Cements.

From the Journal of Chemistry.

A CEMENT WITHSTANDING WATER, ACIDS, OILS, ETC.—Simple shellac, made up into sticks of the size of a lead pencil, is commonly sold for such cement. The objects to be cemented are first warmed till they melt the shellac brought in contact with them. This is very good to cement broken glass, porcelain, etc., especially as the objects are again ready for use immediately when cold; but it is not adapted for flexible objects, as it cracks, and also will not withstand heat or alcohol.

A CEMENT WITHSTANDING HEAT AND ALCOHOL.—Take the best kind of glue; pour on an equal quantity of water; let it soak over night; next morning melt it over a gentle heat, and add fine Paris white, or white lead; mix well, and add a little acetic acid, carbolic acid, oil of cloves, or any other ethereal oil, to prevent putrefaction. This cement is also adapted for flexible objects, like leather. It will not withstand boiling water well, as this softens the glue.

A CEMENT WITHSTANDING HEAT AND MOISTURE.—Pure white lead, or zinc white, ground in oil, and used very thick, is an excellent cement for mending broken crockery ware; but it takes a very long time to harden. It is well to put the mended object in some store-room, and not to look after it for several weeks, or even months. It will then be found so firmly united that, if ever again broken, it will not part on the line of the former fracture.

COATING FOR OUTSIDE WALLS.—The following coating for rough brick walls is used by the U. S. Government for painting light-houses, and it effectually prevents moisture from striking through: Take of fresh Rosendale cement three parts, and of clean, fine sand one part; mix with fresh water thoroughly. This gives a gray or granite color, dark or light, according to the color of the cement. If brick color is desired, add enough Venetian red to the mixture to produce the color. If a very light color is desired, lime may be used with the cement and sand. Care must be taken to have all the ingredients well mixed together. In applying the wash the wall must be wet with clean fresh water; then follow immediately with the cement wash. This prevents the bricks from absorbing the water from the wash too rapidly, and gives time for the cement to set. The wash must be well stirred during the application. The mixture is to be made as thick as can be applied conveniently with a white-wash brush. It is admirably suited for brick-work, fences, etc., but it cannot be used to advantage over paint or white-wash.

The Phenomena of Earthquakes.

In earthquakes, says the *People's Magazine*, we see the conservative agency of fire called in to counteract the destructive agency of water. Wind and rain, heat and cold, are continually at work rending in pieces and grinding down the solid rock; the disintegrated portions of the rock form the soil of the lowlands, and this in its turn is eaten away by running streams, swept down by heavy rains, to be carried by the rivers and deposited in the sea. It is thus that the shallows and great river deltas are formed; and the materials so brought down are gradually, by the action of the waves, distributed over the bed of the ocean. This action, if suffered to continue without interruption, would in time level the highest mountain ranges; and in the place of a varied surface of land and water there would be a uniform shallow sea covering the whole earth. Here the working of fire steps in to counteract the destructive agency of water. It acts suddenly and with terrific force, and therefore it is more noted and more feared than the work which is done so silently and slowly, yet so irresistibly, by the gentle flow of rivers. Of one thing we are sure, that they are caused by the internal heat of the earth. They usually occur in volcanic regions; they are frequently accompanied by volcanic eruptions; during their continuance flames are said to burst from the earth, springs of boiling water rise from the soil, and new volcanoes have been raised as their result. We know that at a comparatively small depth below the surface of the globe there is a temperature very far exceeding anything which we experience at the surface. Whether we accept the hypothesis of a vast central fire, or consider that this heat is generated by chemical action or by electric currents, we know that there are stored up beneath our feet vast reservoirs of heat. What gases are stored under pressure in the cavities of the earth we know not. But we know that the increased expansive force of an elastic fluid under a comparatively small increase of temperature would be sufficient to rend asunder the solid rock and produce the effects we see. Perhaps a fissure so opened may admit water to the heated nucleus, there to be instantly converted into steam with vast increase of volume. This exerting enormous pressure against the rocky walls of the cavity in which it is formed causes a wave of compression in the zone of the rock immediately surrounding it, and this wave is propagated onward through the rock, just as a wave travels through water. The confined fluid strikes the walls of its prison chamber a fierce blow, and this causes a shudder to run through the earth, which passes along the surface as a shock, whose intensity is the only measure we have of the forces causing it.

THE FIRE IN THE EAST RIVER BRIDGE (BROOKLYN) CAISSON.—The fire which recently took place in the East River Brooklyn Caisson, although at the time of its occurrence the dailies succeeded in making quite a sensation out of it, proves to have been nothing serious. The only damage worthy of notice was the delay consequent upon the flooding found necessary to extinguish the fire.

SENATE Committee on Patents: Mr. Willey, Chairman, and Messrs. Ferry, Carpenter, Windom, and Hamilton.

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Vulcanized and Carbolized Rubber Hose.

We have been shown specimens of carbolized rubber goods manufactured by the Gutta-Percha and Rubber Manufacturing Co., Nos. 9 and 11, Park Place, N. Y., under patent dated February 15, 1870, which in a comparison with another piece made in the same manner and of the same materials, but not carbolized, and stated to have been used under the same circumstances for the same length of time, shows that the carbolic acid exerts a remarkable preservative action not only on the layers of cloth, but seemingly on the rubber also. The uncarbolized rubber and cloth were in a rotten and damaged condition, while the carbolized was apparently as strong and sound as when new. The antiseptic and preservative qualities of carbolic acid have long been well recognized, and it would seem that the use of it in the manufacture of rubber goods is one of its most recent but valuable applications.

Postage.

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IMPROVEMENT IN IRON.—An English journal says that at a recent meeting of ironmasters in Birmingham, specimens were shown of purified iron and improved steel manufactured by Sherman's process, as it is called, after the name of the American inventor. Some samples of the steel tested at Chatham dockyard bore a tensile strain of seventy tuns to the square inch, and were at the same time more ductile than any other specimens of the same strength. Common English rough iron by Sherman's method of treatment can be converted into bar steel equal in quality to the best Swedish; so tough and strong that a bar a half-inch square bore a strain of fifty-four tuns to the square inch. The process by which these results are produced is as yet a secret; but we believe that the conversion takes place while the iron is in the puddling furnace.

MANY beneficial uses have been found for carbolic acid, and naturalists now find that by washing out with it the inside of birds which they have not immediate time to skin and stuff, the birds may be kept a week or more in a sound and flexible condition. During the prevalence of the kine pest, carbolic acid was largely used as a disinfectant; and farmers have discovered that the "ticks" which infest sheep and lambs can be killed by dipping the animals in a bath of the acid diluted with water. Great care should be observed not to make the solution too strong, as there is danger that the animals might be killed off along with the tick.

PATENTS.—During the year ending September 30, 1870, there were filled in the Patent Office 19,411 applications for patents, 3,374 caveats, and 160 applications for the extension of patents; 13,622 patents, including reissues and designs, were issued, 11,094 tended, and 1,089 allowed, but not issued by reason of the non-payment of the final fees. The receipts of the office during the fiscal year were $13,630,429 in excess of its expenditures.

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