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Liquid Stone.

Stone is rather a *hard* subject about which to write, but we intend to deal with it in a liquid capacity at present. We have received a communication from a correspondent in Illinois, in which it is stated, he "wishes to procure some silicate of potash,"—liquid quartz or sand, as it is sometimes called. He has endeavored to manufacture it, but although he tried a number of experiments he failed to produce the article. He states that it is a substance which, if it could be produced cheap, would be the means of making gravel walls the best and most durable for houses. To expect the reduction of such hard grains as those of quartz sand to a liquid, like sugar dissolved in water, appears to be something which may justly be termed "a hard expectation." However, the thing can be done, and has been done, and we have a bottle of the limpid stone liquid ensconced not many feet from where we are writing. It was manufactured by the process of Benj. Hardinge, Esq., formerly of Cincinnati, O., but now of this city, who has secured patents both at home and abroad, and who has actually manufactured hogsheads of the liquid. He has never manufactured it for sale, nor are we aware of any intention on his part to engage in this particular business; he has done it for the purpose of showing that quartz can be rendered into liquid at no very great cost and that gold and all the precious metal which rock contains can be extracted from its matrix; and that this liquid can be employed as a building material, for the purposes suggested by our Illinois correspondent (and he is not the only one who has written us upon the subject), and also for manufacturing artificial stone blocks of great beauty.

White sand is composed of grains of quartz rocks reduced to small crystals by attrition. By the process of Mr. Hardinge, quartz rock is first roasted, then plunged into cold water as is practiced with common ores—to render it friable. Then it is pulverized in a mill, from which it is carried in a finely subdivided state into a peculiar steam-tight cauldron, containing caustic lye. Here it is acted upon by steam heat, and the chemical solvent, and dissolved into a liquid state, like crystals of salt in hot water. It may be asked, "what is the use of being at such trouble to reduce stone to a liquid; what use can be made of this stone liquid?" If we take some common salt and dissolve it in water until we obtain a strong brine, and then apply it with a brush to a stone wall, the water will soon evaporate and leave the wall coated with salt in fine crystals. But as the salt is soluble in pure water, it will soon be washed away from the wall with rains. If instead of salt, we dissolve quartz, in the form of sand, or powder, and apply this liquid to a wall, its water of solution will also evaporate, and leave a coat of crystal glass on the wall; but as it is insoluble in pure water, it cannot be washed off with rain. Its usefulness, then, as a coating for gravel walls, which are easily penetrated with rains, as suggested by our Illinois correspondent, is therefore apparent. This is one of the intended applications of liquid stone or soluble glass.

But the reduction of quartz to a liquid state by the process referred to, involves a vast range of other applications to the arts—chemical and mechanical. A pamphlet has just been published by the inventor, from which we learn that the process is intended for special application to reduce gold quartz to a liquid state, and extract every particle of the precious metal from it. Prof. John L. Moffat, late U. S. Assayist, certifies that he has investigated the philosophy of the process, and has satisfied himself of the practicability of reducing quartz rock to a liquid, limpid and clear as pure spring water, by means of humid heat and some simple solvents, and other chemical agents, at a very small expense; he saw hogsheads of the liquid quartz at Mr Hardinge's premises—it was equal parts of water and stone. "In a liquid state, if left to stand in a cistern, all metals will fall to the bottom, by which means every particle of gold or other metal may be obtained and melted in bars."

In another part of the pamphlet, it is stated in reference to this application of the process—"In less than one year from this date, more than ten millions of gold will be obtained from gold-bearing quartz, where a million is now obtained."

This is certainly a brilliant expectation, and if fully realized, may yet lead to gold becoming as common as copper and tin now are. But this is not the only bright prospect pointed out to be yet achieved by this discovery. Mr. Hardinge, in another part of this pamphlet, says:—"As an illustration of the architectural and ornamental uses to which my inventions may be turned, by using the liquid rock after separating the gold, I intend, at some suitable locality to erect a model edifice of moderate size, of materials the most beautiful and durable which imagination can conceive—equalling in brilliancy any and all of the precious stones except the diamond, and yet at a cost for material not exceeding that of brick."

