Quarry, near Philippeville, in Belgium, where fifteen thousand cubic feet of marble are extracted yearly with a thirty horse-power engine, and only thirty hands in summer and twenty in winter, besides the lads who tend the wire-cords. The system is also employed at granite and marble quarries in France, Germany, Spain, Italy, Algeria, Tunis, and other countries, where it is said to be giving satisfactory and economical results.

SEWAGE PURIFICATION.

A NEW process for the purification of sewage, under patents granted to the firm of Jagger, Son, & Turley, of Halifax, England, was recently experimented with at the corporation sewage works of that city. The apparatus employed is described as follows. A carbon filtering medium is obtained by reducing to a carbonized state dry ashpit refuse which contains a large proportion of animal and vegetable matter. The refuse is placed in a carbonizer, where it is allowed to remain until the whole mass is charred by a process of slow combustion. After the carbonized material is withdrawn from the carbonizer, it is sifted by means of a circular riddle; and the cinders and a small percentage of clinkers are laid on one side for use in forming the bottom layers of the filters. The finer grades given out by the riddle, composed principally of charcoal and a small percentage of ashes, are placed as an upper layer of a shallow filter bed, about four inches in thickness.

A small carbonizer has been erected at Halifax, and a filter of 102 superficial yards laid down. The filter is two and a half feet deep, it has a six-inch concrete bottom, and brickwork sides joined in cement. The filter is divided by a fourteen-inch wall, underneath which is laid a channel for conveying away the effluent. The bottom course of brickwork of the central wall is open jointed to allow the effluent to pass from the layers of cinders to the channel. The filter bed is formed as follows. At the bottom is placed a six-inch layer of rough material, which may be clinker or broken bricks or stone. Above this layer is placed another composed of one-inch cinders laid three inches thick; then follows a layer three inches thick of quarter-inch cinders, and finally a layer of carbon four inches thick, giving a total thickness of sixteen inches. The filter is worked with a six-inch head of sewage. The sewage is conducted to the filter by a six-inch pipe, having branches, the pipe being laid on the top of the central wall. Under each branch is placed a floating splash-board, which prevents the sewage washing a hole through the filtering material. The sewage flows over and through the carbon. The effluent is clear, inodorous, and colorless, and has been proved by analysis to be very pure. The organic matter in suspension was 417.2 grains per gallon in sewage, and 1.12 grains per gallon in effluent. The albumenoid ammonia in solution was also reduced from 0.280 grains per gallon in sewage to 0.007 grains per gallon effluent.

The manner of dealing with the sewage is as follows. Across the outfall sewer are placed a series of wire-work baskets filled with cinders of different grades, to arrest the grosser floating solids. The sewage then flows to the filter-bed, where the purification of the sewage is accomplished. No chemicals whatever are used. The filter-beds will work at a rate of from 240 to 300 gallons per superficial yard per day, according to the density of sewage treated. An acre of filtering surface will be ample for dealing with the sewage from 30,000 persons, or say, 1,000,000 gallons per day. The land required for this process is only one two-hundredth part of that required for broad irrigation, or one-fortieth that required for combined precipitation and filtration. The capital cost for this process will be about $340 per thousand inhabitants up to a population of fifty thousand, and the annual working expenses for collecting and disposing of refuse and purifying sewage, inclusive of interest on capital and royalty fees, about sixteen cents per head of population.

This process solves the sludge difficulty. No chemicals being used, no weight is added to the solids in the sewage; the grosser solids are arrested in the cinder baskets, and the finer solids are deposited on the top of the filters in the form of a thin skin After a filter has worked for twenty-four hours, the flow into that particular filter is stopped, the moisture allowed to drain off, and the deposit removed by a scum plow, a little fresh carbon is laid, and the filter is then again ready for work. By a simple mechanical contrivance, a filter of one hundred yards can be cleansed and re-charged in ten minutes. The average weight of sludge made per million gallons of sewage treated by chemicals is twenty tons. In place of a semi-fluid, offensive sludge, by this carbonized refuse process, there remains a manure uninjured by chemicals, which can be carted away as it is removed from the filters, and which will equal in bulk seven and a half tons per million gallons treated.

HEALTH MATTERS.

Leprosy.

AT a recent meeting of the Epidemiological Society of London a paper was read by Dr. P. S. Abraham, on leprosy, of which the *Lancet* gives the following abstract. With the exception of the case recently brought forward in Dublin, no British society has lately had the subject under consideration. Its importance in British medicine is, nevertheless, well indicated by the fact that the Royal College of Physicians of London has its "leprosy committee," which, in view of the fact that there is increasing evidence respecting the communicability of leprosy, has just recommended a full and searching scientific investigation into the whole matter.

