

right here, however, that we should like to mention. The owner wonders whether or not this mare has been worked too hard and this has interfered somewhat in her breeding. It is just possible that steady farm work may be a little heavy for the brood mare if kept at it all the time, and this may have some influence upon her failure to conceive. At any rate, even though working at the heaviest of the farm operations, it is paying her owner to raise colts.

Indications are that there will be, after the war, an increased demand for heavy draft horses. During the past months we have heard considerable about the horse market being dead. However, those who go out to look for the right quality of drafters find them scarce. We have in this country too many horses that are out-and-out misfits. They are not light horses, neither are they drafters, and it is the number of this class that has caused the market to be draggy and it is in no wise due to an over-supply of real high-class heavy drafters. The United States reports a scarcity of high-quality heavy horses. European stocks are being depleted by the war. There

is more work for heavy horses to do than ever before and they must be raised to meet the demand which unless all signs fail is sure to come in the not-very-distant future.

LIVE STOCK.

Proposal to Centralize Sale of Canada's Wool.

Co-operative wool grading has passed the experimental stage in most of the Provinces of Canada. The Western Provinces were pioneers in the movement and have done considerable good work. Last year Ontario handled 270,000 lbs. of wool co-operatively with satisfaction to all concerned. The wool industry is now one of Canada's very important lines of production and many of those who have experience in the work of co-operative

grading and selling believe that all Canada's wool output should be handled through one Federal co-operative. This would nationalize the work and the output. It would put Canada on the map in wool grading and sale. It should increase the amount of wool so handled, strengthen the work, and build up for Canada a reputation for wool by establishing uniform grades for the Dominion. The western horse, cattle, sheep and swine breeders associations recently met in Brandon, Man., and two hundred and fifty sheepmen there assembled favored united efforts and Dominion wide organization selling through one central instead of the Provincial organizations of the past. Three members were appointed a committee to meet the eastern breeders in conference during the week of the live stock meetings to be held in Toronto early in February. It would be a fine result to have the Canadian wool output practically all handled through the one organization. Those interested should attend the sheep breeders' meetings in Toronto in February and come prepared to discuss the project.

Recent Hog-Cholera Investigation and the Outcome.

Canadian farmers who are interested in hogs to any extent and have endeavored to maintain herds of any considerable size, know the danger from cholera, or "swine plague," as it is sometimes called. Since vaccination has become so popular in the United States as a means of preventing this disease, Canadian breeders and farmers have been asking more or less persistently for similar protection here and their request culminated in a deputation being commissioned by the Canadian Swine Breeders' Association to visit and investigate conditions in the Corn Belt of the United States where many hogs are reared and the serum and virus treatment is most extensively used. The Committee thus appointed spent the week ending December 22, 1917, in the States of Illinois, Iowa and Indiana and were accompanied by a representative of "The Farmer's Advocate". We consider that Canadian farmers are entitled to a review of what was seen there and the impression gained by visiting one of the largest hog-producing districts of America. This article will not express the views entertained by any of the Swine Breeders' representatives after their tour of investigation was completed. Their views will probably be voiced at the annual meeting of the Canadian Swine Breeders' Association, and in the meantime the writer will set down only a short story of the itinerary and the impressions gained by himself as a result of the study of swine conditions in the Corn Belt. However, before proceeding further, it might be well to review briefly the history of hog cholera in Canada and its treatment by the Health of Animals Branch.

Hog Cholera in Canada.

Since the early eighties hog cholera has been known in the Counties of Essex and Kent, in Ontario, where it would become serious at times only to be followed by seasons of comparatively few outbreaks. This, the Corn Belt of Canada, has suffered most owing not so much to the feed or care given as some suppose, as to the number of hogs reared in that district. As the hog population increases anywhere, so does the loss from infectious diseases. These two Counties mentioned, however, do not represent the extent of the hog industry in Canada, or the only area where cholera has appeared. Here and there outbreaks have occurred with more or less disastrous results, but they have usually been stamped out immediately by the thorough and speedy action of the Health of Animals Branch. For the fiscal year ending March 31, 1914, the number of hogs killed on account of cholera was 9,900, but throughout the season of 1914 the disease became more insidious and 31,779 had to be slaughtered to keep the scourge in check. There were probably something over 3,000,000 hogs in the whole Dominion that year, no more than the State of Indiana alone has at the present time. The history of hog cholera in Canada, and the United States as well, suggests that it periodically becomes serious and then follow seasons of comparative immunity from the plague.

