

ous are the fragments. Mining uses:—The fact that the action of the gun-cotton is violent and rapid in exact proportion to the resistance which it encounters, tells us the secret of the far higher efficacy of gun-cotton in mining than gunpowder. The stronger the rock, the less gun-cotton comparatively with gunpowder is found necessary for the effect—so much so that while gun-cotton is stronger than gunpowder, weight for weight, as 3 to 1 in artillery, it is stronger in the proportion of 6·27 to that of strong solid rock, weight for weight. It is the hollow rope form which is used for blasting. Its power in splitting up material is executed exactly as you wish. With regard to the military and submarine explosion, it is a well-known fact that a bag of gunpowder nailed on the gates of a city will blow them open. A bag of cotton exploded in the same way produces no effect. To blow up the gate of a city with gun-cotton, it must be confined before explosion. Twenty pounds of gun cotton carried in the hands of a single man would be sufficient, only he must know its value.—Other effects of the Austrian invention were enumerated, and the paper throughout was of a most interesting character. The experiments the results of which were detailed, had been conducted on a gigantic scale.

#### LEATHER CLOTH.

On the subject of leather cloth the *London Times* has the following:—

“The recent continuous increase in the price of leather has naturally directed the attention of practical chemists to the best methods of perfecting the imitations which, under the name of leather cloth, are now so largely used as substitutes for leather itself. The improvements in this branch of manufacture has been so steadily progressive that the original standard taken for imitation—the American leather cloth—has been long since surpassed, and it is, perhaps, not too much to say that the art of making artificial leather has now attained a perfection which promises to make the imitation a better, and, though cheaper a more valuable article than that which it imitates. Among the many new processes and inventions shown in the late Exhibition, there was no lack of English representative of this rising branch of manufacture, striving to displace the American fabric. Nearly all these however, were too much like the Transatlantic article to be successful. With its merits they reproduced its grave defects—the liability of the varnish to crack, the colours to fade, and the material itself to wear out fast as compared with real leather. One series of specimens, however, in this class attracted a good deal of attention, though they failed to attract a medal. These specimens were shown by Mr. SZERELMY, a gentleman well known for his most curious chemical discoveries in hardening wood, stone and paper; and to the present time, the most successful of all the many competitors for preserving the House of Parliament from further decay by indurating the surface of the stone with a fluid silica, which, it is asserted, renders the stone beneath perfectly indestructible. The leather cloth of Mr. Szerelmy has grown in reputation, till it now promises to become a most important manufacturing discovery, since while the cloth thus

prepared possesses all the best attributes of leather in great strength and durability, it has other and special advantages of its own, which even the advocates of the famous virtues of leather have never claimed for it—namely complete impermeability to water, a flexibility and softness equal to a woollen fabric, and a cheapness which makes its cost one-third that of real leather. Thus a good calf-skin costs from 10s. to 14s., and yields leather for three or three and a half pairs of boots; whereas six square feet of the calf-skin leather cloth yields materials for five or six pairs of boots, and costs only about 4s. 6d. Such an important difference and saving as this ought to satisfy any inventor; but even more than this is claimed for the ‘panonia,’ in its capability of being produced in any quantity at a few days’ notice, and in sizes only limited to the size to which the fabrics can be woven, on which the composition is laid. The nucleus of a factory has been established at Clapham, where the leather is now made, and where a company is about to construct large works, and carry on the manufacture on the most extensive scale. The fabric used in the manufacture is entirely according to the kind of imitation leather wished to be turned out. Thus ‘moll’—a very thick, soft kind of cotton fabric, made at Manchester—is preferred for calf-skin; fine calico or linen for water proof material for macintoshes, siphonias, etc., as perfectly water-proof as india rubber itself; and alpaca, silk, cloth or common cotton for boots and shoes, bookbindings, harness, carriage furniture, and all the thousand purposes to which real leather is applied. What the composition of the pigment is which in a few hours changes common cotton into a substance like enamelled leather, and only to be distinguished from the real article by its non-liability to crack, and its greatly additional strength is of course a strict trade secret. The mode of manufacture however is simple. The fabric to be converted into leather, silk, alpaca, or whatever it may be, of any length or width, is merely wound on rollers beneath a broad knife-blade, which by its weight presses in and equally distributes the pigment previously placed upon it. A hundred yards may thus be done in a single minute, and in this most simple application the whole manufacture begins and ends except that three coats of the pigment are necessary to perfect the leather, and an interval of twenty-four hours must elapse between the application of each. During this period the sheets are carried to a drying house heated to a temperature of 94°, and where they are hung like oil-cloth, according to the order in which they arrive, the last comers displacing those which have completed their time, and are ready for their second coat. Thus the manufacturer never stops, and three days suffice to complete ‘hides’ of any length or breadth to which fabrics can be woven. For imitations of morocco or other marked leathers the long sheets are simply passed, when finished, through iron rollers, which indent them in any pattern required. For enamelled leather the enamel is applied after the third coat by hand-labour, which, though slower, of course than that of machinery, is nevertheless rapid enough to cover the sheet in a very short time. The enamel, when dry is infinitely superior to any description of patent leather. It is perhaps scarcely necessary to state that the pigment