effect was observed. The leaves partially collapsed. In all experiments that I have made by inserting dielectrics between a charged body and an electroscope, less electric action has been the result. If, while the charged ball be near the electroscope, the plate of it be touched with the finger, the leaves collapse; and on removing the finger, and then the charged ball, they again diverge. Now let a dielectric be placed between the ball and the electroscope, touch the latter, and remove the finger and ball as before, and much greater divergence will be produced. In both cases the electroscope is charged by induction. Without putting the electroscope to earth, I fail to see theoretically why any greater divergence should occur. I suppose some one must have made the experiment as quoted; but, if a greater effect was produced, it must have been caused by the substance used for a dielectric being charged itself. I have found very great difficulty in preventing plates of ebonite, paraffine, sulphur, etc., becoming electrified when placed near a charged body. I should like to know if any one has experimented in this direction, because either the text-books or myself must be wrong. In Guthrie's book (p. 101) there is a statement similar to Ganot's."

ELECTRIC LIGHTING AT BERLIN. — M. Wybau, a Belgian electrician, has recently read a paper before the Belgian Electrical Society on the electric lighting of Berlin, from which the following particulars of this important system are taken. At Berlin the electric light, as stated in *Engineering*, is supplied from a number of central stations, the two principal of which are situated in Markgrafenstrasse and the Mauerstrasse. Of the other stations, one lights the Kaiser Galerie, and the other a block of houses at the corner of Unter den Linden and Friedrichstrasse. A fifth station, of but small importance, supplies the lighting of Leipzigerstrasse. At the Markgrafenstrasse station there are eight steam-engines, each of 150 horse-power, which drive sixteen Edison dynamos. To this plant there have recently been added four compound inverted engines, each capable of indicating 300 horse-power, which drive direct four dynamos of 165 kilowatts each. These dynamos are of the multipolar type, and are slow-moving machines, their armatures making but eighty-six revolutions per minute in normal working. The boiler-house contains eight De Naeyer tubulous boilers, which supply the steam for the whole plant. In the switch-room is a rheostat of exceptionally large size, which is used to regulate the current in the distributing mains. These mains are eighty in number, most of which are with their coverings about 3 inches in diameter, and the greatest section of copper in any one of them is 800 square millimetres. At the Mauerstrasse station there are six boilers, three engines of 180 horse-power each, and three of 300 horse-power each. At the Friedrichstrasse station there are four engines of 60 horse-power each, and at the Kaiser Galerie four of 80 horse-power each. At the small station on the Leipzigerstrasse there are two engines of 80 horse-power. The floor space required in the above installations per 1,000 lamps for boilers and machinery is from 323 to 377 square feet. At the Edison station in New York about 194 square feet of floor space are required, but the dynamos and engines run at much higher speeds. The total length of cables laid in Berlin is about 170 kilometres, which are laid under the footpaths. In every case Siemens cables are used.

ELECTRICAL SUNSTROKE. — As a remedy against "electrical sunstroke," as the affection is called that attacks men exposed to the intense rays of the electric arc by means of which metals are fused and welded, is a veil or mask of glazed taffeta, supported by a wicker head-piece, and provided with goggles of gray glass.

THE HOUSTHOLM ELECTRIC LIGHTHOUSE. — This lighthouse, the most powerful electric lighthouse in the world, was opened a few weeks ago, and its working has given great satisfaction. Even in rainy weather its light has been distinctly visible at Blokhus, a straight distance of about thirty-five miles. The only undesirable incident attending the working of the new lighthouse is the immense number of birds which get killed, and which amount to thousands, comprising starlings, snipes, larks, etc., basketfuls being collected every morning in the vicinity of the lighthouse. As stated in *Engineering*, the lighthouse is 209 feet high, and the light-power in the beam is 2,000,000 candles. To guard against the stoppage of the light through any accident to the machinery, this is, as far as it has been possible, constructed on the twin principle. There are two engines, three tubular boilers, one of which is a particularly quick-heating one, two electro-magnetic machines with a joint capacity of 45 volts, 250 ampères, from Meritens & Co., Paris, two electric lamps, with various reserve lamps, etc. In connection with the lighthouse, and at a distance of respectively about 2,000 and 16,000 feet, are two powerful sirens, which are fed with compressed air from two air-pumps in the engine-house, and which can be coupled together with the engines. At the siren stations there are reservoirs of compressed air, which are worked by means of electricity and clock-work, and great care and forethought seem to have been bestowed upon the whole installation in all its details.

