ratio of persons attacked in industrial and other establishments employing large numbers was about thirty-five and a half per cent, or less than that of the population at large. That of the inmates of public institutions was still less,— twenty nine per cent. 10. The ratio of persons who were obliged to leave their work on account of illness from influenza was about twenty-seven per cent of the whole number employed. 11. The average length of their absence from work was five days. 12 Special occupations do not appear to have had a marked effect in modifying the severity of the epidemic upon operatives in such occupations. While the atmosphere may constitute one important medium of its communication, human intercourse also suggests itself as an equally important factor."

Fasting.

In connection with Professor Moleschott of Rome, Professor Luciani of Florence made a careful study of the "Hunger Virtuoso," Signor Succi, during his thirty-days' fast some two years ago. The results of their work are published in a monograph entitled "Fasting: Studies and Experiments upon Man," printed in Italian and German.

According to the *Medical Record*, Signor Succi, when not starved, is a man of strong muscular frame, with little subcutaneous fat, and weighing about one hundred and forty-seven pounds. During his thirty-days' fast in Italy he lost 6,161 grams, or about thirteen pounds During his first thirty days of fasting here he has lost considerably more. He drank at that time an average of 577.5 grams of water daily, which is about the amount he takes now.

Luciani states that he had "firm muscles, a good deposit of subcutaneous fat, a very slow tissue-change, and, above all, an extraordinary force of will." The Italian professor seems to think that by voluntary exertion Succi is able to slow down the metabolic processes, just as some peculiarly endowed persons can slow down the heart. It is upon this interesting point that Luciani particularly dwells; and he finds in Signor Succi a proof of the regulating influence of the nervous system over the functions of heat-production, respiration, hepatic action, etc.

How the Pathogenic Bacteria do their Harm.

Brieger and Fränkel have studied this question. Of course, the first condition for successful inquiry was to employ pure cultivations of the organism experimented upon. Basic bodies, denominated "toxine," had already been found in several pathogenic micro organisms, such as the bacillus of typhoid, tetanus, cholera, etc.; yet it was found that this toxine did not invariably call forth all the phenomena of the infectious diseases due to the bacilli, from pure cultivations of which it had been obtained: the supposition, therefore, seemed fair, that, besides the already found chemical bodies, there were other substances which played a momentous part (*The Edinburgh Medical Journal*). Brieger and Fränkel considered that Löffler's bacilius of diphtheria was well adapted for their purpose, because it is now beyond doubt that this organism is the genuine cause of diphtheria. Löffler had already called attention to the fact that this bacillus, when inoculated on animals, — guinea-pigs and pigeons, — colonized only the immediate neighborhood of the infected spot; yet grave alterations of texture and organs, and speedy death, of the animals experimented on, followed. This connection of events could only be explained in this way,— that the bacilli produced, by their local multiplication, a substance of exceedingly poisonous properties, which spread over the whole organism, and, independently of the bacteria did its deadly work. Brieger and Fränkel consider that they have proved that Löffler's diphtheria bacillus engenders in its pure cultivation a poisonous, soluble substance separable from the bacteria, which, when injected into susceptible animals, calls forth the same phenomena as the injection of the living microorganism. The authors also have settled that this substance is destroyed by a heat of 140° F.; that it can stand a heat of 122° F., even in presence of excess of muriatic acid. This last fact of itself speaks against the supposition that the poison of the diphtheria bacillus is a ferment or an enzym. Further examination of this substance showed it was not a ptomaïne or toxine. No crystallizable substance, save kreatinin and cholin, was obtained. Shortly summing up their investigations, the authors seem to have discovered in the diphtheria bacillus a substance belonging to the albumen series of bodies, which has poisonous properties, and causes the phenomena of diphtheria when injected. They propose to give it the name of "toxalbumine." In the living body they consider that the bacteria build up and separate their toxalbumine from the albumen of the tissues. Brieger and Fränkel also examined typhoid, tetanus, and cholera bacteria, and staphylococcus aureus and watery extracts of the internal organs of animals killed by anthrax, in the same way as they had examined the diphtheria bacillus, and found in all of them bodies which, according to their chemical behavior, were albuminoids, were poisonous, and could therefore be aptly called toxalbumines. The road from normal constituents of the body to substances of the most dangerous kind seems a very short one, and our organism itself may be looked upon as the proximate cause of morbid conditions let loose by the life-activity of bacteria.

NOTES AND NEWS.

THE trustees of Johns Hopkins University have decided to reopen the Marine Laboratory of the university in the coming spring. Further announcements will be made later.

— We learn from the London *Journal of Education*, that, according to returns compiled by the Civic Statistical Bureau of the schools of Munich, there were in 1889 in those schools 2,327 children suffering from defective sight; to wit, 996 boys and 1,331 girls. The gradual increase in the figures, which proceeds according to the distribution of the pupils into several classes, is highly significant. Of every 1,000 boys in the first or elementary class, 36 are short-sighted; in the second, 49; in the third, 70; in the fourth, 94; in the fifth, 108; in the sixth, 104; and in the seventh and last, 108. The number of short-sighted boys, therefore, from the first class to the seventh, increases about threefold. In the case of the girls the increase is from 37 to 119.

