

ALUMINUM-BRONZE FOR AXLE BOXES.

A letter was recently read before the Academy of Sciences, Paris, from M. Christofle, detailing his experience with a bronze alloy compound of 90 or 95 parts of copper and from 10 to 15 of aluminum. The following is the substance of the letter referred to:—

"We have applied the aluminum-bronze to two uses for which its qualities of hardness and tenacity appear usefully applicable, and success has answered our attempt. The first is the manufacture in this bronze of axle-bearings, and rubbing surfaces for machines. We give as examples:—First, an axle-box which was placed on a polishing lathe making 2,200 turns per minute; it lasted for nearly eighteen months; other boxes in the same condition do not last over three months. Second, a carriage for a circular saw, making 240 tons per minute, which has lasted for a year without an apparent trace of wear; the carriages in common bronze do not last more than four months. The other application is the employment of this bronze in the manufacture of guns of all kinds. We made a pistol-barrel which, after having been tried at Paris, was afterwards tried at the exhibition at Dijon. It underwent the tests in presence of the jury, and answered perfectly our expectations. We are aware that these experiments cannot be conclusive as to its application for artillery; but the comparative experiments which we have made with this metal, bronze, iron, and steel, have shown its immense superiority over those different metals. The bars may be worked hot as easily as the best quality of steel."

[Some of our friends have recently been making experiments with aluminum alloys, and have found it very difficult to make them. Thus far, we may say that their experiments have been unsuccessful, owing to the difficulty of the aluminum amalgamating with copper, silver and iron. Some of our readers may have been pursuing the same line of investigation, and those of them (if any) who have been successful, would confer a benefit upon the public by giving us the results of their experiments.—Eds.]

COAL FORMATIONS OF NORTH AMERICA.

In an article on this subject, in the last number of *Silliman's Journal*, L. Lesquereux, lays down the theory of the formation of coal-beds as follows:—"The theory of the formation of the coal by the heaping of consecutive layers of plants and trees grown in the place, preserved in water and buried afterwards (or the peat-bog theory as it is called by some) is then the only one admitted now as satisfactorily explaining the process of the coal. The analogy of formation between the peat-bogs of our time and the beds of coal of the old measures cannot be called a theory; it is a demonstrable fact. We can now see the coal growing up by the heaping of woody matter in the bog. After a while we see it transformed into a dark combustible compound, that we name peat or lignite, according to its age. We then see it hardening either by compression, or by the slow burning in water that has been so well explained by the experiments of Liebig. Most of the peat-bogs of Europe, at least the oldest, have at or near their bottom some plates or thin layers of hard, black matter, that ocular examination or chemical analysis fail to distinguish from true coal. We also find in Holland, Denmark and Sweden, thick deposits of peat separated into distinct beds of strata of mud and sand, giving the best possible elucidation of the process of stratification of the coal measures.

It is not only in their general features that both formations are so much alike. But in the minutest accidents and even local peculiarities, their agreement is clear and unquestionable to one who has studied the formations of the peat-bogs of our time."

THE SWING AS A CURE FOR CONSUMPTION.

Dr. L. Long, of Holyoke, in a letter to the *Springfield Republican*, recommends the gymnastic swing as a preventive and cure of pulmonary disease. He says:—"I the suspending of the body by the hands, by means means of a strong rope or chain, fastened to a beam at one end, and at the other a stick three feet long, convenient to grasp with the hands. The rope should be fastened to the center of the stick, which should hang six or eight inches above the head. Let a person grasp this stick, with the hands two or three feet apart, and swing very moderately, at first—perhaps only bear the weight, if very weak, and gradually increase as the muscles gain

strength from the exercise, until it may be freely used from three to five times daily. The connection of the arms with the body (with the exception of the clavicle with the sternum or breast-bone) being a muscular attachment to the ribs, the effect of this exercise is to elevate the ribs and enlarge the chest; and as nature allows no vacuum, the lungs expand to fill the cavity, increasing the volume of air—the natural purifier of blood, and preventing congestion or the deposit of tuberculous matter. I have prescribed the above for all cases of hemorrhage of the lungs and threatened consumption, for 35 years, and have been able to increase the measure of the chest from two to four inches within a few months, and always with good results. But, especially, as a preventive, I would recommend this exercise."

TO MAKE BUTTER IN FIVE MINUTES WITHOUT A CHURN!

A correspondent highly recommends the following recipe:—After straining the milk, set it away for about twelve hours, for the cream to "rise." (Milk-dishes ought to have good strong handles to lift them by.) After standing as above, set the milk, without disturbing it on the stove; let it remain there until you observe the coating of cream on the surface assume a wrinkled appearance, but be careful it does not boil, as should this be the case the cream will mix with the milk and cannot again be collected. Now set it away till quite cold and then skim off the cream, mixed with as little milk as possible. When sufficient cream is collected proceed to make it into butter as follows:—Take a wooden bowl, or any suitable vessel, and having first scalded and then rinsed it with cold spring water, place the cream in it. Now let the operator hold his hand in water as hot as can be borne for a few seconds, then plunge it in cold water for about a minute, and at once commence to agitate the cream by a gentle circular motion. In five minutes, or less, the butter will have come, when, of course, it must be washed and salted according to taste; and our correspondent guarantees that no better butter can be made by the best churn ever invented.