ELECTRIFICATION DUE TO CONTACT OF GASES WITH LIQUIDS. — At the meeting of the London Physical Society, held on Nov. 15, Mr. Enright read a paper on "The Electrification due to Contact of Gases with Liquids." Repeating his experiments with zinc and hydrochloric acid, the author, by passing the gas into an insulated metallic vessel connected with the electrometer, proved that it was always charged with electricity of the opposite kind to that of the solution. The electrical phenomena of many other reactions have been investigated, with the result that the gas, whether H_1, CO_2, SO_3, SH_2, or Cl, is always electrified positively when escaping from acids, and negatively when leaving a solution of the salt. In some cases, according to *Engineering*, distinct reversal is not obtainable, but all these seem explicable by considering the solubility and power of diffusion of the resulting salts. Various other results given in the paper tend to confirm this hypothesis. Seeking for an explanation of the observed phenomena, the author could arrive at no satisfactory one excepting "contact" between gases and liquids; and, if this be the true explanation, he hoped to prove it directly by passing hydrogen through acid. In this, however, he was unsuccessful, owing, he believes, to the impossibility of bringing the gas into actual contact with the liquid. True contact only seems possible when the gas is in the nascent state. Some difficulty was experienced in obtaining non-electrified gas, for the charge is retained several hours after its production, even if the gas be kept in metallic vessels connected to earth. Such vessels, when recently filled, form condensers, in which the electricity pervades an enclosed space, and whose charge is available on allowing the gas to escape. Soap-bubbles blown with newly generated hydrogen were also found to act as condensers, the liquid of which, when broken, exhibited a negative charge. This fact, the author suggested, may explain the so-called "fire-balls" sometimes seen during thunder-storms; for if, by any abnormal distribution of heat, a quantity of electrified air becomes enclosed by a film of moisture, its movements and behavior would closely resemble those of fire-balls. A similar explanation was proposed for the phenomenon mentioned in a recent number of *Nature*, where part of a thunder-cloud was seen to separate from the mass, descend to earth, and rise again. The latter part of the paper describes methods of measuring the contact potential differences between gases and liquids, the most satisfactory of which is a "water-dropper;" and by its means the potential difference between hydrogen and hydrochloric acid was found to be about 42 volts.

HEALTH MATTERS.

SALT AND MICROBES. — A foreign observer has carried out some instructive researches into the effect of salt on various pathogenic micro-organisms. He found, says the *Medical Press*, that the results varied a good deal, according to the particular microbe experimented upon. The cholora bacillus, for example, curled up and died in a few hours, while the bacillus of typhoid-fever and the micrococci of pus and erysipelas resisted its influence for weeks and even months. That part of his observations bearing on tuberculosis possesses a practical importance, owing to the custom in slaughter-houses of salting the flesh of animals recognized to be tuberculous, and exposing it for sale in the course of a few weeks. M. de Freytag has shown that the tubercle bacillus thrives in the presence of an excess of salt, and salting the tuberculous tissues of an ox in no wise prevented the infection of animals fed thereon: hence it is highly desirable that a stop should be put to a

practice which exposes those who partake of the diseased meat to such obvious risks of infection.

COOLING OF THE BODY BY SPRAY. — Dr. S. Placzek, following up some laboratory experiments by Preyer and Flashaar on the effect of spraying a considerable part of the body surface of animals with cold water, has applied the spray for the purpose of reducing febrile temperatures in human beings. In the case of a man suffering from phthisis, whose temperature was high, he found, that, by spraying about a pint of water at between 60° and 70° F. over his body, the temperature fell to normal, and continued so for several hours. Again, a similar method was satisfactorily applied in the case of a girl with diphtheria. In the healthy human subject, according to the *Lancet*, the spray lowered the temperature nearly two degrees, and, in animals which had been put into a condition of septic pyrexia by injections of bacteria, the temperature was reduced to normal by the spray. By keeping healthy guinea-pigs and rabbits some hours under spray, and using from half a pint to a pint of water at the temperature of the room (44° to 62°), the temperature of the animals fell several degrees.

DEATH BY ELECTRICITY. — At the meeting of the Medico-Legal Society held in this city Nov. 20. Dr. Phillip E. Donlin, deputy coroner, who read a paper on "The Pathology of Death by Electricity," in the course of which he said, "The popular idea that the electrical current passes along the nerves and produces shock by conducting the current to the brain, is, as you know, fallacious. Our knowledge of the great electrical conductive power of water, and the experiments of Dr. Richardson, which show the still greater electrical conductive power of blood, would lead one to suppose — and, in fact, it is proved by the greater damage done to the most vascular organs of the body — that the blood is the great conductor of electricity; and that in all cases of exposure to the electric current the blood is the first to suffer, and the nerve-centres and cells the last. Unquestionably our knowledge of the manner of death points out clearly, that, when death is not on the moment produced by the shock of the current, it must be produced by the electric current's action (conducted by the blood) upon the ganglia of the heart, causing spasm of the heart muscle, emptying the ventricles, and abnormally forcibly propelling the charged and fluid blood to the periphery, producing hyperæmic ecchymosis in the most vascular portions of the most vascular organs. Where death is not instantaneous, it must be produced by disorganization of the blood, interference with the circulation causing engorgement of some vital vascular organ. The lungs being the most vascular, death usually results from asphyxia either through the unoxygenated condition of the blood, or hyperæmia of these organs." In reply to a question as to the effect likely to be produced by the infliction of the death penalty by electricity, Dr. Donlin said that the immensity of the power of the machines constructed was such that the purely mechanical result would occasion death. It was possible with those appliances to drive the current of electricity through the tissues with such power as to destroy them, though the amount of power to be employed was clearly within the control of the electrician.

