. Whitehead therefore urges the desirability of careful watching, and the prompt adoption of simple methods, which he describes, for preventing the increase of the pest.

— In his last report, the British vice-consul at Nisch mentions the terrible havoc which is being made by disafforestation in Servia since its independence. He says that during the Turkish occupation Servia was covered with magnificent forests of oak, beech, chestnut, and walnut trees, by means of which the country was assured of a regular and plentiful supply of water, and in the recesses of which the natives found shelter, and refuge from their foreign conquerors. From the date of her independence a destruction of these invaluable treasures commenced which has been carried on with remorseless and unreflecting perseverance, and it appears as though there were at the present day a race against time to complete the havoc. From time to time the consciences of ministers and governments have roused them to interfere; but, beyond passing laws which remain a dead letter, hardly any thing has been done to arrest the evil. Floods in winter, and drought in summer, were declared by Mr. Borchgrave, in 1883, to have already begun to exact the penalty which carelessness or want of foresight must be called upon to pay; but the peasant and his goats continue their work of destruction, while the authorities are apparently more anxious to avoid occasions of discontent which restrictive measures would create than of applying such remedies as legislation has placed in their hands. Whole mountains may be seen completely denuded of timber, with the exception of a low worthless scrub, which were, a few years ago, covered with woods, but which have fallen victims to the innumerable herds of goats which are allowed to browse at will. The peasants among whom the land was divided at the time of the Servian independence have cleared vast tracts for the purposes of agriculture, and possess the right of cutting timber for firewood in those forests which are under the management of the different communes. Very little coal is used for household purposes, and the amount of wood required for daily consumption adds enormously to the drain on the national resources. The best-wooded parts of Servia are the districts of the south and south-east, but especially the department of Toplitza, which may be said to contain the only remaining virgin forests of Servia, and whence are annually drawn large supplies of

walnut trunks and oak staves for casks. The heights of the Nischava valley, Stalatz, and Krushevatz furnish excellent building-timber. Oak forests are abundant on the Turkish frontier of Vrania. Walnut-trees, which attain to an enormous growth, have been mercilessly dealt with, the value of this timber having attracted the attention of Austrian merchants, who send agents to choose and cut the wood for exportation. The fir and juniper are found in the central and western valleys; and on the great Kopavnik range on the south-east, the pine on the heights of Zlatibor.

— Mining for ice is a possible future industry, according to the *American Geologist*, which states that an immense deposit of ice, thought to have its date from the glacial period, has been found in Pine Creek Cañon, Idaho. Capitalists, it adds, are considering the feasibility of mining it for commercial purposes.

— The *Industrie Textile* has a long account of the treatment of wild silks (that is, those which are furnished by silkworms other than those of the domesticated *Bombyx mori*) in their native countries. In India there are no less than fifty varieties of silk-bearing insects, the most important of which is called "tussur;" that is, "the weaver's shuttle." The caterpillar, like the moth, is of a great size, and feeds upon more than thirty species of plants. The cocoons of the tussur, which make their appearance twice in the year, are found attached to the branches of trees in the jungle in large oval masses. The caterpillar lives from thirty to forty days, and then weaves its cocoon. In four or six weeks from this time the moth comes out and lays eggs, from which comes a second generation of caterpillars. These wrap themselves in the cocoon, and remain hanging to the trees throughout the rainy season; that is, for seven or eight months. The cocoon, which is about four times the size of that of the mulberry silkworm, is composed of a double and interrupted thread of about 1,400 metres in length. The thread is impregnated with uric acid of sodium, which must be removed by the aid of an alkaline wash before the thread is unwound. The tussur is tended with great care: in fact, for centuries various religious usages have been employed in rearing it. The moth, which is a large insect of a brownish color, having its wings beautified by four transparent eyes, is venerated, and may be only approached by people of a certain caste. Unlike the tussur, which has been domesticated in India for some thousands of years, the cocoons of the other species are collected in the jungle. Among these is the *Attacus cynthea*, which feeds on the castor-oil plant, and of which the cocoon is white. Other species are the *Antheræa assama*, and the *Cricula trifenestra*, which lives on the mangrove-tree, and spins a cocoon of a bright golden color. The most important Chinese species is the *Antheræa pernyi*, which is cultivated in the province of Sze-chuan. In China also is found the most beautiful of all moths, the *Attacus altas*, which spins an enormous cocoon, covered at both ends with a very thick silk, known as "Fagara silk." In Japan are the *Ailanthus* caterpillar, and the *Yamanai*, which till lately was reserved for the exclusive use of the Mikado; and the exportation of the eggs was an offence punishable with death. At present attempts are being made to cultivate this species in France, and it is believed they will be successful.

