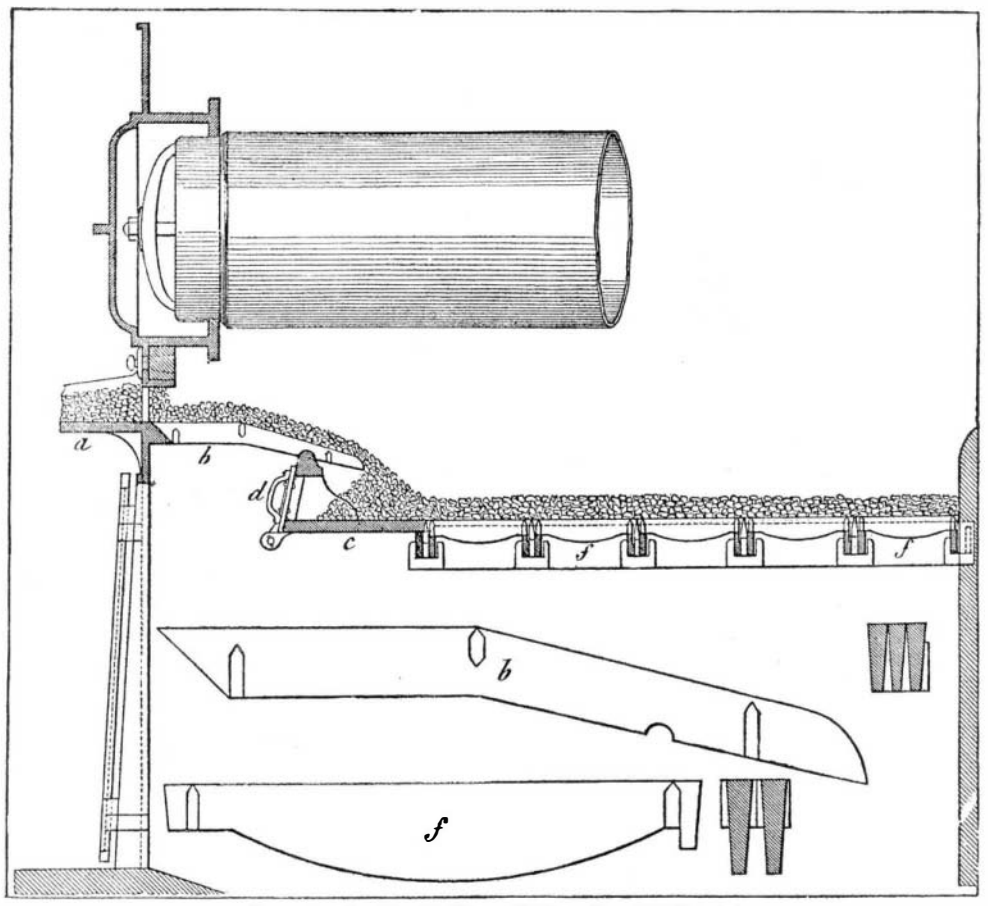
NEW SMOKE-BURNING GRATE.

M. Jordan, of Augsburg, Germany, has recently devised the new smoke-burning grate illustrated in the annexed engraving. Instead of placing fresh coal directly on the fire, it is shoveled upon an exterior plate, *a*, in order that it may previously undergo a kind of dry distillation. From the plate, *a*, the fuel passes to a front grate, *b*, the inner part of which is inclined at an angle of 20°. From *b* the coal falls upon another plate, *c*, situated on a level with the main grate, and being inclined rearwardly upward at an angle of 7°. The aperture between the front grate and plate, *c*, is closed by hinged doors, which are preserved from over-heating by the unconsumed fuel in their rear, so that they may be easily opened and closed by hand.

In its journey from plate, *a*, to plate, *c*, the fuel disengages the greater part of its gaseous elements; and the latter, mixed with the air which penetrates the front grate, *b*, pass to the flame in the main grate, *f*, and are there completely consumed. The management of the main grate is effected through the doors, *d*, but one of which is opened at a time, so as not to cool the fire. The apparatus is said to be easily worked, and the fireman is not subjected to the radiant heat from the furnace.



JORDAN'S SMOKE-BURNING GRATE.

Roquefort Cheese.

