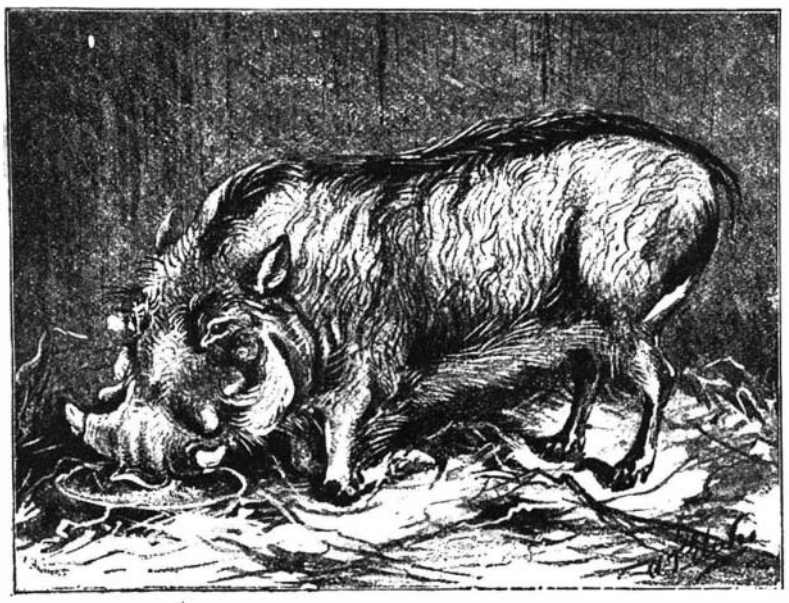
Metal Ties in Mexico.

According to Engineer John Birkinbine, the Mexican Railroad has now some 150 miles of track, including the Pachuca branch, laid with steel ties which weigh 124 pounds each, or 126 pounds with the two key bolts. These ties are 8 feet 3 inches long, rolled so as to have a longitudinal web, and have clips for holding the rails formed by cutting slots out near either end of the sleeper and bending up the steel. The first metal ties of crude design were placed on this road fourteen years ago. On the Inter-Oceanic Railroad, some 50 miles had been laid with "pot" sleepers, an English monstrosity, consisting of two cast iron dishes oval in form, which were inverted in the ballast and connected together by wrought iron bars, the rails being keyed to the pots. About one-fourth of these have been replaced by steel sleepers, and further replacement is made as rapidly as finances permit. The steel sleepers now used are 6 feet long, weigh 90 pounds each, and have near the ends square bolt holes, but no clips. These nest nicely for shipping, and cost $1 gold per sleeper, delivered at Vera Cruz. Wooden ties, 8 feet × 6 inches × 6 inches, cost in the vicinity of Pueblo and Mexico 63 cents for pine and 95 cents for oak; therefore, at the present exchange, the pine ties cost in gold 42 cents and the oak ties 64 cents each. As railroad supplies pay no duty, the expense for steel ties is, therefore, not greatly in excess of wood. On the Southern Railroad (3 foot gauge), steel ties 8 feet long, weighing 110 pounds, are used.

THE WART HOG, OR VLACKE VARK.

This is a new arrival at the Zoological Gardens. The wart hog, or vlacke vark, or Ethiopian wart hog (*P. Æthiopicus*), is a native of Southern Africa. This species differs from his brother from North Africa (Ætians wart hog), inasmuch that his warts at the side of his face are larger; in fact, he is a more formidable animal, his tusks, when full-grown, reaching eight inches in length. The animal lives entirely on roots. The color of this hog is gray, with dark mane, and hair sparsely scattered over the body. When chased, Gordon Cumming says, he presents a most ludicrous appearance on account of his short neck, being unable to look round, and naturally anxious to see if his pursuers are gaining upon him, he is obliged to lift his snout well in the air, so as to look over his shoulder, and with that, and his tail, when running, stiff and upright, he has a most absurd look. The above sportsman also says the animal is not devoid of sagacity.—*Black and White.*



THE WART HOG.

Do Doctors Spread Contagion?

