

and lime-burning. In this new kiln a most remarkable economy of fuel is effected in a twofold way ; in fact, by saving the twofold loss of heat already mentioned ; for, first, it saves the heat of the gaseous products of combustion and unconsumed air passing through and away from the burning bricks, by applying this heat effectively in drying the new fresh bricks about to be burnt, and raising them up to an incandescent temperature, so that only a very slight addition of heat directly from ignited fuel is required to complete their burning ; and, secondly, it saves the heat of the cooling bricks, after their having been sufficiently fired, by applying it all in warming the air which goes forward to supply the fires : so that the fuel is burnt with air already at an incandescent temperature, instead of requiring, as usual, to heat the air for its own combustion. Professor THOMSON, with the aid of drawings, went on to explain the manner in which these principles are practically carried into effect. The kiln is built in the form of a large arched passage, like a railway tunnel, bending round and going forward on the ground till it closes with itself to form a great circular ring chamber, within which the burning of the bricks is carried on. This ring-chamber may be of any dimensions, depending on the quantity of bricks required for daily delivery. Round its circumference there are twelve entrance door-ways (*a*), admitting of being closed with temporarily-built bricks and clay, so as to retain the heat and exclude all entrance of air by the door-ways so built up. The great ring-chamber may now be conceived as consisting of twelve compartments or spaces, with one of these door-ways to each. In the centre of the ring a high chimney is erected (*b*), and from each of the twelve compartments of the annular chamber an underground flue (*c*) leads into the chimney. There are, then, twelve of these flues converging towards the centre like the spokes of a wheel, and each flue has a valve, (*e*) by which its communication with the chimney can be cut off. Arrangements are made by which a partition like a damper or portcullis (*d*) can be inserted at pleasure so as to cut off all communication between any of the twelve compartments of the ring-kiln and the next one. Let us now suppose the working of the kiln to have been already fairly established, for after being once kindled the fire is never extinguished, but the burning of new Bricks and the removal of the finished produce