and it is shown that the greater number simply hinder the development of bacteria, and in no way destroy their powers when they are again placed under suitable conditions.

The little volume may be summed up as clear and concise, well illustrated, and inexpensive.

Dr. Black has adopted a rather high sounding title for a course of lectures delivered to the students in the Chicago college of dental surgery. There is no evidence that he has worked practically at the subject, and the generalizations to which he is inclined have to be made entirely upon the work of others which he has not controlled. He thinks that all the processes causing cell destruction or absorption are a sort of digestion, and that microorganisms act by digesting the cells, or else they are digested by them. Perhaps, if the subject-matter had been a little more digested by the author, he would not have felt himself called upon to publish these lectures.

BILLINGS'S VENTILATION AND HEATING.

THIS book is a reprint, in revised form, of a series of articles which appeared in *The sanitary engineer* in answer to a typical questioner who asked for a rule-of-thumb method for solving problems in ventilation, and who failed to recognize the legitimate relation between 'long-winded discussions on the physics of gases,' and ventilation. The author urges a thorough knowledge of the mechanics of gases, and of the laws involved in their free and constrained movement, as essential to any competent judgment upon the solution of the various pneumatic and thermal problems peculiar to heating and ventilation.

Pecuniary rather than constructive or functional difficulties are stated to be the most serious encountered in providing good ventilation. A partial antidote for scepticism as to the efficiency of any method, because of the frequent entire or partial failure of elaborate and costly systems put to the test of actual use, appears in the description given of systems in successful operation in various types of buildings. If the causes of failure in less successful undertakings had been clearly pointed out, the faith of many would have been still further strengthened. A discussion of the comparative cost of heating, with and without conjoined ventilation, would also have served the good purpose of furnishing needed information, and of allaying any undue apprehension growing out of the author's statements which make ventilation dependent on liberality of expenditure. The ordinary cost of ventilation does not necessarily represent the minimum cost under conditions of maximum economy and efficiency; and it is along these lines that the progress is to be made which shall inspire confidence, and create demand.

The book is a valuable contribution to the literature, rather than to the science, to which it pertains. It furnishes a clear statement of the fundamental principles involved in the art of heating and ventilation, and describes its methods and results in their application to the numerous and varied illustrations cited. In style, the book is fresh, vigorous, and perspicuous; the occasional flashes of the author's individuality lending a charm the more complete because unmarred by dogmatism. Though occasional statements may provoke marginal interrogation-points, the book is an eminently safe guide, and easily takes a leading place among the works of its kind which have appeared in American literature.

Ventilation and heating. By J. S. BILLINGS. New York, *The sanitary engineer*, 1884. 8°.

NOTES AND NEWS.

IT is suggested by G. P. Putnam's sons of New York to secure for the publications of societies the same advantages that are possessed by the issues of publishers, by having them fully described in a priced and classified catalogue, to be made up, say, twice a year, and to be distributed as widely as are the book-lists of publishing-houses. There are at present in the United States some seventy scientific and historical associations which issue in the course of the year transactions, proceedings, or monographs. Many of these publications possess an interest and importance for the general public, and find sale outside of the special circles of the members of the societies for whom they are more particularly prepared. The general sale of such society publications could be materially increased, to the advantage as well of the special interests they are planned to further, as of the various publication-funds, if provision were made for some trustworthy means by which the general public might secure prompt information concerning the works issued, and for some regular channel through which could be supplied the increased demand that such information would unquestionably induce. Each society whose publications are included in the catalogue, will, under the plan proposed, contribute a small annual payment towards the cost of its preparation, while the publishers will assume the payment of such deficiency as may remain.

— D. G. Brinton of Philadelphia announces as in press "The Lenâpé, and their legends; with the com-

plete text and symbols of the Walam olum, a new translation, and an inquiry into its authenticity," by himself.

— At its annual meeting, Jan. 21, the Russian geographical society awarded the Constantine medal to A. Woeikof, for his researches on climatology, especially for his work entitled 'Climates of the globe;' Count Lutke's medal to Col. N. J. Zinger, in consideration of his method of determining time by the observation of two stars, — a method combining accuracy with simplicity without the aid of heavy instruments, and especially suitable for geodetic work (it has already been used in Caucasus, Bulgaria, and other places); the medal of the ethnological section to P. W. Schein, for his study of the folk-lore of White Russia; the medal of the statistical section to Prof. T. Janskeel, for his report on factory statistics of the Moscow region. Inferior gold medals were given to Putkata, Iwanow, and Benderskiy (Ramir travellers); to Professor Klossowsky, for his studies of thunder-storms in Russia; and to Professor Zomakion, for magnetic observations at Kasan in 1882–83 on the international plan. The most important recent publications of the society are the map of the Baikal by Chersky, and the atlas showing Gen. Kaulbars's work on the Amu Sarja.

