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Contents:

(Illustrated articles are marked with an asterisk.)

A Long Felt Want..... 312
American Silk Manufacturing, etc., at Paterson, N. J..... 308
A Museum of Working Models ... 309
A New Astronomical Instrument 308
Answers to Correspondents..... 313
Birmingham Gunmakers' and Inventors' Club..... 304
Biscuit Manufacture..... 309
Boiling Rice in India..... 307
Business and Personal..... 312
Chinese by Telegraph..... 306
Compressed Air Locomotives..... 310
Concentration of Tannin..... 308
*Draft Regulator and Heat Economizer..... 310
Drunken Railway Officials..... 307
Drying by Chemical Action..... 311
Fireproof Building.—The Lesson of Chicago..... 311
*Gardener's Stool..... 306
Gas Meters..... 305
Governor Evans on Sea Sickness 308
How Genuine Pearls are Prepared in China..... 305
*Hydromotor for Ships' Pumps and Other Purposes..... 307
*Improved Water Gate..... 310
Improvement of the Steam Engine..... 307
Inventions Patented in England by Americans..... 315
Iron Shipbuilding in Denmark.... 307
Iron Telegraph Pole..... 306
Japanese Textile Art..... 304
Man and the Lower Animals..... 305
Manufacture of American Sewing Machines in Scotland..... 310
Narrow Gage in the United States 307
*New Method of Propelling Canal Boats..... 306
Notes and Queries..... 313
Official List of Patents, Extensions, Designs, etc..... 315
Opening the Public Libraries on Sunday..... 311
*Pocket Bootjack..... 306
Potash from Corn Cobs..... 306
Power Produced by Steam, under Different Temperatures and Pressures..... 312
Preserving Nuts..... 304
Recent American and Foreign Patents..... 313
Sewing Machines and their Effect upon Health..... 308
Soap a Source of Skin Diseases... 309
Substitute for Lithographic Stone 306
Test for Sulphur and Phosphorus in Iron..... 309
The *Adriatic*..... 305
*The Greene Engine..... 309
The Hartford Steam Boiler Inspection and Insurance Company 305
The Sun a Probable Cause of Terrestrial Magnetism..... 305
The Western and Southern Railway Association..... 307
Underground Tramways in Germany..... 306
Vesuvius and other Volcanoes... 307

OPENING THE PUBLIC LIBRARIES ON SUNDAY.

For some time there has been a growing popular opinion in favor of opening the public libraries on Sunday. It is a just inference that there were and are grounds on which to base argument in support of such a movement. As people have had their attention called to the subject, they see that, instead of tending to greater violation of sabbatarian observance, the opening of the libraries will in all probability prevent many from spending the day in a manner injurious to themselves, and totally out of keeping with the character of the Sabbath. The public libraries are all of them free from any associations tending to vice or immorality. They are retired resting places, where silence, comfort, and order reign. In these respects they are far more desirable places, for clerks, mechanics, and others, than the cramped, ill ventilated lodgings so many are compelled to occupy.

No one, we suppose, will at the present day declare it a violation of the Sabbath day to read good books, even of a secular character. If this be admitted, it is clear that the provision of good books, and a comfortable place to read them in, cannot be objectionable in either a moral or religious point of view.

A primary effect would be that the cheap and often filthy trash, sold in such large quantities at the news stands, would be less sought after, and a general elevation of taste in reading would commence. It needs no argument to show that this must exert a salutary influence on morals. Another scarcely less desirable result would be the attraction of youth from evil associations, found in suburban places to which, by their unpleasant and unsocial surroundings, they are almost driven on the Sabbath.

It may be asked if the luxuriant seats, the excellent music, and the pulpit ability of the churches do not draw young men from such associations as are hurtful, how is it to be expected the opening of the libraries will accomplish it? We reply, that neither libraries nor churches will attract all. The churches will attract some whom the libraries will not, and *vice versâ;* but both together will do more towards purifying the morals of the community than either working separately.

The recent lecture of the Rev. Henry Ward Beecher, at the Cooper Institute, placed this point in an admirable light, and we are glad to see that not only this prominent divine, but others scarcely less influential, are strenuously advocating the measure.

It is announced that the Cooper Institute reading room and library will be opened on Sunday in the Fall. The Mercantile Library will undoubtedly soon follow, and this action will, for the most part, undoubtedly be imitated by the trustees of public libraries throughout the country. We can see no probability or possibility of evil effects resulting from this movement, while its advantages seem obvious. The present state of morals in this country demands that no means of improvement should be neglected.