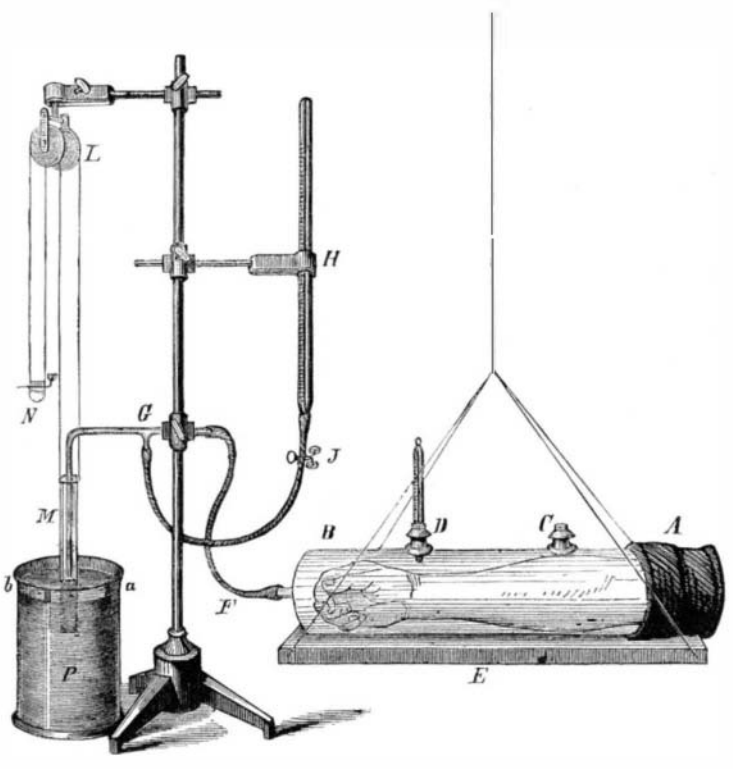
Probably few of our readers know what this very odorous cheese is made from. Its consumption has lately increased, says the London *Grocer*, in an enormous proportion. China itself, it appears, comes in for no mean part in consumption. France, of course, eats more Roquefort than any other nation; and England is acquiring a taste for it. The ewe's milk, from which it is made, is carefully preserved for the special manufacturing of Roquefort; 250,000 ewes furnish this milk, which is poured into large earthen basins, and slightly heated; it is then placed in molds under a slice of decayed bread, which promotes the formation of greenish tints; after which the cheeses are salted and piled up in cellars, where they are left for several months before they are edible; and even then it takes the American people some time to acquire the taste necessary for their proper appreciation.

THE PLETHYSMOGRAPH.

Dr. A. Mosso, of Turin, says *La Nature*, from which we extract the annexed engraving, has devised a new method for measuring the movements of the blood vessels, which is destined to acquire very extended usage in physiological investigation and in clinical medicine. It consists in encircling with a rubber ring, A, any member of the body, as for instance the forearm, and inserting it in a glass cylinder, B, which is filled with tepid water. By means of a special apparatus is measured the quantity of water admitted or expelled through the opening, F, in said cylinder, by the contraction or dilation of the volume of the member. The cylinder rests on a plank, E, which is suspended by cords from the ceiling so as to prevent the involuntary movements of the body causing any motion of the arm in its receptacle.

In order to measure the water, the opening, F, communicates by a pipe with glass tube, G, which, bent at right angles, descends to the level, *a b*. A small test tube, M, suitably graduated, is suspended from a double pulley, L, and is equilibrated by the counterweight, N, to which is attached a pen which marks on an endless band of paper (not shown), caused to unroll before it by clockwork or other suitable mechanism. The test tube is so suspended that the pipe, G, is exactly in its axis. Supposing now that the vase, P, placed below the test tube, is filled with water, and that the vessels of the forearm dilate, increasing the volume of the member, a proportional quantity of water will then be expelled from cylinder, B, and will pass into the test tube, M. The latter will then sink in the vase beneath, and so will displace, in its turn, a quantity of liquid exactly equal to that which it has received. The counterweight, N, will of course rise, and obviously a contraction in volume of the arm will produce just the reverse result. In order that the pressure in the cylinder, B, may be constant, it is necessary that the water level in M shall always be in the plane, *a b*, of the liquid in the vase, P To avoid displacements of these levels, a mixture of alcohol and water, of less density than water alone, is used in the vase. With this precaution the test tube may fill and empty, rise and descend, without its variation in weight causing any disturbance of the levels, the cylinder pressure thus remaining invariable.

By using two plethysmographs, Dr. Mosso has obtained pen traces representing the varying volumes of the forearms, the pulse of the carotid, and, in general, valuable physiological data leading to the demonstration of the most important phenomena of the blood vessels. He has been able to make researches on the causes of sleep and the action of substances which favor or hinder the same. One curious result noted is that all the minor emotions translate themselves into modification of the state of the blood vessels. The mere entry of a person, interesting to the individual whose arm was being experimented upon, produced a diminution of volume in the member of from 0·25 to 0·75 cubic inch. The work of the brain, during the solution of any difficult problem, is said also to be always accompanied by a contraction of the vessels, proportionate to the effort of thought and to the cerebral activity. Dr. Mosso, says our contemporary, has opened a new field in experimental therapeutics, in giving us a most convenient method for studying the direct action of remedies on the human economy.



THE PLETHYSMOGRAPH.

Home-Made Cherry Brandy.

