Capacity of Cupolas," as published by the Frick Coke Co., in a circular upon the use of coke as a fuel for melting iron, in which the assertion is made that coke melts 20 per cent. more iron than coal, and 25 per cent. faster. Upon the strength of this assertion I have calculated the capacity of cupolas using coal as fuel, and have added the results thus obtained to this table :

	COKE.				COAL.		
Diameter of Cupola.	Melting Capacity pounds.	Melting Capacity, when slagged	Capacity per hour, Pounds.	Blast Pressure.	Melting Capacity, Pounds.	Capacity per hour.	Blast Pressure.
20 in.	3,000	4,500	1,715	4 oz.	2,400	1,028	5 oz.
24 "	6,000	9,000	3,430	5 "	4,800	2,056	6¼ "
28 "	9,000	13,500	5,145	6 "	7,200	3,084	7½ "
32 "	12,000	18,000	6,860	6½ "	9,600	4,112	7¾ "
36 "	15,000	22,500	8,575	7 "	12,000	5,140	8¾ "
40 "	18,000	27,000	0,290	8 "	14,400	6,168	10 "
44 "	21,000	31,500	2,005	8½ "	16,800	7,196	10½ "
48 "	24 000	36,000	3,720	9 "	19,200	8,224	11¼ "
54 "	30,000	40,000	7,150	10 "	24,000	10,280	12½ "
58 "	34,000	51,000	9,429	11 "	27,200	11,425	13½ "
62 "	40,000	60,000	2 857	12½ "	32,000	13,714	15½ "

The table below designated "Sturtevant,' is complied from Sturtevant's experiments, and represents results obtained by actual tests. The table designated "West" is an extract from the " Moulder's Text Book " by Thos. D. West, page 314.

	STURTEVANT.				WEST.		
Diameter of Cupola.	Melting Capacity, Pounds per hour.	Cubic feet of air per minute in blast.	Blast Pressure in ounces.	Diameter of Cupola.	Melting capacity, Pig, not slagged.	Melting Capacity, Slagged.
22 in.	1,200	324	5 oz.	20 in.	4,000	6,000
26 "	1,900	507	6 "	25 "	6,000	10,000
30 "	2,880	768	7 "	30 "	8.000	14,000
35 "	4,130	1,102	8 "	35 "	12,000	20,000
40 "	6,178	1,646	10 "	40 "	14,000	26,000
46 "	8,900	2,375	12 "	45 "	18,000	36,000
53 "	12,500	3.353	14 "	50 "	22,000	46,000
60 "	16,560	4,416	14 "	55 "	26,000	56,000
72 "	23,800	6,364	15 "	60 "	32,000	70,000
84 "	33,300	8,880	16 "	65 "	38,000	84,000
				70 "	46,000	100,000
				75 "	54,000	120,000

A comparison of the above tables will show a difference in the results obtained by each of the authorities quoted. In some instances this difference is considerable ; in others trifling. To the practical foundryman this difference is easily accounted for. The word *management* will account for the variations in the results in the different tables, for in the management of any cupola lies the principle cause of the good or poor results obtained. All foundrymen have seen with a change of melters, a change in the working of the cupola, sometimes for the better, sometimes for the worse.

The melting qualities in a cupola, good management, fuel and blast being guaranteed, are governed almost entirely by the tuyeres.

MECHANICAL WRINKLES.

AN experienced machinist contributes the following : Straightening fly wheels, shafting, etc. It once happened that a 12 ft. fly wheel, 14 inch face, put up by one of our prominent iron works, proved untrue laterally by a quarter of an inch, when all set up ready to run. To have taken the wheel down, bored, bushed and rebored the hub, would have been a tedious and expensive job. The defect was perfectly remedied by pening the arms on the side from which it was desired to throw the rim. The arm in the center of the distorted portion was pened the more, and those on each side of it, rather less. When the wheel was made nearly right, by blows with a heavy hammer, the perfecting touches were made with a ball-faced hammer and the trifling dents hidden with "filler" and paint.

The same mechanic used to straighten heavy cast iron shafts, used twenty years ago, in the same way, by p ing, and frequently rectifies light shafting which has sprung, by a few hammer touches on the hollow side.