The surgeon and the obstetrician utilize the means that experiment and observation have proved necessary to render their work aseptic. In case of the entrance of disease germs, they take prompt means to destroy them, or to neutralize their effects. It behooves us, who practice among children suffering from contagious diseases, to inquire if we are equally careful.

The surgeon about to open an abdominal cavity removes all possible sources of infection from his patient's person and environment, and goes to his work with clean linen and clean hands. Do we do likewise?

Some time ago a prominent operator sent me an invitation to witness an abdominal section, adding in his note, "Provided you have not visited a case of scarlet fever or other contagious disease during the last twenty-four hours." I could not but think, if such precaution is necessary to insure the safety of this patient, what are the risks to the little children that I shall visit after seeing the case of scarlet fever or other contagious disease, and whose systems are fertile soils for the poison to develop it?

The danger of such conveyance is great, as physicians with large family practice know, and many, like myself, have been taught the lesson by sad experience. I can recall several instances in which the children of physicians have fallen victims to scarlet fever and diphtheria, the cause being clearly traced to disease brought home by their fathers.

Let me illustrate this danger by a description of a physician's visit to a case of diphtheria. The doctor enters the house, removes his hat, overcoat and gloves, and is shown into the room containing the patient, and comes into direct contact with the atmosphere loaded with the germs of the disease. His hair, woolen clothing, hands, etc., must more or less absorb the poison, in his stay of about fifteen minutes. What does he then do? He replaces his overcoat, carefully buttoning it up, as if to keep as many of the germs as possible warm and well protected. He puts on his hat as he crosses the threshold, jumps into his carriage, covers himself with robes, and drives to his next patient; enters, takes off his hat and coat, and wo to any little ones who live in that house! The doctor has probably that with him which will more likely kill than cure.

What should be done to diminish this danger? Stay no longer in a house containing a contagious disease than is absolutely necessary. Don't remove your hat or unbutton your coat in that house. After examining the patient go down stairs, preferably at an open door or window, and give directions for treatment. The family of the patient will respect you for the care you exercise when you explain the reason. Drive without covering with robes to your next patient, and be sure that patient is not a child. Never allow a messenger from a case of contagious disease to call or wait for you in your office. Instruct him to bring written messages and leave them at your door. If the messenger wishes to speak to you, tell him to wait outside your office and ask the servant to call you to the door.

I have more than once been startled on entering my office to see a man or woman whom I knew had been constantly for days and nights nursing a bad case of diphtheria, sitting complacently alongside of two or three children, all waiting to see me. On several occasions mothers have brought children, suffering from severe attacks of diphtheria, to my office and waited to see me.

When you come home from a case of contagious disease, besides washing your hands, face and head with soap and water, hang up your hat and coat in the air, and put on a fresh coat.

I did this some time ago and forgot to bring them in when I went to bed. It rained hard all night—but better lose a hat and coat than a patient.

If you return late at night from a case of contagious disease, besides washing, undress before going into the room where your children are. Keep your own children out of your office, and do not take them in the carriage with you when visiting patients. How do you know but some of your calls may be upon those with contagious diseases?

Our board of health instructs us, in cases of contagious diseases, to forbid the children of the household to attend school or other places of public resort. This is a wise precaution, and the doctor, when he has been in contact with contagious disease, should, so far as possible, follow the advice given to the children.

We are told that familiarity with crime leads us to endure it. Likewise familiarity with contagious disease is likely to make us at times careless in using the means necessary to prevent its spread. Physicians are but mortals, and while as a body they are conscientious in the discharge of their duties, candor compels me to confess that they are not at all times as careful as they should be.—*Dr. John Graham, in Phila. Medical News.*

The Purification of Water.

The drought happily appears to be coming to an end, but the welcome showers of rain must be continued for some time if our stock of water is to be adequately replenished. In the meantime, the water supplied for domestic use must necessarily have become less and less pure and the impurities which pollute the streams less attenuated. The increased proportion of suspended and dissolved impurities which are presented to the sand filters must greatly impede the filtering process, and if this process is hastened—and we cannot doubt but that the temptation must occur to do this—inadequate treatment results and water unfit for drinking purposes may be distributed in the mains. A continued season of dry weather is especially a time at which very careful regard to the treatment of water for drinking purposes should be given.

