Correspondence.

Frozen Fish.

To the Editor of the Scientific American:

We have several times caught, on the Kennebecasis River, smelt and codfish that have become frozen (wholly or partly) after leaving the water, and have come again to active life several hours later when thawed out in water.

I have not known or heard of trout coming to life under similar conditions. G. F. F.

St. John, N. B.

A Letter from Alaska.

To the Editor of the Scientific American:

The brilliant red appearance of the sky after sunset was plainly visible here. On the 28th of January it was remarkably brilliant, casting a reflection on the houses situated on the hill 50 feet above salt water, in the rear of the town. The islands lying to the westward of us, about 8 miles distant, are covered with a range of mountains, some 2,000 feet high; you can thus form an estimate as to the height of the display above the horizon.

You can form some idea of our winter from the fact that the coldest night we have had the thermometer registered —1°. We have had but little snow so far. Last night it rained, and to-day we have a warm rain and thawing.

Persons living in the East seem to forget, or are ignorant of the fact, that the coast of Southeastern Alaska is under the influence of the Japan Ocean current. As a matter of course, the same latitude in the interior—56°—is cold enough for an Esquimau. The clothing worn here is about the same summer and winter; though a good crop can be raised of all kinds of root vegetables grown in a temperate zone, except those of a semi-tropic kind.

A few months ago I read of the wonderful journey made by Lieutenant Schwatka, from the coast to the tributary of the Yukon, and thence down that stream to its mouth on a raft. For several years past companies of miners have crossed over the same route, loaded with packs of over one hundred pounds each, containing their provisions and tools, through to the watershed of the Yukon, prospecting for gold. When arriving at the tributary of the Yukon they build boats, packing a rip-saw for that purpose, and proceed on their journey. It is reported that a company have found bar diggings on a tributary of the Yukon just west of the Rocky Mountains and on the north side of the river; the average is said to be $15 a day to the man.

Others will go in the spring, before the snow melts, sled their supplies across the divide and up to the tributary of the Yukon, when they will construct boats, and, so soon as the river is free from ice, will continue their journey to Stewart's River, their destination.

The men do not consider it a wonderful trip, and, in fact, scarcely ever make mention of it, unless in general conversation as to their future intentions.

W. H. WOODCOCK.

Fort Wrangell, February 24, 1884.

Electricity, its Effect on Vital Power.

To the Editor of the Scientific American:

In your paper of March 15 is an article on "Beer soured by Thunder," taken from the *Brewers' Gazette*. The writer advances the idea, following the paper of Mr. Allen before the Royal Society at Edinburgh, that it might be (the souring) because of "the electrical conditions leading to the deposition of a greater number of bacteria in a given time. This explanation would apply to beer exposed to the air in open vessels, but scarcely to beer in casks, which is practically protected from the atmosphere." Now this matter is well worth our study, in the light to which the title we have written above directs us. We recognize fermentation as a biogenic act, and that the chemical changes produced by it are due to vital power. We have "beer soured by thunder" because of electrical action on vital power, and no better point can be found for initiating an investigation of this action than this very point where the electrical power is brought to bear on vital power of the lowest and most simple rank.

The article quoted says, "it has been somewhat difficult to reconcile the modern theory of fermentation by germ" with the souring of beer by thunder-storms, and goes on to refer favorably to Liebig's theory of catalytic action; but properly considered we shall find that the biogenic action of electricity gives us a much easier explanation than any other.

Of the almost infinite richness in numbers of the micro-organisms which, in their various forms, we group under the general name *bacteria* swarm in the atmosphere it appears probable that even our imaginations can scarcely get an idea. At all events, we know that the very slightest exposure to the air, the admission for instance of merely a tiny bubble, is sure to supply them to any fluid where we seek their presence, and it is therefore perfectly sure that a vegetable infusion like beer must be fully stocked with them at any moment; and if there comes a cause to give them a sudden and urgent impulse of vitality, there will come an overpowering growth in their numbers, and we shall call it a fermentation. If it is beer at the right stage, this will be an acetous fermentation, and the beer will turn sour. This has been done not by "leading to the deposition of a a greater number of bacteria" from the atmosphere, but by hastening the maturity of development of the myriads of spores which were already present. And taking this view, we see readily that we have no trouble in setting aside the difficulty suggested as to the fact of beer which is in casks becoming sour almost as quickly as that which is open to the air. Why should it not be so? The spores are present in the one as fully perhaps as in the other, and the electrical condition of the atmosphere can probably act as freely on the beer inside the cask as though the cask were not there. The manner in which the difference of electrical tension chemically affects the beer at all is, as yet, a mystery to us, and the fact that the air rests upon its surface seems little likely to have much to do with it. A thin plate of iron is opaque to the rays or vibrations of light, but it is transparent to those of heat, presenting scarcely any resistance to their free passage and action. In the same manner the rays of vibrations of electrical energy may find the wood of the cask *transparent* for their passage.

