Scientific.

PHILOSOPHY OF FREEZING WATER.

The following is the synopsis of a paper lately read at a meeting of the Royal Institution, by Prof. Faraday, "on certain conditions of freezing water:"—

The first point illustrated was the extraordinary affinity of water for other bodies, the proof which was the heat evolved when water was poured on dry or anhydrous sulphate of copper. He could show, he said, a thousand instances of attraction of wator, yet, notwithstanding, ice—particles of water associated together—exhibits the perfect expulsion from water of every other thing. There is no purer substance in nature than ice. A most beautiful block, one hundred and forty pounds weight, from Norway, as transparent and clear as air, was in the theatre; and, if water was made impure purposely, every impurity would be expelled in the act of freezing. One proof of this nature is, that in sea water ice there is no trace of salt. The proofs brought forward were the effects of tests on specimens of water. Cistern and well water were clouded with muritates by nitrate of silver, but in the water from the melted Norway ice there were none. And again, under the solution of soap test, proving the presence of sulphates, which render water hard, the ice water gave the lather at once to a single drop; but seven or eight portions of the test were required to produce the same effect in either of the others. This was a true measure of the difference of purity, but, under the finest tests, no trace of saline impurity could be detected in the ice water.

The next experiment, freezing a solution of indigo, showed how completely matter was expelled. To produce transparent ice artificially is difficult—it is always impure or turbid from air; he had tried boiling and repeated distillation to drive out the air, but he never could get clear ice. He then thought of brushing over the water while it was freezing, and he succeeded. This operation he performed in the indigo solution, by turning a feather round constantly in the tube placed in the freezing mixture; the particles of ice being thus kept separate to allow the foreign matter and air to escape. A vesicle of ice, perfectly transparent, was withdrawn from the tube, which, when dissolved, was perfectly colorless. Sulphuric acid was also similarly expelled. The ice of the acid water, stirred with the same feather as in the indigo experiment, exhibited no bubble, no irregularity, no tinge of colour, and the ice water no acid power. Ammonia, likewise, as being a body of an opposite class, was shown to be subject to the same expulsion. There was no trace of ammonia in the ice or ice water, and the ammonia left behind in the water whence the ice was taken had increased its strength.—The fact, however, of expulsion in regard to air, is most curious. The affinity is stronger, owing to the necessity of air for the existence in water of animals and plants, and it is most difficult to expel air from water. Freezing sets it free, although, in ordinary ice, full of ice bubbles, it becomes mechanically mixed with the ice particles. What particular condition there may be by which air escapes in the Norway and American lakes, Mr. Faraday could not say, but he could say that if disturbed while freezing, the ice would be pure and clear like the Norway block before him, like what might be seen at water falls, or the icicles he remembered seeing after the burning of the Argyle Rooms. In both the latter cases the air is dashed away as the water was thrown against the ice or icicle. When Mr. Faraday found that ice contained no air, he wrote to Prof. Donnet, of Brussells—who discovered that water free from air did not boil until its temperature was raised three hundred deg. Fah., and that it then burst out at once—to ask him whether water from ice simply explodes, and to try it under oil. He did try it, and the ice water did explode. This experiment, placing pieces of ice in small flasks of oil over spirit lamps, melting and heating up to explosion, was, like the other several illustrations of the evening, most successfully exhibited. In conclusion, Mr. Faraday remarked upon another point the ice discloses; namely, the power of solidifying possessed by particles, in contact with two particles, and upon Prof. Thompson's recent discovery, that pressure influences the freezing of water or the thawing of ice.

Flint Enamel Ware.

Every year's experience strengthens the evidence and the conviction that American ingenuity, science and skill are destined to achieve triumphs which the world cannot parallel if a fair field is afforded them.

Some ten or fifteen years ago Mr. Fenton, a manufacturer of Fire-Brick, &c. at Bemington, Vt. commenced a course of experiments on the liquefaction by heat and intermingling in various proportions of the Flint, Quartz, &c. used in his business or existing in the mountains around him, with an eye to the production of Wares adapted to household uses. In these experiments he persevered against every discouragement—the absorption of his means, the remonstrances of his friends and the loss of an eye—until at last he was enabled to produce a Ware combining strength, purity and beauty in a degree utterly unprecedented. This Ware is composed entirely of Flint, Feldspar and Quartz, ground together, bolted like flour, then formed into a clay or paste and molded into any shape which taste or use may suggest, then covered with a delicate enamel and baked to a consistency exceeding that of marble. The enamel, be it understood, is formed entirely of Flint, without a particle of the metallic bases which render much of the Ware now in ordinary use always dangerous and often violently poisonous. Probably no year passes in which hundreds do not die in this country of poison ignorantly imbibed with food which had been prepared in earthen or other vessels enameled by the aid of metals injurious to life. Copper vessels without enamel are often rendered poisonous by the contact of acids, or by other incitements to corrosion. Cheese is often rendered poisonous by the dissolution of the enamel on the milk pans, or by the copper or other metals with which they are brought in contact, and, though not sufficiently charged with the virtue to cause immediate illness, they incite or aggravate diseases which may prove fatal without inducing a suspicion of the cause.

