TALKING MACHINES.

[Condensed from All the Year Round.]

A distinction between the honest and the deceptive in such contrivances deserves to be noted. There have been some so-called talking and singing machines, in which the talking and singing really came from human lips, under such circumstances as led the audience to believe that mechanism produced the sounds. We know very little about Roger Bacon's speaking head; but there is reason to believe that, if the machine were ever produced at all, the sounds emitted came from human lips. A famous exhibition, called the "Invisible Girl," was a deception in which much ingenuity was displayed. In this machine there was a girl or lady concerned, who did the talking and singing, and who was invisible to the audience; the deception consisted in leading the visitors to suppose that she was in a small globe suspended in mid-air. There were four upright posts, united at top by four horizontal rails, like the framework of a table. Bent wires, springing up from the posts, converged to an ornamental center; and from these wires were suspended a hollow copper ball, with four trumpet mouths on four sides. This was all the visitors saw. Any person wishing to propose a question, spoke it into one of the trumpet mouths; and presently afterwards an appropriate answer came from all the four mouths. The voice was so soft that it seemed to come from a very young and diminutive being indeed—a fairy, an invisible girl. French and Italian were spoken by the voice as well as English; witty and lively remarks were made, as well as questions answered; and songs were beautifully sung in silvery tones. It was admitted on all hands to be an attractive exhibition; and as there were means of verifying the fact that the globe touched nothing whatever, except four ribbons by which it was suspended, the surprise felt was great.

The facts of the case were these. One of the posts was hollow, as were two of the rails; and there were openings in the rails just opposite two of the trumpet mouths. In an adjoining room was a lady seated at a pianoforte; a very small opening in the partition between the two rooms enabled her to see what was going on; while a concealed tube was carried from a point near the level of her ear to the hollow part of the machine, beneath the floor. Sounds, as we know, travel very easily through tubes; and thus the questioning, the answering, the singing, and the pianoforte playing, were transferred from room to room. When a spectator asked a question speaking at one of the trumpet mouths, the sound was reflected from the trumpet back to the opening in the horizontal rail, which opening was neither seen nor suspected by the audience; it went down the rail, under the floor, and into the adjoining apartment, where the lady heard it; and the sounds in the opposite direction were similarly conveyed. The sound became so altered in character and intensity by this process of transmission as really to seem to come from the ball; and when an answer was given to a question expressed in a whisper, the impression was very strong that the answers really came from the ball.

But the more interesting contrivances are those in which the sounds are really produced by a mechanism of pipes, bellows, keys, vibrating reed, etc. Musical instruments have in some cases been played with surprising success by such means, involving the expenditure of an almost incredible amount of time, patience, and ingenuity in devising the requisite arrangements. Vaucanson's flute player was a wonderful example of this kind. It was a life-size figure, dressed in the ordinary fashion of his day (about 1730), and standing on a pedestal; both figure and pedestal being full of delicate machinery, essential to the working of the machine. When wound up with a key, the figure played real music on a real flute. Air was projected from the mouth to the embouchure or mouth-hole of the flute; and the force of the current was varied to suit the loudness or softness of different passages, as well as the different pitch of their octaves, the opening between the lips being varied to assist in producing the desired effects. The fingers, made of some elastic material, stopped the holes in the proper order for producing the several notes. The machine was constructed to play a certain number of tunes, beyond which its powers did not extend. Soon afterwards the same clever mechanician produced his automaton flageolet-player. The flageolet had only three holes; and so diverse was the intensity of wind required to produce all the notes of a tune with such limited means, that the pressure varied from one ounce for the lowest note up to fifty-six pounds for the highest. Another of his productions was his automaton pipe and tambour player; the figure of a shepherd, standing on a pedestal, played nearly twenty minuets and country dances on a shepherd's pipe held in the left hand, at the same time playing on a tambour (a kind of hybrid between a tambourine and a small drum) with a stick held in the right hand.