— At a recent meeting of the Kansas Academy of Science, Professor F. H. Snow of the University of Kansas presented a paper upon the species of fossil leaves of the Kansas Dakota rocks. One of these species, of the new genus *Betulites*, according to Lesquereux, but referable to *Viburnum* according to Saporta, is named by Lesquereux *Betulites Vestii*, in honor of the indefatigable collector of these fossils, Mr. E. P. West. A large proportion of the specimens of this very variable species are found to be provided with stipules, which leaf appendages were not previously known to be connected with the Dakota leaves. These stipules, instead of being uniformly in pairs, one upon each side of the base of the petiole, as is the case in living dicotyledons provided with these appendages, are either single (in which case they may be entire, cleft, or parted), or they are in occasional instances entirely divided, constituting a pair of stipules; but, whether single or divided, they are nearly always unilateral, i.e., situated upon one side of the leaf-stem or petiole. In only one instance among at least one hundred stipulate leaves examined are the stipules bilateral, so that their unilateral character fairly distinguishes them from the stipules of modern dicotyledons. The significance of the discovery of these cretaceous stipules lies in the fact that we have here an additional proof of the descent of our modern forms of vegetation from the ancient forms by a gradual series of changes. To the superficial observer it would seem that our modern forest-leaves are absolutely identical with the cretaceous leaves, which, according to Dana's time-ratios, flourished about five million years ago. The opponents of the modern theory of origin of species by descent have derived a strong argument from the apparent identity of the modern with the ancient forms; but the identity is apparent only, not real. Lesquereux has noted the fact that the Dakota leaves, as a rule, have entire borders, while the modern forms of the same genera have denticulated or serrated borders. Another difference between the modern and the Dakota leaves consists in the greater thickness and toughness, or, in botanical language, the coriaceous character, of the ancient forms. But in the stipules of the Dakota leaves we not only have a prevailing unilateral position of these organs, as distinguished from their modern bilateral arrangement, but we are able to witness the gradual change from the single undivided form through the successive steps of transformation to the completely separated and finally bilateral pair; each stage of differentiation being indelibly stereotyped upon the sandstone matrix by which the leaves are enveloped.

— On Dec. 1, 1888, the resident population of Switzerland was 2,920,731, and the total population 2,934,027. Males numbered 1,427,377, and females, 1,506,650. Those speaking German amounted to 2,092,530; French, 637,972; Italian, 156,606; Romanche, 38,305; and various, 8,574. There were 1,724,957 Protestants; 1,190,008 Roman Catholics; 8,386 Jews; and of various or no religions, 10,706. The returns for the chief towns were, Bâle, 70,386; Geneva, 52,457; Berne, 45,966; Zurich, 27,632.

