GYPSUM ENTERS INTO MANUFACTURE OF PORTLAND CEMENT AS RETARDER

Pottery and Glass Works are Large Consumers of the Calcined Products--Gypsum Hollow Tiles are Practically Incombustable -- Cement Plasters Fast Replacing Old-Time Lime Plasters

The greater part of the gypsum produced, is manufactured by grinding and partial or complete calcination, into various plasters or plaster cements such as, plaster of Paris, stucco, cement plasters, hard finish plaster, flooring plaster, etc.

These have been conveniently classified by Eckel in his work on Cements, Limes and Plasters as:—

"1. Produced by the incomplete dehydration of gypsum, the calcination being carried on at a temperature not exceeding 400o F.

(a) Plaster of Paris:—Produced by calcination of pure gypsum, no foreign materials being added either during or after calcination.

(b) Cement Plaster:— Produced by the calcination of gypsum containing certain naturel impurities, or by the addition to a calcined pure gypsum of certain materials which serve to retard the set of the product.

(2) Produced by the complete dehydration of gypsum, the calcination being carried on at a temperature exceeding 400oF.

(a) Hard Finish Plaster:— Produced by the calcination at a red heat or over, of gypsum to which certain substances (usually alum or borax) have been added.

(b) Flooring Plaster:—Produced by the calcination of pure gypsum."

Gypsum is used in the manufacture of Portland cement as a retarder, either as crude gypsum, as a calcined or dead-burned (anhydrous Plaster). Considerable quantities are ground without calcining and used as land-plaster or fertilizer, while smaller quantities are used in the manufacture of paint and paper also as an adulterant in food stuffs.

The pottery and glass works are large consumers of the calcined product.

It is used with wines to retard fermentation and prevents the formation of too much free acid, also to absorb water and strengthen the product. It may be worthy of note to mention that it is claimed that the superiority of certain English beers is attributed to the presence of calcium sulphate (gypsum) in the natural water used for their manufacture.

It has been used for several years as a sulphurizing and basic flux in several smelting operations.

Plaster of Paris:— Calcined plaster is a general term anplied to all plasters produced at a temperature not exceeding 400oF., to which no foreign material has been introduced. If this article is manufactured from a pure gypsum it is a plaster of Paris, or stucco, which are almost identical, being usually manufactured from a fairly pure gypsum but not quite so finely ground.

Cement Plaster:— Although plaster of Paris and cement plasters are essentially different in their properties and uses, yet their process of manufacture is very similar. As has been noted, plaster of Paris is manufactured from the purest gypsum and is quick-setting, while cement plasters are slow in setting, being manufactured from a naturally impure rock or by adding some substance known as a "retarder" to the material during or after its manufacture.

Cement plasters are fast replacing the old-time lime plaster for the interior construction of buildings. In the United States the ratio is about nine to one in favor of the cement plaster. Less than twenty years ago this was practically reversed.

Being a good non-conductor of heat it becomes very valuable in the construction of fire-proof structures. When used in the construction of fire-proof partitions in buildings the material is usually mixed with wood or cocoanut fibre and moulded into blocks 30 inches long, 12 inches wide and when solid 2 inches thick. They are sometimes cored, that is, having two or three holes through them longitudinally; in such cases the blocks are made 3 inches thick.

Studding is also made of this same mixture being cast three inches square over a core of wood. This wood is generally used in two separate one by two inch strips.

Boards made from this material are mixed with wood or cocoanut fibre or as a substitute, sawdust, rushes or excelsior, and cast on iron tables. Other manufacturers use thin cotton cloth or felt paper in alternating layers with plaster in making boards.

Interior partitions constructed either out of this material or from gypsum blocks are considered by the best American authorities to be fire-proof in all that term applies.

