

## OBSCURE SOURCES OF DISEASE.

Under the above heading, Dr. James R. Nichols has communicated a very important article to the *Boston Medical and Surgical Journal*, extracts of which we give as follows:—

"There are many instances of disease, brought to the notice of physicians, which are exceedingly perplexing in their character, and the sources of which are very imperfectly understood. I am led to believe that a considerable number arise from some disturbance in the sanitary conditions of dwellings or their surroundings, and that however improbable this may seem from a superficial or even careful examination of suspected premises, a still more thorough and extended search will often result in the discovery of some agent or agents capable of producing disease.

"The chemical and physical condition of water used for culinary purposes has much to do with health, and is perhaps the oftenest overlooked by the physician in searching for the cause of sickness. We must not suppose that water is only hurtful when impregnated with the salts of lead or other metals; there are different sources of contamination, which produce the most serious disturbance upon the system. Some of these are very obscure and difficult of detection. The senses of taste and smell are not to be relied upon in examinations, as it often happens that water entirely unfit for use is devoid of all physical appearances calculated to awaken suspicion. It is clear, inodorous, palatable, and there is no apparent source from whence impurity may arise.

"During the past summer, the writer was consulted by a gentleman residing in Roxbury, respecting the water used in his family. It was taken into the dwelling through tin pipe from a well in the immediate vicinity, and appeared to be perfectly pure and healthful. Analysis disclosed no salts of lead or copper, as indeed none could be expected from the unusual precautions taken to prevent contact of the water with these metals. Abundant evidence was, however, afforded that, through some avenue, organic matters in unusual quantities were finding access to the water. Careful examination of the premises disclosed the fact that an outhouse on the grounds of a neighbor was so situated as to act as a receptacle for house drainings, and from thence by subterranean passages the liquids flowed into the well. Some cases of illness, of long standing in the family, disappeared upon abandoning the use of the water.

"A few months since a specimen of water was brought to me for chemical examination, by a gentleman of Charlestown, who stated that his wife was afflicted with protracted illness of a somewhat unusual character. It was found to be largely impregnated with potash and the salts resulting from the decomposition of animal and vegetable debris; and the opinion was expressed that a connection existed between the well and the waste fluids of the dwelling. This seemed improbable, as they were all securely carried away in a brick-cemented drain, and in a direction opposite the water-supply. The use of the spade, however, revealed a break in the drain at a point favorable for an inflowing into the well, and hence the source of the contamination. Rapid convalescence followed on the part of the sick wife upon obtaining water from another source.

"Analysis was recently made of water from a well in Middlesex county, which disclosed conditions quite similar to these. The owner was certain that no impurity could arise from sources suggested, but rigid and persistent investigation disclosed the fact that the servant girl had long been in the habit of emptying the "slops" into a cavity by the kitchen door (formed by the displacement of several bricks in the pavement), where they were readily absorbed. Although the well was quite remote, the intervening space was filled with coarse sand and rubble stones, and hence the unclean liquids found an easy passage to the water. This proved to be the cause of illness in the family.

"In cities and large towns, where excrementious matters accumulate rapidly around dwellings compacted together, it is difficult to locate wells remote from danger, and hence it might seem that suspicion should be confined to those localities. This, how-

ever, is not a safe conclusion. How often do we see, upon isolated farms in the country, the well located within or upon the margin of the barnyard, near huge manure heaps, reeking with ammoniacal and other gases, the prolific sources of soluble salts, which find access to the water and render it unfit as a beverage for man and beast. It may no doubt be a convenience to the farmer to have his water-supply so situated as to meet the wants of the occupants of his barn and dwelling, but it is full of danger.

"Whilst admitting that such may be the condition of the water of many wells, doubts may arise with some, whether substances not decidedly poisonous, and received in such quantities, can, after all, be productive of much harm, or the real source of illness. To the great majority of people they are certainly harmless, but it must be admitted that there is a class, and one or more are found in almost every family, whose peculiarly sensitive organization does not admit of the presence of any extraneous agent in food or drink, or in what they inhale. The functions of life and health are disturbed by the slightest deviation from the usual or normal condition of things around them.

"It seems incredible that the thousandth part of a grain of one of the salts of lead, dissolved in water and taken daily, will disturb the system of any one; and yet such is the case. We can see no reason why a very little nitrate of potassa, or soda, or lime, taken in the same way, should produce any effects; still stranger is it that the infinitesimal amount of dust dislodged from painted wall-papers, received into the lungs, should make inroads upon health.

