drains are puddled, and have their internal faces covered with sods, at an inclination of two to one.

As there are many situations where stone is very scarce, and where timber abounds, the author has turned his attention to devising a plan of embanking applicable to such localities. It may be thus briefly described: The body of the embankment should be of clay, earth, gravel, and stones, dug from the surface and thrown up in a bank, with a slope suited to the force likely to act upon it. On the water side is placed a strong facing of fascines, 6 feet thick at the bottom and 4 feet thick at the top, embedded in the soil in an oblique direction, the dip being towards the land; they are securely fastened down by iron screws running at right angles through the whole height. The land face is covered with sods. In a country where wood abounds, this kind of embankment would be formed at a very cheap rate. In other situations, where the embankments would be subjected to greater strain, the thickness of the mass of fascines should be increased to 13 feet at the bottom and 4 feet at the top. In this case, at 4 feet from the front of the bottom of the slope should be placed a row of fender fascines, 3 feet wide by 2 feet high, bolted down, for the purpose not only of defending the face of the bank from the action of the sea, but for retaining all deposits left behind by it; by which means the embankment would in time acquire a natural face of soil, as is the case with some of the embankments in Holland. The average cost of this kind of embankment, including the sluices and the necessary bed of puddle in the centre, would be about £12. per running yard.

This paper is accompanied by seven plans of the proposed embankments and charts of the loughs.

“On the Use of Mica, as a Substitute for Glass, in the Windows of Workshops.” By Joseph Glynn, F.R.S., M. Inst. C. E., &c.

In the windows of the workshops at the Butterly Iron Works so much glass was broken by the chippings of iron, that a substitute was sought which should resist a moderate blow, and yet be translucent. A quantity of sheets of mica were procured from Calcutta, which, when fixed into the cast-iron window frames, were found to resist the blow of a chipping of iron driven off by the chisel with such force as would have shattered a pane of glass. Mica possesses both toughness and elasticity, and when a piece of iron does penetrate it, merely a hole is made large enough to allow the piece

Mica as a
Substitute
for Glass.

INST. C. E. MINUTES, 1840.

E

to pass, while the other parts remain uninjured. It is not quite so transparent as glass, but it is not so much less so as to be objectionable; but this circumstance is not important at Butterly, as, in consequence of the quantity of fluoric acid gas evolved from the fluuate of lime used as a flux in the blast furnaces, the glass in the windows is speedily acted upon, and assumes the appearance of being ground. Mica is a little more expensive than common glass; but, as its duration promises to be much longer, it must be more economical; and if an extensive use of it could be induced, a more ready supply would be obtained—probably from Pennsylvania or from Russia, where it is commonly used for windows in farm-houses, and also on board ships of war, as it is less liable to be fractured by the concussion of the air during the discharge of heavy artillery. It can be procured of almost any dimensions necessary for ordinary purposes, as it has been found in Russia in masses of nearly 3 feet diameter. It is susceptible of very minute subdivision, as, according to Häüy, it may be divided into plates no thicker than one three-hundred-thousandth part of an inch.

“On a Specimen of White Cedar from Bathurst, New Brunswick,” sent by Mr. Churchill.

White
Cedar
Railway
Sleepers.

The specimen exhibited to the meeting was of the dimensions calculated for a railway sleeper, for which use it was proposed to introduce this timber, as it is stated to possess, in a very superior degree, the quality of durability in situations calculated to try its properties. It can be imported at about 3*s.* 9*d.* to 4*s.* per sleeper.

Mr. Hawkins observed, that he knew that species of timber well, having seen it extensively employed in the United States. It is an evergreen tree, and grows only in wet or boggy grounds, and is found most plentifully in New Jersey, Maryland, and Virginia. It attains the height of 70 to 80 feet, but is rarely more than 3 feet in diameter. The concentric circles in it are always perfectly distinct, and prove that the tree only arrives at its full growth after a long term of years—as many as 277 annular rings have been counted in a trunk 21 inches diameter, at 5 feet from the ground. The wood is light, soft, fine grained, and easily wrought. It has an aromatic odour, which it preserves as long as it is guarded from humidity. It resists alternations of dryness and moisture better than any other wood; and on this account is extensively used for shingles for roofing. They sell at Baltimore for 4 to 5 dollars per 1000. These