

great deal of heat may be wasted by carrying a temperature, higher than necessary to maintain surface evaporation, yet too low to produce evaporation from the interior.

When a higher temperature, say that corresponding to 45 lbs. pressure or 292° Fahr. is maintained, a very different action takes place. The water in the substance to be dried is then converted into steam of sufficient tension to not only overcome adhesive attraction, but to expand and force its way out and to float away as steam does from the exhaust of a steam engine. This accounts for the fact stated by a recent correspondent, published in answers to queries, to wit.: that in drying woolen yarn, he finds it necessary to carry forty-five pounds pressure of steam in his drying cylinder. As soon as the temperature corresponding to this pressure is reached, the yarn dries rapidly, while at all lower temperatures the drying is a tedious process.

So much for drying by steam inclosed in pipes. The direct admission of saturated steam into the interstices between solid bodies, which are not only to be dried but heated, has been found in practice to answer admirably in some cases. In this method of using steam, it is received in closed retorts containing the substance to be dried and heated. The steam immediately heats the material, and in doing so becomes condensed. The water of condensation is drawn off, as it forms. The solid bodies attain the temperature of the steam with great rapidity. As soon as this is the case, the following conditions exist in the retort: The bodies are hot and their surfaces are dripping wet with the water of condensation. Now, if they have a temperature sufficiently high, and are sufficiently large, the heat they contain will evaporate all the water upon their surfaces, and still leave the bodies at a temperature of 212° Fahr. or higher, whenever the flow of steam from the boiler is cut off, and the retort is opened or allowed to exhaust into a second retort containing another charge of cold material. This method has been employed with great success for heating broken stone for paving purposes, gravel for roofing, etc. The reader will find full description of a patented invention of this kind on page 305, last volume of the SCIENTIFIC AMERICAN.

Water may be extracted from solutions by the direct injection of superheated steam. Every pound of superheated steam will convert such an amount of water at 212° into saturated steam as corresponds to the excess of heat in the superheated steam over that of one pound of saturated steam. In doing this, it becomes reduced to saturated steam and passes off as such without condensation, carrying with it 967 units of latent heat. Therefore this method of drying or concentrating solutions must be exceedingly wasteful unless the heat in the saturated steam can be subsequently used. It may, however, be employed advantageously in some processes where it is an object to maintain a constant temperature, and in which economy is of secondary importance.

AMERICAN HOMESTEADS.

There is a peculiar charm about old houses, which is seldom felt in America. In Europe, one finds everywhere quaint old buildings, in which generation after generation have been born and reared, and have married and died. Every nook and corner of the building is clustered over with memories and associations. The change of such a mansion from the possession of one family into that of another is regarded as a humiliation, and mourned as disaster. This feeling is not without a salutary moral effect. It cultivates a family pride, a feeling of honor in the family name, which, handed down from father to son, is sought to be maintained through successive generations. It begets a sentiment of unity, among those who bear the same name and are connected by ties of blood, which strengthens these ties, and tends more or less to make each regardful of the interests of all.

But here in America there are, as a rule, no old houses. The son tears down what the father built, or passes it into other hands with little or no regret or compunction. He builds again that which his sons shall raze or sell, regarding merely his own convenience, and careless who shall dwell in the spot he inhabits after he has quitted it forever. Almost all our building is for the present. We erect with a view to tearing down, not for permanence, and hence it is that our architecture has an unsatisfactory air of instability, of cheapness, and temporary expediency, which offends cultivated taste, and goes far to justify the assertion that American architecture as an art is scarcely to be met with in our homes.

It is true there are some fine and costly residences, scattered about through the country and grouped in our large cities, but throughout the land, cheap frame buildings, with scarcely an appearance of design, offend the eye by uncouth forms, shapeless sculpture, and glaring white or dingy mud colored exteriors. Though we do not dwell in tents, like some of the Tartar tribes, we are essentially nomadic in our habits and tastes. Boys escape as soon as possible from unattractive homes, to chance their luck in cities, or hew out fortunes on frontiers. Young men clear off farms in the far west, sell them at the first apparently good offer and try it over again. Land, with us, is not a thing to be kept if possible, but to be speculated in. Cultivation of soil is too often only the temporary improvement preparatory to sale.

Thus increases and flourishes that restless, wandering spirit which characterizes the true Yankee born American. Considerations of love for the spot, on which one has been born and bred, are feeble when placed against hopes of profit. All this may, perhaps, find some compensation in the enterprising spirit it engenders; but it does not make our rural homes picturesque piles half hidden by honeysuckle, ivy, and woodbine, like the garden embowered farm houses and cottages of England.