In an educational point of view, the opening of the libraries is certainly very desirable. It will afford opportunities, for the acquisition of knowledge and for self discipline, now wholly denied to a large class of our city population. Mechanics, clerks, and others, confined at labor almost constantly during the week, will, it is believed, gladly avail themselves of the facilities thus offered, and the usefulness of the libraries will thus be largely extended.

DRYING BY CHEMICAL ACTION.

Having already penned several articles upon various methods of drying substances, we propose to conclude with some remarks upon drying by chemical action. That wonderful property, called by chemists affinity, which exists between different substances, exerts a force so much greater that any which is practicable to the resources of mechanics, that it may be made one of the most effective means known whereby the desiccation of substances can be accomplished. Sometimes it may be employed singly. In other instances, it may be used in connection with heat or mechanical action, or all three may be used together. There are few substances that have no affinity for water, but there are some which seize upon it and hold it with such intense force as almost to defy separation. The strongest chemical reagents, such as sulphuric acid and the other strong acids, the alkaline bases, potassa, soda, lime, etc., owe much of their usefulness in the arts to their affinity for water. There are few substances that have so strong an attraction for water that some one of the alkaline bases will not seize upon it and hold the whole of it.

Of course, when water is an essential ingredient of a compound, and not an extraneous substance, its removal effects decomposition; and in all such cases, the use of chemicals for drying, as it not only removes the superfluous water but injures what remains, is, of course, inapplicable. One of the most important processes in which chemical drying is employed, and one of the best illustrations of the principles upon which it is based, is that of *separation,* as it is called in the soap manufacture. The fats or oils used for soda soaps are first saponified by an excess of the solution of caustic soda, technically called "ley." The soap thus formed contains glycerin, excess of water, and soda, which it is desired to remove. Now, although the soap has a strong affinity for water, it could be dried sufficiently by the slow and careful application of heat, but to do this would require a long time, and, besides being very tedious, would be a very expensive process. Soda, or chloride of sodium (common salt), has a much stronger attraction for water than soap. If either of these substances in strong solution should be added to the soap in sufficient quantity, and heat be applied, the following actions are set up: The soap floats upon a strong solution, "ley," of soda or salt (sometimes both are used). The heat applied to the bottom of the kettle drives off a portion of the water in the solution, which is replaced by water attracted to the salt or soda from the soap; this is in turn converted into steam by the heat, and so on, the soda or salt taking water constantly from the soap, which the heat expels until the soap has been sufficiently freed from water. Meanwhile the soda ley has dissolved out all of the glycerin, and the water in departing from the soap has carried with it the excess of alkali, adding it to the solution at the bottom of the kettle, and so the purified soap floats in hard grains or lumps upon the ley. The soap being then drained is ready for the subsequent operations, which fit it for sale and use.

This is a fine example of chemical action combined with heat to eliminate water. Another illustration is the production of absolute alcohol by distilling it in contact with quicklime, the latter seizing and holding all the water contained in the alcohol, which then passes over and is condensed in the receiver.

Chemists pass gases through quicklime, chloride of calcium, calcined potash, or soda, to rid them of watery vapor. Polished metallic articles, liable to tarnish through the action of watery vapor, may be protected by placing them in a case in which is also placed a little quicklime. Whenever the lime falls into fine powder, it is an indication that it has absorbed all the water it can hold, and that a new supply of quicklime is required.

Very rapid drying without heat can be accomplished by the use of quicklime and a fan blower, using the same air over and over, first passing over or through the substance to be dried, and then over quicklime in lumps. The process can be accelerated greatly by heating the air on its passage from the lime to the substance to be dried (the heating greatly increasing the absorbing power of the air) and keeping the lime cold by means of tubes through which cold water passes. By regulating the heat properly, very delicate substances may be thoroughly desiccated without injury. The writer has applied this process in certain operations with great success. Where an operation of this kind is conducted on a large scale, the lime can be renewed over and over again by calcination, which drives off the moisture (and perhaps carbonic acid) it has absorbed.

The hints thus thrown out may serve as a guide to inventors who are devising means for the desiccation of fruits, vegetables, meats, etc., and for the concentration of milk, etc. Processes of this kind are being extended rapidly at the present time, and the preparation of articles of food, in a palatable form and in a condition to keep a long time, is daily becoming of greater industrial and commercial importance.

