

## SCIENTIFIC GLEANINGS.

## UTILIZATION OF BONES.

The value of ox bones is considerable. The four feet of an ordinary ox will make a pint of neat's foot oil. The thigh bone is the most valuable, being worth \$80 per ton for cutting into cloth-brush handles. The fore-leg bones are worth \$30 per ton, and are made into collar buttons, parasol handles, and jewelry. The water in which the bones are boiled is reduced to glue, the dust which comes from sawing the bones is fed to cattle and poultry, and all bones that cannot be used as noted, or for bone black used in refining sugar, are made into fertilizers, and help to enrich the soil.

## DEFECTS OF CAST-IRON COLUMNS.

The employment of cast-iron columns as main supports has been greatly restricted in Berlin by a regulation issued from the architect's department of the police authorities of that city. The order has been issued in consequence of a discovery made last winter at a fire, when it was found that the cast iron columns had been cracked by the effect of the cold water playing on them while hot. The authorities now insist that when partition walls rest upon cast iron columns, the latter are to be covered with plaster or bricked in, with an air space between the bricks and the column.

## HARDENING PLASTER.

A new process for rendering plaster very hard, and capable of being substituted for wood in flooring, has been brought out by M. Julhe. Plaster has this advantage over cements, and even over wood, that it increases rather than diminishes in bulk on being applied to structures; but it fails in hardness and surface resistance. To overcome this difficulty M. Julhe mixes six parts of good plaster with one part of rich lime, recently slaked and finely sifted. This mixture is to be used like ordinary plaster, and the object made from it, when it is very dry, is caused to imbibe a solution of a sulphate which has a base precipitable by lime, and this precipitate insoluble. Such are the sulphates of zinc or iron. The theory of the process is as follows: The lime contained in the pores of the plaster decomposes the sulphate, with production of two insoluble bodies, to wit, sulphate of lime and oxide, which fill the pores of the object submitted to the treatment in question. With sulphate of zinc the object keeps of a white color, but with sulphate of iron the object, at first greenish, takes on drying, and with lapse of time, the color of the sesquioxide of iron. With sulphate of iron the hardest surfaces are obtained, the resistance to rupture being twenty times greater than with ordinary plaster. To obtain the maximum hardness and tenacity it is necessary that the object should first be very dry, and steeped in a solution which is practically saturated. The first immersion of the object in the solution ought not to last over two hours, as a too long immersion at first is apt to render the surface friable. On drying the plaster object afresh after the first immersion, there is no further fear of its becoming friable. If the proportion of slaked lime is too great, the surface is apt to take a very hard marble-like skin, which prevents the hardening of the inner portions of the object. The proportion of one of lime to six of plaster as stated above has given the best results. Plaques made in this way can be browned by rubbing them with linseed oil and litharge and glazed on the surface with hard copal varnish. A beautiful glossy flooring like polished oak can in this way be prepared.

## FIR LEAF WOOL.

Fir wool is a textile fiber which in Saxony is manufactured out of the needles of the fir tree, the process being partly chemical and partly mechanical. For this purpose the needles are gathered in spring and summer, when they are young and green, old and withered ones being unsuitable. They are taken into barns, and there dried in a current of air. When dried, they are subjected to a settling and fermenting process similar to that in use for flax. This softens the woody parts and loosens them from the fiber, but the complete separation is only obtained after a lengthy boiling by steam. During this boiling a by product is obtained in the shape of an oil (fir wood oil), which is gathered and sold to chemists as a remedy for rheumatism and gout, its properties being similar to turpentine. The complete separation of bast and fiber is produced exactly as with flax. The fiber is now passed through a milling machine similar to that in use for woolen cloth, and is then carded and spun like cotton. Generally the carded fiber is mixed with a certain proportion of cotton or wool, and thus a kind of merino yarn is produced, which is worked in the hosiery frames into singlets, drawers, and stockings, these fabrics being then sold as anti-rheumatics and as a preventive of gout. When examined under the microscope the fiber appears as a tube, and striped, and as if covered by a fine network. Goods made with this fiber are sold to a considerable extent in Germany, though they are dearer than the ordinary merino goods.

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