to consist in the cutters acting during the incursion as well as the excursion of the slide, and when forming long screws, in their being alternately stayed on the side opposite to the tool which was in action; that by these means, good work could be produced with such dispatch, as to reduce the cost of turned screw bolts, as low as that of similar articles produced by screwing machines, which worked with dies acting by compression.

A drawing of the lathe used in cutting the screws was presented with the specimens.

Mr. Field observed that the machine was ingenious and appeared to do the work well; but as far as could be ascertained from the drawing there was not any novelty in it. A similar machine made by the late Mr. Maudslay, had been in use in Maudslay and Field's manufactory for the last fifteen years. The screwing dies invented by Mr. Whitworth, cut out the threads of screws as clearly as if done by a chasing tool, and entirely without compression.

Mr. Field,
V. P.

April 25, 1843.

The PRESIDENT in the Chair.

No. 616. "An Account of the Brick-making at Blechingley Tunnel, during the winter of 1840, and summer of 1841." By Frederick Walter Simms, M. Inst. C. E.

As the forming of this part of the Dover Railway was not let by contract, it was necessary to make extensive preparations previously to commencing the work, and amongst these the brick-making department was one of the principal, the whole being under the personal superintendence of the author.

The bricks were all made on the surface along the line of the tunnel, the brick-grounds being so arranged on each side of the shafts, that when the bricks were delivered from the kilns and stacked, but little labour was necessary to convey them to the spot, whence they were lowered to the underground works.

The mode of manufacture adopted was that of "slop-moulding," in which process the mould is dipped into water previous to its receiving the clay, instead of its being sanded as is the case in making sandstock bricks; the workman then throws the clay with some force into the mould, pressing it down with his hands to fill all the cavities, and strikes off the overplus with a stick; an attendant boy, who has previously placed another mould in a water trough by the side of the moulding table, takes the mould just filled, and carries it to the floor,

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where he carefully drops the brick from the mould on its flat side and leaves it to dry; by the time he has returned to the moulding table and deposited the empty mould in the water trough, the brick-maker will have filled the other mould, for the boy to convey to the floor where they are allowed to dry, and are then stacked in readiness for being burned in clamps or kilns. Minute details of the manufacture are then given, the average results of which are shown in the following Table:—

Force employed.	Area of Land		Duration of Season.	Produce per Week.	Produce per Season.
	Roods.	Perches.	Weeks.	Bricks.	Bricks.
One moulder	2	14½	22	16·100	354·200
One temperer					
One wheeler					
One carrier boy					
One picker-up boy					

A careful comparison is then made between the two modes of sand-stock and slop-moulding, from which it appears that while the production of sandstocks is as 30 to 16 of the slop process, the amount of labour is as 7 to 4, and that the quantity of land required and the cost of labour per thousand are nearly the same in both processes.

The bricks were all burned in close kilns constructed with soft bricks set in pugged clay, the quantity burned in them at a time varying from 30,000 to 40,000. The fuel employed was that known by the name of the Bell Robson Netherton, or South Hartley coals, and for the purpose of more accurately determining the cost of this element, the author caused the quantity of coals consumed in burning ninety-four kilns of bricks to be carefully noted: this is given in a table accompanying the communication; the average of it is, that 10 cwt. 0 qrs. 8 lbs. of coals were used, in burning each thousand of bricks.

The floor of the drying-houses was made of pugged clay about 9 inches thick at the furnace end, and gradually diminishing to 2 inches at the extreme or chimney end, so as to equalize the heat of the floor. The temperature of the interior of these drying-houses when in full operation varied from 50° to 70° Fahrenheit.

The estimated cost of the bricks delivered at the shafts was £2. 1s. 10d. per thousand; but the actual cost, obtained by dividing the total expenditure by the whole number of bricks made, was only £2. 1s. 6d. per thousand, which includes waste and all other expenses that were incurred.

The author notices the substitution of Mauritius sugar mats for the ordinary hack-caps made of straw, and that they were durable and serviceable.

The paper is accompanied by two drawings showing the elevations and sections of the kilns and drying-houses with their flues.

In answer to questions from several members, Mr. Simms stated Mr. Simms. that the price of moulding bricks by the slop process was five shillings per thousand; that slop bricks occupied less time in drying than sandstock bricks; that the former kind were full one pound each heavier than the latter, which he attributed to the greater amount of pressure they received when being moulded; for this reason also the sandstocks were made somewhat quicker. The price of the ordinary hack-caps made of straw was four-pence each, and they lasted one season; the Mauritius sugar mats which were substituted for them, cost about one penny each and would last two seasons.

Mr. Bennett thought that the quantity of bricks which could be Mr. Bennett. produced by each gang of men was underrated, for, at Cowley, the average number of sandstocks moulded was 32,000 per week; while his men very frequently made 37,000, and sometimes they reached as far as 50,000. The space occupied for moulding at Blechingley appeared small; in Mr. Bennett's brick-ground ten stools occupied twenty acres; this might arise in some degree from more time being allowed for drying in the sandstock process: he believed this to be an advantage; the principal part of the shrinkage took place while drying previously to being burnt. The total amount of contraction in his bricks was $\frac{1}{8}$ th of an inch in 10 inches; but all clays differed in the amount of contraction.

Mr. Farey directed the attention of the meeting to Hunt's improve- Mr. Farey. ments on the Marquess of Tweeddale's machine for making bricks; it had not, he believed, yet been brought into general use in England, but it was employed extensively at Hamburgh and other places on the Continent, and was stated to produce stronger and better-shaped bricks, of more uniform quality than those made by hand moulding; the process was a kind of intermediate one between slop and sand-moulding; the moulds being wetted as in the former process, while the clay was tempered in a pug-mill as in the latter process.

A very ingenious system of moulding without wetting the clay had recently been introduced by Mr. Prosser of Birmingham. At present the system was confined to the production of buttons, small tiles, and slabs for painting; but the patentee asserted that the machine could be advantageously used in making bricks. A few had been made which in burning only shrunk $\frac{1}{10}$ th of an inch in 9 inches.