

CROSSING BISON AND CATTLE

First Cross Dangerous But Results are Better in Each Succeeding Generation—Hope of Taking Fur and Hump of Bison and Placing Them Upon Back of Domestic Ox.

MOSSOM M. BOYD, *Bobcaygeon, Ontario, Canada.*

WHEN in 1908 I gave an account¹ of my firm's (Mossom Boyd Co.) experiment up to that date in crossing the American bison with domestic cattle, we had just begun the third stage of the experiment; and although four years² in a work of this kind is too short a time in which to accumulate much data of interest, I will nevertheless report what little there is to tell.

The first stage of the experiment was the crossing of the two species.

The second consisted of crossing the hybrids thus produced with pure-bred animals of both species.

And the third stage, in which we are now engaged, consists of breeding from parents, both of which are of mixed blood.

The produce of the first stage in which both parents were pure, we call hybrid buffaloes or half-bred-buffaloes, or for short, hybrids. The produce of the second stage in which one parent was pure and the other of mixed blood we call three-quarter-buffaloes, or one-quarter-buffaloes, or one-eighth-buffaloes, as the case may be, reserving for the sake of distinction the term "cattalo" for the produce of the third stage in which both parents are of mixed blood; and we put before the word cattalo a figure to denote the proportion of bison blood; for example, one-half cattalo (containing 50% of bison blood), one-quarter cattalo (containing 25%), and so on. Breeders will readily understand that there is a radical difference between what we now call cattaloes and three-quarter, one-half, one-quarter

and one-eighth-buffaloes. Excepting two or three, we have not been raising animals carrying less than one-eighth of buffalo blood.

CHARACTERS OF THE HYBRIDS.

In the first stage the hybrids, of which we succeeded in raising about 30, were all of one type; so uniformly alike that individuals of the same color were as hard to distinguish from one another as are Polled Angus cattle. Those from Hereford dams had white faces, but almost no other white; and excepting these, all were practically whole-colored, and were either brindled or black. The black was not the jet black of the Polled Angus but had a rich tinge of brown. The brindled varied between a tawny red and brown.

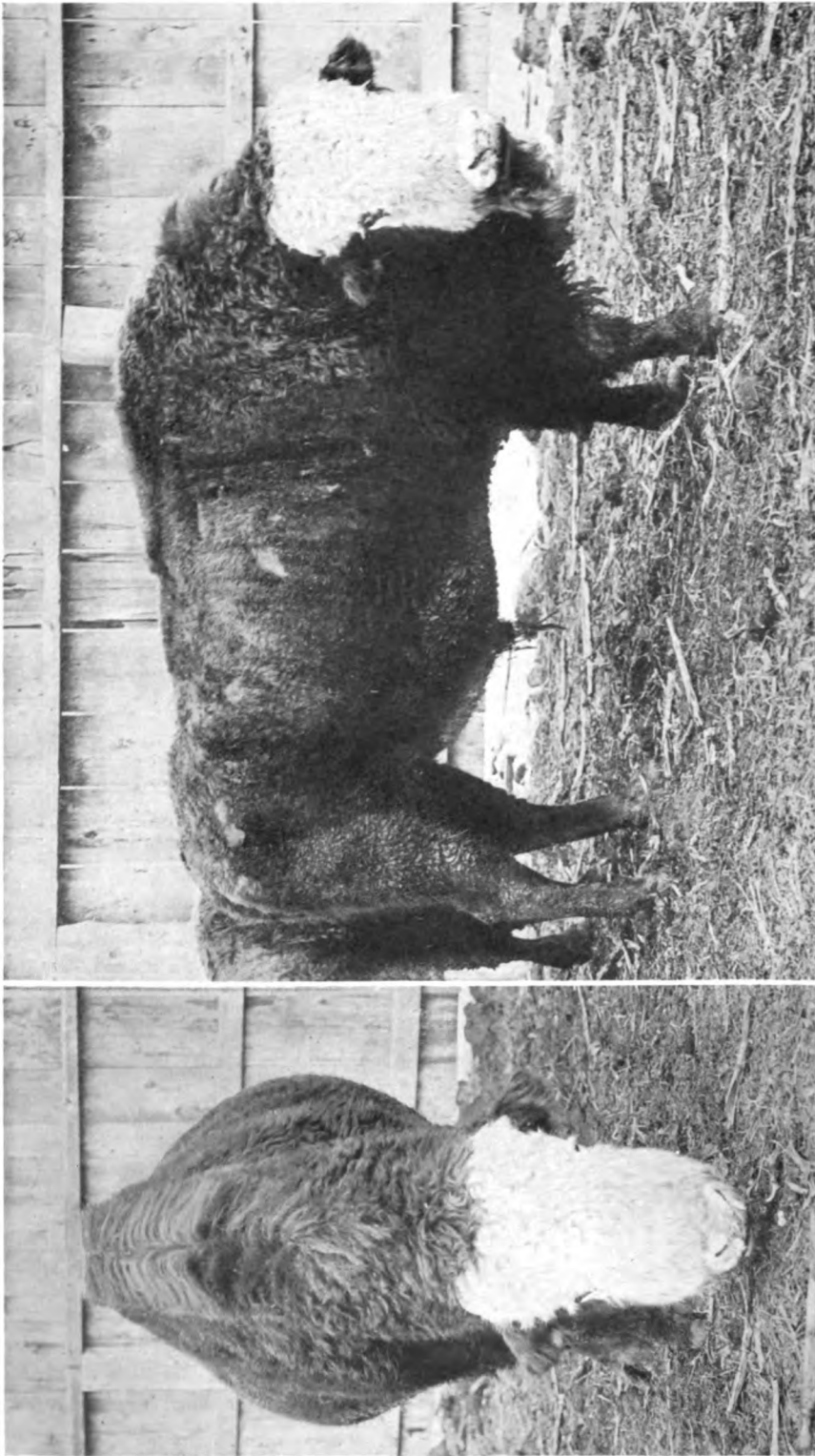
The hybrids were larger than the bison; of "smoother" build; wider chested, had better hind quarters, stood straighter on their hocks, and had coats of a better color, with more lustre and less tufted. Altogether they were much finer-looking animals than the bison.