To prove this a fire and water test was made by the Columbia University of New York. A building was constructed for this purpose 14' x 9' 6", the foundations were 2' 4" from the ground and upon them were placed grates, suitable draft openings were made in the foundations and chimney flues were provided. The end walls and the roof were reinforced concrete. The side walls which would be equivalent to the partition in a building, were made of plaster blocks of gypsum hollow tiles of two different thicknesses. Those on the East side were 2" thick and solid, on the West side they were 3" thick with three holes running through them longitudinally.

The building when completed was fired with dry cord wood and refuse lumber, for a period of one hour. The average temperature on the inside was 1712 degrees F., while on the outside (only 3" away) it was 127 degrees. At the end of the hour, water was supplied through an open door in the end, from 1½" nozzel, having a hydrant pressure from 25 to 30 pounds per square inch, and the fire quenched.

The result of this test was most satisfactory to the Building Bureau of New York City, and demonstrated:—

1—The gypsum hollow tiles are practically incombustible.

2—That the material is a specially good non-conductor of heat, showing less than 7% of the incense heat inside succeeded in going through a 3" partition.

In manufacturing moulds for pottery work, plaster of Paris is extensively used and for this purpose the Nova Scotia Gypsum is particularly well suited. Mr. S. A. Weller a pottery manufacturer of Zanesville, Ohio, writing to the chairman of the "Ways and Means Committee at Washington, D. C., on Nov. 26th, 1908, said:—

"We use in the manufacture of moulds considerable plaster which is made from Nova Scotia gypsum, it being the only plaster which makes a satisfactory mould in our work." And for the manufacture of models for terra-cotta, Mr. Saul of the Atlantic Terra-cotta Company of New York, writing to the above committee on Nov. 24th, 1908, said:—"Calcined plaster from Nova Scotia gypsum is absolutely indispensible." These industries are important consumers of plaster of Paris in both England and the United States.

Plate Glass works:— In manufacturing plate glass, large quantities of plaster of Paris are used for bedding the plates on large circular tables, where they are to be polished. For this purpose it requires 2200 pounds of plaster of Paris for each 1000 square feet of glass polished.

Plaster produced by complete dehydration:— Flooring plaster is included under this classification, being a product of calcination at a temperature exceeding 400oF. It is a plaster entirely free from water and manufactured from the purest gypsum. In manufacturing it the gypsum is not finely ground but broken in small lumps, is calcined in vertical kilns by hot gasses, usually from coal burned as fuel on a grate at one side of the kilns, passing directly through the mass and raising it to a temperature of 500oC., and maintaining this temperature for not more than four hours.

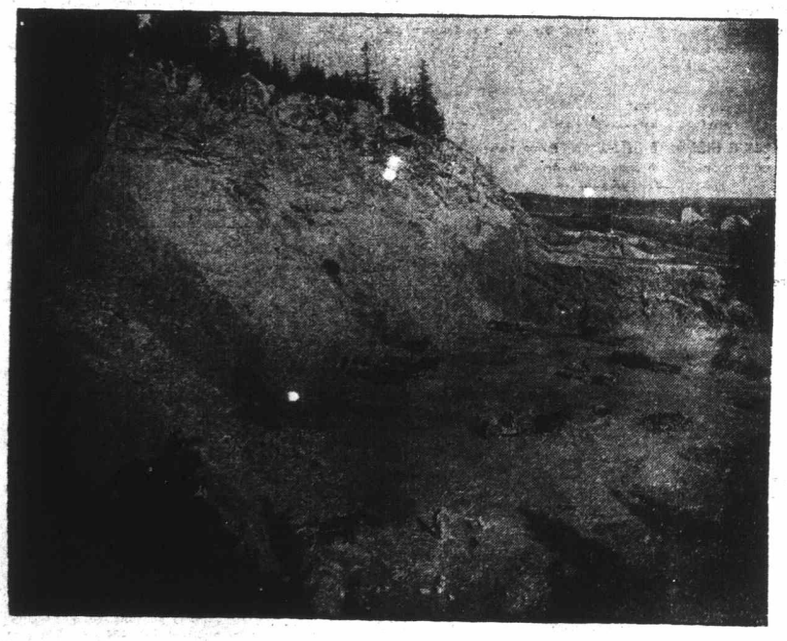
Hard wall plasters:— The materials classed under this heading are, owing to the high temperature at which they were calcined, (exceeding 400oF.) slow-setting, and owe their hardness to this and to the fact that they have been treated by some chemical as borax or alum during manufacture. In this classification are placed a large number of different cements which are defined as hard-finish plasters. Some of theme are known commercially as, "Keen's cement", "Martin's cement", and "Mack's cement."