Maelzel's automaton trumpeter, exhibited about sixty years ago, was quite a triumph of ingenuity. A figure, dressed in the uniform of a trumpeter of Austrian dragoons, when wound up by a key, played the Austrian Cavalry March, and a march and allegro by Weigl, on a trumpet, and was accompanied by an orchestra, the sounds of the trumpet being admirably produced. Then, his dress being changed to that of a French trumpeter of the Guard, the figure played the French Cavalry March, all the signals, a march by Dussek, and an allegro by Pleyel. When we consider the numerous modifications of pressure with which the lips of a trumpeter touch the small end of the trumpet, the production of such results by machinery is certainly surprising. Soon after Maelzel's time, Maillardet produced an automaton pianoforte player. The figure of a lady, seated at a pianoforte, played no less than eighteen tunes, keeping on for an hour when once wound up; the machinery was laid open at intervals in such a way as to show that it was really mechanism that played. The white keys or natural notes were pressed with the fingers in the usual way, but the flats and sharps were produced by pressing on pedals with the feet. The inventor succeeded in making this lady more graceful in her attitude and movements than is generally the case with automata. Somewhere about 1820 there was an exhibition of two automaton flute-players in London; the two figures played eighteen duets, which must have required a vast amount of interior mechanism.

Another class of these ingenious contrivances comprises pieces of mechanism, which imitate the cry of certain animals and the song of birds. This has been rather a favorite problem with clockmakers, and there are many famous clocks of this kind.

The machines which, with more or less success, imitate human speech, are the most difficult to construct, so many are the agencies engaged in uttering even a single word—lungs, larynx, tongue, palate, teeth, lips—so many are the inflections and variations of tone and articulation, that the mechanician finds his ingenuity taxed to the uttermost to imitate them. The speaking doll, which gives forth its melancholy and woe-begone "Papa!" and "Mamma!" is a wonderment to all the little folks, who regret very earnestly that such dolls are too expensive to be freely purchased; but it is, nevertheless, a poor affair, albeit there has been much care and thought bestowed in devising the kind of vibrating reed to be used.

About ninety years ago, a pamphlet appeared concerning two large brazen heads that were constructed by the Abbé Mical, to effect something in the talking way. What was really done is rather doubtful; but we are told that entire phrases were pronounced, that the sounds were *"sur-humaine,"* that there were two cylinders, one of which could produce determinate phrases, with proper intervals and prosody, while the other could produce all the sounds of the French language, analyzed and reduced to the smallest number. There were people uncharitable enough to believe that the speaking was managed by a living person in an adjoining apartment, as in some other instances we have mentioned; but the information was too slight to enable us to judge on this point. Kratzenstein, a few years later, made experiments on a series of tubes and vibrating reeds, which, by the aid of bellows, enabled him to produce or imitate the sounds of the vowels; but he appears to have made no attempt with the much more difficult sounds of consonants.

Wolfgang von Kempelen, inventor of the far-famed automaton chess player, constructed a talking figure which cost him a large amount of thought, time, and inventive ingenuity. First, he made experiments with tubes and vibrating reeds, which enabled him to imitate the sound of the continental "a," like our "ah;" then, with a tube and a hollow oval box hinged like the jaws, he produced the sounds of "a," "o," "ou," and an imperfect "e;" then he succeeded with the consonants "p," "m," and "l," and afterwards a few others; but there were some consonants or sounds which he never succeeded in imitating. Having combined the results of his researches, he constructed a head which contained the requisite wind tubes and vibrating reeds, and a bust provided with some kind of bellows. Thus armed, his automaton could pronounce the words "opera," "astronomy," "Constantinople," "vous êtes mon amie," "je vous amie," "je vous aime de tout mon cœur," "Leopoldus secundus," and "Romanum imperator semper Augustus." These words were spoken when the machine was wound up, without any player being required to press upon keys and pedals. Tubes to imitate nostrils produced "m" and "n;" a funnel and a reed changed "s" into "z," "sch," and "j;" and there were various pieces of mechanism to imitate more or less successfully the movements and action of mouth, lips, teeth, tongue, palate, glottis, lungs, etc. Altogether, it was what the chess-player was not—really an automaton.