The three-quarter-buffaloes, got by using a bison bull on the hybrid females, were likewise all of one type; as much like one another as are Polled Angus cattle; and they were about midway in appearance between their parents. The five we raised (one bull and four females) were in color very much like the bison, but of a somewhat darker shade. One, whose dam was half-Hereford, had the front of its face white.

The one-quarter-buffaloes, got by using Polled Angus and Hereford bulls on the hybrid females, were all of one

¹A Short Account of an Experiment in Crossing the American Bison with Domestic Cattle, by Mossom M. Boyd. American Breeders' Association Annual Report, vol. IV, p. 324 ff.

²This paper was prepared in January, 1913. Mr. Boyd writes that at present his company has 31 head of grade buffaloes and cattaloes in its herd.



“QUINTO PORTO”: FIVE-EIGHTHIS BUFFALO AND THREE-EGHTHIS HEREFORD.

This striking result of hybridization of the American bison is out of a one-quarter-buffalo, three-quarter-Hereford cow, by a pure buffalo bull. His exact pedigree is given in the text. This cross was particularly interesting, Mr. Boyd remarks, because it represented the nearest approach to a repetition of the dangerously severe first cross, when a pure Hereford cow was bred to a pure buffalo bull. Male calves are rarely, if ever, born from such a cross, but this example shows that the presence of one-fourth buffalo blood in the cow is sufficient to insure the possibility of producing a fertile bull calf. (Figure 1.)



A "HEREFORD" WHO IS FIVE-SIXTEENTHS BUFFALO.

"Huron," son of "Quinto Porto" (shown on preceding page), out of a pure Hereford cow. It is from such crosses as these or one generation further removed (say 10% to 15% buffalo blood) that it is hoped to improve the range cattle of the colder parts of the west, increasing their hardiness and improving their meat-producing and fur-producing qualities. (Figure 2.)

type in form, but varied in color, and likewise were about midway in appearance between *their* parents. The same remarks apply to the one-eighth-buffaloes, got from a second cross by the same breeds of domestic bulls.

An ordinary observer might mistake the three-quarter-buffaloes for bison; and he would scarcely distinguish the one-quarter-buffaloes from domestic cattle, except for the finer quality of hair. The one-eighth-buffaloes he would not distinguish at all from domestic cattle.

Accordingly, in stage one we got animals that were all of one type. In stage two, animals that were all of one

type or all of another, according as we used the bison bull or the domestic bull; and the proportion of bison blood always determined the measure of likeness to the bison.

In stage three, as was expected, the proportion of bison blood no longer determines the likeness to the bison. We have two one-half-cattaloes, yearlings, quite as like the bison as are our three-quarter buffaloes; and among 12 cattalo calves of 1912 are a one-half-cattalo, a three-eighths-cattalo and a one-quarter-cattalo, which, notwithstanding their difference in grade with respect to bison blood, show equally the



A FIRST-GENERATION HYBRID.

This cow represents the most difficult achievement of hybridizing buffaloes—namely, the first cross, between a pure buffalo bull and an ordinary cow. (The reverse cross cannot be made.) The percentage of failures in this cross is extremely high, and almost no male calves are produced, partly, at least, because their height just back of the shoulders prevents them from passing through the cow's pelvis. Hybrid cows of the sort shown in the photograph are often barren, but fertility is gained at each subsequent cross back to cattle blood. (Figure 3.)