Use in Portland cement:— In the manuacture of Portland cement, gypsum in its crude state or manufacture as a plaster of Paris or as dehydrated plaster, is used as a retarder, and it also has, in small quantities a beneficial effect in increasing the tensil strength of the cement. It has been shown by laboratory tests, and in actual practice, that from two or three per cent used gives better results than either greater or lesser quantities. For this purpose the cement manufacturers of Canada use from 20,000 to 30,000 tons of gypsum annually.

The form in which it is used to get the best results, is a question open to much discussion, but as a matter of fact the manufacturers of Portland cement in the United States use it almost exclusively in the crude form.

Alabastine:— Alabastine, often called cold-water paint is manufactured from the purest gypsum; ground, calcined and reground to the finest powder. This extra fine calcined plaster is mixed with various metallic colors and with the addition of water may be used for tinting walls. If properly mixed and applied it will set like wall plaster and will not rub or scale off. It may be applied coat over coat on any solid surface as wood, brick or iron, with a satisfactory result.

Adulterant:— Uncalcined gypsum is often used as an adulterant in the manufacture of white lead, where it is claimed to have a beneficial effect. It is also used as an adulterant of various foods and drugs.



GYPSUM QUARRY AT WALTON, HANTS COUNTY, N.S.

Crayons:— In making crayons for blackboard and carpenter's use, the ground uncalcined gypsum is used extensively by mixing it with other ingredients (a secret formula) and pressed in the shape required. One Company alone, in the United States uses for this purpose nearly 1000 tons of gypsum annually.

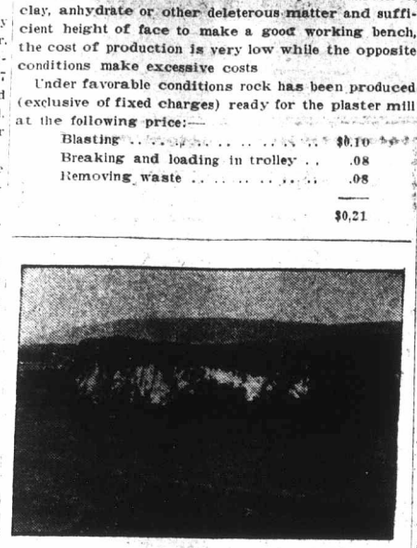
Cost of Production.

The cost of production of crude gypsum varies much with the condition of its occurrence in the different deposits but it can be safely said that at different points in the Maritime Provinces there are deposits from which the rock can be produced at as low a cost, if not lower than at any other place in the world. The material is soft and can be bored with the ordinary crank auger and having usually a free face it blows well. The breaking which is usually done with a sledge or specially designed pick, is not an expensive operation to one accustomed to the work.

If the quarry is free from a heavy overburden of clay, anhydrate or other deleterous matter and sufficient height of face to make a good working bench, the cost of production is very low while the opposite conditions make excessive costs

Under favorable conditions rock has been produced (exclusive of fixed charges) ready for the plaster mill at the following price:—

Blasting	$0.10
Breaking and loading in trolley	.08
Removing waste	.08
	$0.21



Undeveloped deposit of gypsum in Victoria County, N. S.

In a few of the quarries operating in Nova Scotia this price would be considered reasonable but in many others, especially where there is an overburden of clay of 20 feet or more in thickness to be removed, it would be much too low.