Professor Willis and Sir Charles Wheatstone some years ago devoted a good deal of attention to this matter; not, of course, for any exhibition purposes, but to analyze the production of vocal sounds in a scientific way. Sir Charles showed the results of his experiments at one of the meetings of the British Association. Professor Willis separated all the sounds, whether letters or exclamations, emitted in speaking, into three groups, which he called mutes, sonants and narisonants. Leaving consonants untried, he made experiments in the mode of producing vowel sounds by mechanism. With an air chest, vibrating reeds, and cavities and tubes of different kinds, he produced a great variety of sounds. One curious result of his experiments was, that with the same apparatus, drawn out gradually in length, he could produce in succession all the vowel sounds which are heard in such English words as "see," "pet," "pay," "past," "pan," "caught," "no," "but," "book," "boot;" we find, in effect, that the lips protrude more and more as this series advances; and this supplies a noteworthy confirmation of the views held on this matter by the experimenter.

Some of the readers of this article may perhaps remember Professor Faber's automaton-speaking figure, called the "Euphonia," when exhibited in London. It was a draped bust with a wax face. Concealed from the visitors were sixteen keys or levers, a small pair of bellows, and numerous little bits of metal, wood and india-rubber. When any word or sentence was spoken out, either by Faber or by one of the audience, the exhibitor mentally divided all the syllables into as many distinct sounds as they embodied; he pressed upon a particular key for each particular sound, which admitted a blast of air to a particular compartment, in which the mechanism was of the kind to produce the sound required; there were thus as many pressures as there were elementary sounds. By a modification of the movements, whispering could be produced instead of speaking.

This machine has been improved by the nephew of Herr Faber, and has recently been exhibited in London. One good point about it is that every part of the mechanism is laid fairly open to visitors. True, a wax head or mask is used, through the lips of which the produced sounds are really emitted; but this mask is at intervals removed, to show the movements of india-rubber lips and tongue belonging to the machine itself. The elementary sounds, by further analysis, have been brought down to fourteen, all others having been found to be really compound sounds, made up of two or more elements. A lady, seated at a kind of key-board, has fourteen keys or short levers before her; a sentence is given out, in any one of two or three languages; the lady instantly analyzes the sounds, and decides which of the keys will produce each, or which combination will produce the whole of them; she then plays, somewhat in the manner of harmonia-playing, giving the proper number of pressures on the properly selected keys. Some sounds are difficult to imitate, some are imitated readily; a laugh is capitally given, and a cry is sufficiently doleful for all required purposes; a whisper and a sigh are also producible.

What Becomes of Carbonic Acid?

Animal life, and fire, diminish the amount of oxygen in the atmosphere, while increasing the amount of carbonic acid. Hence, in the lapse of time, the present conditions for life would greatly change.

This is the more apparent, since air containing as much as one per cent of carbonic acid acts already deleterious on the human system. But as animal life has existed for ages on the globe without producing any dangerous accumulation of carbonic acid in the air, there must exist a cause continually diminishing the amount of this gas in the air.

Vegetable life is this cause. Plants absorb carbonic acid from the air, build their substance mainly from the carbon contained therein, and give up a great part of the oxygen to the atmosphere. This is proved by the following facts:

1. Plants cannot grow in air completely deprived of carbonic acid, for, brought into such an artificially prepared atmosphere, they die.

2. When a small, living branch with leaves is brought into a glass vessel containing atmospheric air, the amount of carbonic acid in the latter diminishes, while the amount of oxygen increases, provided the plant be exposed to the sunlight.

Besides the carbonic acid, plants take also water from the air, and part of the latter is found to combine with the carbon resulting from the former. The principal parts of plants, such as woody fiber, etc., is indeed composed of carbon, hydrogen, and oxygen, the latter two in such proportions as to be equivalent to carbon and water. Hence they are termed *carbohydrates.*

Decaying animal matter exerts a favorable influence on the growth of plants, constituting a ready source of nitrogen to the same.

Finally, from the soil wherein the plant has its root, the plant obtains those mineral matters which constitute the ashes of the plant when burnt.

