by the works being closed for three days, during which time the men have absolute license to get drunk if they feel so disposed, the fact being that about one per cent avail themselves of this privilege. Drunkenness at another time is followed by dismissal. The married workmen are provided with comfortable cottages surrounded by gardens, and with rents varying from six to twelve francs a month, according to their size and location. A bonus is secured to them on each addition to their family, in the shape of a monthly reduction in their rent; and long service also secures a further reduction. By this arrangement the cottages gradually fall into the absolute ownership of the workmen, and a most powerful inducement for steadiness and content is thus secured. The single men are also allowed to have a plot of garden if they desire it, and this is found to be a great attraction in taking and keeping service under M. Decauville. The result of this wise administration is seen in the fact that the Petit-Bourg colony possess savings to the extent of 200,000 francs, which are not invested in savings banks, but in the works themselves, where it receives a guaranteed interest at six per cent. Workmen are insured against all accidents by M. Decauville, who encourages and assists the several benefit societies, which are mainly supported by the workmen themselves. But the glory of Petit-Bourg is its theatre, — a substantial and really elegant building, 100 feet long and 39 feet wide, capable of seating about 500 persons. This theatre is nicely fitted up, and has a capacious stage, with appointments that would do credit to many a provincial town. Here about four performances are given a year, not by third-rate actors representing sensational drama, but, when it is determined that a performance shall take place, subscriptions are raised among the employers, the foremen, and the men, a committee is formed to negotiate with some good Paris company, and every thing is arranged admirably. It may be mentioned, in passing, that the "Maitre des Forges" is a never-failing favorite. But, besides theatrical performances, the theatre at Petit-Bourg serves other purposes: it is the gathering-place on all political occasions, at which, needless to say, M. Decauville presides in his capacity as Monsieur le Maire; it is the scene of numerous concerts given by the Petit-Bourg band, formed exclusively of Decauville workmen; the corps of Sapeurs-Pompiers, also from the works, hold their meetings and celebrations here; and in the theatre M. le Maire distributes prizes gained in the schools which he controls.

Altogether the Petit-Bourg colony leads a happy and prosperous, though a laborious life; and if M. Decauville can succeed in the future, as he has done in the past, in saving the district where he and his family have ruled for so many generations from the contagion of discontent and communism, Petit-Bourg will continue in its prosperity, and its hard-working population will remain contented.

THE TRANSMISSION OF ENERGY BY COMPRESSED AIR.

WE have not before us any data to show the actual development of the Compagnie Parisienne de l'Air Comprimé, but a statement of the number of installations in active work towards the close of last year will serve to give an idea of the number and variety of industries which have availed themselves of this means of obtaining motive power. Since then, the number of subscribers has largely increased, and one section of the great public lighting scheme of Paris has been carried out by the company. At that date there were, says *Engineering*, seven central stations fed from the installation at St. Fargeau for the distribution of electric light. They represented a total force of 750 horse-power given off by the air-motors; and of these, six were of 100 horse-power each. Four theatres, fourteen cafés and restaurants, two hotels, the same number of newspaper-offices and of clubs, and sixteen private houses were electrically lighted by the same means. Sewing-machines were driven in thirteen different establishments, ice was produced in four, and the air formed the motive power for driving machine-tools in thirty-four different shops. Sixteen printing-offices availed themselves of the same means, and in thirty-five other establishments it was also employed. Among the various applications there were a number of sanitary establishments that were on the list of subscribers; in six instances it was employed for raising wines and spirits; it was also used for working lifts, shearing metals, and cutting stuffs, for ventilation and for driving mills, and to a large extent for wood-working machinery. At the end of last year, over 1,200 horse-power was distributed daily through the mains. Of this, 478 horse-power found employment among 276 subscribers for various industrial purposes, and 803 horse-power was absorbed in supplying 6,220 incandescent lamps and 145 arc lamps. Since that date, the demands of subscribers have gone on increasing until the reserve of engine-power at St. Fargeau was of necessity absorbed to supply the existing demands, and it became necessary to extend the main station. At the end of last year the situation of the company appears to have been as follows: the subscribers who had made themselves liable for periods of from five to ten years brought in a revenue from various industries of $12,000; for lighting, of $92,000; and for the pneumatic clocks, of $19,400. Besides these, there were a number of subscribers who paid by the records of their counters. Of these, $14,600 was paid for miscellaneous industries, and $32,000 for electric lighting. At that time, also, several important installations were in progress which have since been finished. Among others was the Bourse de Commerce, who spent $20,000 on an installation; refrigerating companies paying $20,000 a year, and the Eden Theatre $24,000 a year; there were also a number of miscellaneous applications, amounting to $16,000 a year. These sums together brought the total revenues of the company to about $170,000 a year, the expenses being $152,000 for that part of the installation which was in full operation. This sum included interest on loans at 6 per cent, and interest on capital at 5 per cent. At the beginning of the year the works were not running at any thing like their full capacity, so that a large amount of capital on which interest was being paid was earning nothing. The financial condition became more favorable a short time later, when a large number of other installations were completed. It is said that this year the company will be in a position to pay regular dividends of 10 per cent upon its share capital; and, if all that is claimed for the system be substantiated, there appears to be no reason why such a rate of interest cannot be maintained or even exceeded.