Owing to the fact that in the past we have operated purely fort export many million tons of this material may be seen in the old dumps at the different quarries which for manufacturing purposes was equally as good as that shipped away.

The loss in weight in manufacturing is also a matter of consideration. Where the hygroscopic water does not have to be considered, the usual allowance made for the loss is from 15 to 20%, according to how near complete dehydration the manufactured product requires to be, together with the waste of material in dust which is often appreciable. We may therefore estimate that to produce one ton (2000 lbs.) of calcined plaster it would be necessary to furnish 2500 lbs. of crude rock, which would cost as above estimated about 26c. Assuming coal to be used as fuel and its cost at the mill $3.00 per ton, we have the following calculation exclusive of fixed charges:—

2500 lbs. of crude rock	26c
375 lbs. coal for power, and calcining kettle	.16"
Labour at mill	.35"
	$1.07 per ton.

To the above cost before the material can be marketed, must be added the cost of package.

In the United States plasters are usually packed in jute sacks containing 100 pounds or in paper bags containing 80 pounds each. Sack cost the mill from four to six cents and any not returned yield a fair profit. A charge of 50 cents per ton is usually made for packing in paper bags which are not returnable.

Markets.

It is pleasing to note, that with the growth of Canada the gypsum industry is receiving a fair proportion in the increase. The value of this industry in 1912 was over one and three quarter millions and this, exclusive of imports of plaster boards made with alternate layers of calcined plaster and paper. There are large quantities of this particular board being imported annually from the United States. This is classified and pays duty as paper, and is not included in the imports of gypsum. Such articles as plaster board, hollow tiles or hard wall plaster etc., are no specified in the customs tariff, and are not classified by themselves in the customs statistical returns. It is therefore almost impossible to get accurate statistics regarding the importations of these different products. It is only necessary, however, to visit the industrial centres of the country and see the large buildings, such as the Linton apartments at Montreal, the Chateau Laurier at Otawa, the new theatre at Calgary and mny others throughout the length and breadth of the land, which have used this material in their construction, to realize the importance of the industry and the possibilities of a Home market.

Not the slightest attempt has ever been made by us to secure any foreign market for manufactured gypsum. Content have we been, to allow our crude material to go from us and to be manuacatured by others and to allow others to supply our requirements in the manufactured article. While we have been accepting the fact that there was no other market for us but that of the United States, the manufacturers there, on the other hand, were not only supplying their own trade but shipping considerable quantities abroad.

It is true that while we held control of their supply of crude rock and could at any time close every mill on their Atlantic coast, they placed a prohibitive duty on the manufactured article and we never murmured. Never have we asked for reciprocity in the products of gypsum, never have we asked to even have the duty reduced, and whatever reduction has been made within the past few years, was made at the instance of and for the benefit of those interested in the United States.

W. F. JENNISON.

Truro, Nova Scotia.

CONTRACT HOLDERS OF C. H. J. C. BECOME ORDINARY CREDITORS.

Vancouver, B.C., March 27.—Argument as to the status of the different contract holders in the Canadian Home Investment Company has been brought up in chambers before Chief Justice Hunter, the court directing that the lapsed contracts on which payments had been made prior to lapsing, became ordinary creditors for the amount of the claim, less the fines which would have been inflicted in the usual order of business, the holders of paid-up certificates becoming ordinary creditors for the amount certified to, and the surrendered contracts sharing pro rata on the trust funds in the hands of the liquidator and becoming ordinary creditors for any deficit.

How The Royal Engineers Do It

"Sapper," in The London Mail.

Sergeant Michael Cassidy, of the Royal Engineers, had promised to tell me the story of Dennis O'Rourke and what happened at the bridge. So I strolled round to his hospital in the afternoon to hear it.

I found him sitting up and he lit one of my cigarettes as he began the tale.