Dr. Abraham demonstrated on a map the wide prevalence of the disease, especially in the British Empire, and remarked that it is no wonder that the subject is coming to the front. He hoped that the inquiry urged by the College of Physicians would be sanctioned by the government, not only to set at rest, if possible, doubtful points regarding the causation of the disease and the desirability of preventive measures, but also to allay a possible emotional scare on the part of the British public. From the insufficiency of data it is difficult to say accurately whether leprosy be really increasing or decreasing in many of the British colonies. In many cases we have to rely chiefly upon general impressions. Even the death returns cannot be depended upon always, for they are frequently, as in Jamaica, uncertified by qualified practitioners; and we must remember the natural and universal tendency on the part of the sufferers and their friends to conceal their affliction. The belief in the increasing spread of leprosy at the Cape of Good Hope was so strong that a leprosy repression act was passed in 1884. From the numerous medical reports which Dr. Abraham quoted there can be little doubt that the disease is really on the increase in South Africa. It probably is spreading, but in a less marked manner, in the West Indies; and on the whole, in India, especially in certain districts.

The articles which are now appearing in the Anglo-Indian press indicate that the public mind is becoming somewhat inflamed over the matter; and that there is some cause may be inferred from the large amount of official attention which has been for some time past directed in India to the matter. Dr. Abraham quoted the late resolution (September, 1888) of the Indian government, stating that a measure of rigorous segregation would be repugnant to public opinion, and recommending for the present the grant of medicine and charitable relief in voluntary hospitals and asylums. A short history of leprosy in Hawaii was then given, the latest information having only just come to hand. He pointed out that, in spite of the efforts at isolation, the disease had enormously increased since 1865. The author gave an account of his visit last year to the Norwegian leper asylums, and gave particulars relating to the treatment of the patients, and the views with which he was favored by Drs. Danielssen, Nickoll, Kaurin, and Daud, who were in charge of the asylums at Bergen, Molde, and Trondhjem. He showed curves indicating the relations between the gradual decrease of the disease throughout the country and the number of patients in the hospitals.

With regard to leprosy in Great Britain and Ireland, he referred to cases he had recently seen in London. Through the kindness of Mr. Larder he was able to exhibit to the Society two fairly typical examples of the chief varieties of the disease, one the "nodular dermal form," and the other the so-called "anæsthetic" form. The latter case was that of a man sixty-four years old, a meat salesman, of English parentage, and born in London. When young he had been a sailor in the Mediterranean and in the Baltic, but had not been out of London for upwards of forty years. Until

six years ago he had always enjoyed the best possible health. The author did not admit that this was a case of *de novo* development, though the period of incubation was extraordinarily long. The germ must have been dormant, like the "mummy" wheat, for nearly forty years.

After referring to the present unsatisfactory nomenclature of varieties, and to the army and navy records of the disease, he, in conclusion, summed up, and, had time allowed, would have adduced arguments in support of the theories that leprosy is caused by the bacillus, that the disease is communicable from person to person, and that segregation is justifiable. Microscopic specimens, prepared by the author, were exhibited, showing the *bacillus leprœ* scraped from the tongue and mouth of a patient, and sections of dermal nodules, anæsthetic skin, nerves, etc. Many of the references were from hitherto unpublished sources, both private and official.

Death from Electricity.

A DEATH recently occurred at Brighton, England, from the accidental contact of the conducting wire of the electric lighting apparatus with the neck of one of the employees at a brewery. The deceased was "found dead" in the neighborhood of the fatal electrical conductor, and a report in a local newspaper states that a post-mortem examination revealed perfectly healthy organs, the only abnormality in this case being "a mark half-way round the neck as if grazed by the wire." With the extension of electric lighting, says the *Lancet*, occasional fatalities of this kind are to be expected, and the number of deaths from this cause has already been considerable. In the case recently reported there was, it is to be observed, a slight mark upon the body, and in a case which occurred in 1884 a blister was found upon one of the fingers of the deceased with which contact had been accidentally made by the machine. In other cases there has been no mark whatever, so that we may conclude that the pathological evidence of the cause of death in such cases is almost *nil*. It seems to us of the greatest importance that these accidents should be carefully studied, and it would almost seem to be the duty of the local government board to send a trained pathologist to attend the post-mortem examination of every case which occurs, in order that a careful comparison might be established between the cases, and any points which they might present in common be duly noted. This could only be done by one having considerable accumulated experience, and such experience could only come to one having such opportunities as an official position would give.