— Mr. G. W. Roosevelt, American consul at Bordeaux, in a report on the treatment of diseases of vines in France, says that in spite of the numerous inventions meant to destroy *Phylloxera*, it still continues its ravages. One of the most recent plans is that of an American, Mr. L. H. Davis, who inoculates the vine, through a carefully made excision, with a preparation which he claims is destructive to the *Phylloxera*, while it leaves the vine uninjured. It is too soon yet to speak of the results of this plan. Dr. Griffin advocates a distribution, by a machine constructed by him, of a substance which can be used in either a dry or a liquid state. Last spring he operated on a vineyard placed at his disposal by the French Government, and had the satisfaction of seeing the vines treated by him sound and healthy, while other plants in the same vineyard were perishing, The most generally employed remedy has been found to be very serviceable, and free from the danger that was thought to follow it; that is, the submersion, for not less than forty days, in carbon of sulphur dissolved in water. In light permeable soils a strong mixture is used, but on hard soils a weaker solution is better. Within the past few years the actual area of the vines destroyed by this pest is 1,200,000 hectares, or, roughly speaking, one-half of the vineyards of France; and, if we remember that a hectare of vines is worth about 6,000 francs, we can see what a terrible loss France has suffered. In the case of *Oïdium*, as in that of *Phylloxera*, no positive remedy has yet been discovered; but the usual mode — that is, the application of sulphur, pure or mixed — checks the disease, and at the same time helps the growth of the vine. In fact, so great have been the good results of the use of sulphur, that it will for the future be used in most vineyards, even where *Oïdium* does not exist. Till the year 1885 no remedy was known for mildew. Since that year, however, salts of copper have been successfully employed, though there is some doubt whether that substance is really beneficial to the vineyards. The most general method is to pluck off the diseased leaves and burn them. Besides these, there are other methods, such as the use of *bouillie bordelaise*, *eau céleste*, ammoniate of copper, and verdigris with powdered sulphate of copper. On account of the recent appearance of the disease called "black rot," no satisfactory remedy has yet been tried. With regard to anthracnose, if steps are taken early in the spring, the disease may be brought under control. Perhaps the best remedy is a mixture of lime and sulphur. A first

sulphuring is given when the shoots are four or five inches long; then, if lesions appear, the operation is repeated in about a fortnight with a mixture of lime and sulphur, the proportion being one part of sulphur to three of lime. A mixture of plaster and sulphate of iron has also been very successful. The only really efficacious remedy for pourridie is by removing and burning all roots showing traces of the disease. Erinnose may be treated like mildew; that is, by repeated applications of sulphur.

— The International Prison Congress will be held in St. Petersburg in the summer of 1890. A prize of four hundred dollars is offered by the conductors of the *Prison Discipline Review*, for the best essay on the subject, "What in the most civilized nations has been the historical development of the institutions relating to the correctional education of minors who have been convicted of crimes at common law, or who have been put in custody for idleness and vagabondage, or with a view to paternal discipline?" The essays must be written in Russian or French, and must be sent to the president of the organizing committee of the Fourth International Prison Congress, at St. Petersburg, not later than May 15, 1890. They must be furnished with a motto, and accompanied by a sealed letter containing the writer's name and address.

— The Paris correspondent of the *Medical Press* writes, under date of July 13, 1889, that in the last sixteen years the number of suicides increased in France 55 per cent. Their proportion in regard to the population rose during that period from 15 to 21 per 100,000 inhabitants. In 1872 the total number of suicides was 5,275, while in 1887 8,202 were registered. Women, as in other countries, are less prone to self-destruction than men, — 1,768 (22 per cent) against 6,434 (78 per cent). The frequency of suicides increases with age. Up to the fortieth year the propensity is about the same in both sexes, but after that the men take the lead. There were 2,894 unmarried, 3,706 married, while 1,355 were widows or widowers. As to the social condition, 2,614 were in agricultural pursuits, 2,276 belonged to varied industries, while the remainder were in business, or were householders, domestics, clerks, etc. The rural population furnished a higher number of suicides than the urban, — 4,279 of the former to 3,807 of the latter. As to the period of the year, summer and spring furnish the largest contingent. The means employed were chosen in the following order of frequency: strangling, immersion, fire-arms, asphyxia by charcoal, sharp instruments, poison, precipitation from heights. The presumed causes were, insanity, 2,023; physical suffering, 1,407; poverty and reverse of fortune, 1,059; domestic affliction, 1,116; drunkenness, 914; disappointed affections, 305; etc. In the above list, alcoholism producing cerebral affections takes the first rank. During the last fifty years the consumption of alcohol has increased threefold, and the number of insane persons fourfold. The liquor which contributes the most to producing mental derangement is absinthe, of which the French are so fond. When a man gets in the habit of taking that drink, he is sure to commit some crime or destroy himself.