— Among the prominent members of the Russian geographical society who died during the past year was Count A. S. Uwarow, one of the first archeologists of Russia, and founder of the Archeological society of Moscow. His first work was an investigation of the archeology of southern Russia. Later he made a very thorough examination of the tumuli on the Oka (Wladimir), and published an important work on the Finnish people of the Meria, who inhabited the country before its colonization by the Russians. For this work he was awarded the Constantine medal of the society. The last fifteen years of his life were devoted to the study of prehistoric archeology.

— The electrical exposition, organized by the International society of electricians at the Observatory of Paris, will open March 15. The exposition will be the first in a series of special expositions preparatory to the great universal and international festival in 1889.

A KANSAS TORNADO IN APRIL, 1884.

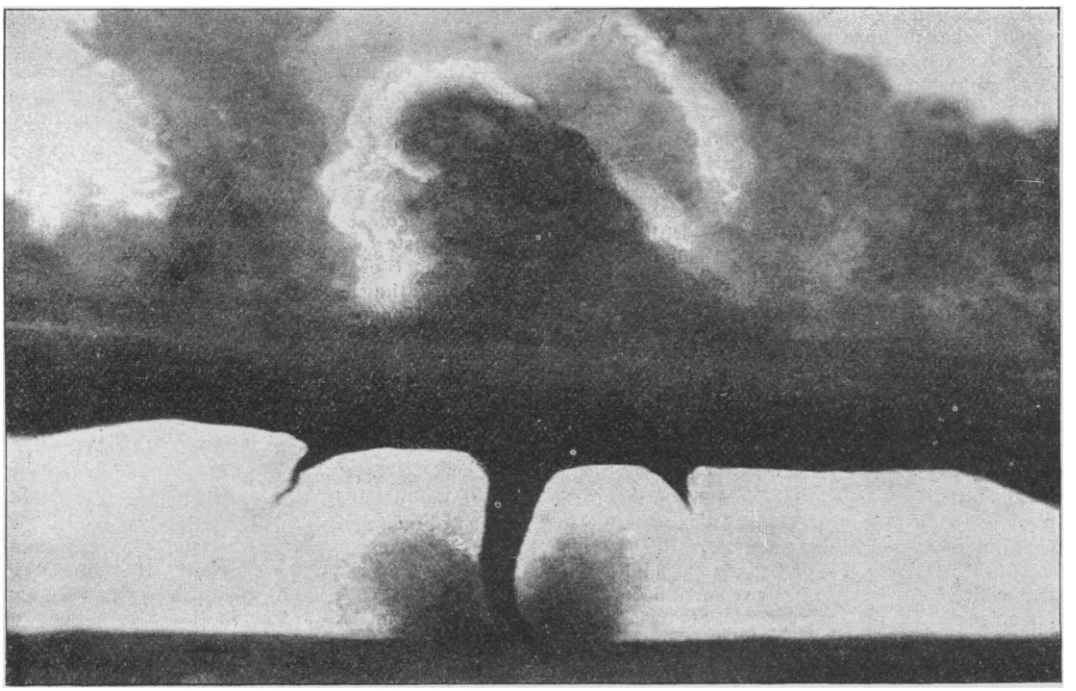
— Capt. Mitchell of the English steamer Wentmore reports that on Jan. 28, at half-past two A.M., a ball of St. Elmo's fire fell between the bridge and foremast, and afterwards played upon the foremast and gaff. This ball of fire was so bright that for a time it blinded the officer on watch.

— Ambulance classes for railway employees have been instituted in Berlin, and it is intended that in future every German railway official shall be an accomplished student of the Esmarch ambulance system.