To those who keep only one cow, this method of making butter will be found really valuable; while quite as large a quantity of butter is obtained as by the common mode, the skim-milk is much sweeter and palatable. In the summer season it will usually be found necessary to bring the cream out of the cellar (say a quarter of an hour before churning) to take the excessive chill off; in winter place the vessel containing the cream over another containing water to warm it; then continue to agitate the cream until the chill has departed.

Before washing the butter, separate all the milk you possibly can, as the latter will be found excellent for tea-cakes. Butter made in this manner will be much firmer, and less oily in hot weather than when made in the ordinary way.

PRESERVING EGGS.—The following recipe is from a recent work on "Game Fowls," by Cooper & Vernon, of Media, Pa.:—"Dissolve some gum shellac in a sufficient quantity of alcohol to make a thin varnish, give each egg a coat, and after they have become thoroughly dry pack them in bran or saw-dust, with their points downwards in such a manner that they cannot shift about. After you have kept them as long as you desire, wash the varnish carefully off, and they will be in the same state as they were before packing, ready either for eating or hatching." The author of this work states that he has been engaged for thirty years in raising the best of game fowls, and he has frequently imported eggs from Europe which he directed to be packed according to this recipe, and from such eggs he has raised chickens. This is certainly a very simple mode of preserving eggs and very superior to the common method of laying them down in milk of lime.

TO MAKE CREAM CHEESE.—Take a quart of cream, or, if not desired very rich, add thereto one pint of new milk; warm it in hot water till it is about the heat of milk from the cow; add a small quantity of rennet (a table-spoonful is sufficient); let it stand till thick, then break it slightly with a spoon, and place it in a frame in which you have previously put a fine canvas-cloth; press it slightly with a weight; let it stand a few hours, then put a finer cloth in the frame; a little powdered salt may be put over the cloth. It will be ready for use in a day or two.

QUESTIONS ABOUT HEAT.

MESSRS. EDITORS:—Is there any heat lost by the expansion of steam in the cylinder of an engine, besides that which is conducted or radiated away by the iron? Is not flame the result of a combination of elements that constitute heat after the combination has taken place; and, consequently, are not the products of combustion invisible and hotter than the flame itself?

Greenbush, N. Y., July, 1859.

J. H. P.

[In the abstract, heat is never lost. But, independent of radiation, it has been ascertained that condensation of steam always takes place in a cylinder according to the amount of expansion, and thus the working heat is converted to inactivity, and is thus actually lost for mechanical purposes. Flame is the result of a combination of elements, and heat is produced while this combination takes place. The nature of heat is not known, and it is explained in different ways by different philosophers. The products of the flame are invisible, and they are colder than the flame, which latter is the seat of the heat, and serves to heat the invisible products.]

SUMMER SOURS.

Physiological research has fully established the fact that acids promote the separation of the bile from the blood, which is then passed from the system, thus preventing fevers, the prevailing diseases of summer. All fevers are "bilious," that is, the bile is in the blood. Whatever is antagonistic to fever is "cooling." It is a common saying that fruits are "cooling," and also berries of every description; it is because the acidity which they contain aids in separating the bile from the blood, that is, aids in purifying the blood. Hence the great yearning for greens and lettuce, and salads in the early spring, these being eaten with vinegar; hence also the taste for something sour, for lemonades, on an attack of fever. But this being the case, it is easy to see, that we nullify the good effects of fruits and berries in proportion as we eat them with sugar, or even sweet milk, or cream. If we eat them in their natural state, fresh, ripe, perfect, it is almost impossible to eat too many, to eat enough to hurt us, especially if we eat them alone, not taking any liquid with them whatever. Hence also is buttermilk or even common sour milk promotive of health in summer time. Sweet milk tends to biliousness in sedentary people, sour milk is antagonistic. The Greeks and Turks are passionately fond of sour milk. The shepherds use rennet, and the milk-dealers alum to make it sour the sooner. Buttermilk acts like watermelons on the system.—*Hall's Journal of Health.*

FOOD FOR HORSES.—The *Working Farmer* says:—Carrots have a value far beyond that which can be attributed to the mere nutriment they contain, for in addition to what they furnish in this way, they contain a quantity of pectic acid, and this carries the property of gelatinizing the vegetable and animal matters held in solution, and thus enabling the the peristaltic motion of the intestines to seize hold of their contents, so that digestion of all matters of food is perfected by the presence of carrots. It is for this reason that a bushel of carrots and a bushel of oats, are better for the horse than two bushel of oats; not from the nutritious matter contained in the carrot, but in part from the power of the carrot to cause all the nutriment of the oats to be appropriated in the making of muscle, instead of part of it being evacuated in excrement. This action is true in regard to all the vegetable substances which go to make up the variety of food for animals, and the very instinct of every animal gives evidence of this truth.

SUPERPHOSPHATE OF LIME FOR TREES.—Phosphoric acid has a mysterious influence on the development of roots, causing plants to throw them out vigorously. The most convenient way of employing this substance is in the form of superphosphate of lime—that is, a mixture of oil of vitriol and burnt bones. This compound, rich in the acid in a soluble state, mixed with a little dry mold, will be found a fertiliser of great use in transplanting trees. But it must be used in moderation, for plants, like animals, may be injured as much by over-feeding as by starvation.

AMERICAN COPPER.—There were smelted at the Cleveland (Ohio) Works, last year, 1,127 tons of crude copper and 871 tons of fine, besides some thousands of barrels of stamp and crude masses.