HEIFER WITH HALF BUFFALO BLOOD.

The hybrids average rather larger in size than either parents (buffalo cows weighing only 1,000 to 1,200 lbs., while the buffalo bulls weigh from 1,800 to 2,000). Their meat is said to be indistinguishable from beef of the same age and quality, but they produce more of it, and the cuts are considered choicer. The first hybrids of this sort were produced as far back as the revolutionary period; in 1908 W. T. Hornaday estimated that there were 260 of them in the United States, 57 in Canada and 28 in Europe, a total of 345, while the number of pure bison in the world at that time barely exceeded 2,000. (Figure 4.)

bison characteristics. The one-quarter-cattalo has, we think, somewhat the best coat of the three.

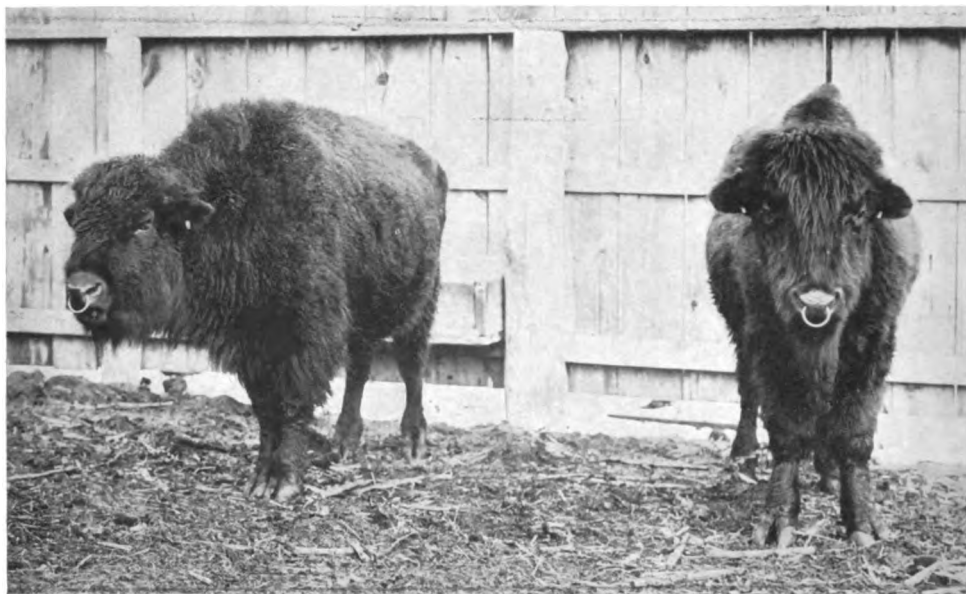
HOPE FOR THE FUTURE.

This is encouraging, especially in these early matings, and seems to warrant the expectation that in later generations, after there has been time for selection, there may be seen on cattaloes, having say 10% or less of bison blood, as good fur as is now seen on the one-half and three-quarter-buffaloes.

Moreover, there is a promising prospect of greatly improving the beef carcass also, for the bison carries an exceedingly high percentage of beef on his back, which is the most valuable part of a beef carcass; and the inheri-

tance of this quality may well be encouraged by selection. The hump of the buffalo is not a mass of fat as some people suppose, but is formed by neural spines in length fully double those of domestic cattle, and by the huge muscles which lie alongside and fill up the angle between these neural spines and the ribs. In a rib roast of beef, these muscles constitute the upper cut, and I have had on my table a hybrid roast with an upper cut nine inches deep.

I give the measurements of the length (measured from the centre of the spinal cord) of the neural spines of the smallest of our three bison bulls. They are in inches respectively: 11, $16\frac{1}{2}$, $16\frac{1}{2}$, 16, $15\frac{1}{2}$, $14\frac{1}{4}$, 13, —, $10\frac{1}{2}$, $9\frac{1}{2}$, 8, —, $6\frac{3}{4}$, —, $4\frac{3}{4}$, —.



THREE-QUARTERS-BUFFALO BULLS.

Bulls of this type are larger and "smoother" in build than the average full-blood bison-bull; they are wider between the front legs and thicker between the quarters, and stand straighter on their hocks. Frequently they are not fertile, or only imperfectly so. In the hands of the butcher they will cut about 70% net of their gross weight, according to Col. Goodnight. The bull here shown was bred by the Mossom Boyd Co., and is by a pure buffalo out of a hybrid (first generation) cow. (Figure 5.)

DANGERS OF FIRST CROSS.

The most remarkable and the most disastrous feature of the first stage was the abnormal secretion of the amniotic fluid which was excited without exception in every cow and which proved fatal in a large percentage of cases. This feature was so calamitous that others should be warned against attempting this severe cross. We began without any suspicion of the evil and had we not gone to work unwittingly on a large scale, the experiment would probably have failed in the first stage.