IS COLORADO'S CLIMATE CHANGING? — The inhabitants of Denver are asking what is the meaning of the unusual snow-fall and humidity of the past month. The newspapers of that city, as we learn from *Medical News*, have expressed the opinion that their climate is about to undergo a change, in consequence of surface changes of "building up" and improving the State. The present moist season has been especially disappointing to Eastern people, who have journeyed to Denver to escape the humidity of our seaboard winters. From a letter recently received, a few sentences are quoted: "Snow has fallen each night and morning, but the sun conquers by mid-day, making walking almost impossible. As a usual thing, the inhabitants expect about ten days of inclement weather during winter and spring, and have not looked upon the paving of streets and crossings as at all necessary. But they are now aroused to remedy this condition. The snow-fall is said by some to be already greater than the total for three ordinary winters." The total fall at the Denver station, in October, was 2.11 inches, and is the only October since 1871 when 1.49 inches have been exceeded, with the single exception of that of 1877, when 2.15 inches were registered. There have been but nine cloudless days in the same month, while nineteen were partly cloudy. The mean temperature has been somewhat above that of the past decade. Fog — a condition hitherto almost unknown in Colorado — occurred during five mornings in October.

CARE OF THE TEETH. — At the meeting in Berlin last spring, of the German Association of American Dentists, the best means of preserving the teeth were discussed, and Dr. Richter of Breslau said, "We know that the whole method of correctly caring for the teeth can be expressed in two words, *brush*, *soap*. In these two things we have all that is needful for the preservation of the teeth. All the preparations not containing soap are not to be recommended; and if they contain soap, all other ingredients are useless except for the purpose of making their taste agreeable. Among the soaps, the white castile soap of the English market is especially to be recommended. A shower of tooth preparations has been thrown on the market, but very few of which are to be recommended. Testing the composition of them, we find that about 90 per cent are not only unsuitable for their purpose, but that the greater part are actually harmful. All the preparations containing salicylic acid are, as the investigations of Fernier have shown, destructive of the teeth. He who will unceasingly preach to his patients to brush their teeth carefully shortly before bedtime, as a cleansing material to use castile soap, as a mouth wash a solution of oil of peppermint in water, and to cleanse the spaces between the teeth by careful use of a silken thread, will help them in preserving their teeth, and will win the gratitude and good words of the public."

THE DIGESTIBILITY OF BOILED MILK. — Though the importance of sterilizing milk for bottle-fed infants in cities has been proven beyond a doubt, the process seems to have some disadvantages. In a recent number of the *Zeitschrift für physiologische Chemie*, Dr. Randnitz publishes some striking experiments on the subject. He shows by analysis of the milk ingested, and of the fæces and urine, that much less nitrogenous material is abstracted from boiled than from unboiled milk. If 15.6 grams of nitrogen in the form of unboiled milk were given to dogs for three days, analysis showed that 9.4 per cent was stored in the tissues of the animal. On the other hand, with the same amount of nitrogen in boiled milk, but 5.7 per cent was assimilated. If these results are confirmed, it is evident that an infant must need a larger quantity of sterilized than of raw milk.

ARTIFICIAL FOOD FOR INFANTS. — Dr. Escherich of Munich gave a lecture in the pædiatric section of the sixty-second meeting of German naturalists and physicians at Heidelberg, advocating a reform in the artificial feeding of infants. He bases his belief in the necessity of such a reform on the errors produced by Biedert's theory, which depends upon the difference between cow's milk and normal human milk. Biedert's view was, as stated in the *Lancet*, that all the troubles and diseases occurring in artificially fed infants were due to the indigestion of the caseine of the cow's milk, causing irritation of the mucous membrane of the bowels. He therefore considered, that, if the latter were diluted so as to contain one per cent only of caseine, the infant could not possibly take an injurious quantity of this noxious substance. Dr. Escherich considers that this theory, and the practice resulting from it, have gone far to prevent due care being exercised as to much more important conditions. Such are, according to the lecturer, germs and fermentation in improperly kept cow's milk, the number of meals, and the quantity of food given at a time in proportion to the capacity of the infantile stomach, the total quantity of nutritious matter and its proportion in the food, and finally the injurious effect which the water which has been added to the food has on the digestion and the metamorphosis of nutritious matter. Dr. Escherich holds it, above all, necessary to return to physiological principles, and so to approximate artificial feeding as much as possible to the mother's milk, as regards the absence of germs and the number and quantities of meals. The lecturer then pointed out that it is easy enough, by sterilization of small quantities of milk according to Soxhlet's plan, to comply at least theoretically with all these conditions, and at the same time to limit the quantity of caseine so as to fulfil Biedert's requirements.