The chemical life of plants thus appears to consist mainly in the decomposition of the carbonic acid taken from the atmosphere. The carbon is accumulated in the body of the plant, while the oxygen is returned to the air. But since carbonic acid results from carbon and oxygen under production of a great amount of heat, heat must be applied to it to separate the carbon from the oxygen. The life of plants, therefore, requires the expenditure of a great amount of heat or power to reduce the compound to carbon and free oxygen. This expenditure of heat is met by the sun's rays. Hence it is that plants grow only in the sunshine.

Since animals cannot live without plants and since the plants require the power of the sunbeam in order to separate the oxygen from the carbon, we see that the sunbeam is the true source of all physical life upon the earth.

Since, finally, the muscular power and the heat of animals are due to the combustion of carbon and oxygen, both furnished them by the sun's action on the plant, the life of animals, both in regard to heat and power, is a direct effect of the sunbeam, being neither more nor less in amount, only changed in form.—*Am. Scientific Monthly.*

Hampshire, Eng., Bacon.

We cut the following from one of our foreign exchanges: The reputation of the Hampshire bacon is owing entirely to the care with which it is cured. The hogs, which are fatted on peas and barley meal, are kept fasting for twenty-four hours at least before they are killed; they are used as gently as possible in the act of killing, which is done by inserting a long-pointed knife into the main artery which comes from the heart. The hair is burnt off with lighted straw, and the dirty surface of the skin scraped off. The carcass is hung up after the entrails have been removed, and the next day, when the meat has become quite cold, it is cut up into flitches. The spare-ribs are taken out, and the bloody veins carefully removed; the whole is then covered with salt, with a small quantity of saltpeter mixed with it. Sometimes a little brown sugar is added, which gives a pleasant sweetness to the bacon. The flitches are laid on a low wooden table, which has a small raised border at the lower end. The table slants a little, so as to let the brine run off into a vessel placed under it, by a small opening in the border at the lower end.

The flitches are turned up and salted every day; those which were uppermost are put under, and in three weeks they are ready to be hung up to dry. Smoking the bacon is no longer as common as it used to be, as simply drying in

the salt is found sufficient to make it keep. Those who from early association like the flavor given by the smoke of wood, burn sawdust and shavings in a smothered fire for some time under the flitches.

When they are quite dry they are placed on a board-rack for the use of the family or are packed with wheat chaff into chests till they are sold. The practice of cutting the hogs into pieces and pickling them in a vat, being attended with less trouble, is very generally preferred when there is only a sufficient number of hogs killed to serve the farmer's family; but flitches of bacon well cured are more profitable for sale. Corn-fed bacon is at least equal if not superior to the barley-fed, which is considered the prime article in England.

Consumption of Alcoholic Drinks by the Wealthier Classes.

We may appeal to any medical man with a knowledge either of metropolitan or of provincial society as to the accuracy of the following computation. We shall admit, in the first place, that there are many men and very many women who drink almost no alcohol. But the greater number of men, and a large number of women, of the middle and upper ranks, habitually take a daily allowance of alcohol far larger than that above indicated. We purposely leave out of sight the reckless "fast" men who are perpetually "nipping" at bitters or absinthe, or "setting themselves right" with just another "brandy and soda;" and also the miserable women—whose numbers none but the doctors even faintly suspect—who indulge in secret dram-drinking. Excluding all such persons from our reckoning, let us merely consider the case of the moderate diners-out and the virtuous dancing young ladies. The former will certainly take on the average eight ounces of strong wines, and twelve to sixteen of light wines, daily; or he will make up the equivalent of this with beer or with spirits; in fact, he will take about three ounces of absolute alcohol, or the equivalent of about a gallon of the puddle-beer that laborers drink. And the young lady will not take less than three fourths of this quantity by the time she has finished her last champagne-cup at the ball or rout. If any one thinks this estimate excessive, we assure him that, were it discreet, we could produce accurate notes of the performances of sundry terpsichorean and otherwise athletic young ladies, of irreproachable character, to which the foregoing facts are a trifle.

