Selection from Animal Breeding

By Thomas Shaw
The question of prepotency is of great practical moment to the breeder of live stock, because of the direct influence which it has upon improvement or the want of this, in a stud, herd, or flock. Like many of the features of breeding it is only understood in part, but happily enough is known regarding it to enable the skilled breeder to choose animals possessing it with a reasonable degree of certainty.

The importance of the ability to select animals with skill and judgment when breeding them cannot easily be overestimated. In the absence of such ability mistakes will be made all along the line of the breeder’s work. He will not be able to make improvement save in a sort of accidental way, nor will he be able to maintain it if perchance he should be so fortunate as to make it. His work as a breeder can never rise above the level of mediocrity, however much wisdom and care he may exercise in other respects in conducting his work.

What is Meant by Selection? – Selection in breeding means the ability to choose animals for propagating their kind that, with proper care, a high standard of excellence will be acquired and maintained. As implied in what has been said above, such ability is indispensable to the highest success in breeding. That it should be so is self evident, for it is only through the skillful mating of animals accompanied by judicious management in other respects that improvement can be made. If the improvement thus secured is made the basis of wise selection, it will result in still further improvement, but in the absence of such selection it is likely to sink again to former levels. And yet, this acquisition, notwithstanding its great importance, is possessed in a high degree by the few only, even among breeders of purebreds. It is an acquisition that money alone cannot purchase. It is in itself an intuitive gift, but is susceptible of cultivation in a high degree. The evidences of it are not found in show yard successes, unless the animals who are winners have been bred by the exhibitor. They are manifest in the uniformity shown in the average of the herd or flock, in the high average of outstanding animals produced, that is to say, of animals of high excellence.

The Necessity for Selection. – The necessity for selection is based on the tendencies to variation found in all animals. When they are downward as they frequently are, selection eliminates them. The tendencies to variation that is downward manifest themselves, more or less, however skillfully the work of the breeder may be conducted. Such downward variations may be eliminated lest they should be reproduced in the progeny. When these variations are upward, selection utilizes them to secure still further improvement. The field that is thus opened up for improvement has no limitations other than those of the skill of the breeder and the inherent capacity of the animals which he breeds to be improved. It is reasonable therefore to expect that the greatest triumphs in breeding are yet to come.

Selection Covers the Whole Art of Breeding. – The art of breeding may in a sense be said to be epitomized in the one word selection, since it involves a consideration of every peculiarity of form and the application of every establish principle of practice. While more attention must be given to those peculiarities of form that are important, no feature thereof can be overlooked. Even fancy points must not be lightly passed over as long as they are included in the standard of excellence, and in fact as long as they have any traditional significance such as may affect market values. It is pre-supposed that the principles of practice referred to are correct, since sometimes practices prevail widely that tend to lower the level of attainment in breeding. The practice of breeding from sires too immature, which is of this character, is all too prevalent at the present time.

Considerations Included in Selection. – Selection in breeding includes the following among other considerations: 1) The breed in its relation to adaptation, 2) The choice of animals with reference to a standard of excellence, 3) The consideration of pedigree, 4) Individual merit in the animal, 5) Special care in the choice of sires, 6) Allowing no animals to come within the flock or herd which are liable to transmit undesirable characters, however excellent in themselves, 7) The unsparing elimination of all undesirable animals, and 8) Judicious mating. These various features pertaining to selection will in turn be further considered.
Selection and Adaptation. – When determining which breed or class of animals may be advantageously introduced into any particular locality, the character of the surroundings and the natural capabilities of the country should be most carefully considered, and that breed or class should be chosen which these natural conditions would best maintain. Any mistake in the choice thus made will hinder success, and in proportion to the degree of the mistake, even though the work in other respects should be judiciously carried on. Amateur farmers are much prone to allow what may be termed fancy preferences to lead them in this matter without giving due weight to the question of adaptation to the conditions. They overlook the fact that intrinsic merit is one thing and adaptation another, and that inherent suitability to some conditions may mean inherent unsuitability to other conditions. Hereford cattle have been found eminently adapted to the Southwestern ranges of the United States; hence, they should be freely grown there rather than on the arable farm where both milk and meat are wanted. Some other breeds as Shorthorns and Red Polls, which are more suitable for meeting this combined need, should be kept on the arable farm rather than on Southwestern ranges. Southdown sheep are small in body and active in limb. Lincolnse are large and massive. The former therefore may prove profitable on upland and broken pastures of sparse production on which the latter would fail, and the latter may prove more profitable than the former on rich levels.

