if we take rods B, of once, and C, of twice, the length of stroke, to establish a ratio of extra pressure for friction, we find B is .118 per cent., and C, .031 per cent., which is sufficiently near the convenient ratio of the squares of the rods inversely, to make that the rule for practice. Then say the additional pressure for friction over the parallel, or infinite, rod, is, for once the length of stroke 12 per cent., for twice 3 per cent., and for thrice $1\frac{1}{2}$ per cent.

The value of the pressure for friction is matter of opinion, but if the amount of friction with the parallel rod, exclusive of the piston, and its rod, which are not affected by the changes, be set down of its power at

Once, the stroke will be 12 pr. ct. additional	=	16.80	"
Twice, " " 3 "	=	15.45	"
Thrice, " " $1\frac{1}{2}$ "	=	15.20	"

From these data the engineer may see the extent of power sacrificed for the convenience of a short connecting rod, which, we apprehend, is found much less than had been generally supposed.

Cincinnati, 20th June, 1844.

On the Magnesian Limestones. By Mr. C. H. SMITH.

This paper was a continuation of those formerly read, treating on the sandstones and oolites; on the present occasion Mr. Smith proceeded with the subject by describing the great beds of magnesian limestone, which lie, with little intervals, from Nottingham and Tyne-mouth, and more especially those between Mansfield to Knaresborough, an extent of about seventy miles. In this district stone is found combining the carbonate of lime and magnesia from the lowest amount of the latter, to proportions comprising pure dolomite—of course, they vary greatly, both in appearance and quality, and that even in cases when the substances are, chemically speaking, the same:—among the best of these stones, as building materials, are the Bolsover, Roche Abbey, Barnham Moor, and Huddlestone. The first named has been tested in the Norman Church at Southwell, which remains in a state of high preservation; but much, as Mr. Smith particularly insisted upon, depends upon the situation of the beds from which the stone is raised; the remains of Roche Abbey, for example, and the church at Tuxhill, both built with the stone which Sir C. Wren distinguished as second only to Portland, are in a perfect state, with all the sharpness of the mouldings preserved, whereas buildings in the neighborhood erected with the same material during the present century, but without due regard to the choice of the beds, are already in a state of decay; so also with regard to the Barnham Moor stone, many Roman remains at York are in a far better condition than the works of the middle ages in that city, not excepting the cathedral, and others at Hull, Beverly, and Tadcaster, built with the same stone. The Cadeby stone is found to decompose rapidly; a specimen used in London, perished in about fourteen years, and yet this stone is found within a short distance of Conisbo-

ugh Castle, which was built with a similar stone from an adjoining hill, and remains the most perfect specimen of masonry of its age existing in this climate. The characteristics of durable magnesian limestone are its compactness, and high crystalization; those which appear earthy, and powdery, and leave white on the fingers, on being handled, are not to be trusted. The Anston quarries, which supply the stone for the Parliament Houses, were left to be the subject of a local communication.—*Trans. Soc. Brit. Arch., April 29.*

London Athenæum.

Light-House for the Island of Bermuda.

The cast-iron light-house for the Jamaica light-house commissioners, which was constructed at Bramah & Robinson's Works, three years ago, under the direction of Mr. Alexander Gordon, induced her Majesty's Treasury to apply to Mr. Gordon, for a still larger light-house on the top of Gibbs' Hill, on the main island of Bermuda, where numerous engineering difficulties have prevented the erection of a light-house in masonry. This work is now visible rising above the houses near the Waterloo Bridge Road; the contractors being Messrs. Cottam for the tower, and Messrs. Wilkison, of Long Acre, for the lantern, and the fitting therein of M. Fresnel's lenticulated apparatus of the first order. The tower is conical; the diameter at the base is 5 feet, tapering to 15 feet at the narrowest part near the top, where it is spanned out for the gallery, on which the lantern is to be placed. The total height, from the base to the top of the lightning rod, will be 138 feet, and when erected on Gibbs' Hill, Bermuda, will be 368 feet above the level of the sea, and the light (a fixed light with bright flashes) will be visible all round the dangerous reef of rocks to northward and westward. The outside carcass of the tower is composed of 139 cast-iron plates, their flanges being fixed together by screw-bolts and nuts. There are seven rooms, lighted by port-holes, and ports fitted with plate glass. The rooms are lined with wrought-iron, paneled in oak frames, and the ascent from the bottom to the top is by means of a spiral stair-case of iron, with oak treads. The floors are all of cast-iron, and there is in the centre a hollow column, 16 inches in diameter, for waste water pipes, and for the ascent and descent of whatever may be required in the light room and lantern, or for any of the seven rooms, thus obviating the necessity of carrying any thing up, or down, the stair-case. The whole is constructed with an especial view to the resistance of those terrific hurricanes, and other destroying causes, so common in Bermuda, and some of the West India islands. Being a perfect conductor of electricity, no thunder-storm can effect this structure; being incombustible, it cannot be destroyed by fire. Mr. Gordon's light-house at Jamaica, before mentioned, we described at the time of its temporary erection in this country. It has several times been struck by lightning, which, passing down, exhibited no other effect than the flash reaching the very top of the lightning rod, and has now been lighted for more than two years.

Ibid.