An Atmospheric Telegraph.—Speed of Air in Tubes.

MESSRS. EDITORS—A circular has been sent to me, from which it appears that an effort is being made to form a company for the purpose of constructing an atmospheric telegraph from Boston to New York. In this circular an extract is given from the SCIENTIFIC AMERICAN, of which the following was the concluding paragraph :—

"Suppose a line of two feet tube laid from Boston to New York, it would contain about 4,000,000 cubic feet of air. Suppose twenty pumps of ten feet diameter and ten feet stroke are located at the Boston end, connected with the cylinder; these twenty pumps contain about 15,714 1-7 cubic feet. Suppose the pumps are worked twenty strokes in a minute, we have removed 314,285 2-7 cubic feet of air. Suppose the plunger was let in at New York at the commencement of operating the pumps, and the pumps continued to run for fifteen minutes, in which same rate 4,714,279 2-7 feet of air would be removed, and the cylinder only containing 4,000,000, the plunger must reach Boston about as soon as this work could be performed, so far as we can see, and the same result the other way."

In respect to the *time* required to pump the air out of a pipe of the length, and under the circumstances named, the laws of nature have fixed a limit below which it cannot be reduced, whatever be the number, capacity, and speed of the pumps, for the pumps can remove air no faster than it is capable of flowing towards them, by virtue of its own inherent elastic force.

The laws which govern the flow of air by virtue of its own elastic force are given in the *American Journal of Sciences*, second series, Vol. 5, page 78, Vol. 9, page 344, Vol. 12, page 186.

Applying the principles which are developed in the articles referred to, to the case in hand, we shall arrive at the following conclusions :—

1. If the number, capacity, and speed of the pumps be such as to maintain a semi-vacuum beneath the pistons, (a vacuum say of 7 1-2 lbs. to the square inch,) the air will flow in the pipe towards the pumps under half its natural density, and with a velocity of about 650 feet per second.

2. If the number of pumps be increased so as to maintain a greater vacuum beneath the pistons than 7 1-2 lbs. to the inch, the flow of air towards the pumps will not thereby be increased.

3. After the pumps are put in motion 30 minutes must elapse before the effect will be felt at the other end of the pipe.

4. Supposing the plunger to move without friction or other resistance, and the air to flow in behind it without obstruction, 30 minutes more will be required to bring it to its destination.

5. Eight pumps of the capacity and speed named will be sufficient to maintain a semi-vacuum beneath the pistons, to drive which will require the power of 4,000 horses.—Twenty pumps will accomplish the work in no shorter time, and will require the power of 12,000 horses. * * *

New Haven, Conn., Nov. 8th, 1856.

[The foregoing article is from the author of the articles referred to in the *Journal of Science*.

Rice Thrashing Machines.

MESSRS. EDITORS.—At a time when we have machines invented for most every purpose, and that too of a cheap and economical kind, it is strange that our inventors cannot find a cheap and economical method of thrashing rice, The rice grain, when properly harvested, holds on with considerable tenacity, and therefore is hard to quit the straw; this would be the principal difficulty to be overcome. Great care would also have to be taken not to break or fracture the grain, as in this particular the value of the article in market in a great measure depends. It is true we have rice thrashers and steam engines to drive them, but the cost is so great that none but large planters can afford to get them. These machines cost thousands of dollars, whereas the small planter wants a machine that will do his work and only cost its hundreds. I have no hesitation in saying, that if such a thrasher and engine could be got up, they would meet with such a ready sale as would amply remunerate the inventor. A. S.

Georgia, November, 1856.

Buying Machinery.—A Hard Case.

MESSRS. EDITORS—I address you for the purpose of gaining information in relation to a difficulty with parties in this city about machinery purchased one year ago.

I purchased three machines of a manufacturing company, with the understanding that they were not and could not be patented after using them several months. I have been called on by a representative of another company, and forbid to use the machines, as they were an infringement of their patent. The party of whom I purchased refuse to take back the machines.—Both companies continue to make the machines—one stamping them "patented," and the other does not. What redress have I, and what is the proper course to take? By answering in your next number you will much oblige S. T. MCDOUGALL, 333 Broadway.

New York, Nov. 10, 1856.