A cheap boring bar, for sizihg and turning bearings in cast iron machine framing, etc., is made by taking a plain round iron bar, and *clamping* to it with a lathe dog, a cutter worked out of square steel, one side hollow to fit the bar side, and the two ends at 60° angles. This bar cuts either ended ; is quickly made and adjusted ; is quite effective and the cheapest yet brought to our attention.—*Practical Mechanic.*

The Port Arthur Council will submit a by-law to grant a bonus of $10,000 to W. & J. G. Greey, of Toronto, to aid in the erection of a flour mill. A similar amount will also probably be voted to Hastings Bros. & Co., of Winnipeg, for a similar object.

Western Letter.

NO further evidence has been secured upon which to base an estimate of the wheat crop of Manitoba for last season. The delivery of wheat at provincial points continues to grow lighter each week. Receipts at Lake Superior elevators of Manitoba wheat have ranged about 40,000 to 50,000 bushels per week, recently, or a little over one half the amount of weekly receipts a year ago. The total quantity of wheat which has gone into store up to the time of writing, is about 1,940,100 bushels, against about 3,420,000 bushels to the same date last year. This shows a heavy decline, and will give an indication of the shortage in the crop this year, as compared with last. Shipments all rail are also light. Another way of looking at the matter is to take individual markets in the province, and compare the quantity of wheat received this crop with last crop. Thus for instance, at Brandon, less than 400,000 bushels have been marketed up to the time of writing, and probably two-thirds of the wheat in the district has been brought in. Brandon will therefore receive between 500,000 and 600,000 bushels from this crop—probably not greatly in excess of the minimum estimate—against over 1,000,000 bushels from the crop of 1887. Deloraine, the second largest market in the province last year, took in about 800,000 bushels from the crop of 1887. This year it is expected that not over 250,000 bushels will be received. Of course the falling off has not been as great at all points, but at some of the smaller markets it has been proportionately greater. Of the wheat shipped eastward, about 700,000 bushels are in store at Port Arthur and Fort William elevators. There is no definite way of arriving at the amount of wheat held by farmers, but it is variously estimated at the wide range of from one to two million bushels. The mills have kept running pretty steadily, and will turn out about the same quantity of flour as last year, namely, about equal to 2,500,000 bushels of wheat, of which about 1,800,000 bushels will be available for export. A small portion of this, however, will go westward to British Columbia and the territories.

In connection with the gathering of grain statistics, it may be noted that the Winnipeg Grain Exchange recently appointed a deputation to wait upon the local Government, and urge the adoption of some system of gathering crop statistics. A very efficient system of crop reports was carried on by the late Norquay Government, but the present Government discontinued this service on the ground of economy. It is likely that the work will be resumed.

The first annual meeting of the Winnipeg Grain and Produce Exchange was held recently. The Exchange was organized on Nov. 24th, 1887, and it is therefore a little over a year old. Already it has become a flourishing and important institution. The Exchange was formally opened on Dec. 7, 1887, and daily meetings for the transaction of business, buying and selling grain, et ., have been held. At the meeting to organize the Exchange, ten leading local dealers were present. The membership has increased steadily from the beginning, and has now reached over 100, the members being mostly grain dealers. The entrance fee, which was first fixed at $15, is now $100. Many dealers in outside towns have become members. The institution has been a great assistance to the trade, not only in facilitating trade transactions, but also in disseminating information among dealers, both of a local and foreign nature. Telegrams and cables are being constantly received from the leading American, British and European markets, giving information as to prices and other features. One of the latest moves made by the Exchange is in the direction of organizing a call board. Rules governing a call board have been arranged, but so far the proposed board has not been put into operation. It is not likely that it will be put into operation during the present crop year, and for the present dealing in futures will consequently not be indulged in. It will, however, likely go into operation next fall should the crop turn out well next harvest. Financially, the Exchange has been a success. At the end of the first year the treasurer's report shows a balance on hand, after meeting all expenses, of $1,132. The first officers of the Exchange were : D. H. McMillan, president ; G. F. Galt, vice-president ; C. N. Bell, secretary ; A. Atkinson, J. A. Mitchell, N. Bawlf, S. Spink, D. G. McBean, W. A. Hastings, and K. McKenzie, committee of management. The present and recently elected officers are : S. Spink, president ; N. Bawlf, vice-president ; C. N. Bell, secretary-treasurer. Council—A. Atkinson, D. H. McMillan, W. A. Hastings, J. A. Mitchell, H. Crowe, F. W. Thompson, A. H. Plewes, Geo. McBean, D. H. McBean, S. Nairn, H. S. Patterson. Board of arbitration—S. Spink, G. F. Galt, A. McDonald, F. W. Thompson, W. A. Hastings, A. Atkinson and N. Bawlf.