Engineering does not hold itself in any way responsible for the figures given. They were furnished by the company, whose good faith is evident, because they court investigation, and are even now making arrangements for a series of trials to be conducted by wholly independent experts. Naturally the most interesting feature of the system is that by which the efficiency of the compressed air is claimed to be doubled by the application of heat and of a certain proportion of water. Apart from the inconvenience resulting on the extreme cold produced at the exhaust, for large motors at least, the permanent success or failure of the system depends upon the high degree of efficiency that can be obtained. For small motors this question is comparatively of little importance, because, even with an efficiency of 30 per cent, the balance of advantages would rest with the compressed air as compared with power produced by other mechanical means or by manual labor. The great electric-lighting installation which the company has just completed between the Rue Royale and the Opera will afford, after a few months, absolute data as to the relative economy of the system, and a means of comparison between it and the other installations of the other electric companies. Under every aspect, this great industry for the transmission of power, of which the station at St. Fargeau is the centre, is a most interesting one; and it may be predicted with certainty, that, if the reports of independent engineers confirm the statements by the company, applications on an equally large scale will soon be at work in other cities besides Paris. In a great many instances the advantage of being able to promote ventilation and to obtain a supply of pure air in the workshop is an advantage of great importance, and is one that is shared by no other medium of energy after it has done its work. Unlike the waste products from the gas-engine, or exhaust steam, or the discharged water from a hydraulic motor, the expanded air, after having done its work in the cylinder, can be turned directly into the apartment where the engine is at work. There are so many other purposes to which the system may find an application, that its field of usefulness appears to be a very wide one indeed. For

refrigerating purposes it is already in successful use in Paris, and to a modified degree it may well serve to reduce the temperature of houses in hot climates. The production of intense heat for metallurgical purposes, and the aërification of water, are also two other practical uses of which the ultimate list will probably be a long one.

HEALTH MATTERS.

The Mortality in the City of New York for 1888.

A PRELIMINARY report in relation to the mortality of the city for the year 1888 has just been presented to the board of health by Dr. Roger S. Tracy, the assistant sanitary superintendent; and the deductions made in it, as we find them summed up in the *Boston Medical and Surgical Journal*, are somewhat remarkable. The sanitary police took a census of the tenement-house population during the year, which includes all the houses that are more or less constantly under the supervision of the board of health, but not the better class of apartment-houses. The entire population included in this census was 1,093,701 persons, among whom there were 24,842 deaths, while the total number of deaths in the city was 40,175. The highest death-rate, 26.60 per thousand of the population, is in the district south of 14th Street and west of Broadway; the next highest, 23.52, is in the district west of Fifth Avenue and between 14th and 59th Streets, in which are situated a large proportion of the residences of the wealthiest citizens; and the third highest in the district east of Broadway and south of 14th Street, the most densely populated part of the city, and containing almost exclusively a tenement-house population.

The general tenement death-rate was 22.71, while the general death-rate of the city in 1888 was 26.33; and this fact would seem to indicate that the population of the city has been underestimated, and the quoted death-rate too high, or that all the deaths belonging in tenement-houses had not been credited to them, or else that the death-rate is actually lower for the tenement-house population than for the rest of the city, which would certainly seem most extraordinary. It might be that deaths that should have been credited to the tenement-houses have not been so credited; but of the total number of deaths in institutions, 7,774, the former place of residence of the individuals was ascertained in 3,444, and these deaths have all been credited to the houses in which they had lived. In all the districts the death-rate of persons five years of age and over, as a rule, decreases as the number of tenants increases; while the death-rate of children under five years of age increases up to a certain point, diminishing when there are more than eighty tenants to a house. The general death-rate is highest in houses containing from sixty to eighty tenants; and this is caused by the higher death-rate among the children, which reaches in these houses 114.04 per 1,000 living.