— Dr. Schmidt-Rimpler, the well-known Göttingen oculist, has been asked by the Cultusminister von Gossler to draw up a list of requirements for diminishing the shortsightedness so prevalent in German schools. Dr. Schmidt-Rimpler, according to the London *Journal of Education*, recommends (1) that teachers must acquire some knowledge of school hygiene; (2) that a medical attendant be attached to the school staff, and periodically inspect not only the school, but individual pupils; (3) that printed instructions be sent to the parents to inform them of the best position of the body for their children, especially with reference to writing, while engaged in the preparation of home-lessons; (4) that afternoon school be abolished, as far as is possible, so that the children may have plenty of exercise in fresh air; (5) that the amount of home-work be diminished, especially with regard to written tasks; (6) that the school course be not allowed to extend over too many years.

— The public lecture course of the New York Academy of Sciences for the season of 1890-91 is as follows: Nov. 24. "The Cliff Dwellings of the Mancos Cañons" (illustrated by projections of original photographs), by Mr. Frederick H. Chapin of Hartford, Conn.; Dec. 15, "Life and Scenes in the Hawaiian Islands" (illustrated), by Dr. H. Carrington Bolton of New York; Jan. 19, 1891, "Science and Miracle," by Professor A. J. Du Bois of Yale University, New Haven; Feb. 16, "Instantaneous Photography as an Aid to Science, History, and Art" (illustrated by novel lantern views), by Professor Wallace Goold Levison of Brooklyn, N.Y.; March 16, "The Orkneys and Shetlands" (illustrated), by Professor Charles Sprague Smith of Columbia College, New York; April 20, "Practical Applications of Electricity" (illustrated experimentally), by Francis B Crocker, E.M., of Columbia College; May 18. "What is a Diatom?" (illustrated,) by Charles F. Cox, M.A., of New York.

—W. T. Harris, United States commissioner of education, Washington, D.C., has issued a circular letter, dated Dec. 10, to presidents of colleges and universities in the United States, in which he says that it is assumed that language instruction in colleges and universities, so far as it relates to living tongues, is based on

the system of "visible speech" invented by Mr. Alexander Melville Bell, and that by its aid the pronunciation of a dialect can be conveyed in writing by one who has learned the sounds, to another person who has never heard the sounds, with reasonable accuracy. The object of this letter is to state that a rare opportunity is now presented to a limited number of higher educational institutions to avail themselves of the direct teaching of Mr. Bell through a lecture in elucidation of visible speech. All teachers of comparative philology understand this system, but perhaps can learn something in regard to the method of teaching it by seeing the method employed by Mr. Bell himself. It may be stated that the inventor of this system does not require any compensation for his lecture, but is willing to engage during the coming season, January to June, 1891, to give a free lecture on the subject named. Applications should be addressed to Mr. Alexander Melville Bell, 1525 Thirty-fifth Street, N.W., Washington, D C. Mr. Bell begs to state that for colleges, etc , near and to the south of the District of Columbia, early dates should be selected, and immediate application made, in order that visits may be serially arranged.

— The *Journal of Education* (London) is authority for the statement that Professors Ludwig, Wislicenus, Bruns, Bohm, Hoffmann, and Ostwald, all of the University of Leipzig, have signed the following declaration: "The undersigned, without as yet deciding what the course of instruction in the high-schools should be, nevertheless feel themselves compelled to declare that the education which our students have received in the Gymnasia, as at present constituted, is but little suited as a basis for the study of natural science and medicine." This has called forth the following counter-declaration, signed by one hundred and twenty-two Leipzig professors: "The undersigned professors and lecturers of the University of Leipzig declare that all educational reforms which do away with, or materially lessen, the study of the Greek language and literature, can only result in a serious injury to our national education. At the same time the undersigned express their conviction that the alterations, which may possibly be necessary in certain particulars, are quite possible with the retention of the classical basis of our Gymnasium education." Among the supporters of this declaration are the "Cultusminister" of Prussia, Bavaria, Saxony, Würtemberg, and Baden.

— Mr. Arthur Winslow, State geologist of Missouri, in his report of the operations of the State Geological Survey during the month of November, says that detailed mapping has been continued in Johnson, Madison, St. François, Washington, and Iron Counties, and about 170 square miles have been covered. In the laboratory analyses have been made of mineral waters collected during September and October, and work on a large number of clay samples has also been in progress. Examinations of clay deposits and building-stones have been made in Henry, Vernon, Bates, and Johnson Counties, and a number of specimens and samples have been collected for exhibition and test. For the purposes of the preliminary report upon the coal-deposits of the State, inspections have been extended into Miller, Morgan, Bates, Vernon, Dade, Cooper, Saline, and Audrain Counties. The field-work allotted to the past season is now very nearly completed, and during the month of December all members of the survey will be withdrawn from continuous field-work until next spring, and the intervening time will be devoted to preparing the results of the past season's work for publication.