FIREPROOF BUILDING.---THE LESSON OF CHICAGO.

A disaster is partially compensated for when from it is derived the knowledge necessary to avoid similar catastrophes. The lesson of the great Chicago conflagration was a severe one, yet full of instruction which, we regret to say, appears not to be fully heeded in the haste to reconstruct that devastated city. In the first tide of excitement that spread over the country, as the news of the terrible conflagration was received, the press teemed with theories hastily devised to account for the magnitude of the fire and the rapidity with which it devoured the richest part of the Garden City. Statements equally baseless, as subsequent developments have proved, were circulated far and wide about the influence, of the wood and tar pavements and the bituminous stone largely employed in some of the buildings, upon the spread of the flames. It was to be expected that many conflicting accounts would be promulgated and much false theorizing be indulged in, and that some months would elapse before the opinions of calm and dispassionate observers would be listened to. It is the purpose of this article to give in condensed form the opinions of such an observer, and to make such brief comments upon them as may suggest themselves.

The gentleman referred to is Mr. P. B. Wight, Secretary of the American Institute of Architects, whose remarks upon the subject of fireproof building in connection with the Chicago fire constituted the most interesting and valuable part part of the "Proceedings" of the above named association at its fifth annual convention, a copy of which proceedings now lies before us.* The views of this able architect and engineer, and the facts stated at the convention will correct many erroneous impressions.

Red brick and Milwaukee buff brick are the kinds chiefly used in Chicago. The buff brick endured the trial much better than the red, but both yielded in many instances under the heat. Mr. Wight attributes the great destruction of brick buildings to the extreme thinness of their walls, and to the use in them of soft brick fillers. This latter practice, Mr. Wight says, is yet in some instances indulged in, notwithstanding the evident inefficiency of such walls to withstand excessive heat as demonstrated by the fire. These walls were cracked and warped, in fact "all shattered to pieces" by the heat. The bricks were "all burned white, even the red ones." Some of the bricks were rent in pieces, others were rounded off at the corners, and some softened instead of being vitrified.

The Illinois limestone was the worst to withstand the heat, being in many instances entirely calcined. Some of the fronts of this material were burned off entirely, leaving one or two stories of brick backing standing after the fire. In other instances, this stone was so rounded at the corners as to appear like "boulders." The Lockport limestone proved better, but still was badly damaged. The two sandstones which withstood the heat the best were the Cleveland stone and the Lake Superior stone. Little granite was used in the burned district, but such of it as was exposed to the heat was cracked badly and rounded at the corners.

The Illinois stone exploded where the heat was very intense. "It seemed," says Mr. Wight, "to calcine with great rapidity, and I suppose the effect was very much like that seen in the manufacture of pop corn." No observations of marble were made. One building, in which a great deal of artificial stone was used, stood the heat remarkably well. Mr. Wight says: "I do not know whose patent stone it was, but it was used from the second story up to the top in pilasters, cornices, and sills. In many places, this stone was scarcely injured at all." We deem this fact of importance as proof of the part which artificial stone is destined to fill in future building.

A correlative fact is that all kinds of mortar were less affected by the heat than natural stone. This might be inferred from the statement relative to artificial stone, since mortar, strictly speaking, is an artificial stone. This point has much significance, showing that, when the real constitution of stone which will withstand destructive influences is thoroughly comprehended, chemical science will be able to supply the requisite conditions for its artificial formation.

The petroleum stone, of which so much was said in the newspapers and which was charged with having greatly assisted the spread of the fire, is spoken of as follows:

"There was one church in Chicago built of what they call prairie boulders, which ten years ago were supposed to contain tar, but really contained petroleum. The amount of petroleum in the church was so great that the heat of the sun would draw it out, soon after being set up in a wall, and it would run down in black streaks. The effect of the heat on the inside of the walls threw out upon the exterior all the oil it contained, which formed a thick hard coating about a quarter of an inch in thickness; and though the interior of the church was exposed to great heat, and every particle of wood in it was burned up, so that there was not a scrap left in it, the interior sides of its walls were not greatly injured. In some places the stone had flaked off, and yet this stone stood the test better than any other natural stone used in the city."

*Proceedings of the Fifth Annual Convention of the American Institute of Architects held in Boston, November 14th and 15th, 1871. Published by the Committee on Library and Publications of the American Institute of Architects, and sold by D. Van Nostrand, Nos. 23 Murray street and 27 Warren street.