

THE CIRCUMSTANCES AND CONDITIONS INFLUENCING THE SEX OF OFFSPRING.

MR. J. SANDERS SPENCER'S PAPER ON THIS SUBJECT.

(Concluded from last week.)

To the Editor of the CANADIAN BREEDER.

The system of attempting to regulate the sex by mating the female with the male as soon as the state of heat commences, with a view to the production of a female, and at a late period for producing a male, has a large number of adherents. Many apparently most carefully conducted trials have been given in the American agricultural papers, whilst some few of our own countrymen have given us the result of their experiments. Mr. John Slater of Cordell Hall, relates in a prize essay, written by him in 1871, that in a herd of 20 cows, he had for the last seven years been able to obtain a heifer or bull as desired, except with Alderney cows; the reasons for the failure with these, he stated to be that they "were timid and afraid of a big bull" (he used a Shorthorn), "so that he could not be sure of detecting when they first came into season."

In proof of this system, a very interesting report was written in the year 1863 by a M. G. Conraz, in which he states that in twenty two successive cases he endeavored to obtain heifer calves from Swiss cows by a Shorthorn bull; in every case he obtained the sex desired. He afterwards bought a pure-bred Shorthorn cow, and was anxious to breed from her a bull calf, this time the cow was served at the later period of the heat, and a bull calf was the result. M. Conraz also tried to breed six half-bred bull calves for conversion into working oxen, and was successful, in fact, had no failures. I could give several other similar cases.

As a set-off to these instances, I find in the American *National Live Stock Journal*, of November, 1881, a long letter, written by a Dr. Watt, giving the results of a series of experiments with horses, cattle, and dogs, extending over a period of more than half a century, which, according to his view, conclusively proved that an early mating ensures male offspring, and a late one the reverse. It is scarcely necessary to give these experiments in detail, but they appear to have been so carefully carried out as to be deserving of consideration.

The superiority theory, which is the one strongly supported by Mr. Starkweather, whose most interesting and instructive book on "The Law of Sex" has been of immense value to me in the preparation of this short lecture, appears to have considerable claims to be seriously thought over and discussed. Starkweather writes that there can be no doubt that the stronger, physically and mentally, of the two parents at the time of copulation, so determines the sex that the produce will be of the opposite gender. The statistics, etc., on which he relies, chiefly relate to the human species, and may not have the same relative value when applied to the animal world. At all events, the conclusion to which I have come after having carefully thought over the experiments related to me, and those of which I have read, is exactly the opposite, viz., that in the animal world the most vigorous parent at the time of mating will, in great majority of cases, have such an influence that the produce will be of the same sex. If no other evidence were available I should feel almost inclined to press into my service the theory of early mating producing a female, and the late mating a male, and argue that at the early state of heat the female would be the more vigorous, whilst at the latter stage of the *œstrum* she would have become exhausted or less vigorous owing to the state of excitement and the partial abstinence from food and rest, but I can point to several cases which seem to bear out my conclusions.

Mr. T. J. Gayford of East Wretham, Norfolk, informed me that for half a century it had been the

custom on the farm now in his occupation to select from the flock of 700 or 800 ewes about 260 of the best to put to a dark-faced ram, for the purpose of breeding ewes to replenish the flock; and that both he and the shepherd had noticed that when there was a heavy fall of lambs, the ewe lambs exceeded in number the ram lambs, and that the majority of the ewes lambed within a very short period; whereas, with a short crop of lambs, exactly the reverse was noted. Thus we find that in the former case an excessive number of the ewes being in a vigorous and thriving state came into heat as soon as the rams were placed with them. This heavy drain on the rams produced the natural result that they quickly became less vigorous than the ewes, and an excess of ewe lambs resulted. In the latter case the lambing season was protracted, proving that the ewes, not being in a vigorous or thriving condition, came into season so slowly as to enable the ram to continue to be in a more vigorous state than the ewes.

Mr. Starkweather endeavors to prove his theory by quoting the following experiment, carried out by a Mr. Charles Girou, who took a flock of some 270 ewes and divided it equally, with the avowed purpose of producing a large excess of males in one division, and of females in the other. He accomplished his end; the result was satisfactory, and as follows:—

Age of Mothers.	Sex of Lambs.	
	Males.	Females.
2 years	14	26
3 "	16	29
4 "	5	21
Total	35	76
Five years and older	18	8
Total	53	84

There were two rams with this flock; one fifteen months and the other nearly two years old. Rams and ewes were all placed in the richest of pasturage—were highly fed.