Illustrations could be multiplied indefinitely. The attempt to maintain animals under conditions un-adapted to their needs is likely to lead to failure, as shown in the results of the effort to improve Cheviot sheep while on their native pastures by crossing them with Leicester rams. The cross thus made created a tendency to increased size. The tendency thus created was not well sustained by the pastures, hence, eventually, the progeny of this cross were found inferior to pure Cheviots and it had to be abandoned. It would of course be possible in some instances to so change the animals that their necessities would in time conform to the conditions of environment. But why engage in so perilous and profitless a work when breeds can exist adapted to all the varied conditions that may arise?

Selection and Standards. – In breeding purebreds the standard must conform to that which truly represents the breed whether that standard is drawn up by an association or not. Any distinct variation from the recognized standard, especially in the foundation animals, is likely to lead to similar variation in the progeny, and any distinct variation in the choice of sires is likely to lead to modification of type. While distinct variation is thus to be shunned, it is not to be shunned to the exclusion of what may be termed outstanding individuality in individuals, especially when that individuality is of the character of improvement. For instance, more than average fullness in the Hereford thigh should be welcomed, though marked fullness there is more characteristic of the Shorthorn.

In breeding grades the breeder has much more latitude. He can fix his own type. But it must first be clearly defined in his own mind, and in fixing it due recognition should be given to useful qualities and to the needs of the market. Progress will be more rapid and success more pronounced when the foundation animals are possessed of similarity rather than of divergent characters. For instance, when selecting foundation animals for a Shorthorn herd, unification or resemblance in the progeny will be more complete when the foundation females have similarity of type rather than divergence in the same. But even when such dissimilarity does exist, prepotent males may ere long produce unification.

Selection in Pedigree. – In the absence of pedigree there can be no certainty in transmission except in the case of animals of known purity of breeding. For instance, early in the nineteenth century, Southdown sires were used in the formation of certain breeds as the Hampshire and the Oxford. They were so used because of the known prepotency which they possessed, although at that time pedigrees as such were not kept of the breed. But for many generations previously Southdowns had been bred pure. They had, what may be termed, unwritten pedigrees. But even when pedigree is present, transmission may be of a character far from desirable, as has been witnessed in very many instances. Such transmission however, is not to be
charged up against pedigree as the result of improper breeding. It follows therefore that selection in pedigree is more important than pedigree itself. The best pedigree is that which has the largest number of animals in it distinguished for high merit. But this definition should be modified by the enhanced proviso, that the value of the pedigree is enhanced by excellence in the near rather than in the remote ancestry. The little attention that is given to pedigree in the choice of sizes is costing the United States millions of dollars every year.

Selection and Individual Merit. – No selection of any kind is admissible in breeding that is not possessed of at least fair individual merit, even though it should be selection based on the best pedigrees that exist. High individual merit means the possession in a marked degree of the useful qualities essential to the breed. Opinion differs as to the relative value of individual merit and pedigree. The tendency has been to exalt pedigree over individual merit. In discussing this question, the character of the pedigree should be most carefully considered. If it is possessed of no other merit than its length, then unquestionably individual merit is more important than pedigree, for transmission cannot then be of a high order. If, however, the pedigree has in it many animals noted for individual merit, then pedigree becomes relatively more important, since the transmission may resemble the near ancestors quite as much as the parent.

This explains the fact not infrequently observed, that some sires which never won prizes themselves, because of want of the requisite individual merit, have begotten animals noted for a successful show yard career. It the choice must be made between individual merit and pedigree, the former should be given the first place, since the danger is always imminent, that a pedigreed animal inferior in its individuality will transmit its own qualities to the progeny rather than those of its ancestors which may have been superior. In choosing breeding animals the aim should be to combine high individual merit and excellence in pedigree. The most suitable animals for breeding, therefore, are those possessed of the best pedigrees and also the highest individual merit.

Selection and the Sire. – Special care should be exercised in the choice of the sire, since he is likely to exert an influence on the stud, breed or flock, equal to the sum of the influence exerted by all the females of the same, when as male and females of the same, when as male and female they stand on an equal plane with reference to breeding and individuality. In this comparison it is presupposed that but one sire is used in the stud, herd, or flock. If, however, the male should be superior in both these respects, the influence which he exerts on the progeny is likely to be proportionally superior to that of the conjoined influence exerted by the females of the same. It will be as much superior to the sum of the influence exerted by all the females, as the individuality of the sire conjoined with his prepotency exceeds the same in each individual female.