NOTES AND NEWS.

THE eighth congress of Russian naturalists and physicians will be held at St. Petersburg from Dec. 27, 1889, to Jan. 7, 1890.

— There are now thirty-nine crematories in various parts of the world. Italy has twenty-three; America has ten; while England, Germany, France, Switzerland, Denmark, and Sweden have one apiece. In Italy there were two cremations in 1876; the number rose to fifteen in 1877, and in 1888 the number was 226. Since 1876, 1,177 cremations have taken place in Italy, while the combined numbers in all other countries brings the total only to 1,269.

— The following is a list of the papers read at the meeting of the Royal Meteorological Society, London, Nov. 20: "Second Report of the Thunder-Storm Committee," being a discussion by Mr. Marriott on the distribution of days of thunder-storms over England and Wales during the seventeen years 1871–87; "On the Change of Temperature which accompanies Thunder Storms in Southern England," by Mr. G. M. Whipple; "Note on the Appearance of St. Elmo's Fire at Walton on the Naze, Sept. 3, 1889," by Mr. W. H. Dines; "Notes on Cirrus Formation," by Mr. H. Helm Clayton, who has made a special study of cloud-forms and their changes; "A Comparison between the Jordan and the Campbell Stokes Sunshine Recorder," by Mr. F. C. Bayard, being the result of a year's comparison between these two instruments; "Sunshine," by Mr. A. B. MacDowall, being a discussion of the hours of sunshine recorded at the stations of the Royal Meteorological Society; "On Climatological Observations at Ballyboley, County Antrim," by Professor S. A. Hill, the result of observations made during the five years 1884–88.

— A circular letter has been sent to the members of the National Electric Light Association by the secretary, Mr. Allan V. Garratt, asking them to state to him as briefly as possible the most difficult electrical problems they meet in their investigations or in the conduct of their electrical business. They are also requested to state what feature of their business is the least economical or efficient, and why, and where the greatest economy could be effected if the difficulty could be overcome. The answers to these queries will be digested, and the results submitted to Professor Henry A. Rowland of Johns Hopkins University. Professor Rowland has consented to address the next electric-light convention at Kansas City in February, basing his remarks upon the problems suggested by the members, and pointing out the direction in which their solution must be sought.

— From a memorandum appended to the last report of the United States consul at Shanghai, it appears that the greatest silk-producing province in China is Che Kiang, and Kiang-Su comes second. The two great divisions in silk as exported from central China are known in all places of consumption as *tsatlees* and *taysaams*. *Tsatlee* is simply the Cantonese for *tseih le* (or "seven li"); that is to say, an area of that dimension, taking Nanzing as the centre, where the best fine-sized silk was formerly produced. The radius has been extended, in consequence of the higher price paid for fine compared with coarse sorts; and *tsatlees* now include some silks reeled from Sinsze and Seloo cocoons, which formerly were only employed for silks of the coarser thread. Considerable quantities of *taysaams* are still, however, being reeled in the two last-named districts. At the present time *tsatlee* means silk produced at Nanzing, Chinza, Linglooh, Shwangling, Woochin, Leensze, Hoochow, and a portion of Sinsze and Seloo, besides the intermediate towns, all situated in Che-Kiang. *Taysaam* (meaning "a big worm") has really only the signification of silks of a coarse reeling, and under the denomination are classed silks from Kiahsing, Sinsze, Dongse, Shaouhing, Woosieh, and Laeyang, the last two districts being situated in Kiang-Su. Haining or Yuenfa, situate in Che-Kiang, produces silk reeled of the finest size known in China; and when native competition was crippled by the Tai-Ping rebellion, large quantities annually found a ready sale in Europe. Of late years, however, the export has dwindled down to almost nothing. Hang-Chow, also Che-Kiang, produces both fine and coarse sized silks, *tsatlees* and *taysaams*, the size of the former from this district very nearly approaching to that of Kiahsing *taysaams*, and they are generally in favor both for export and for home use, while the coarse sorts are mostly taken by Chinese. Shaouhing, in Che-Kiang, produces a very considerable quantity of silk, that, when reeled on foreign methods, is said to be equal to any in the empire, but which, as natives persist in reeling on a large wheel and without care, has gradually lost all interest to foreigners. Laehang, in Kiang-Su, produces from 3,000 to 4,000 bales annually, but the same remarks as those applied to the Shaouhing production must apply also to this district's production. The principal towns where throwing is carried on are Nanking, Soo-Chow, and Hang-Chow, and the business must be large to meet the requirements of the enormous piece-goods trade of China. Formerly foreigners used to export considerable quantities; but the improvements made in Europe which have not extended to China have extinguished the trade. The re-reeling of silks (for the purpose of rendering the manipulation of the silk easier to manufacture) is carried on in the centres of Nanzing and Chinza, and the outlying farms and hamlets. The production is considerable, and would be larger, it is said, if the Chinese would use greater care and abstain from adulterating the silk during the process.

