XLVI. On a new rotative steam-engine

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XLVI. *On a New Rotative Steam-Engine.* By JOHN TAYLOR,
Esq., F.R.S., Treas. G.S., &c.

To the Editors of the Philosophical Magazine and Journal.

GENTLEMEN,

IT is very well known to those who have observed the duty of steam-engines employed in the mines of Cornwall, that an enormous difference has existed between those which raise water by a reciprocating motion, and those which for other purposes have that motion converted into a rotative one by the intervention of a crank. The cause of this difference has often been speculated upon, but has not, I believe, been well explained: it is important in an æconomical point of view, as while in the pumping engines 60 millions pounds are commonly raised one foot by each bushel of coal consumed, the rotative engines for stamping ores have seldom raised more than 20 millions; and those for winding up the ores from underground are found to be even far below this in effect.

Now, it should be observed that the pumping-engines are at present universally, I believe, single engines, that is to say, receiving the steam from the boiler on one side of the piston only, the principle of working double, as it is called, which was introduced by Mr. Watt, having been for some time discarded; and in these single engines the method of working high pressure steam expansively, which we owe to Mr. Woolf, has long been used with the greatest advantage.

The rotative engines in Cornwall, like all others which are used for manufacturing purposes, are double engines, and receive the steam alternately above and below the piston; and though attempts have been made to work them expansively, these attempts have not been very successful.

The object of my present address to you is to notice an engine which has lately been constructed for a mine in which I am interested, which is a rotative one for stamping tin ores, and which when I visited the mine a few days since was calculated to be performing a duty of about 60 millions, or nearly equal to the average of the better class of reciprocating engines, and nearly three times as much as the best rotative engines have hitherto done.

I wish to call the attention of persons concerned in the use of steam-engines to this fact, because if it should be found that this rate of duty can be maintained, a very great improvement may take place in all such as are most generally employed.

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This engine is at work at the Charles Town United mines near St. Austell; it was erected for us under the direction of Mr. Sims, an engineer of great experience in Cornwall. It differs from the general construction in being a single engine, having the beam loaded at the outer end; and the rotatory motion of the crank is rendered almost completely uniform by the assistance of the fly-wheels. It works nearly as expansively as the pumping-engines.

It was predicted, I understand, before the engine went to work, that a steady rotative motion could not be produced in this way, and some believed that the crank would never pass the centre; I can, however, bear witness that the action is extremely good, and will, I believe, by a little alteration in the weight and diameter of the fly-wheels, be made perfect; and as it must be an object to save at least one half the fuel ordinarily consumed, I point it out as deserving attention and inquiry. I have desired that its performance may be regularly reported in the monthly duty papers.

I am informed by Captain Thomas Lean, who reports the duty of most of the engines in Cornwall, that this is not the first construction of the kind, but that a similar one was erected formerly at Wheal Vor tin-mine by Mr. Peter Godfrey, and that it then surpassed in duty any other stamping engine of its day, but that for some reason it never attracted much notice.

Mr. Sims is constructing a winding-engine for the same mine on a similar principle. Yours very truly,

Bedford Row, Oct. 12, 1835.

JOHN TAYLOR.

XLVII. *A Sketch of the Geology of West Norfolk.* By C. B. ROSE, *Fellow of the Royal Medical and Chirurgical Society of London.*

[Continued from p. 279.]

Chalk with Flints.—**M**EDIAL chalk of "Geology of Norfolk."

The escarpment of this bed of chalk (incumbent on the last) forms the high range or downs of Norfolk, running nearly due north and south from Thornham and Brancaster through Docking, Great Massingham, Lexham, Litcham, Castleacre, Swaffham, Hilborough, Saham-Tony, Weeting, to Thetford. From this range flow the principal rivers of the county; two only, the Setchy or Nar and the Wissey or Stoke, cutting through it in their western course to the sea.

This bed is well characterized by its numerous horizontal