"'Twas a hot day in the early stages when we were drawing the Germans after us into France, when we received the order to go at once to a bridge near by and have it prepared for the demolition. Mr. O'Rourke was in charge, and I was with him, and we had about a dozen of the lads. When we got there we found 'twas a big one over a river. Like a sort of suspension bridge, and 'twas evidently an important one. 'Twas a scorching day, and Mr. O'Rourke, he says, 'Let's get it fixed up quick, boys,' he says, 'and it's a bathe we can have." Well, there is not the necessity for me to tell you the details of the fixing, of how we placed the guncotton on the cables, and the leads were running to the exploder hidden behind a tree on one side. We tested it all and we had the bit of fuse and another detonator fixed up in case of any failure in the electricity. When we had it done some of the lads had a bathe, and we lay in the shade of a few trees, most of us fast asleep—for you will mind that our orders were only to prepare it for the demolition, and not actually to blow it up. 'Twas still—'twas just peace. The heat haze shimmering in the blue and the buzz of the little flies were things to send one to sleep, and we were well behind our own men. Two hours later—well we will come to that, sir, but it will give you an idea of how those fellows came on. It seemed as if we had been there but a minute, but maybe it was half an hour, when with a crash one of the Horse batteries galloped over the bridge. The dust rose in great choking clouds, and through it we could see the drivers—their collars open, their faces grey with it, some with hats and some without, sitting down and riding like men possessed, and the guns swayed behind it. In a second they were gone and only the dust remained.

"Mr. O'Rourke he turned to me and he said. 'They were going fast, even for the Horse, he said, 'along a road, and I would to Heaven it had 'been the other way they were galloping,' for I should tell you, sir, they were going south. Five minutes later we heard them come into action quarter of a mile behind us. 'Covering the retreat again,' he muttered, and barely had he spoken when an infantry regiment came in sight—going the same way. Mr. O'Rourke and I we went into the centre of the bridge to keep our eye on the charge, and we watched them come by. Walking dogged they were, with a fixed sort of stare, and some were asleep as they marched and some were whistling through lips that made no noise. The sweat was caked on them and they were grey from head to foot, and the officers were staggering up and down cheering them on—for those lads had been going without rest at all for ten days and more. And one of the sergeants said to me as he went by, he said, 'There are thousands of them and they're behind.' When they had gone I went to Mr. O'Rourke and I said to him, It's close work it's going to be, sir, I'm thinking for they are near behind.'

"And then up galloped a staff officer.

"'Are you the Engineer officer in charge?'" he said.

"I am that," said Mr. O'Rourke.

"There are still two squadrons of Lancers between you and the Germans,' he said, 'and they will be across soon, for they are only covering the infantry who have just gone over. When they are over blow up the bridge, and do not linger to admire the view, for it will be unhealthy.'

"'Very good, sir,' says Mr. O'Rourke.

"'And,' says he, 'let there be no mistake, for the love of Heaven; for should the charge fail we are undone. This bridge is the most important of any there are to be destroyed, and they must not get it.'

"They will not get it," says Mr. O'Rourke, and with that he galloped away. When he had gone we walked off the bridge. 'Pray Heaven Cassidy,' he said, 'that all is well, for we will not have much time if there is a fault, to adjust it.'

"'It will be allright, sir," said I, for we have tested it.

"And then the cavalry started coming back.

"Clear out, you boys," shouted an officer, 'they are in touch with us, and we cannot hold them longer.'

"'Cassidy,' said Mr. O'Rourke, 'take the men back, for it is no good them stopping here.'

"'Would we be leaving you, sir?' I cried.

"'You would not,' he said, 'but what good can you do? For if the charge fails there will be no time to relay it, and if it succeeds, 'twill be easier for me to get away alone than if you are all here.'

"I saw his point and I knew he was right—though it went against the grain to leave him in the lurch, as it were. But he would not alter and so I took them away, muttering and cursing they were. I took them to a little rise under cover two or three hundred yards away, where it was easy to clear from when the bridge was down without us being fired on. Before I went I said to him, I said, 'We will be yonder, and it's there we will wait for you. If you go that way round you can get there easily.'