— In response to a despatch from Emin Pacha, doubtless sent on to Zanzibar in advance of the main party, and thence cabled to Cairo, the Egyptian government steamer "Mansourah" has been sent to meet Stanley and Emin and their party at Zanzibar. This will hasten Stanley's return to Europe, and the completion of his adventurous three-years' task may be chronicled very soon. A long letter from Stanley to a friend, dated September, 1888, has just been published. It records his discoveries, and recounts the difficulties anticipated on his homeward journey. There is an account of the hostility of the King of the Kabburega, who stripped Casati, and turned him adrift to perish. He was fortunately found and rescued by Emin. Another letter gives a full account of his sojourn with Emin.

— The *Lancet*, commenting on the passage of the English infectious disease notification bill, says, "One thing is remarkable in this legislation, — the slight resistance which politicians of advanced views have been able to offer to its fundamental principle; viz., the right of the community to insist on knowing the affairs of individuals and families where these are likely to involve in any degree the health of others: in other words, the subordination of the individual to the community. This is, of course, the fundamental principle of society, but it is ever undergoing fresh development. National education, vaccination, isolation, and notification of disease, are all illustrations of the same principle. We have ourselves no hesitation in accepting the principle that individual liberty must give way where such doubtful advantages as the freedom to have small-pox and scarlet-fever are the only badges of liberty; and it will involve no misfortune to the world if many other rights claimed by well-meaning but discordant individuals are curtailed in the interests of society."

— The New York Electrical Society, the oldest body of the kind in the country, is the Electrical Section of the American Institute. The object of the society is to bring before its members such topics and new inventions as merit their study and attention. There is a large and rapidly growing class of those who wish to gain a greater familiarity with electricity, and it is to the education of this class that the society directs its work. There is another class, composed of those who, while not earning a livelihood from electrical work, are greatly interested in all the developments of electricity, and who are glad to attend the meetings of the society, because they there are given the opportunity to come into contact with practical electricians, from whom they may elicit instruction and information such as no book could impart. The appreciation of the work of the society in connection with this element of the community is shown by the growing attendance at the meetings, and by the readiness of the press to publish reports of the proceedings. During the present season the society will introduce to its members a number of the leading men in the electrical profession, who will handle the subjects with which they are most familiar, and of which they are acknowledged masters. From such a course of papers and lectures as has been arranged, there can be no doubt that a great stimulus will be given to the study and application of electricity in New York; and the society therefore confidently appeals to those in any way interested in electricity for all the support

that they can give. Among the papers and lectures already read this season are "Electrical Exhibitions, and a Description of Recent Electrical Developments in Europe," and "How to test Electric Motors." Among those yet to come are "Progress of Electric Railroads," "A Talk on Cables," "The Electrical Torpedo, — New York's Sole Defence," "Storage-Batteries," "The Incandescent Lamp," "The Telegraph," "The Telephone," "The Alternating Current," "The Galvanometer and its Uses," "Electricity in War," "Phantom Wires," "How to run an Electric-Light Station," "Transformers," "Power Transmission," "Laboratory Manipulations," "The Social Side of the Electric Street Railway," "The Solution of Every-day Electrical Problems," and "The Progress of the Year." The officers of the society are as follows: president, Francis B. Crocker; vice-presidents, Joseph Wetzler, Francis Forbes, and Dr. Otto A. Moses; secretary, George H. Guy; treasurer, H. A. Sinclair; trustees, J. M. Pendleton, C. O. Mailloux, and A. A. Knudson.

— It is well known, says *Nature*, that whales can remain a long time under water, but exact data as to the time have been rather lacking. In his northern travels, Dr. Kückenthal of Jena recently observed that a harpooned white whale continued under water forty-five minutes.