The question then arises, Are there any facts which give us reason to believe that the effects of electricity on vital power can be such as to develop fermentation? A.

Steel Fire Boxes.

To the Editor of the Scientific American:

An acquaintance of mine who has charge of the locomotive department of a large road informed me lately that he had had so much trouble with steel fire boxes that he had returned to iron. Many of his engines with steel fire boxes had developed large cracks after the engine had had the fire pulled out and had stood for a few hours in the roundhouse. They were sure to crack if the engine was cold and any work was then done on the fire box. An engine that had stood over night required that the stay bolts which were leaking some be headed over or calked. The first blow struck developed a crack 33 inches long in the side sheet. The M. M. tested this sheet and found that it broke like cast iron. One of the pieces thus broken from the sheet was thrown into a blacksmith fire, and a few drops of water dripped on to it. When the water showed signs of boiling, the piece was removed from the fire, grasped in a vise and bent with a hammer. It was found to be as pliable as lead. This led the M. M. to order that, when work on a steel fire box was to be done, a fire of shavings should first be lighted in the fire box, heating it so that a man could just stand it to work inside the fire box. The result was that no more cracked sheets occurred. The same M. M. had tried cast iron guide bars and found that they acted nicely until through carelessness they were allowed to cut, when they very rapidly destroyed themselves. He replaced them with case hardened wrought iron, and let into the wings of the crosshead three disks of chilled cast iron retained in place by running Babbitt metal around them.

I saw several engines fitted up this way which had been running four years, or about 200,000 miles, and the wear was so slight that a piece of writing paper could be just slipped between the crosshead and guide.

FRANK C. SMITH.

To the Friends of the Patent Laws.

To the Editor of the Scientific American:

The series of articles published by you within the last few weeks in regard to the numerous bills affecting the rights of patentees and inventors, introduced during the present session of Congress, and which, under the guise of protecting innocent purchasers and the public generally, aim to undermine the very foundation of our patent laws, I have read with a great deal of interest, and am glad you are giving this matter the attention it deserves.

As a general thing, the patent laws are regarded by those not directly interested in them, as a dry and unimportant subject. It is not surprising, therefore, that such bills as those recently passed by the House (H.R. 3,925 and H.R. 3,934) should have met with such little opposition in that body. It would be unfair to say that our representatives in Congress are not aware of the importance of our patent laws as a whole; they fully understand the value and importance of some of the more prominent inventions of the present day with which they come in contact, such as the railway, steamboat, telegraph, telephone, electric light, etc., and recognize the fact that it would be disadvantageous to the best interests of the country to repeal the law to which they owe their existence. The trouble is that the bills in question are so framed as to make them appear to be in the interest of the general public, for the purpose of curing certain real or imaginary defects in the present system, and it is to this feature of the bills that their passage may be attributed.

Had the members who voted for the bills known their real import, it is doubtful if the bills would have passed the House even with the indorsement of the Patent Committee. These bills have not as yet been acted upon by the Senate, and to guard against any recurrence of the mistake made by the House, the Senators in Congress ought to be promptly put in possession of facts which will enable them to see the dangerous ground they are treading; and it is to the interest of every patentee or owner of patent rights to see that this is done.