It is, in fact, a considerable puzzle to understand, at first, how our respectable classes manage to consume so much more alcohol, without reproach, than the unfortunate Wiltshire clodhopper, for example, can do. No doubt one reason is that their drinks are not muddled with *Cocculus indicus*, etc., as his is. But no doubt the truth is that the intoxicative, that is the *visibly* poisonous effects of alcohol, are mainly kept at bay by powerful exertion either of the muscular or nervous system; and the wealthy classes to a large extent do task either one or both of these systems far more heavily than laborers, except those employed in some specially fatiguing callings. Nevertheless there is grave danger of excess, were it merely from the multiplication of alcoholic drinks which are taken by the richer classes.—*Dr. Anstie's "Uses of Wine in Health and Disease."*

A Dangerous Water Pipe.

The following remarks of the Boston *Journal of Chemistry* are worthy of careful study:

"Attention has been called several times in the *Journal* to the dangerous character of galvanized iron pipe, when employed for conducting water to be used for culinary purposes. Instances of severe poisoning from the use of this pipe are continually coming to our notice, and we are led once more to caution our readers against it. It is almost a crime for dealers and manufacturers to recommend this zinc-covered iron pipe for water conduit, as they thereby jeopardize the health and perhaps the lives of purchasers. When this comes from the hands of the manufacturers it has a fresh, clean appearance, and to those who do not understand the nature of the covering the idea is conveyed that it will not oxidize or rust like iron pipes. But this is an error; it will even rust more rapidly than clean iron in most localities. The superficial covering of zinc is rapidly decomposed under the influence of ordinary pond and spring waters, and the oxide, carbonate, and chloride of zinc are formed, which salts are of a deleterious or poisonous character. This covering of zinc on the interior is attacked immediately when water is allowed to flow through, and in some instances we have known it to be entirely removed in forty-eight hours. The insoluble carbonate of zinc is seen to float upon the water in a tea-kettle or other water vessel used in families, and this has often created alarm where no suspicions previously existed."

[The SCIENTIFIC AMERICAN has already called attention to the fact that galvanized iron pipes could only be used with safety for domestic purposes in cases where chemical analysis proved the water to contain nothing capable of combining to form soluble compounds with the oxide of zinc, or capable of dissolving this oxide.—EDS.

Count Moltke, aged 70.

The most potential man in the world just now, says the London *Lancet*, is General Moltke, and the days of his years are threescore years and ten. We will leave military critics to do justice to the military genius of Moltke, and to say where he is to be placed in comparison with Grant, and Wellington, and Napoleon, and Marlborough, and the older heroes of the world. What we design now is much more simple, but equally interesting. The "still strong man," about whom one hears so little, who can be "interviewed" only by Bismark and by the Royal family of Prussia, and without whom all Bismark's grand designs might have been unavailing, the man who is renewing the art of war, and concentrating with such terrible efficiency the whole force and manhood and discipline of Germany, is seventy years old. The King of Prussia, himself seventy-three, has made him a count in honor of his seventieth birthday; but to us it is far more interesting to know that he has reached that age, than to hear that he has become Count Moltke. Grant is not yet fifty years old. Marlborough was all done with war by the time he was about sixty. Napoleon died at the age of fifty-two. Wellington's military career was over before the age at which Moltke began to distinguish himself. Indeed, before the war with Austria, Moltke had kept his power and his genius very much to himself.

Here, then, is a point for physiologists, that a man of seventy may alter the complexion of the world, and the relation of nations, and the history of civilization; that he may at this age have physical power for going through arduous bodily exertion, and mental power for solving the most tremendous military problems. Meantime, let the example of Moltke cheer old men, and make many young men more modest.

Agricultural Items from Various Sources.

PROFITABLE CULTURE.—In March, 1869, Mr. C. A. Hutchinson, of Jacksonville, Florida, planted a plot 50 feet square, with orange seed. In February next the plants were 12 to 18 inches high, when $200 worth were sold at the rate of $20 per hundred. The remainder were transplanted, and are now 2½ to 3 feet high, and occupy a space of 50 by 100 feet, and number about 8,000 plants. They are worth an average of $30 per hundred in the market, making the product of the lot, within two years, $2,600. The expense of seed and cultivation is estimated at about $60.