— For determination of the air-temperature at great heights, the Berlin Society for Ballooning, we learn from *Humboldt*, is going to try a method of Herr Siegsfeld, who uses a thermometer, which, by closure of an electric circuit when certain temperatures are reached, gives a light-signal. Small balloons, each containing such a thermometer, will be sent up by night; and the light will affect photographically a so-called "phototheodolite," while the height then attained will be indicated in a mechanical way. It is hoped that more exact formulæ for the decrease of temperature with height may thus be obtained.

— From the *Journal of the Anthropological Society* in Vienna, we take the following conclusions of Dr. B. Hagen, respecting the Malay peoples: Their great predilection for the sea, which makes them pray to Allah that they may die on sea, seems to render the Malay race adapted for the Polynesian and Further Indian Archipelago. The centre from which they migrated is to be sought in the highlands of West Sumatra, particularly in the old kingdom of Menang-Kabau. Thence the peoples extended slowly eastwards, — at first probably the races now to be found only in the interior of the great islands (the Battas in Sumatra, the Sundanese in Java, the Dayaks in Borneo, the Alfurus in Celebes, etc.). These "aborigines" of the islands crushed out a population already in possession, as remains of which the Negritos may be taken. The Malays in the narrower sense, occupying Sumatra, Malacca, and North Borneo, are to be regarded as the last emigration from the centre referred to, occurring from the twelfth to the fifteenth century, A.D. With the Indians and Chinese, who have been long in intercourse with the archipelago, arose mixtures and crosses, in less measure also with the Arabs. One must not therefore expect the pure racial type, especially in the coast population. The crania of the anthropological collections are too imperfectly determined in respect of their *locale* to be of any service for a judgment of the Malay peoples. Of more value are the measurements of the living, begun by Dr. Weisbach and executed by Dr. Hagen, in four hundred cases. The latter's conclusions are: (1) The peoples in the interior of Sumatra — the Battas, the Allas, and the Malays of Menang-Kabau — compose a closely allied group always in direct contrast with the hither-Indian peoples, and yet showing just as little community with the Chinese. We must therefore take them for the pure original type, characterizable as follows: small, compact, vigorous figure, of less than 1,600 millimetres average size; long arms; very short legs; very long and broad mesocephalous skull of very great compass, with high forehead; a prognathous face 10 per cent broader than long, with large mouth, and uncommonly short, flat, and broad nose with large round nostrils opening mostly frontwise, and with broad nasal root. (2) The Malays of the east coast of Sumatra and those of the coasts of Malacca indicate a much greater affinity to the Indians than to their tribal peoples of Menang-Kabau. They are plainly, therefore, thoroughly mixed with Indian blood. (3) The Javanese peoples stand much nearer to the original type of the Sumatrans than to the Malays just mentioned. They show, therefore, less mixture with Indian, but, on the other hand, more mixture with Chinese, blood; and the Javanese more so than the Sundanese.

— A London paper says that some experiments in judging distance by sound were carried out recently by one of the London brigades of the Metropolitan Volunteers. This branch of military tactics is quite a new departure. It was first explained to the men that sound travels at the rate of 1,100 yards in three seconds, and on this basis they were to estimate the distance at which some rifles were being discharged in the darkness. The answers at first were very wide of the mark, some of the men being as much as 150 yards out in their calculations. With a little practice, however, a great improvement was shown, many of the men guessing the distance exactly. The experiments are not as satisfactory as was hoped, and it is thought some time must elapse before judging distance by sound can be relied upon with any certainty.

— At the monthly meeting of the Royal Society of Tasmania on Sept. 9, the president (his Excellency Sir Robert G. C. Hamilton) said he desired to bring before the society a matter relating to the young salmon at the Salmon Ponds. These were the undoubted product of the ova brought out by Sir Thomas Brady, which had been stripped from the male and female fish and artificially fertilized, and the utmost care had been taken to keep them apart from any other fish bred in the ponds. He recently visited the ponds, accompanied by the chairman of the Fisheries Board, the secretary, and two of the members, when they carefully examined a number of the young salmon, among which they were surprised to find marked differences existing, not only in size, but in their characteristics. It has often been held, according to *Nature*, that the *Salmonidæ* caught in Tasmanian waters cannot be true *Salmo salar*, because so many of them have spots on the dorsal fin, and a tinge of yellow or orange on the adipose fin; but nearly half of the young salmon they examined, which had never left the ponds, had these characteristics. Again, many of them were almost "bull-headed" in appearance, — another characteristic which is not supposed to distinguish the true *Salmo salar*. He would suggest to the chairman of the Fisheries Board, whom he saw present, that the secretary should be asked to make a formal report of the result of this visit, and to obtain some specimens of the young fish, which could be preserved in spirits, and perhaps sent to Sir Thomas Brady to be submitted for the consideration and opinion of naturalists at home.