[This is a hard case, and, we regret to say, not a singular one by any means. Numbers who have purchased machines honestly, without any intent to infringe a patentee's right, have been subjected to threats of law suits, or the payment of the patent fees exacted. In the case before us it does not speak well for the company that has threatened our correspondent, nor the one that sold him the machines upon the understanding which he mentions. However, we are afraid that there is no remedy for him in the premises, if his machines really do infringe a patent.

A patentee (or his assignee) has a right to prevent the *making*, *using*, and *selling* of any machine which infringes his patent. The company that has threatened him should in equity sue the parties that make the machines mentioned, as more evil is done by them than by those who buy and use them, their conduct involves innocent persons, like our correspondent.

Unless a machine or article has been in use with the consent of the inventor for more than two years prior to his application for a patent, it does not become public property. An inventor, when he receives his patent, can stop the constructing, selling, and using of any machine that infringes his patent, even if it were in use for twenty-three months before his application. If our correspondent had inquired of us before purchasing the machines, he would have been informed that the use of his machines for *several months* did not render them public property, unless they had been in public use for over two years previous to the application for the patent. If he can prove by witnesses or by good documentary evidence that the company from whom he purchased those machines gave him assurance that they were not, and could not be patented, then he has his remedy at common law. This is his only remedy; if he has not this security we advise him to settle with the patentees of the machines, and look out in future for such traps.

Dark Days.

MESSRS. EDITORS—On page 59, present volume, SCIENTIFIC AMERICAN, there is an article under the head of "Dark Days," which is evidently designed as a description of Indian Summer. Your correspondent says that the great distinguishing feature of the season was that the atmosphere was filled with smoke, and that he should like to know where it comes from.

Now I propose to inform him of facts within my knowledge. The past summer has been remarkably dry, and since harvest a fire has been running over the counties of Ingham, Eaton, Clinton, and others north and west, destroying a large amount of hay on the marshes, and burning deep into the muck, also in swamp lands, burning the soil, and making a clean sweep of much valuable timber. I venture the assertion that more smoke arose from the above-named counties in one day than half the cities in the Union would make in a week; and when the wind blew from the north, we would be enveloped in smoke, as in a thick cloud, rendering large objects invisible at the distance of a few feet. Would it not be reasonable to suppose (the wind being from the north) that the smoke at Dayton proceeded from the places above-named. When the wind came from the south, south-east, or south-west, we were comparatively free from smoke, and the sun shone out, giving the peculiar tint of an ordinary Indian Summer. If the same changes of wind produced the same results at Dayton as were noticed here, the evidence, I think, is conclusive that the great smoky laboratory was a few miles north and west of this place. H.

Parma, Mich., Nov. 4th, 1856.

The American Institute Fair.—How Conducted.

MESSRS. EDITORS—In your notice of the close of the Fair of the American Institute you give the Managers too much credit. I have been an exhibitor at their fairs for 15 years, and this year had six entries in four departments, and know something of their management, and I am compelled to say that I have never seen a fair so badly managed as their last. They have shown a total disregard to the interests of the majority of the exhibitors, both in making their examinations and in accommodating them with space. The consequence of this mismanagement is that a new society is forming, to be called the "Mechanic's Association," which will pay a little more regard to the interest of the Mechanic.

S. T. MCDOUGALL,
333 Broadway.

New York, Nov. 10, 1856.

Stoves Economising Heat.

It is well known that cylindrical stoves give out the most heat, and have the best draft, but there are few who seem to know the reason why. They do not seem to be aware, at least, that there is anything in the principle of their construction which imparts to them such qualities. Stove manufacturers cannot be accused of professing too much scientific knowledge regarding the best form of stoves, or we would not see so many blunders committed by them in casting so many with square and rectangular furnaces. This is especially the case with cooking ranges and stoves,—their fire-boxes are constructed on wrong principles.

The reason why a cylinder stove gives out so much heat, and tends to produce such a good draft, is owing to the sides of its fire-box or furnace being concave in form. Heat, like light, may be concentrated by concave mirrors, hence the heat is more concentrated in stoves which have concave, than those which have square fire-boxes. The rectangular form of fire-box may be more convenient for cooking ranges, but there is no excuse for constructing the furnace of any parlor or other heating stove of a square form.