Fortunately no trouble of this sort was experienced in the second stage and none to date in the third stage; but we had an interesting reminder of it through crossing our five-eighths-buffalo bull on three domestic cows in 1911. One of these cows swelled to proportions which indicated the former trouble, but it did not prove serious and it is possible that the diagnosis was wrong. The

other two cows did not attract any notice in this respect.

FERTILITY OF BULLS.

On the subject of fertility or infertility of bulls I have not much data. The percentage of male births in the first stage was so small as to be remarkable and excite curiosity as to a possible cause. Out of forty-five hybrids only six were male, i.e., about 15%, and we may add to this experience that of Charles Goodnight, who wrote me in 1900 that he had raised many female hybrids but had never one male born alive. Of our six, three died at birth, one within 24 hours, and of the two raised one proved barren after having been thoroughly tested. The other was killed at an early age without having been tested.

In the second stage the proportion of male births rose to 40%. Out of 26 one-quarter-buffaloes, ten were males.

Of these only four were tested and one of the four was found normally fertile. The other three were barren up to 36 months, 32 months, and 25 months of age, respectively, but should have had a longer trial.

Of five three-quarter-buffaloes one only was a bull and this bull, born in March, 1905, was killed by an accident in September, 1908, i.e., at the age of three and one half years. Although given a fair opportunity during the seasons 1907 and 1908 he did not appear to be fertile, but should have been further tested.

Of one-eighth-buffaloes, the only one tried was thoroughly fertile.

One five-eighths-buffalo bull was bred in 1905 from the cross of a bison bull upon a one-quarter-buffalo cow. This cross was interesting as being our nearest approach to a repetition of the severe cross of the first stage. It proved that the 25% of bison blood in the cow was sufficient to make the cross perfectly successful; for gestation was normal and the bull is more or less fertile. We had one calf by him in 1911 and four in 1912. His pedigree is interesting and I give it here:

QUINTO PORTO

Brindle with white face
dam Quarto Prettymaid
g. d. Hybrid Prettymaid
3 d. Prettymaid 19th 55397 Am. Hereford
Record

Born May 23, 1905
Sire Banff 2nd (a pure Bison)
by Tecumseh 63518 Am. Hereford Record
by Bonie (a pure Bison)
by Cherub 4th 32333 Am. Hereford Record

It will be seen that he is a mixture of pure buffalo and pure Hereford blood. He is a whole-colored brindle except for the white front to his face; and like the hybrids he is larger and "smoother" in build than an average bison bull; is wider between the front legs and thicker through the quarters; stands straighter on his hocks, and has an immense back.

We have a yearling bull by "Quinto Porto" out of a registered Hereford cow.

FERTILITY OF COWS.

Of 24 hybrid cows, 15 were barren and of the remaining nine only three were regular breeders. These three, all born in 1895, are now 18 years old, and were regular breeders up to last year;

having to their credit nine, ten and twelve calves respectively.

Of 12 one-quarter-buffalo cows got by using domestic bulls on the fertile hybrids only one was barren, four were irregular breeders, and seven normally prolific.

Of four three-quarter-buffalo cows got by using a bison bull on the hybrid females only one proved barren, and this one was by a sire which was himself a very poor breeder, for he got no other produce although he had the run of the herd for four months.

The tables on page 197 are given for comparison with the table for the hybrids given in my former report.

The average age at which the *hybrids* produced their first calf was four years.

Of five one-eighth-buffalo cows, one was beefed at four and one-half years of age without having bred, and four were found normally fertile.

As to the fertility or infertility of cattalo bulls we have no information at all. Of 73 cattalo births to date, 30 were bulls. Six of these are being kept for testing but no testing has been done yet. The first females have just come

to the breeding age. Of two born in 1907, one gave a calf in 1911 and the other was sent to the butcher December, 1912, as being probably barren. Of four born in 1908, only one has given a calf as yet. We have besides a calf from a three-year-old, and one from a two-year-old. This is sufficient to indicate that even if not so much so as the grade buffaloes (hybrids excepted) which were just about normal, the cattalo females will be fairly fertile; and there is little doubt as to finding a sufficiency of fertile bulls. Complete fertility, if it is not found at once, will doubtless come through selection, as will early maturity.

It does not seem unreasonable, therefore, to suggest that the fur of the bison and his great back may be carried by



A TRUE CATTALO CALF AND ITS MOTHER.

The sire was a grade buffalo (exact pedigree unknown), while the mother is three-quarters buffalo from a first-generation hybrid cow by a pure buffalo bull. This heifer having mixed blood in both lines of ancestry, is therefore a true "cattalo." The photograph, like all those preceding, was made on the ranch of the Mossom Boyd Co., in Ontario. (Figure 6.)

