

maintain an inefficient animal before the war, now it is uneconomical and unpatriotic.

Many men are buying the best pure-bred stock, who in a less critical time might have worked with animals of lower merit.

But in the present situation they do not care to chance even the trial of inferior animals for the sake of a tem-porary saving in the purchase price.

DALTON Massachusetts

## SHORTHORNS FOR SALE

Good animals of both sexes. Burlington phone and G.T.R. Jct. Radial every hour from Hamilton.

C. N. Blanshard, R. R. 2, Freeman, Ont.

## Mardella Shorthorns

Herd headed by The Duke, the great, massive, 4-year-old sire, whose dam has 13,599 lbs, of milk and 474 lbs. of butter-fat in the R.O.P. test. I have at

#### THE FARMER'S ADVOCATE.

#### The Formation of Diamond

The formation of diamond is a subject which has apparently commanded greater attention from eminent scientists than has been generally known. As a mere scientific achievement, the possibilities had a peculiar attraction, altogether apart from any commercial potentialities. It has long been known that the diamond is almost pure carbon, being converted to charcoal at high temperature, and burning in oxygen with the production of carbonic acid gas in the same proportion as pure carbon. If the transforma-tion of diamond to charcoal takes place at high temperatures, what may be the possibilities of the reverse change, and, if effected, what are the prospects of commercially producing diamonds?

As crystalline carbon the diamond is worth millions of times as much as its amorphous allotrope, charcoal. Crystallization usually occurs during solidification from gas, liquor or solution. Metals crystallize on solidification from fusion, while salt and sugar crystallize from saturated solutions. Can carbon be made to crystallize from either of these conditions? As far back as 1880 Marsden showed that black diamonds were to be found in a mass of silver melted in a carbon crucible and raised to the temperature of melting steel. The first systematic investgation, however, was carried out by Proessor Henri Moissan. Charcoal dissolves freely in iron at a very high temperature. With ordinary cooling the carbon separates as graphite. No diamonds result from slow cooling. Some consideration of slow cooling. Some consideration of the conditions likely to obtain in the formation of diamonds in nature led Moissan to a method which strikingly achieved success.

The procedure followed by Moissan, and the hypothesis which dictated it, came undercritical review based on experiments extending over nearly forty years, brilliant-ly conceived and skillfully carried out by the Hon. Sir Charles Parsons, F.R.S., who unfolded his methods and results before the Institute of Metals recently. Methods of research, involving the production of extraordinarily high temperatures and pressures, were adopted in order to test Moissan's fundamental conception of the formation of diamond. The experimental work involved the application of enormous pressures -- sustained or instantaneous-to graphite and carbon liquids, such as benzone, paraffin, treacle, carbon retrachloride, and carbon disulphide. Upwards of 200 chemical reactions were arranged to deposit carbon under high pressure with central heating by electrical methods. The products were ex-amined by the analytical methods adopted amined by the analytical methods adopted by Moissan and Crookes. Small residues of diamond, which occasionally occurred, appeared to be due to unintentional iron in the charge. Attempts were then made to melt carbon in bulk, but the greatest change appeared to be a slight alteration in the structure of the graphite. The same conclusion had been reached by Threfall, who found that, under a pressure of 100 tons, graphite electrically heated re-mained graphite. Still higher tempera-tures and pressures were obtained by the rapid compression of an oxy-acetylene flame with an excess of acetylene to supply the carbon. The evidence showed that a pressure of 15,000 atmospheres had been reached, but nothing more than a little brown amorphous powder easily destroyed by boiling sulphuric acid and nitre resulted. In this experiment it was calculated that the extraordinary temperature of between 15.000 deg. C. and 17 700



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BECAUSE nothing but sound lumber of a kind which long experience has shown to be best suited for the purpose is used in their construction.

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BECAUSE the staves are held together by extra heavy iron hoops, so as to be able to withstand the tremendous pressure at the time of filling and fermentation and to resist the ravages of the weather at all times.

BECAUSE the doors and staves are treated with specially prepared wood preservative, which insures maximum life.

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