The course pursued by the Health of Animals Branch of the Dominion Department of Agriculture has been to slaughter infected animals and partially compensate the owner. The farm is cleaned up and a strict quarantine maintained until the danger is past. Viewing the method retrospectively, there were many features which commend it. Looking into the future, such a policy seems altogether inadequate and unsuited to cope with conditions that are sure to arise.

Serum and Virus.

Before proceeding with our story of what was seen in the States of Illinois, Iowa and Indiana, it seems necessary to explain a few terms which must necessarily be used in the text of this article. Two treatments are in vogue whereby hogs are immunized against cholera. The "single," or "serum alone," and the "double" or "simultaneous". These terms entail still further explanation. Serum is taken from the hog which has been not only immunized but hyper-immunized, and when injected into a pig it will render only a temporary immunity covering a period of five or six weeks. Serum is not considered capable of setting up the disease in healthy hogs, and consequently its use does not expose the herd to any danger. Virus, on the other hand, is a preparation of the blood taken from cholera hogs. It will, in susceptible pigs, set up a virulent form of the disease at once and it is not considered good virus if it will not.

The single, or serum alone, treatment consists in the inoculation of swine with serum to establish a temporary immunity. In the double, or simultaneous treatment serum and virus are injected at the same time, imparting to the hog a lasting immunity from cholera. It is the virus and the double treatment to which the authorities at Ottawa take objection, and which, with one exception, they have not allowed to be used.

Details regarding the manufacture of serum and virus will be given further on in this article when describing the visit to the laboratories of Pitman and Moore.

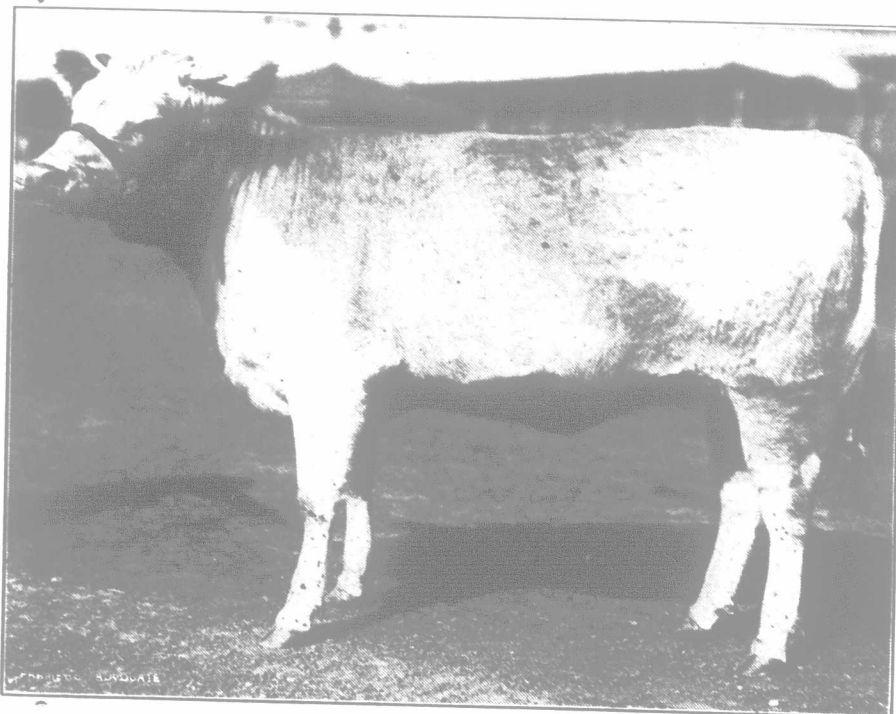
A State With Nine Million Hogs.