— British Consul Pettus of Ningpo, in his last report, says that one of the principal and perhaps most profitable industries of his consular district is the *ming fu* or cuttlefish trade. For two months, from the latter part of April until the closing days of June, the number of small and somewhat barren islands of the Chusan archipelago, situated within a radius of fifty miles of Chinhae (at the mouth of the Yung River), swarm with men engaged in the occupations of cleaning and drying the fish for the Ningpo market, and the adjacent waters are covered with boats engaged in fishing. The cuttlefish boats are from twenty-five feet to thirty feet in length, with a beam of seven feet. They are furnished with a single lug-sail, usually made of foreign cloths tanned with mangrove-bark. They are worked with two, sometimes three, oars, with which the boats are propelled with immense speed. The boats, as a rule, work in pairs, a bamboo fastened at the bows of each to keep them separated, with a space of about twenty feet between. To the bamboo is attached the large net. Others, again, catch the fish by means of a square net, fastened at the corners to the ends of two slender bamboos which cross at right angles, and sewn together in the middle. These bamboos, with the attached net, are suspended from a stout beam which projects some distance over the bow, and has fastened to the inboard end a heavy weight for facilitating the raising of the net. This is used in shallow water, and principally at night, when a fire is kept burning in a pan in the bow of the boat to attract the fish. One or two men attend to the working of this net, while the rest of the crew are employed in scooping in the fish with hand-nets. The fish are then landed, cleaned, and sun-dried, the latter operation taking about three days. The cuttlefish is called by the Chinese

uri tsê ("black thief"): *ming fu* is the commercial name of the fish when dried. The black liquid secreted by the fish was used as a substitute for ink, but was abandoned, as it faded after a lapse of a few years.

— Many late and valuable reports of ocean-currents have been received at the United States Hydrographic Office, but lack of space forbids any extended reference to them. The graphic record of the tracks of derelicts, wrecks, buoys adrift, etc., published each month on the "Pilot Chart," is itself instructive as to the general set of currents, especially in the case of a large iron buoy like that from Port Royal, S.C. Attention is called, also, to the "bottle papers" issued by the Hydrographic Office, for masters of vessels to seal up in empty bottles and throw overboard, in order, that, when found and returned, data may be obtained regarding the general drift of surface currents. This is an old plan, but one that is still used, and is thought to give results of some value when a large number of such facts are available for study. Many of these papers have been returned to that office, and the latest may be mentioned here. One was thrown overboard Dec. 30, 1888, by Chief Officer Downie (British steamship "Crown Prince") off the north-west coast of Cuba: it was picked up on the beach at Matagorda Island, Texas, Aug. 10, 1889, by the keeper of the Saluria life-saving station. Another was thrown overboard March 27, 1889, by First Officer Conklin (American steamship "Cherokee") in latitude 36° 42′ north, longitude 75° 06′ west: it was picked up on Sept. 25 by Capt. Touguerant (French brig "Bonne Joséphine") in latitude 44° 30′ north, longitude 52° 10′ west. The forms issued for this purpose are printed in six languages, and efforts are being made to give them a wide distribution.

— A lake-dwelling has been discovered in the neighborhood of Somma Lombardo, north-west of Milan, through the draining of the large turf moor of La Lagozza. The Berlin correspondent of the *Standard*, who gives an account of the discovery, says that this "relic of civilization" was found under the peat-bog and the underlying layer of mud, the former being 1 metre in thickness, and the latter 35 centimetres. The building was rectangular, 80 metres long and 30 metres broad; and between the posts, which are still standing upright, lay beams and half-burnt planks, the latter having been made by splitting the trees, and without using a saw. Some trunks still retain the stumps of their lateral projecting branches, and they have probably served the purpose of ladders. The lower end of these posts, which have been driven into the clay soil, is more or less pointed, and it can be seen from the partly still well-preserved bark that the beams and planks are of white birch, pine, fir, and larch. Among other things, were found polished stone hatchets, a few arrow-heads, flint knives, and unworked stones with traces of the action of fire.