This house, it is contemplated, will be a realization of the famous palace in the Oriental story of "Alladin's Wonderful Lamp." Pillars, capitals, cornices, architraves, mantels, are to be formed of agate, jasper, and porphyry. The table tops are to be sapphire and amethyst, embedded in bands of opal. The onyx, the garnet, the topaz, and ruby are to be common decorations of doors, chairs, and other furniture; and all this produced by the use of the liquid quartz, as a base or binding agent. We really hope that such bright expectations will not be disappointed. We have seen the liquid stone reduced in a few minutes, by Mr. Hardinge, to a plastic state, capable of being molded into any form. Faraday, and Marshall Hall, of London, it is stated, have endorsed the usefulness of the discovery; supported by such authority, it really appears to be one of the grandest discoveries of the present age.

Books of Patents.—Noble Present to the Astor Library.

The Astor Library, this city, has been presented with a valuable donation of 274 volumes—137 volumes octavo, and 137 volumes folio—containing the printed specifications and drawings of all the patents granted in Great Britain during the years 1852–5. These are accompanied with index volumes to all the patents granted from 1617 to 1853. By an act of the British Parliament in 1852, the Commissioners of Patents were required to cause the specifications for patents to be printed, and plates of the corresponding drawings to be made. They began with the patents granted in 1852, and have completed them up to January, 1856.

The whole of this invaluable and truly beautiful work has been published under the direction of Bennett Woodcroft, Esq., the Superintendent of Specifications, and it is so perfect that it would not be possible to point out in what respect it could be improved.

The volumes are all bound uniformly in red Turkey morocco, and the drawings mounted on strong white calico, in such a manner that the whole plate spreads open without any fold. The Commissioners are now going on with the specifications and drawings for the years previous to 1852, and we believe the same liberality will be extended with the continuations.

This is one of the many instances of the liberal spirit which has been manifested by the British government in the distribution of their numerous costly publications. The only condition attached to their gift is that the library should be free to the public. The Astor Library is indebted to Mr. Buchanan, when he was our Minister in London, for making known to the Commissioners of Patents that it was free, and this simple assurance secured for it this great work; and Dr. Cogswell, the gentlemanly, learned, and indefatigable librarian, feels pround of it, and so may our whole city.

It was a fortunate thing for the people of Britain (and our people also) that Mr. Bennett Woodcroft was selected to superintend the patent business of the London Patent Office, He is "the right man in the right place."—These volumes afford evidence of his taste, ability, industry, and liberal spirit.

The British Commissioners of Patents, appointed according to the new Patent Law, consist of the Crown law officers, and Master of Rolls. The officers exercising these powers under the new law have been characterized by broad and liberal sentiments. The last number of the London *Mechanics' Magazine* pays a handsome compliment to one of them—the Ex-Attorney General—Sir Alexander Cockburn, who has been promoted to the Chief Justiceship of the Court of Common Pleas. In deciding many very delicate and important questions belonging to inventors, he was always courteous and impartial, always exhibiting solid good sense and good temper—qualities of mind without which no man should be allowed to fill an office connected with such subtle matters as belong to inventions, and respecting which so much patience and knowledge are required.

Fusible Plugs for Boilers.