"Several instances of this latter result have recently come to my knowledge. In two families of the highest respectability in this city, illness of an unusual and protracted character existed, and at the suggestion of the physician, portions of the green wall-paper of the dwellings were submitted to me for analysis. The pigments were found to consist mainly of arseniate of copper, and upon the removal of the papers the illness disappeared. In experimenting with apparently the most suitable apparatus, and employing delicate chemical tests, in rooms the walls of which were covered with those arsenical papers, no evidence of the presence of the poison in the atmosphere has been afforded; and this corresponds with the results of all similar experiments made in this country and in Europe, so far as my knowledge extends. We must conclude that agents not recognizable by chemical tests are capable of disturbing vital processes. The evidence is very clear that in instances of illness confined to one or two members of a household, the cause may be due to some accidental disturbance with which all are equally brought in contact, but which has the power of injuriously injuring only a part. It is also clear that these sources of disease are of such a character as easily to escape detection, and therefore any facts or experience which may serve as guides to their discovery are worthy of record."

## Shoemaking by Machinery.

The employment of machinery in the manufacture of boots and shoes is of but recent date, but it has effected a wonderful revolution in this important industrial art. On this subject the *Lynn (Mass.) Reporter* says:—

"Comparatively few people are aware of the quiet but steady revolution that is going on in the business of shoemaking, and particularly as that business is conducted in Lynn. Previous to the introduction of the original sewing machines, which are now universally used for the binding and stitching of the uppers, but little or no improvement or even change had been made in the manufacture of shoes. The awl, the bristle and thread, the lapstone and hammer, with plenty of 'elbow-grease,' were, as they had been for years, the main appliance of the shoemakers, and little was known or thought of labor-saving machinery. After a time, women's nimble fingers were found inadequate to the demand, and sewing machines soon transformed the old-fashioned "shoe-binders" into a new and more expansive class of "machine girls" whose capacity for labor was only limited by the capabilities of the machines over which they presided. Iron and steel came to the aid of wearied fingers and weakened eyes. This was the beginning of the new era, which is destined to pro-

duce results big with lasting benefit to our flourishing city.

"It is scarcely ten years since the first introduction of machinery of any kind into the manufacture of shoes in this city. Everything was done by hand, even to the cutting-out of the soles, which was a slow process and required the expenditure of a large amount of physical force. The introduction of sole-cutting and stripping machines, although sparingly, was the first indication that a change was to take place in the business of shoemaking; but no one, even ten years ago, would dare to have prophesied that the change was to be so immediate and so great. The rapid progress that has been made during that time, and especially within the past year or two, in the introduction of machinery in shoemaking has been beyond all previous calculation. It may almost be said that hand-work has already become the exception, and machinery the rule. The little shoemaker's shop and the shoemaker's bench are passing rapidly away, soon to be known no more among us; and the immense factory, with its laboring steam-engine and its busy hum of whirling wheels, is rising up in their place, to change the whole face of things in this ancient and honored metropolis of the 'workers in the gentle craft of leather.'

"The problem as to how best to bring in and concentrate the vast army of men and women employed in the shoe manufacture of Lynn is one that has attracted the attention of many thinking minds among our business men, but it has never been satisfactorily solved until now. Machinery, and particularly the sewing machine, has done in a few short months what years of theorizing and speculation could not do. It has demonstrated that the factory system can be successfully and profitably introduced into the shoe business; in fact, that, with the rapid strides which the business has made within a few years, it is the only system that can be made available for its successful application in future. Of course, the new system is yet in its infancy—the business is yet in a transition state; but the wheels of revolution are moving rapidly, and they never move backward. Operatives are pouring in as fast as room can be made for them; buildings for 'shoe factories' are going up in every direction; the hum of machinery is heard on every hand; old things are passing away, and all things are becoming new. Could the disembodied spirits of some of our old-time inhabitants visit the scenes of earth once more, how great would be their astonishment at the change which has taken and is taking place in this once quiet town which claimed them as citizens!"

## Attempt to sound the River Niagara.

The gentleman who has been trying the experiment of sounding the river Niagara below the Falls writes as follows:—"Another attempt was made with a similar iron of about 10 pounds weight, attached to a No. 11 wire, all freely suspended, so as not to impede the fall of the weight. I then let the weight fall from the bridge, at the height of 225 feet. It struck the surface fairly, with the point down, must have sunk to some depth, but was not longer out of sight than one second, when it made its appearance again on the surface, about one hundred feet down the stream, and skipped along like a chip until it was checked by the wire. We then commenced hauling in slowly, which made the iron bounce like a ball, when a cake of ice struck it and ended the sport. I am satisfied that no metal has sufficient specific gravity to pierce that current, even with a momentum of 225 feet. The velocity of the iron when striking must have been equal to 124 feet per second, and consequently its momentum was 5,000 pounds. Its surface exposed to the current was about 50 superficial inches. This will give an idea of the strength of that current, and at the same time a hint at the Titan forces that have been at work to scoop out the bed of the Niagara river."

It is stated that the British Government have finally determined to purchase the International Exhibition building for national uses, connected with the extension of artistic and scientific knowledge.

The *Journal de Bruxelles* publishes a letter describing the discovery, at Blankenberghe, of a fossil man eight feet in length, found in a layer of antediluvian peat, and supposed to be 6,000 years old.