METAL IMPORTS FROM GREAT BRITAIN.

The following are the sterling values of the imports of interest to the metal trade from Great Britain during June and the six months ending June, 1897, 1898:—

	Month of June.		Six months ending June.	
	1897	1898.	1897.	1898.
Hardware and cutlery	£6,283	£1,675	£31,930	£11,918
Pig iron	1,847	384	2,865	6, 7
Bar, etc.	808	1,627	5,013	6,737
Railroad	..	7,845	20,286	14,817
Hoops sheets, etc	6,245	5,034	22,690	16,626
Galvanized sheets	3,377	3,187	19,375	24,167
Tin plates	7 981	11,507	88 953	73,475
Cast, wrought, etc., iron	2,369	2,684	17,334	16,342
Old (for re-manufacture)	925	1,571	1,497	3,075
Steel	4,958	3,559	23,438	27,857
Lead	2,806	4,240	7,260	12,290
Tin, unwrought	909	1,698	9,834	10,785
Alkali	3,638	4,273	15,360	21,010
Cement	1,777	1,700	6,555	10,052

FIRE-PROOF BUILDINGS.

BY FRANCIS C. MOORE.

I think it advisable, in an article of this kind, to state, as premises, certain propositions which might be treated as deductions. Some of them are self-evident, and ought to appeal to any practical mind as being truths, rather illustrated than demonstrated by the experience of the past few years. In accordance with this line of treatment, I desire to state by way of premise:

It may be claimed that no construction is "fire-proof," and that even iron and masonry could with propriety be designated as "slow burning." The iron or steel used in a modern building has, in its time, been smelted in a furnace which presented no greater capacity for running metal into pigs than some of our modern buildings, whose interior openings from cellar to roof correspond to the chimney of a furnace, and the front door to its tuyere. If a pyrometer could be adjusted during the progress of a fire it would be found to rise quite as high as in any forge.

Glass windows will not prevent the entrance of flame or heat from a fire in an exposed building. It may seem strange that so obvious a proposition should be thought worth stating, and yet to-day more than 75 per cent. of the "fire-proof" structures of the country have window openings to the extent of from 30 per cent. to 70 per cent. of the superficial area of each enclosing wall without "fire-proof" shutters. Heat from a building across a wide street finds ready entrance through windows, and the several "fire-proof" floors serve only to hold ignitible merchandise in the most favorable form of distribution for ignition and combustion, like a great gridiron, to the full force of a neighboring fire. A recent article on the Pittsburgh fire in The Engineering News aptly expresses this in the following words: "There seems to be some irony in calling buildings 'fire-proof' which opposed hardly anything to a fire from across the street more sturdy than plate glass!"

Openings through floors for stairways or elevators, gas, water, steam pipes, and electric wires, from floor to floor of "fire-proof" buildings tend to the spread of flame like so many flues and should be fire-stopped at each story. This fault is more generally overlooked than any other. Ducts for piping, wiring, etc., should never be of wood.

In view of the fact that it is necessary to cover iron with non-combustible, non-conducting material to prevent its exposure to fire and consequent expansion, and in view of the fact that all ironwork, except cast iron, will rust to the point of danger, it is best to use cast iron for all vertical supports, columns, pillars, etc. It is not advisable, of course, to have floor beams of cast iron (except in the form of Hodgkinson beams thoroughly tested). If a floor beam should give way, however, it might not necessarily wreck the building, whereas if a vital column should give way a collapse of the entire structure might result.

At a convention held some years ago in New York, at which were present a greater number of experts in iron than probably ever met before or since in one room, there was not one who contended that cast iron would rust beyond the harmless incrustation of the thickness of a knife blade, whereas there was not one who did not believe wrought iron would rust to the point of danger; and there was not one who claimed to know whether steel would or not, each admitting that steel had not been sufficiently tested as to rust to warrant a reliable opinion. If it could be relied upon as rust-proof, it would be superior to all other material for "fire-proof" buildings because of its great strength in proportion to weight. The use of steel in construction is growing, because it is cheaper than wrought iron, as lighter weights are used for the same strength, but while supposed to be superior to wrought iron, some of the prevailing impressions with regard to it are erroneous. Defects not possible of detection by tests are liable to exist in its structure. Among the first steel beams brought to the city of New York there were instances in which they were actually broken in two by falling from the level of trucks to the pavement, probably due to their having been rolled when too cold, as steel when rolled below a certain temperature becomes brittle. Better beams are now made. In my opinion, cast iron columns are superior to steel and more reliable. It is not generally known that American cast iron is vastly superior to English cast iron, and will stand a greater strain without breaking. Cast iron, moreover, will not expand under heat to the same extent as wrought iron and steel, which is another fact in its favor.

No bearing column should be placed in such a position that it cannot be uncovered and exposed for examination without danger to the structure. One of the ablest architects in New York makes it a rule to so "fire-proof" his columns that they can be examined at any time by removing the "fire-proofing" to determine whether rust has invaded their capacity to carry their loads. In my judgment, examinations should be made, from time to time, in this way, of all wrought-iron or steel columns, as it may happen that a leaky steam or water pipe has worked serious harm. Such a discovery was accidentally made recently in an important New York building. Numerous newspaper paragraphs appear, from time to time, which claim that metal stripped of its covering of cement has been found exempt from rust, with the paint intact, etc., and the fact is cited as evidence that cement is a preservative of iron and that the danger of rust is over-estimated. It is probable that cement will protect paint for a long time, and, of course, paint, if properly put on, will protect iron while the oil in it lasts. Painting, by the way, should be done with the best quality of linseed oil and without the use of turpentine, benzine, or dryers. It should be thoroughly applied in three coats, with about a gallon to 400 square feet, and the iron should be first thoroughly cleaned of rust and dirt, by picking or other process. Paint is rarely properly applied, however, and even when of the best quality, is a preservative of the metal, as already stated, only so long as the oil in it lasts.

Those who claim to have evidence of the exemption of iron from rust rely, I think it will be found, upon iron which has been under exceptionally favorable conditions, free from dampness, the action of gases, etc., overlooking the fact that a leaking water pipe or steam pipe, or the escape of gases from boiler furnaces will attack iron and gradually but surely consume it. A notable instance of this is the case of the plate girder of the Washington bridge over the Boston and Albany Railroad in Boston, where a quarter-inch plate girder was recently found to be entirely consumed in places from the operation of gases from the locomotives passing below.

It is quite common to have advocates of wrought iron cite railroad bridges and the elevated railroad structures of New York as proof of their claims, but if they will take the trouble to examine these structures, they will discover that in spite of the fact that they are exposed to view, that they can be painted frequently, the evidences of rust are unmistakable, especially about the rivets; and one can well imagine what would be the result in the case of riveted iron members in the skeleton structure of a building where such ironwork is entirely concealed from view, periodical inspections being impossible. Rust is especially liable to be found in the cellars and basements of buildings. The wrought-iron friction brakes of freight elevators in the cellars of stores, for example, are frequently found so consumed with rust as to be easily rubbed to pieces in the hand. Steel rivets are dangerous and they should never be used, unless of a very superior quality, so soft that hammering will not crystallize the material, and yet with sufficient tensile strength

*Extracted from the publications of the British Fire Prevention Committee.