— Dr. H. W. Wiley, chemist of the United States Department of Agriculture, in a note accompanying a recent report on the manufacture of sugar by the diffusion process, calls attention to the advancement made in the last few years in the sugar-industry of Louisiana, and to the important part taken by the government in developing that industry. In 1884 the Department of Agriculture established, in connection with the exposition at New Orleans, a complete sugar-laboratory, and at the same time placed an experimental diffusion battery on exhibition. It also established at Magnolia Plantation, Lawrence, La., a complete chemical control of the sugar-factory. In December of the same year, the attention of sugar-growers was called by Dr. Wiley to the importance of chemical control and new methods. In 1885 the department made an unsuccessful attempt to introduce the process of diffusion into Louisiana on a manufacturing scale, and during the next year one hundred and fifty tons of Louisiana cane were shipped to Kansas and worked by the process of diffusion, securing a yield fully thirty per cent greater than the average milling process would have given. In 1887 the diffusion process was successfully introduced by the department on Magnolia Plantation. During the coming season the diffusion process will be used on four large plantations in Louisiana. Many other planters have also instituted a chemical control of the factory, and a sugar experiment station has been in successful operation at Kenner for four years. The practical result of the work first undertaken in Louisiana by the Department of Agriculture is seen already in a more scientific agriculture, a better knowledge of the problem of sugar-manufacture, a more scientific method in the sugar-house, and the introduction of recent and improved machinery. Before the time first mentioned, the average yield of sugar per ton on the best plantations in the State was scarcely one hundred and forty-five pounds. It is now over two hundred pounds.

— Cholera is reported as raging in Peking with great violence. All foreigners, with the exception of a few officials, have fled to the mountains.

— The total length of submarine cables is 209,322 kilometres (130,066 miles).

— Dr. A. König of Berlin has been promoted to the rank of extraordinary professor of physics.

— Professor Lankester proposes, in *Nature*, that this new word, "Mithridatism," be admitted to the scientific vocabulary, to signify that immunity from the effects of a poison which is induced by the administration of gradually increased doses. The selection of the word has reference to the fable concerning Mithridates, King of Pontus, that he became so charged with the poisons he experimented with, that he obtained an immunity from them all.

— In a paper on the pathogenic properties of the microbes present in malignant tumors, by M. Verneuil, read at a recent meeting of the Paris Academy of Sciences, the author still adheres to the opinion already enunciated in 1883, that these parasites have nothing to do with the initial stage of boils, ulcers, cancer, and the like. At the same time he does not regard their presence as a matter of indifference, but admits that in certain cases they may themselves possess special pathogenic properties, in virtue of which they act on the system like septic poisons.

— At a meeting of the Academy of Sciences at Paris recently, M. Mascart gave a true account of the striking by lightning of the Eiffel Tower, which took place on Aug. 19, and exaggerated reports of which appeared in the daily papers. The conductor was struck, with the normal results, showing perfect communication with earth, and consequently complete safety of the structure from any danger on this score.

— By the will of the late Alonzo Clark, M.D., LL.D., it was placed in the power of the faculty of the New York College of Physicians and Surgeons to bestow a scholarship, with an income of about nine hundred dollars a year, for the purpose of promoting the discovery of new facts in medical science. This has been bestowed, for three years from Oct. 1, 1887, upon T. Mitchell Prudden, M.D., of New York City.

— The *Handels Museum* states, on consular authority, that the fibres of the banana, or paradise fig-plant, are the most important products of the soil in Africa which have hitherto remained unused. This fibre, which is capable of being divided into threads of a silky fineness, extends the entire length of the plant, which has no branches. In Central America this fibre, without any other preparation than the drying, is used for shoe-strings, and for strings and ropes for various purposes. During the twelve months of its vegetation the banana-plant produces only a single bunch of fruit, after which it dies, but from its roots four to ten young plants spring up. In its native place, a bunch of fruit of the banana is worth about twenty-five cents, while the plant, which is thrown away, is worth ten times that amount to a soap-factory, paper-mill, or coffee-bag manufacturer. The leaf of the banana, composed, with its stalk, of the toughest and finest threads, has hitherto only served the native women as an umbrella during the rainy season, as a carpet to sit upon, or a bed to sleep on. "If," says the *Handels Museum*, "this plant, in the innumerable banana plantations of the entire tropical world, is only properly utilized, the whole human race will obtain such a vast mass of textile material that it is certain to influence the value and cultivation of other kindred plants, such as hemp and flax, cotton, jute, etc., and nobody can predict the consequences which the utilization of this hitherto unnoticed material may have."