The matter is of very great importance, because a cause of death which is, so to say, gradually becoming omnipresent, and which leaves no mark, is tolerably sure to be made use of for criminal purposes, and if there be any certain means of establishing how death took place, a knowledge of this would be the only means of checking the misdeeds of persons with criminal intentions. It generally has happened hitherto that the surrounding circumstances have left no doubt as to the cause of death, but it is not reasonable to suppose that such would always be the case, and if it suited the crafty schemes of a criminal it might very easily be contrived otherwise. In short, there is no doubt that we ought to use every endeavor to increase our exact knowledge of this cause of death, and we can only hope that post-mortem examinations will be carefully made in all cases which occur, and that practitioners will regard it as a duty which they owe to the profession and the public to place upon record the results of such examinations.

CANCER. — A small commune in Normandy, Saint Sylvestre-de-Courcelles, with a present population of only 379, as compared with 500 twenty years ago, has in the eight years 1880 to 1887 lost no fewer than eleven of its inhabitants, between the ages of sixty-two and eighty-three, from cancer, — a proportion of 15 per cent of the total mortality. All but one of the cases were males, and in as many as eight the cancer was seated in the stomach. Such facts have led Dr. Arnaudet, according to *L'Union Médicale*, to conclude that cancer is contagious, and is propagated through the medium of water. It is true, he remarks, that not one of the eleven persons mentioned were water drinkers, but then they drank cider, which is made with the pond water of the district. Dr. Arnaudet thinks this sufficient ground to advocate the use of antiseptics and of boiled water as prophylactics against cancer, as well as against typhoid fever or phthisis.

TYPHUS BACILLI IN WATER. — Several cases of typhoid have recently occurred in a town in the province of Baden, Germany, and it came to light that three of the patients first affected procured their drinking water from the same well. The water was then examined, the strictest precautions being used to prevent infection from other sources. In three days the cultures were found to have developed on an average one hundred and forty thousand colonies to the cubic centimetre. Ten tests had been made, but only in one of these was there found a single colony of typhoid bacilli.

NOTES AND NEWS.

IT is officially announced that a general national exhibition of agriculture and sylviculture will be held at Vienna, next year, from the 15th of May to the 15th of October. The exhibition is to include the following international sections: (1) machinery and implements used in agriculture, sylviculture, and the industries cognate to them, such as horticulture, viticulture, hop-growing, bees, silk, fishing, and hunting; (2) artificial and auxiliary branches of agriculture, such as artificial manures, remedies for sick animals, etc.; (3) models, plans, designs, and statistical information respecting agriculture and forestry; (4) inventions dealing with the utilization of waste material; (5) information and suggestions respecting the food supply of large cities.

— The fifty-ninth annual meeting of the British Association will be held at Newcastle-on-Tyne, beginning on Sept. 11 and 12; and the Durham, Northumberland, and Newcastle Botanical and Horticultural Society has arranged to hold its autumn meeting and exhibition at the same time and place. The local committee have spared no efforts to make the arrangements for the meeting as complete as possible, and their labors have been greatly lightened by the fact that many fine buildings suitable for the purposes of the association have been erected since it held its last meeting at that place in 1863. The reception-rooms, occupying a central position with respect to the various section rooms, will be located in the new buildings of the University of Durham College of Medicine, in which building a writing-room and ladies' drawing-room will be provided, and special rooms for the use of the officers of the association. The Cambridge Drill Hall, near the reception-room, is to be fitted up for a luncheon-room. Sections A and B will meet in the new buildings of the College of Science, opened in November last; and in the chemical laboratory of this college it is intended to bring together a series of exhibits illustrating the chemical and allied manufactures of the district. The general meetings of the Association will be held in St. George's Drill Hall. The Natural History Museum, opened in 1884, in which building is Mr. Hancock's unique collection of British birds, will be used for the two *soirées*, the first to be given by the mayor and corporation, and the second by the local committee. A guide-book, arranged in three sections, has been prepared for the occasion, dealing respectively with the history and topography, the geology and natural history, and the industries of the district.

— The Royal Society of New South Wales offers its medal and a prize of £25 for the best communication (provided it be of sufficient merit) containing the results of original research or observation upon each of the following subjects, to be sent in not later than May 1, 1889: "Chemistry of the Australian Gums and Resins;" "Aborigines of Australia;" "Iron Ore Deposits of New South Wales;" "List of the Marine Fauna of Port Jackson, with Descriptive Notes as to Habits, Distribution, etc." The same offer is made for the best communications on the following subjects, to be sent in not later than May 1, 1890, "Influence of the Australian Climate (general and local) in the Development and Modification of Disease;" "Silver Ore Deposits of New South Wales;" "Occurrence of Precious Stones in New South Wales, with a Description of the Deposits in which they are found;" also on the following, to be sent in not later than May 1, 1891, "Meteorology of Australia, New Zealand, and Tasmania;" "Anatomy and Life History of the Echidna and Platypus;" "Microscopic Structure of Australian Rocks." The competition is in no way confined to