Much has been written with a view to improve our architectural taste as a nation, but we are yet too young to progress rapidly in this respect. The greater portion of our land is too cheap. We have too much elbow room, and we are too fond of change. We do not wish to spend much money on what we may, in a few years at furthest, cease to occupy. So we go on the cheap principle in building, and content ourselves with mere bodily comfort, sacrificing æsthetic considerations to utility. It is vain, therefore, to expect any great general improvement in architecture until we shall have advanced beyond adolescence as a nation. When the great West shall have absorbed all it will hold of the world's population, and people look to die where they are born, homesteads will be beautified, and a sense of what is meant by the word home will be so impressed, upon the minds and hearts of youths, that to adorn the place of nativity will seem almost a duty.

THE STUPIDITY OF IGNORANCE.

Some three years ago, the Commissioners of the Central Park, New York, at the instance of some of our leading scientific men, undertook to establish a palæozoic museum, where the pupils of the public schools and those interested in the study of natural history might find specimens of the earliest animal creations, now extinct, and acquire useful knowledge of their forms and habits. For this purpose Mr. B. Waterhouse Hawkins, one of the most learned and talented of professional men, was empowered to construct the restorations, and upon them he labored as assiduously as means were provided for nearly two years, when a political change took place, by which a new set of Commissioners came into power. These men were under the control of an Irish politician, the head of the notorious gang known as the Ring, by whom the city treasury was plundered of so many millions.

One of the first acts of these blundering and ignorant Commissioners was to annul the contract made with Mr. Hawkins, and arrest his work. He recently stated that all he had done during twenty-one months to restore the skeletons of the extinct animals of America (of the Hadrosaurus, and the other gigantic animal, which was thirty-nine feet long), was destroyed by order of Mr. Henry Hilton, late vice president of the Commission, on the 3d of May last, with sledge hammer, carted away and buried. The preparatory sketches of other animals, including a mammoth and a mastodon, and the molds and sketch models were also destroyed. Mr. Hilton did this, said Mr. Hawkins, out of ignorance, just as he had a coat of white paint put on the skeleton of a whale which Mr. Peter Cooper had presented to the Museum, and just as he had a bronze statue painted white. Mr. Hilton told the celebrated naturalist, who had come from England to undertake the work, that he should not bother himself with "dead animals," that there was plenty to do among the living. This illustrates the policy of having such ignorant men as Hilton at the head of one of the most important departments of the city government. A new and more intelligent set of Commissioners having recently come into power, the skeletons were dug up again, but they were found broken in thousands of pieces. Professor Henry, of the Smithsonian Institute, when he heard of this piece of barbarism, would not believe it. "Why," he exclaimed, "I would have paid them a good price for the work." Mr. Hilton, however, preferred to destroy the work of the naturalist, which has cost the city at least \$12,000.

THE POSITIVE MOTION LOOM GRAND MEDAL OF HONOR.

This exceptional prize of the American Institute, awarded only to inventions of such great importance as to promise a revolution in the industries to which they are applied, was, as our readers are aware, awarded to Mr. James Lyall for his Positive Motion Loom, on its first exhibition at the annual fair held by the Institute. After some delay, the medal has been struck, and is now in the possession of Mr. Lyall. It is of gold, large and handsome; and is mounted in a beautiful case. It is a just recognition of a masterpiece of ingenuity. The loom was shown again at the last year's exhibition with very marked improvements, which, according to unanimous opinion, have greatly increased its utility. All the predictions made by us in our description of this invention, page 17, Vol. XXI, have been fully verified, and although the proprietors have had to contend with a disastrous fire, they are meeting with the most gratifying success in the introduction of their looms. The invention has been applied with remarkable advantage in the weaving of corsets and the manufacture of wire cloth, as well as oil cloth foundation, druggets, etc., and several new and large manufactories have been put into operation, employing the positive motion loom in the industries named. The inventor, Mr. James Lyall, is one of those men whose characteristic modesty and other good qualities secure the heartiest goodwill from all who know him, and a choice party of these friendly well wishers honored the occasion of the presentation of the medal, on the evening of February 22, at his residence in this city.

GLYCERIN CEMENT.—A cement, said to be capable of use where resistance to the action of both water, and heat is required, is composed by mixing ordinary glycerin with dry litharge, so as to constitute a tough paste. For uniting the joints of steam pipes and other similar applications, this preparation is said to be very satisfactory.

Mr. J. F. McCURDY writes to us to suggest that grindstones are often burst by the strain on the center caused by the shaft, and that centrifugal force is not the sole cause of such accidents.