BANANA CULTURE.—The cultivation of the banana is engaging considerable attention in the neighborhood of Palatka, Florida, and the river counties. Three years ago a gentleman in Orange county set out nine plants, and is now reaping the fruits of a three-acre field, and realizes $125 per month from the fruit and the young plants that are continually suckering around the roots of the old plants. The banana fruits in all seasons, the year round, and is fertilized by the shedding of its huge leaves.

CRANBERRIES.—It is stated that quite an impetus has been given to the sale of marsh lands in Washington Territory recently, by the advent of a New Jersey cranberry grower in quest of these valuable lands. The Oregon *Statesman* says there is a large marsh near Gray's Harbor, in that State, which is already covered with cranberry bushes growing wild, and yielding considerable fruit, which is picked and sold by the Indians. This marsh has been purchased of the Government by several gentlemen of Salem, N. J.

CALIFORNIA WINES.—It is estimated that 700,000 to 800,000 gallons of red and white wine have been made in Anaheim, Los Angeles county, Cal., for this season, and of a better quality than the product of any preceding year. The amount is 250,000 gallons in excess of the yield of any previous season. It is claimed that, owing to the fine weather and the extra condition of the grapes, this wine is already so thoroughly fermented that it will be in a marketable conditon in sixty days. Preparations are being made for the immediate setting out of 300 to 400 additional acres of vines. From 300 to 400 boxes of Malaga grape raisins have been made this year, as an experiment, and are said to be of unusual size and flavor, and superior to any in the market. Don Mateo Keller, one of the largest wine-makers of Los Angeles, has expressed 100,000 gallons of pure juice this season. The San Francisco *Commercial Herald* states that the total shipments of domestic wines from that port to New York from the beginning of 1868 to about the first of July of the current year, were 848,637 gallons of all grades.

Of this quantity the United Anaheim Winegrower's Association shipped 237,600 gallons. G. Groezinger's shipments averaged $40,000 per annum, and the proportions were two thirds white or hock, and one third port, angelica, sherry, muscatel, etc. The usual prices charged were, for white or hock, 50 to 70 cents per gallon; port, $1·25 to $1·50; angelica, $1 to $1·25; sweet muscatel, $1 to $1·50; sherry, $1 to $1·50. I. Landsberger & Co. shipped 2,500 cases of champagne, 4,000 cases and 40,000 gallons assorted, besides 250 cases of wine bitters. Kohler & Frohling shipped about 120,000 gallons. The Lake Vineyard Wine Company consigned 45,377 gallons of port, 24,826 gallons of angelica, 40,353 gallons of white, 31,147 gallons of claret, 4,071 gallons of sherry, 8,758 gallons of grape brandy, etc. There were several smaller shippers whose consignments are included in the grand total above given.

CALIFORNIA COTTON.—A scientific expert in cotton states that the cotton grown from Alabama seed in Merced county, Cal., this year, compares favorably with Brazilian and Egyptian cotton, and is superior to the best Southern upland for spinning purposes. He asserts that the effects of the dry and equable climate of California is an improvement in the staple yielded from the same seed as planted upon Southern uplands. There are large sections of the State well adapted to this culture.—*From the U. S. Commissioner's Report for November and December*, 1870.

The Iron Trade.

A convention of the representatives of thirty-one out of forty-eight blast furnaces in Western Pennsylvania and Eastern Ohio was held at Sharon, Pennsylvania, on December 29, 1870, to consider the interests of the business. The call for the convention stated that its object was to take into consideration the best means of obtaining a reduction in the prices of Lake Superior ores, dockage, lake and railroad freights, and labor at furnaces, so as to produce pig iron at less cost, in order to meet competition. It was also stated that unless a considerable reduction in the cost of ore and labor can be secured the iron furnaces will not yield a profit to the owners.

At the convention one of the members asserted that not even four or five of the Monongahela furnaces are making money. It was contended that the railroads charged too high freights, and that the dealers in ore at Cleveland charged two and a half per cent commission, while one per cent would be ample. It was also argued that the furnace men ought not to be compelled to pay for the ore with four months' notes until it is delivered, and that the present plan of dating the notes from the time when the ore was contracted for was unjust. Complaints of short weight, amounting to four per cent, were also made. Suggestions were made that an iron clearing house, to manage business at an expense of $28,000 a year, should be established. Nothing definite, however, was determined, but committees to examine into the above-mentioned subjects were appointed, with directions to call a mass meeting, to be held in Cleveland next February.