The fire-bricks for lining stoves should be fluted. Bricks with plain surfaces are not so durable as the fluted kind, because the latter tends to prevent the adherence of clinker.—Some bricks for stoves are actually cast with convex surfaces, as if designed for scattering the rays of heat, thus exhibiting ignorance of the laws of heat.

Bright metal surfaces do not radiate heat so well as dark, dull surfaces, therefore Russia iron in stoves and pipe does not radiate so much heat into a room as common iron.—Those surfaces which radiate heat most efficiently also possess the power of absorbing it, and *vice versa*.

As the intensity of heat varies inversely as the square of the distance from the radiant point, it is evident that the nearer the stove is placed to the center of the room, or space which it is designed to heat, the more uniform will be the temperature of the whole space and not only so, but a greater amount of heat will be economized.

Stove manufacturers have devoted an immense amount of attention to elaborate the surfaces of cast-iron stoves, and to produce an incalculable amount of complicated forms, but not much to produce stoves based upon the philosophy of the laws of heat. We hope that more attention, scientifically, will hereafter be devoted to this great and important bnrach of American manufactures.

Pure Water and Health.

At the late meeting of the British Association, Dr. Lankester exhibited some water taken from a well at Cirencester. The water from this well had been the cause of illness in a family which had partaken of it. Although at first clear, after standing a little time it exhibited the mycelium of a fungus. This water had been sent to him for examination, and he had been struck with the resemblance of the fungus to that of one which he had found in the well-water of Broad street, Golden Square, the drinking of which had been undoubtedly connected with the outbreak of cholera in that district in 1854. This well had subsequently been found to have received into it the contents of house drainage. He had now discovered that the well at Cirencester had also received into it a certain amount of house drainings. He related other cases in which fungi appeared in contaminated water. None of the waters mentioned exhibited any injurious constituents that could be discovered by chemical analysis; before chemistry could detect them they had lost their injurious properties, and the microscope alone could realize their presence.

Tests of Pure Water.—The following practical rules for testing the wholesomeness of water, says Dr. Marcet, will be useful :

1. The water must be perfectly colorless and transparent, leaving no deposit when allowed to stand undisturbed.

2. It must be quite devoid of smell.

3. When litmus paper is immersed in the water, the color of the paper must remain unaltered.

4. The water when boiled must not become turbid.

5. About half a tablespoon of the fluid being evaporated to dryness on the spirit lamp, there must be a slight residue left at the bottom of the spoon not turning black from organic matters.

6. The residue obtained by evaporating to dryness a sample of the water in a porcelain cup upon the tea urn, must not become black on the addition of a solution of sulphuretted hydrogen.

Yankee Ingenuity.

It is said that Mr. John E. Gowen, of Boston, Mass., who is now in Russia, has contracted with the Imperial Government to raise the ships of war and other vessels, 52 in number, sunk in the harbor of Sebastopol during he siege. Mr. Gowen, it will be remembered removed the wreck of the steamer *Missouri*, from Gibraltar Bay, after all the efforts of British engineers for that purpose had failed.

Collision at Sea.

The new French steamship *Lyonnais*, which left this port for Havre on the 1st of October was run into on the same night by an unknown ship, and, it is believed, went to pieces. Sixteen of the crew and three passengers picked up in a boat by the ship *Elsie* have been brought to this city; the others and some of the crew—40 in all—perished.

The *Great Eastern* steamship is to have ten large boilers, each weighing 38 tuns—or 380 total. These boilers have been lifted into the vessel one by one, by a steam crane, and laid down in the exact places they are designed to occupy.

Oxygen and chlorine, at a strong heat, decomposes the fluoride of calcium; the gas set free is fluorine.

The fluoride of calcium is an ingredient of bones, and is chiefly found in the enamel of teeth. It is a very abundant mineral.

One grain of hydrogen combines with eight grains of oxygen to form water. As no other element takes up such a large proportion of oxygen, this is probably the reason why the combination of hydrogen and oxygen is attended with such an intense heat.

During the voyage of the *Merrimac* steam frigate to England, the brass seats of the air-pump foot valves gave way and were crushed downwards.

The Franklin Institute Fair is now open in Philadelphia, and has been pronounced to be superior to any of its predecessors.