— The board of directors of the National Educational Association, at the meeting held in St. Paul, indicated Saratoga Springs, N.Y., as their first choice, and Toronto, Canada, as their second choice, as the place of holding the next meeting of the association. The executive committee was instructed to make personal examination of railway facilities and local guaranties, and was empowered to make final decision as to time and place, and to complete arrangements for the next meeting. Three members of the committee visited Saratoga Springs. The local and State authorities gave guaranties beyond the requirements; but the Trunk Line Association, in whose territory Saratoga Springs is situated, refused to grant the customary reduced rates. The committee then opened negotiations with Toronto. Four members of the committee have visited that city and held consultations with the local and railroad authorities. Satisfactory guaranties have been presented by the local authorities and by the railroads with the exception of the Trunk Line Association. The next meeting of the association will be held at Toronto, Canada, July 14–17, 1891. The council will convene July 10. A cordial invitation, indorsed by the authorities of Ontario, of every province in Canada, and by the authorities of the Dominion, has been before the association for two years. Many of the teachers of Canada have become members of the association. They will meet in Toronto in full force, and will prepare an exhibit giving a complete view of Canadian systems of education.

— A patent has been issued this week to N. D. C. Hodges, editor of *Science*, for an improved method of protecting buildings from lightning. This invention is based on the large electrical capacity of a fine powder scattered in a dielectric. The electrical discharge is received on some body, which is then dissipated in the form of powder, and the potential of the charge is thereby largely reduced. The quantity of material which it is necessary to dissipate in order to furnish protection is not large if the material be placed so as to serve to the best advantage, at the most not exceeding a few cubic inches.

— In connection with the meeting of the National Electric Light Association in Providence, R.I., on Feb. 17, 18, and 19, 1891, it is proposed to hold an exhibition of electrical apparatus and appliances, especially such as are used in the business of furnishing light and power. A suitable hall has been secured opposite the hotel, which will be the association headquarters; and through the courtesy of the Narragansett Electric Lighting Company all the electric current necessary will be provided. There will be no charge for space or current to exhibiters, who must, however, be associate members of the association. The installation and care of exhibits will, of course, be at the expense of exhibiters. As this meeting may be said to virtually mark the close of the first decade of electric lighting commercially, it is suggested, that, as far as possible, efforts be made to show the progress in the art by exhibiting the earlier forms of apparatus and appliances, together with those embodying the latest improvements. The exhibition will open on Tuesday, Feb. 17, and close on Thursday evening, Feb. 19, and will be open day and evening. Exhibits may be installed on the Saturday and Monday previous, and removed on the following Friday. It is expected that this exhibition will prove very attractive to the Providence public, as well as to the members of the association. To exclude the street-gamin element, a nominal admission fee (twenty five cents) will be charged; but it is intended to circulate complimentary invitations freely among the representative business-men of the city, and exhibiters will be supplied with as many complimentary tickets as they may desire to distribute. As space is limited, and will be allotted in the order in which applications are received, it is desirable that all intending exhibiters apply to the chairman of the committee, C. H. Barney, 20 Cortlandt Street, New York, prior to Jan. 15, 1891, at which date all allotments of space will be made.

— The Copley Medal of the Royal Society, London, has been awarded to Professor Simon Newcomb of Johns Hopkins University, and superintendent of the "Nautical Almanac," for his contributions to gravitational astronomy. The medal was first given by the society in 1753, to Dr. Benjamin Franklin. In the following list the names are recorded of those who have received this honor during the last thirty years: 1860, R. W. Bunsen; 1861, L. Agassiz; 1862, T. Graham; 1863, A. Sedgwick; 1864, C. Darwin; 1865, M. Chasles; 1866, J. Plücker; 1867, K. E. von Baer; 1868, C. Wheatstone; 1869, H. V. Regnault; 1870, J. R. Joule; 1871, J. R. Mayer; 1872, F. Wöhler; 1873, H. L. F. Helmholtz; 1874, L. Pasteur; 1875, A. W. Hofmann; 1876, C. Bernard; 1877, J. D. Dana; 1878, J. B. Boussingault; 1879, R. J. E. Clausius; 1880, J. J. Sylvester; 1881, K. A. Würtz; 1882, A. Cayley; 1883, William Thomson; 1884, C. Ludwig; 1885, A. Kekulé; 1886, F. E. Neumann; 1887, J. D. Hooker; 1888, T. H. Huxley; 1889, G. Salmon; 1890, S. Newcomb. The mathematical medalists in previous years have been, Waring (1784), Ivory (1814), Gauss (1838), Sturm (1841), Chasles (1865), Plücker (1866), Sylvester (1880), Cayley (1882), Thomson (1883), Salmon (1889).