Woolen Rags and Shoddy.

Some thousands of tuns of rags are collected in England and thousands more imported. In the manufacture of shoddy, the careful cutting and sorting and the proper classification of the various qualities of rags is the most important stage; for this great experience is required. The mechanical department is supplied by washers, rag-tearers (vulgarly called devils), and scribbling engines. The washer is of the same description as a flock engine or grinder. The rag-tearer consists chiefly of a large cylinder, the surface of the circumference of which is covered with teeth, spiked coarse or fine, according to the rag to be torn. The scribblers are machines used in opening wool. The price of woolen rags depends upon the precise kind of woolen rag; from £5, with intermediate prices, to as high as £70 and £80 per tun are given. The manufacture of flocks and mill pulp is generally carried on with that of shoddy. In Yorkshire shoddy mills are legion; in Gloucestershire there are many.

Precautions Against Fire in Paris.

As soon as the investment of Paris was completed, the authorities took measures for preventing the destructive effects of shelling. Bills were printed and affixed to almost every house with directions for stopping the fire set up by the bursting of shells. Large tubs filled with water were placed on every floor of the large houses and private buildings. Although covered carefully with canvas, the water, having been left for weeks and weeks, became corrupted and fetid. Proper instructions were given for stopping the infection by the using of charcoal. Two of these tubs are placed in the hall where the French Academy held its sittings, and two others in the *Salle des pas perdus*, by which visitors and members are introduced to it.

HEATING BUILDINGS.—Some one has wisely said: "Instead of asking ourselves with how little fuel can I warm my house? the question should be, How much can I afford to pay for fresh supplies of air, moderately and equally warmed, and distributed without waste?" Instead of this, says the *American Builder*, most of our friends are making arrangements for stopping the flues where no fire is kept, in order to keep the heated air in. If you have a grate in your room, in which you do not need a fire, be assured that it will, if left open, carry off more impure air, which you would otherwise breathe, than you are aware, and that the sum of your health and happiness will be greatly increased by leaving it open even during the coldest weather. It is an excellent ventilator, and the extra heat you will require on account of its use may prove much cheaper than the fee of your physician, should you yield to the notion that it must be stopped to keep the warm air in.

PYROXYLINE DISSOLVED IN OILS.—*Xylonite* differs from *Parkesine* in respect of the solvents employed—fixed oils, such as castor and linseed oils, being used for this purpose, as well as wood naphtha, alcohol, and other of the hitherto well-known solvents. In order to render the oils solvents of pyroxyline, it is necessary to heat them previously, then dissolve a portion of camphor in them, after which they become solvents of pyroxyline. This, Mr. Spiller pointed out, is a new fact in science. The cotton used for this purpose was the lowest form of gun cotton, and burnt very slowly on account of its low nitration. The temperature of the oil has to be raised to 300° Fah. in order to dissolve the cotton. The cotton is prepared by immersing it in four parts of sulphuric acid to one part of nitric acid at a low temperature.—*Br. Jour. of Photo.*

NEW REMEDIES FOR BURNS.—Two new remedies for burns are added to the long list. The first is charcoal. A piece of vegetable charcoal laid on a burn at once soothes the pain, says tle *Gazette Medicale*, and if kept applied for an hour cures it completely. The second one is sulphate of iron. This was tried by M. Joel, in the Children's Hospital, Lausanne. In this case a child, four years of age, had been extensively burnt, suppuration was abundant and so offensive that they ordered the child a tepid bath, containing a couple of pinches of sulphate of iron. This gave immediate relief to the pain, and being repeated twice a day—twenty minutes each bath—the suppuration decreased, lost its odor, and the child was soon convalescent.—*Medical Press and Circular.*

VERY intimate relations exist between the sun and digestion. Digestion and assimilation become weak and imperfect if the man or animal is not daily exposed to the direct rays of the sun.