That there are evils of the nature complained of connected with our present patent system is not denied, but it does not follow that the entire system should be condemned for this reason. It is about time that inventors should stand up for their rights and meet their opponents, whoever they may be, upon an equal footing. Thus far nearly all the bills introduced lately have been against the inventor. Why cannot the inventors of the country unite to protect their interests, and, if necessary, introduce bills to accomplish that end? Just at the present time it might be advisable to frame a suitable bill which may be introduced into the next Congress, which shall do away with the objections urged by the promotors of the obnoxious bills before referred to, and at the same time protect the inventor and patentee. Until this is done, the opponents of our patent laws will continue introducing bills of the character described, to the imminent peril of overthrowing what is probably the most valuable provision of our Constitution. ELIAS E. RIES.

Baltimore, Md., March 13, 1884.

How to Prevent Fires.

The following simple precautions suggested by the New York *Independent*, if strictly followed, would prevent a great many destructive fires. The rules might be posted in every store, dwelling, and factory with good results:

The leading causes of fires are kerosene oil, matches, and furnaces.

1. Always buy the best quality of oil.
2. Never make a sudden motion with a lamp, either in lifting it or setting it down.
3. Never place a lamp on the edge of a table or mantel.
4. Never fill a lamp after dark, even if you should have to go without a light.
5. See that the lamp wicks are always clean and that they work freely in the tube.
6. Never blow out a lamp from the top.
7. Never take a light to a closet where there are clothes. If necessary to go to the closet, place the light at a distance.
8. Use candles just as much as possible in going about the house and in bedrooms. They are cheaper, can't explode, and for very many purposes are just as good as lamps.
9. Matches should always be kept in earthen jars, or in tin.
10. They should never be left where rats or mice can get hold of them. There is nothing more to the taste of a rat than phosphorus. They will eat it if they can get at it. A bunch of matches is almost certain to be set fire if a rat gets at it.
11. Have good safes in every place where matches are to be used, and never let a match be left on the floor.
12. Never let a match go out of your hand after lighting it until you are sure the fire is out, and then it is better to put it in a stove or an earthen dish.
13. It is far better to use the safety matches, which can only be lighted upon the box which contains them.
14. Have your furnaces examined carefully in the fall, and at least once during the winter by a competent person. All of the pipes and flues should be carefully looked to.
15. If there are any closets in the house near chimneys or flues, which there ought not to be, put nothing of a combustible nature into them.
16. Never leave any wood near a furnace, range, or stove to dry.
17. Have your stove looked to frequently, to see that there are no holes for coal to drop out.
18. Never put any hot ashes or coal in a wooden receptacle.
19. Be sure that there are no curtains or shades that can be blown into a gaslight.
20. Never examine a gas meter after dark.

Fires, of course, arise from other causes than those we have stated. Smokers burn up much valuable property which is not in the shape of cigars. Bunches of oiled rags of the most inanimate nature in themselves still perform the most wonderful feats in the destruction of property. Tramps, with their old pipes, will creep into barns and haymows, and servants will be careless in thousands of ways, but if every person who owns property will give the subject attention, and see that those around him are posted, and see that reasonable rules are always obeyed, many thousands of dollars could be saved annually which are now burned out of existence.

Microscopic Examination of Water.

The detection of micro-organisms in potable waters is of considerable hygienic importance. When they are present, yet in relatively small numbers, their detection is difficult unless they can be concentrated in a small volume, which cannot, of course, be accomplished by evaporation. This may be effected by precipitating them in a precipitate that dissolves readily in acids. Brautlecht makes use of a solution of one part of aluminum sulphate in eight parts of water and one part of hydrochloric acid. He puts five drops of this solution in the water to be tested, then adds three drops of the officinal aqua ammonia, which precipitates the alumina, and with it any organic matter. This he collects upon a smooth filter, and while still soft scrapes it off with a glass rod and dissolves it in ten drops of acetic acid. In these ten drops are to be found all the micro-organisms previously distributed through a large quantity of water, and this is used for microscopical examination. If necessary they may be stained with a suitable dye.—*Pharm. Zeitung.*

A GENTLEMAN stepped up to the counter at the Astor House the other day, and asked for a telephone cigar.

"What kind of a cigar is that?" inquired the unsuspicious proprietor.

"One of the kind that you smoke in New York and they can smell in Brooklyn," was the answer.—*Electric Review.*

[We think this new brand must be a favorite one with smokers. This conclusion is predicated by the fact that a good many visitors at this office smoke cigars answering the above description.—ED. S. A.]