"Just after we got there we saw a major gallop over the bridge with his orderly behind him, and he shouted something to O'Rourke. We saw him running to the exploder and fixing the leads, and then he paused and straightened himself up behind the tree. From where we were we could see two Uhlans coming near the bridge, with more of them, hundreds of them, behind. And then he forced down the handle of the exploder. 'Mother of Heaven!' I screamed, for nothing happened. He did it again, and it failed again. You will mind, sir, that from where he was he could not see the Uhlans and they could not see him, but we could see both of them from the rise. The men were sobbing and cursing.

"A corporal caught my arm and he muttered: 'It was not to fail,' he said, 'and it has. What will we do?' 'What can we?' I said, 'for they are on the bridge.' And then a sudden we saw the lad creeping along under cover of the trees, and he reached the bridge and ran like a hare to the charge. The Uhlans saw him too, and rode at him, and the men started screaming and cheering, for they were off their heads, and they thought he would be able to do something. 'But what can he do,' I groaned, 'for the fuse will not burn quick enough? They are too close.' He reached the charge first, and his revolver was drawn. It was drawn I say, but it was not at the Uhlans it pointed. For a second he stood there with his head thrown back, and it seemed to us as if he laughed at them. And the lads saw what was in his mind, and they were silent—saving only one, and he threw himself on the ground sobbing. And the Uhlans saw what was in his mind, and one pulled his horse over backwards trying to get off the bridge, while the other rode at him, and then he fired. From the range of an inch he fired into the guncotton and the roar of the detonation shook the heaven. They were there one minute and the next they were not. And then with a great sort of rending crash, the whole thing fell into the river below.

"We looked for a moment, and then we stumbled away—and the most of us could not see with ease—for the lads had loved him well."

Cassidy paused, and looked into the fire.

"So it was not a failure," I said softly, as I left him.

WOOL CLIP OF THE UNITED STATES.

Wool will be the first considerable money "crop" of the season of 1915. Ranchers and farmers expect to do well. There are about 37,000,000 head of sheep of the shearing age in the United States. If each one yields an average fleece of 6.8 pounds, the production in the 1915 season will be 251,600,000 pounds. At an average of 25 cents a pound the gross income would be $63,000,000.

Stockmen in different parts of the country look for some improvement in the sheep industry with the rise in wool and meat prices. The farm value of the 50,000,000 sheep in this country on January 1 was estimated at $224,687,000, averaging $4.50 a head. As late as 1912 it was as low as $3.46, having gained $1.04 a head or 30 p.c. in three years. Last year sheep increased in value $23,884,000 and in number 237,000. Below are the records of wool production for five years:

Years:	Shg. Sheep. Only.	Av. Clip. Lbs.	Wool—Unwshd. Lbs.	Total Sheep.
1914....	37,000,000	6.8	256,000,000	49,956,000
1913....	36,319,000	6.95	296,175,300	49,719,000
1912....	38,481,000	6.82	304,043,400	51,482,000
1911....	39,761,000	6.98	318,547,000	52,367,000
1910....	41,999,500	6.70	321,362,750	53,633,000

LONDON PETROLEUM REVIEW.

The Petroleum Review of London says: "Far from closing our ordinary channels for the supply of petroleum products, the German "blockade" of our coast line has given a decided impetus to the import of oil into the United Kingdom, for, following upon the fairly large shipments recorded last week (February 27) as having been received at English ports, the official figures of arrivals during the present week (March 6) show that nearly 11,000,000 gallons of petroleum products have been imported, this figure almost constituting a record."

The exact figures show that 10,730,000 gallons were imported, all of which came from New York, Port Arthur, Texas; Sabine, Texas; New Orleans and Talara. The Anglo-American Co. was again prominent in the United Kingdom's imports, 7,036,000 gallons being credited to that company exclusive of its imports at Bristol where several large cargoes were received.

TO START MADE-IN-FRANCE CAMPAIGN.