Age of Mothers.	Sex of Lambs.	
	Males.	Females.
2 years,	7	3
3 "	15	14
4 "	33	14
Total	55	31
Five years and older	25	24
Total	80	55

Two strong rams, one four and the other five years old, were with this flock, and all were kept on a scanty supply of food.

Yet Mr. Starkweather, in attempting to show that this experiment proves his theory, says, "Two young rams that have gained their normal weight, and that are in fact in the very prime of their existence, and sufficiently well-nurtured to meet almost any drain upon life's fund, are placed among a flock of sheep, dull and inactive from over-feeding, and therefore 'inferior,' the young rams are not deteriorated in this way, as their food is only sufficient for them, owing to the heavy drain upon their reproductive system. Again, two rams past their prime are turned in with sheep that have to work for a living, that is, to wander about the pasture in search of food, which elevates them by stimulating them to activity. The rams have not only to search for food, but also to meet the draughts inseparable from the circumstances, and thus perhaps deteriorate somewhat, while the ewes are kept in the most favorable condition for 'superiority,' that is, with the nervous system in the ascendant." The somewhat close attention which I have given to the breeding of stock during the last quarter of a century, and the experiences of Mr. Gayford, M. Girou, and other leading flock-masters, appear to indicate that Starkweather's want of practical knowledge of sheep-breeding upon light lands, has caused him to draw totally wrong inferences and conclusions. The conditions related in the first part of

the experiment, would not tend to make the ewes dull and inactive and consequently 'inferior,' but would cause a great number of them to seek the attention of the rams, who would thus have so sudden and great a strain upon their systems, as to render them 'inferior' to the ewes, with the certain result of an excessive fall of ewe-lambs. In the second part of the experiment also, the effects would be of exactly an opposite nature to that assumed by Mr. Starkweather—the ewes would not be thriving, nor in a state likely to cause them to have sexual desires, the calls upon the rams would be very much less frequent, so that they would not become reduced in vigor, nor 'inferior' to the ewes; thus the excess of males spoken of by Mr. Girou would follow.

Mr. James Long, of Gravely Manor, Stevenage, has by the following facts been confirmed in his belief of the truth of the theory, that the more vigorous parent at the time of coition causes the produce to be of the same sex. In the years 1881, 1882 and 1883 he mated a Swiss bull from three to five years old with strong vigorous young cows or heifers, with the result that 90 per cent. of the calves were females. He then sold the old bull, and used a strong well-grown young bull full of vigor, to three heifers, and to the cows, which would by this time have bred two calves, and be consequently somewhat reduced in vigor, especially as the pasturage was of an inferior quality; the next twenty-four calves which were dropped proved to be eighteen males and six females, three of the latter being the produce of the three heifers, which were under two and a half years old.

In a recent letter to the *Live Stock Journal*, Mr. Hilhouse mentioned "seasonal" influence on the increased births of male or female calves; this seems to be effected by the scarcity or plenty of food, which is acknowledged to have an effect on the proportion of male or female children born.

In conclusion, I would wish to apologise for the manner in which I have introduced to your notice this subject of controlling the sex in animals. The want of a professional education has doubtless been the cause of my missing many of the nice and subtle points. Notwithstanding this, I hope that the discussion will lead to a thorough ventilation of the subject, and thus once more prove how fully the council of the Institute of Agriculture are deserving of the thanks of agriculturists for continued efforts on their behalf.

As to the proper age for castrating colts Dr. Liautard says that a period between eighteen months and two years is generally preferred for horses, though according to others even a much earlier date may be chosen, some English veterinarians being accustomed to operate at as early a date as ten days from birth. It is immaterial, however, at what precise time the operation may be performed, since it is a conceded point that the earlier it is done the better.

The owners of some of our pampered stock horses can find a hint worth following in this item from the *London Stock Journal*:—"In regard to over-feeding of stallions, we are glad to notice that Professor Williams, of Edinburgh, strongly recommends that draught stallions should be worked a little later in winter. This is not only with a view of preserving the horse's procreative powers, but his health. As now, when attacked, his organs not being in a very healthy condition, he is unable to withstand the usual veterinary remedies when in trouble, and succumbs suddenly. The late Mr. Drew was of the same opinion, and every spring-time he gave his famous stud-horse Prince of Wales good sweating work in the chain-harrow,