— Mr. Cochery, the French minister of posts and telegraphy, was present at Rouen, Jan. 2, at some experiments in long-distance telephoning. The object was to test the application between Rouen and Havre, a distance of about ninety kilometres, of the simultaneous transmission system of Van Rysselberghe. The result was excellent, and Cochery announced that the communication would be open to the public in a fortnight. It is probable that before long there will also be a connection between Rouen and Paris, using either the Van Rysselberghe system or a special wire, according to the cost. Since Jan. 1 the first public telephone-offices have been in operation in Paris.

— The January number of the *American meteorological journal*, edited by Professor Harrington of Ann Arbor, Mich., and published at Detroit, is of more than usual interest. Among the meteorological papers, one by Mr. H. H. Clayton, jun., on the 'Thunder-squalls of July 5, 1884,' is of much value. A new feature that appears in this number of the journal is twelve pages of methodical review by various contributors. If extended and continued, this will form a current bibliography of great value to many readers who are unable to consult a large variety of publications. The number contains a woodcut (here produced) prepared from a photograph of a tornado that occurred in Kansas last April. The view was taken by Mr. A. A. Adams, Garnett, Kan., from whom copies may be bought. Another tornado photograph was taken in Dakota last August by F. N. Robinson of Howard, Miner county, from whom copies may be obtained. The storm passed twenty-two miles west of that town, moving in a

south-easterly direction. It was first noticed at four o'clock, and remained in sight over two hours. Several persons were killed, and all property was destroyed along its track. This view has already been published in *Nature* and in the *Comptes rendus*, while its appearance here has been delayed on account of its having been copyrighted. Although the destructive effects of tornadoes have often been photographed, we believe these are the first views ever taken of the tornado itself. No others of the kind are found in the great collection of tornado illustrations in the U. S. signal-office at Washington. It is due to our readers to say that our knowledge of the authenticity of these two views depends simply on the tacit guaranty given by their owners, and that the second one especially bears evidence of having been somewhat 'touched up;' but, in any case, they are certainly unique. It is to be hoped that there may be additional examples reported of this new use of the camera before the coming season is over.



FROM AN INSTANTANEOUS PHOTOGRAPH OF A TORNADO IN DAKOTA.

— The veteran Chevreul, who is approaching the close of the hundredth year of his age, presided the first week in January, in Paris, at a meeting of the new Student's association. It is needless to say that he was enthusiastically received. He spoke of himself as being still merely a student.

— The government astronomer of the colony of Victoria has recommended that a party be sent to New Zealand next September to carry out the necessary physical and other investigations for which the eclipse of the sun in that month will present a favorable opportunity. "The occurrence," he says further, "of long-continued earthquake disturbances in Tasmania during the past year, and the tendency they have lately exhibited to extend to the southern part of Australia, coupled with the probability that they are indicative of a new centre of seismic-action not very far removed from the eastern portion of Bass's Straits, suggest the propriety of establishing some seismometer apparatus at our observatory; and I have now under consideration the question of the form of apparatus best suited for this locality."

— Mr. Lauth, the superintendent of the porcelain factory at Sèvres, is said to have discovered a new porcelain which is far superior to the celebrated old Sèvres. After ten years' experiment and investigation, he thinks he has produced a porcelain identical with that of China. Not only does it lend itself to artistic decoration, but it takes all kinds of glazes, and surpasses in beauty the colors obtained in China.

— Our imperfect knowledge of the more obscure forms of marine life is shown by the fact that a new parasitic copepod has just been discovered in the gill-tubes of the ordinary clam (Mya arenaria), and described in the *American naturalist* for February. It is rather large, and belongs to the group Poecilostomata. The male is found in a free state in the mantle cavity.

— The first part of the new 'Journal of the New-York microscopical society' has appeared as a well-printed octavo of thirty-two pages. It is to contain the transactions and proceedings of the society, and to be published in nine monthly numbers, from November to July inclusive, at one dollar per annum. The present number contains an abstract of Stein's article on electrical illumination for the microscope, which appeared in the *Zeitschrift für wissenschaftliche mikroskopie;* a short critical essay on pollen-tubes, by Dr. Britton; the report of the proceedings of the society; and, finally, an 'Index to articles of interest to microscopists.' From the examination of the journal, we conclude that the society opens its career with good prospects; and we find among the members a number of familiar and esteemed names, which makes us hope that it will prove something more than an association of *dilettanti.* Cornelius van Brunt is president of the society, and B. Braman editor of the journal.