The Flint Enamel Ware, though especially prized by us for its capacity to supersede the enameled wares now used for Milk Pans, Stew Pans, Coffee Urns, &c. is intended to subserve a far wider circle of uses Among the articles into which it has already been fashioned are Water-Jars, Stove-Urns, Mantel and other Parlor Ornaments, Lamps and Candlesticks, Table-Slabs, Door-Plates, Door-Knobs, Block Letters, Daguerreotype Frames, Inkstands, Pitchers, Wash Bowls, Bathing Tubs, Spittoons, &c. &c.

The usual color of this Ware is a rich, dark brown, shaded and flecked or mottled with white and blue, though it is made of a pure white when desired. It is harder than marble, and a delicate pitcher may be thrown on the floor with violence without starting the handle. The point of a nail driven smartly against its side with a hammer makes no scratch or dent of any kind. The enamel stands heat perfectly, and all this Ware may be as most of it is, made absolutely fire-proof, so as to be buried in a pit of burning anthracite and come out of the ashes as good as new. Withal it is nearly if not quite as cheap as the fragile, clumsy and homely 'Stone Ware' now in use. We cannot doubt that it will rapidly find its way into very general use throughout the country. A Company has been formed to manufacture it, with ample capital. The Ware is patented, and agencies for its exclusive sale, by Counties and Towns, are being formed throughout the Union. The Company's Depository in this City is not yet opened, but soon will be; and meantime we advise those who might take an interest in the sale to call on the agent, Mr. T. W. Johnson, National Hotel, Cortland street, who exhibits abundant specimens, and will impart all desired information.—*N. Y. Tribune.*

Hardening Objects in Plaster of Paris.

Take 2 parts of stearine, 2 parts Venetian soap, 1 part pearl ash, and 24 to 30 parts of solution of caustic potash. The stearine and the soap are cut into slices, mixed with the cold lye and boiled for about half an hour, constantly stirring. Whenever the mass rises, a little cold lye is added. The pearlash, previously moistened with a little rain water, is then added, and the whole boiled for a few minutes. The mass is then stirred until cold, when it is mixed with so much cold lye that it becomes perfectly liquid, and runs off the spoon without coagulating and contracting. Before using this composition, it should be kept for several days well covered. It may be preserved for years. Before applying it to the objects, they should be well dusted, the stains scraped away, and then coated by means of a thick brush, with the wash, as long as the Plaster of Paris absorbs it, and left to dry. The coating is then dusted with leather or a soft brush. If the surface has not become shining the operation must be repeated.—*London Chemical Gazette.*

Hint for Housekeepers.

Silk cannot be ironed smoothly so as to press out all the creases, without first sprinkling it with water and rolling it up tightly in a towel—letting it rest for an hour or two. If the iron is the least too hot it will injure the color, and it should be tried on an old piece of the same silk. Bright colored silks or ribbons, such as pinks, blues, yellows, greens, &c., always change colour on the application of an iron. Blacks, browns, olives, grays, &c. look very well after ironing. Silks should always be ironed on the wrong side.

The Farm.

COWS AND THEIR KEEPING.

The cow is undoubtedly the most profitable animal that can be kept by the New England farmer, at least. It is advisable to keep no other than good cows, and a question may arise, how shall each and every farmer manage in this particular? If we have animals deficient in good properties how shall the evil be obviated? If we will have superior cows, we must raise them ourselves. The practice of some dairy farmers is to purchase the best cows that can be obtained; it is considered an unprofitable business to raise them, and hence many are led to destroy the young animals.—Whether this practice is warrantable, and all things considered, is rather questionable. A few farmers, having the command of capital, may possibly purchase cows cheaper than they can raise them. Very well. What is profitable for one farmer, we conclude is so for another; and what will be the result? None will raise cows if the means of purchasing them can be obtained. Then shall we send to Massachusetts for cows, if no heifers are to be raised in Maine? Our brethren of the Old Bay State will be wise enough, undoubtedly, and we shall be compelled to take their second or third best. But if it is a fact that the dairy is a very profitable branch of farming, the time is probably not very far distant when the demand for good cows will be very great, and a superior animal will not often be offered for sale at a very moderate price.