It has always been very difficult to obtain a proper fusible plug for steam boilers. Lead and tin—metals employed to form fusible plugs—do not fuse until high temperatures are obtained, tin requiring a temperature of 440° Fah., and lead 600°. These temperatures correspond to the heat of steam under a pressure considerably above the maximum strength of boilers. Plugs of these metals are therefore only suitable for being placed in such a position in the flue of a boiler, that when the water falls below the proper line, and the flue becomes over-heated, they will melt. They are unsuited for safety by fusing when there is an over-pressure of steam. As the pressure of steam is according to its temperature, it is very desirable to have a fusible plug that will melt by the heat of the steam when it attains to a pressure near to the maximum strength of the boiler. Hitherto, a reliable fusible plug of this kind has not been obtained. A plug that will fuse at any temperature, from the boiling point up to a very high heat, can be manufactured, but by constant use, for a short period of time, in a steam boiler, it loses the property of fusing, and thereby becomes useless. Such plugs are generally alloys, or rather amalgams—mercury being employed as the basis of their composition. A fusible plug, containing mercury, is not homogenous; the pressure of the steam forces the mercury out from the metals with which it is combined in the plug, thus leaving it porous, very difficult to fuse, and totally unfit to perform its intended function. This is the reason why fusible plugs are held to be ineffectual as safeguards against explosions of steam boilers from over-pressure of steam. A fusible plug that would meet all the demands made upon it for correct action and safety, would be a desideratum. This question has engaged the attention of our government for many years, and it still occupies the attention of its engineering officers. The Inspectors of Steamboats called in the services of Prof. Booth, of the Mint in Philadelphia—an eminent chemist—about two years since, in relation to fusible plugs, but so far as we have been able to learn, he has not yet arrived at a truly satisfactory result. We perceive that an improvement in the construction of such plugs has recently been invented in England, by James Marsh, of Manchester, but whether it will really accomplish the exact objects required, we cannot tell; it requires experiments to determine such a question. We will describe it, so that our engineers may experiment with it and test its qualities. The improvement consists in making the fusible plug of a tapering form, and arranging it in the boiler in such a manner that the pressure will come upon its smaller end, or area. This form of plug, apparently, subjects it to but little compressive action, so that when softened or rendered partially fused by the heat, the more fusible portion of the alloy will not be blown out. We hope this form of fusible plug may meet the requirements of safety in steam boilers.

A company has been formed in the city of London, for manufacturing boots and shoes by machinery.

Manufacturing Steel.

On the 27th of May last an American patent was secured for a process for manufacturing steel from cast-iron, by F. Uchatius—an Austrian military officer. This invention we described on page 309, last volume, SCIENTIFIC AMERICAN, in such a manner that any of our iron refiners might easily test the process, and thus decide its value. If none of them have tested this invention, it is but little to their credit, as it affords evidence of a lack of enterprise and enthusiasm in this business on their part. If any of them have tested it, we have not been able to learn the results of their experiments.

A Commission appointed by the French government has tested the process at the workshop of the Paris Northern Railroad, and has pronounced a most favorable judgment upon it. It has also been tested at the Albion Works, London, and an equally favorable opinion pronounced upon it.

The best English steel is not manufactured from English, but Swedish and Russian iron. This invention, it is asserted in some English papers, will render England independent of other countries for iron to make good steel, as it can be manufactured as well from English or East Indian pig iron. It is also stated that steel can be manufactured by this process at a comparatively low cost, and that many parts of machinery, such as shafting, now made of iron on account of its greater cheapness, will soon be made of steel.

We again call the attention of our iron manufacturers to this process; they will find it described on the page referred to, so that they can test its value. If it is as valuable as some of the English and French journals assert it to be, there is no use of importing any more steel from Europe; it can be manufactured from our own pig iron, and sold at a much lower price than the foreign. The question, we believe, is one of cost entirely; we have no doubt but good steel can be manufactured by the process—but how cheap? That is the important question to be decided. We are of opinion that the cheapness of the process has been exaggerated by the French Commission and by some of the English journals. Those who have tested it in Europe have operated on too small parcels, and have not taken all the expenses into consideration in their decisions.

Death of a Man of Science.

The death of M. Goujon, of the Observatory of Paris, is announced. Although only 33 years of age he was not undistinguished in astronomicol science. Amongst other things he discovered a comet, demonstrated the periodical appearance of Brorsen's comet, assisted in determining the difference of longitude between Paris and Greenwich, &c. He was for some years secretary and assistant to Arago.

Health of Dr. Kane.

The recent news from Europe states that Dr. Kane had sailed from London for the West India Islands, by advice of his physicians, on account of his health. He had been very unwell, and it is believed that the hardships to which he was exposed in the Arctic Regions have sowed the seeds of consumption in his system.

Opponents of the Woodworth Patent Extension must not fail to write urgently to their Members of Congress, in opposition to this scheme. Write at once. No time is to be lost.