Almost all the houses, and many of the public buildings, in Turkey, being constructed of timber, destructive fires were frequent. In many parts of the country the common building materials were expensive; iron had therefore been resorted to for construction, and Mr. Fairbairn had already sent over an iron house for a corn-mill, 50 feet long, 25 feet wide, of three stories in height, and with an iron roof. It was finished in 1840, and erected at Constantinople in the succeeding year.

The success of this attempt induced a second order, which was for an extensive woollen factory, to be composed entirely of cast iron plates, the interior being formed throughout of brick arches, upon cast-iron columns and bearers, with an iron roof. He then described in detail the construction of the different parts of the building, and the machinery, which would be driven by a fall of water of 25 feet in height, of the computed average power of 180 horses.

Several ingenious devices were described for preventing any objectionable effects from the high conducting power of the metal. The piers between the windows were hollow, so as to admit a current of air through during the hot season; and the iron roofs were so arranged as to have beneath them a coating of plaster, to serve as a non-conducting substance.

The two principal rooms were described to be 272 feet long, 40 feet wide, and 20 feet high; and 280 feet long, 20 feet wide, and 20 feet high: with a great number of other rooms, for the several processes in the manufacture of coarse woollen cloths, for the counting-houses and apartments of the directors, and for the reception of the sultan, &c.

The area of the inclosed surface, including the court-yard and buildings, was nearly 3 acres, or . . 110,621 square feet.

The floor surface in the basement rooms = 16,480 „
Ditto in the upper rooms = 54,616 „

March 28, 1843.

The PRESIDENT in the Chair.

No. 599. "Experiments upon Cast and Malleable Iron, at the Milton Iron Works, Yorkshire, in February, 1843." By David Mushet, Assoc. Inst. C.E.

Strength of hot and cold blast Iron at Milton.

The blast furnaces at Milton had been for a long period worked with heated air, generally under a pressure of 3 lbs. per square inch, and each with two nozzles on the blast-pipes of $2\frac{1}{2}$ inches and $2\frac{9}{16}$ inches in diameter. The apparatus requiring to be renewed, a quantity of iron was made by cold-blast, which, as the materials or other circumstances of manufacture were not in any way changed, offered an opportunity of testing the relative strength of the two sorts of iron, of which Messrs. Graham and Co., the proprietors, took advantage, and secured the assistance of Mr. Mushet to conduct the experiments.

A strong wooden frame was erected, upon which were fixed iron supports at 4 feet 6 inches apart, for sustaining the bars to be proved. A bar of iron planed perfectly true, with a dove-tailed grove and a graduated brass scale in it, was used for ascertaining the deflection.

The bars to be experimented upon were all cast alike, 5 feet long and 1 inch square, and cooled with equal precaution. The results are given in a series of tables, of which the following are the average results :—

Table.	No. of Experiments.	Quality of Iron.	Specific Gravity.	Breaking Weight in lbs.	Deflection in Inches.	Impact.
1	12	No. 4. Cold-blast iron re-melted in the cupola, mottled or approaching to white	7·153	442	0·9418	427
2	12	Same iron re-melted in the cupola with an increased quantity of coke produced gray iron	7·054	435	1·1916	519
3	12	No. 3. Hot-blast iron re-melted in the cupola . .	7·012	520	1·542	782
4	13	Nos. 3. and 4. Hot-blast iron re-melted in an air-furnace with coal	7·107	$610\frac{1}{2}$	1·532	940
5	10	No. 1. Hot-blast iron cast from the blast furnace .	7·012	439	1·56	686
6	12	No. 3. Hot blast iron ditto .	7·046	439	1·43	630

The results of these tables are examined, and upon the deductions drawn from them are—that the Milton cold-blast iron is rather deficient in strength; that the hot-blast iron is stronger than cold-blast, when re-melted in a cupola with coke; that hot-blast iron from the furnace is equal in strength to the average of the two sets of specimens of cold-blast re-melted in the cupola; that the No. 3 iron from the blast furnace is not stronger than No. 1 quality. The general results show, not only the superiority of the Milton hot-blast iron over that made by cold-blast, at the same furnaces, but over that of a very large number of works, as shown by the following comparative table taken from Mr. Fairbairn's report in 1838:

					lbs.
Milton, hot-blast iron,		No.	3	Air furnace	610½
Ditto, hot-blast		,,	3	Cupola	520
Ponkey,	cold-blast	,,	3		581
Bute,	ditto	,,	1		491
Wind-mill End,	ditto	,,	2		489
Old Park,	ditto	,,	2		485¾
Lowmoor,	ditto	,,	2		472
Buffery,	ditto	,,	1		463
Brimbo,	ditto	,,	2		459
Oldberry,	ditto	,,	2		455
Adelphi,	ditto	,,	2		449
Blaina,	ditto	,,	3		448
Devon,	ditto	,,	3		448
Frood,	ditto	,,	2		447
Milton,	ditto	,,	4		438½
Elsecar,	ditto	,,	2		427

The waste in re-melting the hot-blast iron was under 2 per cent.

	Cwt.	qrs.	lbs.
There was charged into the cupola No. 3, pig-iron . . .	20	1	0
Pigs and scraps obtained	19	3	14
		1	14

The results of the experiments upon malleable iron made from hot-blast pig, and plate, show extreme ductility, when subjected to blows of a hammer 24 lbs. weight, of which one example will suffice.

A bolt 2¼ inches diameter, puddled from refined metal, notched half round to the depth of one-eighth of an inch, required 120 blows to break it.

Mr. Cottam. Mr. Cottam remarked, that the paper would have been more satisfactory, if it had stated more particularly the progressive additions of the weights, the intervals of loading, and the length of the periods during which the bars remained loaded. He had found that when a beam was near the point of fracture, if the weights were added quickly, it would apparently bear more, than if a certain time was suffered to elapse between their application. His practice in experimenting was to make small additions of weight, at given intervals, which might be increased in length toward the point of fracture; more correct results were thus obtained.

Mr. Lowe. Mr. Lowe believed, that in making iron, the main consideration after selecting good materials, was to proportion them according to