As the cherry season is now at hand, the following description, from the *British Trade Journal*, of how Swiss peasants make cherry brandy will doubtless prove interesting to those possessing large quantities of the fruit and desiring a possibly profitable utilization for a portion of their crop. The soft red-stalked black cherries are principally used, and are gathered as soon as they are ripe. They are preserved in open barrels during fermentation, when the fermenting cherries rise just to the top and form a comparatively thick covering over the cherry liquor: as soon as fermentation has ceased, they sink again to the bottom, and are entirely covered by the liquor. The carbonic acid gas usually escapes with violent precipitation. When the weather is warm, this stormy flight ceases after a few days, but only very gradually; and then, if the manufacturer does not wish to enter into the process of distillation immediately, the cask is hermetically closed. As a rule, distillation is postponed to the winter, not, however, for want of time, but principally because in the meanwhile the cherry brandy acquires a bitter taste, which is the result of the fermentation of the kernels of the cherry stones. This bitter taste is considered of such importance that in some places the cherry stones are specially taken out and pressed, and the results are then infused into the pure liquor.

Distillation among the peasants is effected by means of copper kettles, which have big hollow handles and one or two vapor-diverting pipes. The kettles, in consequence of the rise of the fermenting product, are never quite filled. They are very slowly heated, as their contents easily catch fire, and the brandy possesses the best taste when it has been gradually drawn off at a medium temperature This process in the preparation of the *kirschwasser*, as it is called, is managed by professional distillers. The cooling apparatus is generally nothing more than a stone or wooden reservoir into which the icy waters of a spring continually flow, and through which run one or more pipes (communicating with the still) in an oblique direction from top to bottom. Great care is taken that the distilled liquor is well cooled, as otherwise its quality very perceptibly suffers. That portion which runs over—the so-called precipitate—is carefully collected and poured back into the kettle in order to prevent the ether, of which it is partly composed, from concentrating in any one portion of the cherry brandy before the entire mass is properly boiled: perhaps also to prevent the cherry brandy from accumulating verdigris. When, towards the end of the process, the fluid is not found to possess the necessary strength—a *statu quo* which practised distillers can easily detect by the manner in which the atmospheric bubbles rise to the top when shaken—it is specially drawn off and mixed with the next cask. In large distilleries the process is conducted by steam.

Setting Flower Cuttings.

A practical florist gives the following directions for setting cuttings: A healthy plant should be selected, and strong-looking woody pieces cut off: these, with a blossom on the end, rarely fail. Trim off the large leaves and put them in water for a few hours or a day. Cuttings of ivy (*tradescantia*), wandering jew, canary bird flower (*tropæolum peregrinum*), and oleander, should be started in water and kept in water, in the shade, until a little root appears. Each cutting should have a good sized pot, or several cuttings can be put in a wooden box. The best soil for amateurs to use is half good earth and half white sand, well mixed; water well and keep in the shade, but not in damp, until the cuttings have taken, then give full sun. Transplanting geraniums requires skill. An amateur should use pots and keep the geraniums in them, sinking the pots in summer; and if the earth is not rich, they can be watered with fertilizers in winter. A five inch pot will do for a geranium for a year.

The Pictet Ice Machine.

Anhydrous sulphurous a cid, SO_2, is liquid under the atmospheric pressure at a temperature of 14° Fah., and does not give a pressure exceeding four atmospheres for a temperature of 95° Fah. It has no action on metals, or on grease, is not combustible, and at the same time is not expensive. A new ice machine has been devised by M. Raoul Pictet, to produce cold by using anhydrous sulphurous acid.

The experiment which has given the best results, for a type of machine capable of manufacturing 550 lbs. of ice per hour, may be described as follows:

A tubular cylindrical copper boiler, 6 feet $6\frac{3}{4}$ inches long by $13\frac{4}{5}$ inches diameter, is traversed longitudinally by 150 tubes of $\frac{3}{32}$ inch diameter, which are welded at their extremities to each end of the boiler or refrigerator. The vessel is placed horizontally in a large sheet iron vat containing one hundred boxes of $5\frac{28}{100}$ gallons of water. An anti-freezing liquid (salt water) is constantly driven into the interior of the refrigerator by means of a screw. This liquid cools to about 19·5° Fah. for ordinary working, and in returning washes against the sides of the box in which is the water to be frozen. In the reserved space between the refrigerator tubes, the liquid sulphurous acid is evaporated, and its vapors are drawn by a force and suction pump, which compresses them in the condenser. This condenser is a tubular boiler identical with the refrigerator, with this exception, that a current of ordinary water continually passes and repasses through the interior of the tubes to carry off the heat produced by the change from a gaseous to a liquid state of the sulphurous acid by the work of compression. A tube, with a stopcock regulated by hand once for all, allows the liquid sulphurous acid to return to the refrigerator to be again volatilized. The anhydrous sulphurous acid has the exceptionally advantageous property of being an excellent lubricator, so that the solid metallic piston working in the cylinder of the forcing pump does not need oiling. Thus introduction

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