The results of the investigations are summed up by Dr. Tracy as follows: "The death-rate in tenement-houses is less than the general death-rate of the city. The death-rate in the large tenement-houses is less than in the smaller ones. While diarrhœal diseases and diphtheria show a greater death-rate in the larger houses, phthisis and pneumonia show comparatively little difference; that difference, however, being in favor of the larger houses. The greatest general death-rate among persons over five years of age, the next to the highest death-rate from diarrhœal diseases and pneumonia, and markedly the highest from phthisis, are in the district south of 14th Street and west of Broadway. The excessive mortality in this part of the city is probably connected with the great number of old houses and the dampness of the soil. These results are much at variance with what was expected. It seems to be sufficiently established that people do not live under such extremely bad sanitary conditions in the tenements as they have been supposed to."

Contagious Consumption.

The following report on consumption as a contagious disease was approved July 9 by the Health Department of New York City: —

"Pulmonary tuberculosis (consumption) is directly communicated from one person to another. The germ of the disease exists in the expectoration of persons afflicted with it. The following extract from the report of the pathologists of the Health Department explains the means by which the disease may be transmitted: —

"'Tuberculosis is commonly produced in the lungs (which are the organs most frequently affected) by breathing air in which living germs are suspended as dust. The material which is coughed up, sometimes in large quantities, by persons suffering from consumption, contains these germs often in enormous numbers. . . . This material when expectorated frequently lodges in places where it dries, as on the street, floors, carpets, handkerchiefs, etc. After drying in one way or another, it is very apt to become pulverized, and float in the air as dust.'

"By observing the following rules, the danger of catching the disease will be reduced to a minimum: —

"1. Do not permit persons suspected to have consumption to spit on the floor or on cloths, unless the latter be immediately burned. The spittle of persons suspected to have consumption should be caught in earthen or glass dishes containing the following solution: corrosive sublimate, one part; water, one thousand parts.

"2. Do not sleep in a room occupied by a person suspected of having consumption. The living rooms of a consumptive patient should have as little furniture as practicable. Hangings should be especially avoided. The use of carpets, rugs, etc., ought always to be avoided.

"3. Do not fail to wash thoroughly the eating utensils of a person suspected of having consumption as soon after eating as possible, using boiling water for the purpose.

"4. Do not mingle the unwashed clothing of consumptive patients with similar clothing of other persons.

"5. Do not fail to catch the bowel discharges of consumptive patients with diarrhœa in a vessel containing, corrosive sublimate, one part; water, one thousand parts.

"6. Do not fail to consult the family physician regarding the social relations of persons suffering from suspected consumption.

"7. Do not permit mothers suspected of having consumption to nurse their offspring.

"8. Household pets (animals or birds) are quite susceptible to tuberculosis: therefore do not expose them to persons afflicted with consumption; also do not keep, but destroy at once, all household pets suspected of having consumption, otherwise they may give it to human beings.

"9. Do not fail to thoroughly cleanse the floors, walls, and ceilings of the living and sleeping rooms of persons suffering from consumption at least once in two weeks."

Ten thousand copies of the report were ordered to be printed for distribution.

PREVENTING TUBERCULOSIS BY MILITARY ORDERS. — The German war minister has decided, says *The Medical Record*, that the chest of every soldier shall be examined once a month. If the chest does not reach a certain breadth, and does not develop with drill and athletic exercises, the soldier will be disqualified, and regarded as being predisposed to phthisis, and, moreover, likely to infect his comrades.

PASTEUR'S METHOD. — In his brief report for the year ending May 1, 1889, the director of the Pasteur Institute, Paris, announces the treatment of 1,673 subjects, of whom 6 were seized with rabies during, and 4 within a fortnight after, the process. But 3 only succumbed after the treatment had been completely carried out, making 1 death in 554, or, including all the cases, 1 in 128.

PROFESSORSHIPS OF HYGIENE. — The University of Kiel, as we learn from *The Medical News*, has inaugurated a professorship of hygiene, and Dr. Bernard Fischer has been appointed to the chair. There now remain only two Prussian universities — those of Bonn and Königsburg — without such chairs. Dr. Fischer was one of Professor Robert Koch's pupils, and accompanied him on that memorable journey into Egypt and India which resulted in the discovery by Koch of the bacillus of Asiatic cholera. Another companion on that voyage was Dr. Gaffky, now professor of hygiene at Giessen. Other pupils of Koch occupy the same department of instruction in other universities, as Dr. Gärtner in Jena, Dr. Löffler in Greifswald, Dr. Hüppe in Wiesbaden, Dr.