Though Manitoba has now direct connection with Duluth via the Northern Pacific Railway, and trains are running daily over the road, yet so far very little grain has been shipped out via Duluth or the new railway. The C. P. R. continues to handle about the entire grain traffic of the country. The main reason for this is, that the new road does not reach any of the principal grain markets, and as yet very little grain is delivered at any of the stations on the line. The road reaches Winnipeg, but all the grain marketed in the city is required for local consumption, and there is none to ship from here. The wheat goes to the city mills, the barley to the breweries, and the oats are required for feeding in the city. Prices to farmers for grain at Winnipeg are always higher than at outside markets, and usually too high for shipment east, owing to the local demand. At present oats and barley are worth 5 to 10 cents more here than in country markets, prices to farmers being quoted.

The Northern Pacific will be obliged to extend its road throughout the province, and erect elevators on its line, before it can do much grain trade. Here the C. P. R. has a great advantage. In the towns already established, the elevators are all on the C. P. R. line. The Northern Pacific might run into these towns, but it would be at a disadvantage from not having elevators on its road, and in a good many of these towns, it would not pay to build more elevators. Another disadvantage in shipping via the new road, is the customs regulations. Cars of grain shipped to Duluth must be forwarded in bond, and the cars must be sealed by a customs officer, on Canadian territory. Then the grain must be received at Duluth by a Canadian customs officer, and stored in special bins, under his charge. From these bins it can be shipped in Canadian boats only to points in Eastern Canada. The Northern Pacific railway is obliged to pay for the cost of maintaining a Canadian customs officer at Duluth. When grain is shipped all rail via the United States, to Eastern Canada, the cars are sealed here and remain so till they arrive in the east. Some shipments were made via Duluth before the close of navigation, and a few cars have been sent through all rail by the southern roads. Grain going to Duluth from Manitoba would of course be under the charge of a United States customs officer while in store there, so that the necessity for a Canadian customs officer at Duluth does not seem to exist. The Canadian Government, however, have insisted upon the maintenance of an officer there, at the expense of the railway company, otherwise the grain would not be received back into Canada free of duty. The full value to Manitobe of a competing railway to the south will never be secured until the United States decides to admit wheat free of duty. Then Manitoba dealers would be able not only to ship via Duluth and Minneapolis, but also to sell their grain in these markets. That the United States Government will see the wisdom of admitting wheat free is not at all unlikely. Manitoba wheat is a raw material which Minneapolis millers want, and its admission into their country free of duty would materially assist their great flour industry, while it would in no way reduce prices to farmers in Minnesota and Dakota. The admission of Manitoba wheat into the United States free of duty, would therefore be a mutual benefit to both Manitoba producers and Minneapolis millers, while it could not injuriously affect any United States interest.

The rage for granting bonuses to flour mills still continues here, though it is noticeable that bonuses now offered are not as large in amount as those granted a few years ago. There are a number of points, however, where small bonuses, ranging from $1,000 to $5,000, are offered for the establishment of mills. There are several points in Manitoba and the territories which offer excellent inducements for the establishment of small mills, of say about 100 borrels capacity, and where a very large local and farmers' trade could be done. Some of the best settlements in the province are still without mills. In the past, mills have not always been established at the best points for business, bonus inducements having led to the erection of mills at less favorable points, so far as business and natural advantages were concerned.

Hastings Bros. and McGaw, late of the Winnipeg branch of the Ogilvie Company, have not yet decided where they will erect their large mill. When established this mill will be next to the Ogilvie mill here, the largest in Manitoba. The capacity will be not under 600 barrels. Port Arthur has offered them a bonus of $10,000 to build the mill at that place. Port Arthur has the advantage of cheap fuel, but its distance from the source of wheat supply is a disadvantage. Hastings Bros. & Co. intend to do a wheat-buying business in Manitoba, and should they establish their mill at Port