After equipping themselves with information of a general character in Chicago, the Swine Breeders' Committee proceeded to the Iowa State College, at Ames. There they were taken in charge by Prof. Pew, Chief of the Animal Husbandry Division, and shown the herds and flocks on the College farm. Cholera treatment, however, was foremost in their minds so the greater part of the time was spent in the serum plant of the Veterinary Division. Dr. Stange, Dean of the Division of Veterinary Science at Ames, received the deputation and answered all questions in regard to cholera and its treatment in the State of Iowa very willingly and frankly. When asked for an expression of opinion on this subject, Dr. Stange replied: "Six years ago when we began to agitate for the double treatment, we were severely criticized but I answered

not enter. The losses in the pens the man entered and those he did not were in the same proportion: One case out of the seven pens not entered and two out of the fourteen pens exposed. In another case, pigeons were tested as carriers of the disease but here also the results did not verify the general contention regarding bird life as carriers. Dr. Stange did not belittle the value of sanitation and caution in respect to hog cholera, but he cited these cases to show that much was still to be learned regarding the means of spreading contagion. In reply to a question re the danger of using virus, he said: "You can't expect to double treat any great number of hogs without developing cases of cholera. These will be rare, but the only thing to do is to treat and isolate them." He also stated: "I have never found double-treated hogs to be carriers of the disease, unless they showed symptoms of the disease". Dr. Stange was then asked for his opinion regarding the position of the Canadian farmer or breeder who desired to import a double-treated hog for his herd. He replied to the effect that he considered the danger from a double-treated hog in a herd of swine which were not immunized less than from the ham and bacon rinds that were thrown about the country.

The Division of Veterinary Science, at Ames, maintains and operates a laboratory for the production of serum and virus. Dr. Cole, who has been in charge of this plant for four years, was interviewed on the subject which the committee were investigating and he imparted

a great many interesting facts; some of these were: "A vaccinated pig will not transmit the disease unless the vaccinated pig gets sick. —A country will never be absolutely clean of hog cholera so long as virus is used. —Vaccinated pigs should be held three weeks before shipping. —All imported, double-treated hogs should be kept with two or three susceptible pigs for thirty days before being released in the non-immune herd. —To be absolutely safe, a farmer or breeder should separate his vaccinated hogs from the others for a period of three weeks after treating. —The proper kind of serum and virus used on healthy hogs should produce one hundred per cent. immunity. However, a hog might be debilitated on account of lung worms or other causes and in consequence develop a chronic case of cholera, becoming a carrier of the disease. —All the showmen and 99 per cent. of the breeders of



Gainford Belle.

First-prize Shorthorn senior heifer calf at Toronto, 1917. Exhibited by J. A. Watt, Elora, Ont.

that criticism thus—'In spite of all the rules of sanitation and prevention known to practice and science which have been preached, cholera has increased. We now have something we know will prevent the disease, and if it is not a perfect instrument it is at least no worse than what we have been using, and it promises to be exceedingly better.' The results have substantiated our claim, for in 1914 sixty million cubic centimeters of serum and virus were distributed in Iowa, which would treat at least one and a half million hogs. In spite of this tremendous use of virus, hog cholera is constantly decreasing and we now have the lowest loss on record." The Dean of the Veterinary Division furthermore pointed out that the doctrine so long accepted in regard to the means of spreading the disease was none too well founded. In one experiment, including twenty-one pens of susceptible swine, it was shown that a man did not carry the disease on his boots as much as was generally supposed. To test this an attendant first walked through pens where hogs were dying with cholera, then he went direct to fourteen of the pens of susceptible pigs, walking through their pens and even putting his feet in their troughs. Seven pens he did

pure-bred hogs in Iowa double treat."

Both Dr. Cole and Dr. Stange expressed themselves wholeheartedly in favor of the double treatment, but neither tried to cover up any defects peculiar to this method of prevention. "In 999 cases out of 1,000," said Dr. Cole, "everything works satisfactorily, but that one other case in the 1,000 may break."

The information gleaned at Ames and what was to be seen there would tend to influence any unbiased mind in favor of the double treatment, but in setting down what was seen and heard there an effort has been made to do so absolutely without prejudice. In fact, the dark side of the story has been emphasized more than the other in order that readers may view it to better advantage and not come to any false conclusions in regard thereto.

Needless to say, the College herd of swine is double-treated, and only with serum and virus as a protection could they maintain their herd. Prof. Pew strongly endorsed its use.

From the report of the Iowa State Biological Laboratory for 1916, we take the following table, which de-

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