The presidents of 75 French Chambers of Commerce at a meeting at the Paris chamber, decided to gather data regarding articles imported from Germany both by France and allied and neutral countries, which could be made in France.

COMMODITY MARKETS SHOWED

New York, March 27.— The p commodities displayed consider week, there being 43 alteration tions received by Duns Review, vances and 37 declines, but while was upward there was notable co ber of the more important article

Sharp fluctuations were the f market, but the net result was wheat and oats, and a moderate tions of corn and rye. Flour, tically unchanged. Dairy produ steady for this period of the year ing was generally firm no alter occurred in butter, cheese or eg

In live meats beef and sheep hogs somewhat easy, while the sions about offset each other. hides continue decidedly weak, an ther recession in several variet cows, latin American dry hides an tions on leather, however, are fa ed, although the feeling reflects a ward tendency.

Some producers of pig iron redu efforts to stimulate business, but are generally firm and advances a ed on some products. In the minc ous weakness developed in tin, and ing of quotations on spelter, strength was displayed by copper

Raw cotton scored a substantial ished merchandise tends upward, firm, but practically unchanged i teas, sugar, spices, and naval store the enhancement in the prices of chemicals continues.

DULLNESS IN SHOE AND LEAT

Boston, Mass., March 27.—Althou little activity in the retail shoe t proach of Easter and the displayin conditions are quiet in the shoe a generally.

The slow down in factory operat this time, of course, as manufac practically to the winding up of the mer run and the fall run does not g about the first of May. Activity largely for the next few weeks on th cate orders received for spring and

Dullness is even more marked hides than in the shoe industry. T eign orders for leather, which was a materialized to any considerable ext ther dealers are, however, confident advent at any time. Some foreign sole stock are coming along all the main firm for the most part, but considerable softening in calfskins week or two as a result of the flat stock.

Hide prices have worked lower a show reductions of 10 per cent. to 12 the high points, but this is in large m poor quality of the pelts now coming

ARGENTINE WOOL CLIP AF

According to La Prensa of Buenos wool clip of Argentina will yield 85,0 current prices are obtained, will pr U. S. currency. Never in the bus these countries has wool realized su are now being paid, due entirely to for this raw material in certain of t gaged in the war in Europe. Althou wool clip is less in quantity than last value compensates for this shrinka proceeds should amount to about t year's.—Consular Report.

BUILDING UP BETTER LIVE STOCK FOR WESTE

Regina, Sask., March 27.—An offic inion Department of Agriculture sta partment is well pleased with the res of supplying pure bred stock to farm elling all over Satskatchewan he finds which has been in operation three y out well. The stock is well looked af ty-five per cent. cases are having a effect on building up a better quali in farmers' hands.

NEW OIL REFINERY FOR VA

At a cost of $1,000,000, the Imperia Ltd., is erecting a new refinery on the Burrard Inlet, near Vancouver, which eration in about three weeks' time. plant will give employment to 200 me Five hundred men have been engage struction work for the past nine mon

THE HIDE MARK

New York, March 27.—There were n ments in the hide situation yesterday. tinued to hold aloof from the marke dry hides and no sales were reported. easy and quotations are merely nomi sence of transactions. There were no f reported in wet or dry salted hides.

Orinoco	
Laguayra	
Puerto Cabello	
Caracas	
Maracaibo	
Guatemala	
Central America	
Ecuador	
Bogota	
Vera Cruz	
Tampico	
Tabasco	
Tuxpam	
Dry Salted Selected:—	
Payta	
Maracaibo	
Pernambuco	
Matamoras	
Wet Salted:—	
Vera Cruz	
Mexico	
Santiago	
Cienfuegos	
Havana	
City slaughtered spreads	
Native steers, selected 60 or over	
Ditto, branded	
Ditto, bull	
Ditto, cow, all weights	
Country slaughter, steers 60 or over	
Do., Cow	
Do., bull, 60 or over	