— According to recent work of Professor H. W. Wiley, the chemist of the United States Department of Agriculture, the value of sorghum-seed as a food for man and other animals is fully equal to that of maize and oats, and but little inferior to that of wheat. The essential constituents of the cereals as food are the albuminoids and the carbohydrates. Comparing these two constituents of sorghum-seed with the other great cereals, it contains more albuminoids than either unhulled oats or maize, and only about three-fourths of a per cent less than wheat. Its contents of carbohydrates is almost identical with that of the other cereals mentioned. The glumes of the sorghum-seeds contain a coloring-matter of great intensity, and it has been thought that this substance might prove injurious to the health of animals consuming it. Professor Wiley has therefore had a careful examination made of the properties of this coloring-matter, and finds it to be a vegetable coloring-matter without noxious principles, and, as far as the investigations have extended, wholly free from tannin. This study includes only the chemical re-actions of the color, and the characteristics which distinguish it from other companion colors of a vegetable origin. Owing to the small quantity of pure color obtained, and the difficulties of complete purification, no experiments were made with regard to its dyeing qualities. The richness of the color (a deep red) would certainly point to the desirability of such experiments. In the heavier and larger hulled seeds, such as those of Deutcher's Hybrid, Early Tennessee, and the Early Amber varieties, the color seems to constitute between five and fifteen per cent of the alcoholic extract, which latter ranges from five to ten per cent of the seed. The yield of cane per acre appears to average from ten to twelve tons; and the seed-head, fifteen to twenty per cent of the cane. Assuming the seed to constitute seventy-five per cent of the head, we have three hundred pounds of seed to the ton of cane. This affords thirty pounds of extract, and three pounds of pure color, to the ton of cane, or thirty pounds per average acre. The higher the tonnage, and the darker and heavier the hull of the seed, the greater the yield of color.

— A curious instance of the vicissitudes of commerce is afforded by the change going on in the raisin trade between this country and Spain. In 1882 Malaga shipped to this country nearly a million boxes of raisins, which was about half its production for that year. Since that time the annual production in Malaga has steadily decreased, while that of California has as steadily increased, till in 1888, out of a total crop of 112,000 boxes, Malaga sent us only 700,000 boxes. It is now predicted by vine-growers that in a few years California will be shipping raisins to Spain.

— Iron buoys, being constructed so as to withstand the buffetings of the heaviest seas, are apt to remain long afloat when once they get adrift from their moorings. Although their movements are then governed by the combined influence of wind and current, the relative effects of each of these components of the force acting upon them vary more or less, according to the shape and immersion of the buoy. When a considerable portion of the moorings are still attached, the immersion is generally so great that the influence of the current largely outweighs that of the winds, and the drift of the buoy is a very fair indicator of the set of the current it has experienced. A notable instance is afforded by the mid-channel buoy from Port Royal, S.C., which went adrift in the latter part of November, 1886, and is still floating about in the North Atlantic, probably somewhere between the parallels of 35° and 45° north, and the meridians of 45° and 55° west. Eleven reports have been received thus far by the United States Hydrographic Office.

— The following is a list of the Saturday morning lectures to be given in the Law School building of Columbia College during the season of 1889–90: Nov. 16, "The Influence of Locality in American Fiction," by L. J. B. Lincoln, Esq.; Nov. 23, "Petroleum and Natural Gas" (with illustrations), by Dr. John S. Newberry; Nov. 30, "Cæsar and Cleopatra," by John William Weidemeyer, Esq.; Dec. 7, "Benjamin Franklin, America's Practical Philosopher," by Dr. Henry M. Leipziger; Dec. 14, "The Avesta and the Religion of Zoroaster," by Dr. A. V. W. Jackson; Dec. 21, "The Geological History of Man" (with illustrations), by Dr. John S. Newberry; Dec. 28, "The Relation of the Higher Education of Women to Literature in America," by L. J. B. Lincoln, Esq.; Jan. 4, 1890, "Shakspeare and Corneille," by Professor Adolphe Cohn; Jan. 11, "The Cyclades," by Dr. Louis Dyer; Jan. 18, "The Career of Leon Gambetta," by Professor Adolphe Cohn; Jan. 25, "Progress of Education in the United States," by Dr. Henry M. Leipziger; Feb. 1, "Total Solar Eclipses and What We learn from Them" (with illustrations), by Professor J. K. Rees; Feb. 8, "Where and How We remember," by Dr. M. Allen Starr; Feb. 15, "The Moon: A Study of her Surface" (with illustrations), by Professor J. K. Rees; Feb. 22, "Methods of teaching French," by Dr. B. O'Connor; March 1, "Emerson as an English Writer," by Professor T. W. Hunt; March 8, "Methods of Education," by Dr. B. O'Connor; March 15, "Words and their Abuse; from Philological, Rhetorical, and Moral View-Points," by Dr. J. D. Quackenbos; March 22, "The Poetic Edda," by Professor Charles Sprague Smith; March 29, the same subject continued; April 5, "Swinburne and the Later Lyrists," by Professor H. H. Boyesen; April 12, "George Eliot and the English Novel," by Professor H. H. Boyesen; April 19, "Shakspeare's Dramatic Construction: The Winter's Tale," by Professor T. R. Price; April 26, "Shakspeare's Verse Construction," by Professor T. R. Price; May 3, "Athenian Days," by Professor A. C. Merriam; May 10, "The Geographical Distribution of North American Plants" (illustrated by lantern projections), by Dr. N. L. Britton; May 17, "Daniel O'Connell," by Dr. William A. Dunning; May 24, "Shop-Girls and their Wages," by Dr. J. H. Hyslop.