SCIENTIFIC AND PRACTICAL INFORMATION.

GUN COTTON.

In our number of September 3, 1871, we described the apparent dangers and difficulties of the manufacture of gun cotton; and we are now in possession of a report of a commission of enquiry, appointed by the British Secretary of State for War, which gives some information which will interest many of our readers. The committee decided that compressed gun cotton is not uncertain or perilous in use; and, as an explosive, it is effective, certain, safe, and portable. The paper pulp gun cotton of Mr. Abel's invention is capable, says the report, of being more thoroughly purified than the ordinary cotton in cords or skeins, and moreover is, from being prepared in a wet state, unflammable up to the time of its leaving the press. The drying is alone the dangerous part of its manufacture.

SULPHURETTED ALCOHOL.

Professor Gamgee informs us of a new concentrated disinfectant, obtained by impregnating alcohol with sulphurous acid, of which gas it is capable of containing no less than three hundred times its own volume. The portability and convenience of such a fluid will be obvious to every one; its general use as a disinfectant will be probably somewhat qualified by the nauseous smell. But for the destruction of insects and as a substitute for fumigation with burning sulphur, it has the recommendation of apparent efficiency.

SUBSTITUTES FOR GUNPOWDER.

The exigencies of the people and authorities during the protracted siege of Paris called out many improvements and substitutes for articles in common use. M. Deplazanet, of Grenelle (a suburb of Paris, within the besiegers' lines), produced a powder in which chlorate of potash was used instead of saltpeter (nitrate of potash). This preparation answered well for torpedoes and mining purposes, but it proved to be so destructive to metal as to be unfit for use in small arms and artillery. It was composed of 2 parts chlorate of potash, 1 part of prussiate of potash, and 1 part of powdered sugar. These ingredients are known to be very dangerous when combined, and it is not to be wondered at that the factory of M. Deplazanet was destroyed by an explosion, which catastrophe put an end to the manufacture.

ELECTRICAL EXPLODERS.

Mr. Clemens Herschel, of Boston, Mass., writes to call public attention to the dangerous implement called an electrical exploder, used for igniting blasting charges, etc., by electricity. It is said to be so sensitive that dusting near it with a feather duster produces sufficient electricity to discharge it, and the use of a rubber comb may occasion a similar accident. He suggests that such contrivances, useful enough in their proper places, should be so constructed that the spark of a battery would be needed to discharge them. There is reason in the suggestion, as a battery is always used for the purpose.

STACKING LUMBER.

The news of a distressing accident in which some little children were crushed by falling lumber, in Newcastle on Tyne, England, warrants us in calling attention to the dangers of our lumber yards and the insecure manner in which high piles of timber and boards are stacked. In many of our cities, it is common to see stacks of great weight piled together without due regard to safety, giving the next high wind an opportunity of toppling them to the ground. Children are apt to seek lumber yards to play, and we would warn our lumber merchants to guard against such an accident as has recently occurred in England.

New Invention.

The Girard *Cosmopolite* says that, at a certain station on the Philadelphia and Erie Railroad, the company has a new night telegraph operator, who, if inclined to slumber, is too ingeniously wide awake to be caught napping at his post. Recently he was seized with drowsiness which he could not shake off. As it was his duty to report all passing, he dared not yield, and yet could not resist. That mother of invention, necessity, at length suggested an alarm signal, which he proceeded to put in operation by suspending a scuttle full of coal, by means of a cord which was passed through the keyhole of his office door and fastened across the track at the requisite elevation. Mr. Operator then resigned himself to rosy dreams, which were finally interrupted by a passing train, the engine of which snapped the cord, causing the coal scuttle to come down with a rattle-tang that would have aroused even a sleeping Erie policeman. Another young operator, some thirty miles up the road, let a train slip by him the same night, and applied to the inventor of the coal scuttle alarm to know, when the train passed his station. No answer was vouchsafed, the inventor remarking "Why don't the darned fool get the right to use my patent?"

THE *Lens* is the title of a new quarterly magazine, of microscopy and its allied natural sciences, published by the State Microscopical Society of Illinois, at Chicago: S. A. Briggs, editor. The first number is before us. It is illustrated with a variety of diagrams of monads, and contains a large amount of useful matter, rather technological in character, but of value to the trained microscopist. The *Lens* promises to be a valuable addition to the scientific periodical literature of our country. We trust that it will be well sustained.

HUMILITY is the lesson of science. It is by measuring ourselves against the unsolved mysteries of science that we learn our feebleness.