— The *Deutsche geographische blätter* of Bremen publishes a 'sociological essay' on the Kongo tribes, written by Mr. R. C. Phillips, an old resident at Ponta da Lenha. The writer deals more especially with the social condition of the tribes with whom he was brought into contact, and only incidentally enters into questions of commerce and international policy. What he says about the recent 'annexations' and purchases of land by the International association, the French, and the Portuguese, is of some interest just now. It is quite clear that the native chiefs, when they signed the documents so ostentatiously made public, never meant either to 'sell' the land of their tribes, or to place themselves under the sovereignty or protection of foreign powers.

— The following three monographs, part of the larger work on the fauna and flora of the Bay of Naples and the neighboring coasts, will shortly be published by Engelmann of Leipzig: 'Doliolum,' by Dr. Basilius Uljanin, with twelve colored lithographs, ten zincographs, and a woodcut; 'Polycladae,' by Dr. A. Lang, with fifteen lithographs; 'Cryptomeniaceae,' by Dr. G. Berthold, with eight colored lithographs.

— The eighteenth volume of the new edition of the 'Encyclopaedia Britannica' is to be published this month. It opens with the article 'Ornithology,' of Prof. A. Newton: and among the other scientific articles are 'Oysters,' by Mr. J. I. Cunningham; 'Pacific Ocean,' by Mr. J. Murray; 'Parasitism,' treated under the three heads, 'animal,' 'vegetable,' and 'medical,' by Mr. P. Geddes, Mr. Milne Murray, and Dr. C. Creighton; 'Pathology,' by Dr. Creighton; 'Photography,' by Capt. Abney; and 'Phrenology,' by Professor Macalister. 'Philology' is dealt with by Professor Whitney of Yale, and Prof. E. Sievers of Tübingen.

— The fourth edition of 'Tables, meteorological and physical,' by Professor Arnold Guyot, has just been published by the Smithsonian institution. The preceding or third edition was published in 1859; and though stereotyped, it was thought advisable to have this new edition entirely reconstructed. It now forms an octavo volume of seven hundred and sixty-three pages, and is offered for sale at the price of three dollars. The first series of tables (fifteen in number) embraces thermometrical comparisons and conversions; the second (of thirty-three tables), hygrometrical computations; the third (of twenty-seven), barometrical tables; the fourth (of twenty-six), hypsometrical tables; the fifth, geographical tables of conversions, including forty-nine tables of measures of length (for heights, etc.), ten tables of itinerary measures, and ten tables of square measures, or measures of geographical surface; the sixth (of ninety-nine), tables for corrections of variations of temperature, etc., at different parts of the earth; the seventh and last series (of nine tables) embraces miscellaneous tables.

— The brothers Donhardt have reached Zanzibar, and will continue the explorations in the interior of eastern Africa, which they began in 1878 and 1879.

— The International association has sent out an officer to open a station between Karema, on Lake Tanganyika, and the station at Stanley Falls, on the Upper Kongo. A transcontinental route will then be opened by steamer up the Zambezi and Lake Nyassa, across the Stevenson road to Lake Tanganyika, thence by the new station to Stanley Falls, and so down the Kongo.

— The two Austrian explorers, Dr. von Hardegger and Professor Paulitschke, have sailed from Trieste for Aden, whence they mean to go to Harar, and make scientific studies, and collect specimens between there and Sela.

— The general geographical conference of the Australian colonies, to be held at Melbourne, is to discuss the necessity of defining the exact meaning of the geographical term 'Australasia,' the compilation of a reliable work on the geography of Australia for Australian schools, the New-Guinea exploration, and the discovering and defining of the exact boundaries of what may now be termed 'British New Guinea.'

— It is stated in the anthropological notes of the *Athenæum*, that Deniker's study of the Kalmucks, which has appeared in the last five numbers of the *Revue d'anthropologie*, is now complete. He remarks that in Russia, as in China, the Kalmucks are little by little losing their originality, though not so quickly as some other peoples; and that the time is not far distant when there will only remain of this ancient and warlike people, which has its own literature, religion, and laws, some thousands of peaceable subjects whose physical type will perhaps be all that will be left to prove their Mongolian origin. In sooner or later absorbing themselves into the rest of humanity, however, they will certainly add to the mass some traits of character distinctively their own. The same author has also published an investigation into the foetus of the gorilla; a specimen of which, the only one which has ever reached Europe, is in his hands, and has been described by him to the Society of anthropology of Paris.