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The question has been raised whether native or imported cattle, or a cross of both, are to be preferred. Experience, the parent of true wisdom, will, in process of time, fully decide this important question: but let us say to the farmer, be sure to get the best cows you can, and endeavor to improve your stock by every possible means. Never sell your best heifers, but your poorest cows, year after year. The farmer who perseveringly follows this course, and who occasionally purchases the best stock he can find, will not fail, in due time, in obtaining an excellent breed. If the great body of our farmers will pursue an intelligent and judicious course, we shall soon witness what a well-directed union of efforts can accomplish.

But we have endeavored to prove that the farmer should keep first rate cows, and it is quite as important that he should provide enough of the *right kind* of food for them. The cows should be plentifully fed with good hay through the winter, and in the spring should be especially cared for—this is the time when provender and the best of hay must not be grudged. The farmer will do well to grow a good supply of carrots, or some other good roots, and thus save a considerable amount of grain feed. Be sure to feed the cows liberally till the grass in the pasture has attained a good growth. We should not pride ourselves so much on the number of our cows, as how well they are kept. A few good cows, with superior keeping, will certainly yield a great profit. —*Maine Farmer.*

Care of Horses.

To go fully into this subject, would require a whole volume, yet a few hints may be useful to some of our readers. Those persons who are constantly taking care of horses, are generally faithful and intelligent, and manage well. The horse is most neglected by the farmer who, in the winter, has but little for him to do, and spends but little time—often too little—in taking care of him.

The standing of the horse is too much neglected, or this subject is not judiciously managed either by the professed groom or the farmer. The horse is often allowed to stand in the stable, on a hard floor, with his fore feet considerably higher than his hind ones, constantly straining his muscles. The floor on which horses stand, should only slant one or one and a half inches in eight or nine feet, barely enough to conduct off the liquid manure.

Some farmers turn their horses into a pen, and let them stand as they please. This is a good arrangement, as they can move about, and stand at ease; and by standing on the manure which is moist and soft to their feet, they are much less liable to injuries in their feet than horses that stand on hard floors.—By this arrangement a horse may eat from a trough by the barn floor, so as to breath freely of pure air. But with this plan, it is necessary to level the manure frequently where the horse stands to eat, else it will accumulate under his hind feet and give him an uneasy position.

Horses should be curried and brushed down daily. This is as necessary as it is for a person to wash his face and hands daily. It is not only necessary to comfort, but to permanent health.

Horses should have a good supply of pure water. Farmers often consult their own convenience in supplying this, to the serious injury of their horses. The animal comes home rather late in the evening, warm and perhaps sweaty, and in that condition he is supplied with cold water, as the hour for retiring for the night is at hand, and to water the horse, as the saying is, after he has become cool, would be very inconvenient. To avoid so great an evil as giving cold water to a warm horse in winter, when his labour is over, give him water when he is about to return, if convenient; if not, wait till the horse has become cool, afrer returning home, and turn him to the water, or if more convenient carry some to the stable. If a little hot water can be added to the cold, he may have drink without waiting: or moistened food may be given to him, so that water will not be necessary.

There is one thing in which many farmers are negligent in the care of their horses. They feed their whole stock early in the evening, and they do not go to the barn again for the night. When the horse has eaten his supper of dry fodder, he is very thirsty, but he has no drink, and suffers greatly for want of it. The next morning his thirst has abated, by an equalization of moisture in the system, and he has become hungry, and is looking for his breakfast, so he will not drink frequently, in the morning, though water is offered. It is but little trouble to turn the horse to water, about nine o'clock in the evening, and it should be attended to. If the food be cut and moistened, as now practised by many, it will be, in a great measure, a remedy for the evil.

When the horse is out keep him well covered, while standing in the cold, especially after hard driving, or when warm; and put a blanket on him on being put into the stable when sweating. Never wash a horse's legs in cold water when he is warm, not even in hot weather. Cold water may be used for inflamations, but only when the horse is still and cool.—*New England Farmer.*

Feeding Swine.

Many farmers, who raise pork for their own tables, or for market, render the business far more expensive than it need be. They give only the best grains or vegetables, and feed them raw, without any previous preparation, either by steaming, boiling, or grinding. In this way a much larger amount of food is demanded than would be requisite were the articles cooked or ground. Indian corn, fed whole to any animal, is an expensive feed, and the farmer who makes his pork exclusively on this species of food, must expect that it will cost him more per pound than pork purchased by the barrel in the market. It is frequently the case, indeed, that the corn consumed by the animal would purchase more pork if sold than is obtained for the hog's carcass when the process of fattening is completed. By grinding the grain into meal, mixing it with boiled potatoes, carrots, apples or pumpkins, all of which are highly nutritious and salutary in their effects upon the general health, a very considerable and important saving may be made, and the pork, instead of being a costly article of food, will be rendered an economical one. In connection with every piggery there should be a steaming apparatus, where the different kinds of food can be prepared and tempered with facility and ease. They not only save much food, but much time in the preparation of it.—*Germantown Telegraph.*

Few things are impossible to skill and industry.