ELASTICITY OF BRICKWORK.

Experimental tests of the elasticity of common brickwork, in mortars of prevailing lime and sand are rarely made, and more rarely published. We are therefore left to infer the probable results from such available tests as come nearest to the specification of ordinary brickwork. The following is taken from the report for 1884 of tests made at the Watertown Arsenal, U. S. A. A common hard burned brickwork pier 8 in. by 8 in. by 6 ft. 8 in. laid in lime mortar, three of sand, joints broken all round, in half-brick laps, no closers, bed joints about ¼ in. to ⅜ in. thick, give a compression of $\frac{1}{100}$ in. with a load of 8,0000 lb. on 61½ inch gauge length and $\frac{52}{1000}$ in. with 10,000 lb. and a permanent set of $\frac{45}{1000}$ in.. The age of the pier when tested was 15 months. A similar pier of half burned face brick, 23 months old, with joints ⅛ in. thick, gauged on 5 ft. 4 in. of its 6 ft. 8 in. length, gave a compression of $\frac{2}{1000}$ in. with 7,500 lb. and $\frac{58}{10000}$ in. with 10,000 lb., with a permanent set at the latter load, when released to 5,000 lb load of $\frac{5}{10000}$ in. This compression was obtained on a ⅛ in. joint, breaking joints all round with half-brick overlaps and no closers. In an ordinary half-inch mortar joint laid up in walling of quarter brick bond lap, with bats and mortar filling between the faces, the compression would be five or six times this quantity—say, six times, or $\frac{23}{1000}$ compression, and a permanent set of $\frac{3}{1000}$ in 10,000 lb. load per square inch, which is equivalent to ten tons per square foot—i. e., 10,000 lb. ÷ 64 square inches = 156·2 and 156·2 ÷ 15·6 = 10 tons. With a load of 20,000 lb. the compression was ·019 and set ·009. It crushed with 108,400 lb. = 1,877 lb. per square inch, and gave a final compression in the 5 ft. 4 in. of gauge length of 13 in. with a set of ·085 in. These quantities might be multiplied by at least six to represent the equivalent result of a ½ in. lime mortar joint, and by 9 to represent, in addition a less perfectly formed brick, and for bat and mortar filling and careless workmanship. If the brickwork were built in continuous damp weather, the compression, as well as the permanent set, would be increased. Under such conditions the difference of levels of lintels, girders, etc., would be increased when iron supports, as columns and stanchions, were used in conjunction with rickwork. It is in such weather that failures are most frequent. The observations on the behaviour of brick piers of this class laid in lime mortars tended to the general conclusion that the higher the loads the greater was the difference of the readings of the gauged compression for each additional 5,000 lb. of load increments. Another observation offered by the tester, the engineer of the machine, was that repeated heavy loads tend to destroy the mortar joints, by disintegration, and in time the piers fail in detail at the joints in consequence. From this circumstance is to be obtained an explanation of some failures which have occurred in masonry subject to oscillations, heavy concussions or impactive force, jar or vibration.

Mildew in painted work may often be prevented by adding a little sulphur to the paint.