It is thus apparent, that the statement so often repeated, that the male is half the herd may not tell the whole truth. He may indeed be much more than half the herd, especially when he is pure bred and the females are mixed in breeding. The most important qualities in the male in addition to good lineage and high individuality are masculinity, bodily vigor and prepotency. Masculinity and bodily vigor so far evidence the presence of prepotency. Observation has shown that both, as a rule, tend to accentuate the impressiveness, that is to say, the prepotency of the sire.

Selection and Undesirable Transmission. – Selection should most rigidly exclude the admittance of animals into the herd that are liable to admit undesirable characters, notwithstanding their individual excellence. Such are animals in whose near ancestry have been shy breeders, indifferent performers, and those which have evidenced a tendency to certain forms of disease. Shy breeding will influence profitable returns adversely in addition to the disappointment which it brings, and it is certainly transmissible even to the extent of becoming a herd trait. A dairy cow may have great beauty of form, but she is low in milk production. She also comes of an ancestry indifferent in milk production. Her beauty of form should not entitle her to a place in the breeding herd, since she is not likely to produce good milkers. The exclusion of
animals as breeders which have evidenced a tendency to certain forms of disease should be most rigid, as, for instance, horses with tendencies to spavin, cattle with leanings to tuberculosis diseases, sheep affected with goiter and swine whose limbs are weak. The germs of undesirable qualities thus admitted may crop out for generations, howsoever judicious the breeding may be that follows their admittance.

Selection and Un-sparing Elimination. – The selection of breeding animals should be of that character which will rigidly, and persistently, eliminate all animals possessed of undesirable characters. It should extend:

1. To all animals below the average in essentials as to form, otherwise a high average of excellence can never be reached, nor if reached could it be maintained. There will be that lack of resemblance to one another that should not obtain between animals of the same pure breed.

2. To all such animals as are poor feeders and indifferent producers. The first will not give a profitable return for the food fed, and transmission from them would also be undesirable.

3. To all shy breeders whether male or female, and to those deficient in fecundity. Non-breeders are simply a bill of expense and shy breeders are unprofitable in proportion as they fail to breed regularly. When more than one may be produced at a birth the profits are proportionate to the numbers produced up to the limit of capability to produce and nurse properly young animals not below the normal standard.

4. To those which have shown themselves lacking in prepotency. Lack of prepotency in the male would be far more serious than deficiency in the same in the female. Especially would this be true in the breeding of grades. But in the breeding of purebreds prepotency in the female also is of much value. The elimination of un-prepotent males should be most unsparing, since to breed from them may result in much loss.

5. To those among purebreds possessed of color markings which are highly objectionable. Such would be color markings which bar from registry in purebreds, and color markings which seriously discount the selling value of animals, though they may not bar them from registry. Such would be Shorthorn males white in color. This course should be adopted though the power of fashion with reference to fancy points is stronger to compel rejection than the power of good individuality linked with objectionable color markings is to overcome such prejudice.

6. To all who have passed the meridian of best usefulness through old age, unless in the case of breeding animals of rare value. Such dams are more costly to keep, are not so likely to produce animals of high individual merit as at an earlier age, and are not so likely to nourish them so well during the nursing period.

7. To those animals which give indications of abnormal tendencies. Even though these tendencies should be inherently unobjectionable in themselves, their elimination should be of the most unsparing character. Such would be the absence of horns in any of the horned breeds, unless the accidental variation thus manifested were to be utilized in producing a hornless breed. How much more then would it be fitting to eliminate all such variations as are objectionable in themselves. All such animals should be sent quickly to the block. They ought not to be sold as breeders. The ethics of the golden rule would forbid such sales.

Selection and Judicious Mating. – Animals should be so mated that their mutual weaknesses will be likely to be corrected, and with that object in view they should be selected accordingly. For instance, suppose a herd of Tamworth swine becomes unduly lengthy in the barrel or coupling, and that they are also too long of limb. The proper selection of a male to correct these defects would mean choosing one with requisites of form bearing in the opposite direction, and so of all mating. Where points are weak in one sex they should be strong in the other. The eventual outcome will be equilibrium in development. In small herds or flocks such mating may be impossible in practice, for a time at least, when a marked diversity exists in the females,
since in such herds or flocks it is usually impracticable to keep but one male. The evening up process in such herds therefore will be more prolonged, and while it progresses, the elimination of undesirable variations should of course be continued. It may also be mentioned that violent crosses should be avoided.