The purification of water supplied to the consumer's house, be it from the pump or the main, may be effected thoroughly and efficiently if he will only exercise ordinary care and judgment in regard to the use of filters or to other treatment of the water. Water may be made fit for drinking by three processes: 1, treatment by precipitation; 2, by filtration; and 3, by boiling. In some cases it is advisable to combine the effects of two or more courses of treatment. The latter process (boiling), though of course efficient, is not popular, because the water is rendered tasteless and insipid by withdrawal of the gases, chiefly oxygen and nitrogen, and part of the mineral salts in solution. Treatment by filtration is largely in vogue because it it simple and convenient. It is well known, and it is to be feared that it occurs in many instances, that filtration may render the water much less pure. A word therefore with regard to the choice and management of filters. The best and most effective filtering materials are those which not only remove organisms, matters in suspension, or even soluble matters, but which exert an oxidizing action upon the organic contents of the water and an aerating action upon the water itself. Such agents are well burnt animal charcoal, spongy iron, magnetic iron, polarite and coke. For the mere removal of organisms, filtration through kieselguhr and biscuit porcelain is effectual.

Animal charcoal has grown into disrepute owing to the observation that the organic constituents of water in long contact with it decompose more rapidly than they otherwise would do, a fact which is probably accounted for by the presence in the charcoal of calcium phosphate, a material which favors the growth and development of low forms of life. If properly cleansed and frequently renewed, however, animal charcoal exerts a marked purifying as well as aerating effect upon impure water. Whatever medium is used, every part of the filter should be easily got at for the purpose of cleansing or for the renewal of the filtering material.

We have repeatedly drawn attention to the investigations of Dr. Percy Frankland upon the action of filtering agents, whose experiments showed that well carbonized coke was one of the best filtering materials that could be used. It is cheap, can be easily renewed, and effects the removal of organisms better than any other material experimented with. A drawback to its use is the long preliminary washing it requires before the water becomes clear, owing to the presence in its multiple pores of tarry matters derived in the distillation of the coal. When foul it is still available of course for use as fuel. A common barrel of eighteen gallons capacity provided with a false bottom and filled with layers of respectively fine, medium, and coarse pieces of coke, the latter at the top, has, in our own experience, answered admirably.

Purification by means of precipitating agents has recently been the subject of considerable investigation, and the purifying effects of this treatment, both as regards the removal of organisms and of suspended or dissolved matter, are surprising. Purification by this means is best accomplished by the use of alum. This substance (two or more grains to the gallon will suffice) is decomposed with the formation of a flocculent precipitate (hydrate of alumina, Al_2O_3), which rapidly settles and carries down all suspended matter as well as a large proportion of dissolved organic matter. The precipitation is further attended with a very large if not complete reduction in the number of micro-organisms present. In response to inquiries that have reached us from numerous correspondents, we strongly recommend this treatment in lieu of boiling, preliminary to passing the water through a filtering medium of well known purifying powers, such as those we have enumerated. One of the best is, as we have already said, coke. The addition of alum does not interfere with the normal taste of the water, is itself eliminated as alumina in the sediment, removes some of the lime, and, above all, does not de-aerate the water as in the boiling process. By first precipitating, therefore, in the way suggested, and then filtering security is made doubly secure, and the water so treated, which should not be insipid, may be consumed with confidence.

It may be added that tartaric acid or citric acid has been found to be destructive to disease-producing organisms, notably the bacilli of cholera, and an ingenious filter has been constructed in which tartaric acid is first dissolved in the water and then neutralized and removed as calcium tartrate by means of chalk. At the same time the chalk yields carbonic acid to the water, which is thereby agreeably aerated.—*Lancet.*

ONE of the rooms of the Press Bureau, at the Chicago Exposition, has its walls entirely papered with title pages of leading publications from all over the world. These publications include daily papers, religious and trade papers, magazines, etc. A central feature on this wall is the title page of the SCIENTIFIC AMERICAN. Every nation and nearly every colony in every part of the world is represented. The effect of this method of papering is remarkably good.