Why Do We Condemn Inbreeding ?

It Offers the Only Hope for Real Breeding Progress—Raymond Pearl

THE art of breeding is at once a conservative and a progressive matter. It is conservative in the sense that it holds steadfastly to certain definite and relatively fixed ideals as to what the perfect animal should be. It is progressive in the sense that it bends every effort towards the attainment of those ideals. While it is, I think, unquestionable that these statements are true as general propositions it is unfortunately equally true that many breeders of animals exhibit in their practice rather striking exceptions to them.

To the true breeder it is unbelievable, and indeed unthinkable, that there should be so many men as there are who breed without any definite ideals whatever before them. Again, there are the so-called breeders whose ideals are perennially subject to change "without notice and without doubt." To-day one type or one family is the greatest, indeed the only hope of the breed to one of these men. Meet him a year hence and you will discover, somewhat to your astonishment and confusion, that a totally different type, or wholly foreign blood lines, offer the only chance to stay the rapidly progressing annihilation of the breed. It is a misuse of words to call such persons breeders. They belong mentally in precisely the same category as the colored gentleman of the story who averred that he didn't know where he was going, but that he was on his way.

Keep Ideal Ever in View.

Success in breeding is possible only for the man who has a definite, and for him permanent, ideal as to the kind of animals which he wants to breed. This ideal is something which must be always in his mind as he makes his matings, or studies pedigrees, or buys stock to add to his herd or flock or sells stock from it. Lacking such a definite ideal the breeder is worse off than the mariner without a compass, because he not only lacks a means of guidance but also has no notion of what port he would like to arrive at if he could.

If he is to be succesful the breeder must not only have an ideal but must also stick to it, and not change it every time he makes a mating. This implies that the breeding must fall within definite and rather narrow blood lines. It may fairly be said that some degree of narrow breeding (line breeding or inbreeding) is an essential for the highest success in breeding.

This may seem a radical statement, but a careful study of the history of the best improved strains of live stock of all sorts leaves no room for doubt that the attainment of the highest degree of excellence has always been associated with the practice of a very considerable amount of inbreeding, of rather close degree. It is a curious paradox of animal husbandry in general that while, as a matter of fact, every successful breeder of high grade stock practices inbreeding to a greater or lesser extent, a great many of these men are violent, even fanatical, opponents to inbreeding in theory. Most of them will deny stoutly that they ever practise inbreeding. They contend that they practise "line breeding," but never, never "inbreeding."

Line Breeding a Form of Inbreeding.

The distinction here is obviously verbal and not biological, being in its essentials precisely similar to that between Tweedledum and Tweedledee. What is called "line breeding" is simply a less intense form of narrow breeding than that which is called "inbreeding." The essential and important biological point is that what is actually done is to purify the stock in respect to all characters to as great a degree as possible. What the successful breeder aims to do is to get his stock into such condition that he has only one kind of "blood" in it. Expressed more precisely, though unfortunately more technically, it may be said that the breeder endeavors to get his stock homogeneous with reference to all important characters or qualities. The quickest way, indeed the only way, practically to obtain this result is by the practice of some degree of inbreeding. Sometimes a great stride towards the desired end may be made by mating brother and sister or parent and offspring together.

That a mating of such close relatives will surely result in disaster is one of the carefully nursed superstitions of breeding, which has often been exploded, but will doubtless always be with us. It may be said that all the evidence which may be gleaned from the experience of stock breeders indicates that the results which follow inbreeding depend entirely upon the nature of the individuals inbred. If one inbreeds weak animals, lacking in constitutional vigor, and carrying the determinants of undesirable qualities in their germ cells, the offspring resulting from such a mating will undoubtedly be more nearly worthless than were their parents. If, on the other hand, one inbreeds in the same way strong and vigorous animals, high in vitality, and carrying the germinal determiners of desirable qualities there may be expected a corresponding intensification of these qualities in the offspring. The time has come when a vigorous protest should be made against the indiscriminating condemnation of inbreeding. It should be clearly recognized that if the experience of stock breeders extending throughout the world, and as far back as trustworthy data are available, means anything at all, it plainly indicates that some degree of narrow breeding is an essential to the attainment of the highest degree of success in the breeding of animals.

The Influence of Germ Cells.

This contention receives full support from the results of modern exact studies in genetics. Such studies show that the personal bodily characters of the parents have no casual relation to the personal characters of the progeny. What the progeny shall be like is determined by the constitution of the germ cells of the parents. When by a proper system of selective breeding the point is reached where these germ cells are pure with reference to a particular character, or degree of a character, then that character will unfailingly appear in the offspring, in the degree of perfection in which it is represented in the germ cells. This is the highest goal of the practical breeder. But in sexually reproducing organisms like the domestic animals purity of the germ cells with respect to the determiners of any characters, is only to be obtained, in the hands of a practical breeder without special scientific training, by the practice of inbreeding.

It should be clearly understood that indiscriminate inbreeding without definite purpose or reason is not advised or advocated. What we do mean is this: all successful breeding is the working out of carefully made plans looking toward the attainment of a definite ideal. In those plans narrow breeding has a place.

New Blood May Prevent Improvement.

Introduction of new blood for purposes of rejuvenation or reinvigoration is, as ordinarily done, one of the surest ways to prevent any real or permanent improvement of stock by breeding. The difficulty here is that when one introduces new blood he runs the risk of introducing a whole set of characters inferior in their degree of perfection to what he already has in his own stock. As a matter of fact the average breeder is usually much too ready to introduce new blood. If one is breeding in certain definite blood lines and getting good results he should be exceedingly conservative about introducing any new blood, and should only do so when he has absolutely sure evidence that it is actually necessary for one reason or another.

There are two main reasons which induce the breeder to go out after new blood. The first is a fear of the evil consequences of inbreeding. This fear is usually, in the particular case, absolutely without foundation in fact. Yet how widely prevalent is the idea among cattle breeders that at least as often as once in every three or four years one must go out and buy a new bull. It passes all comprehension that any intelligent person could expect to make steady progress in breeding on such a system.

When to Introduce New Blood.

Again the careful breeder sometimes finds himself in this situation. He has by well planned and executed breeding brought his stock up to a particular level of excellence. There the improvement stops. His animals breed true to that particular degree of quality but cannot be made to attain a higher degree. In other words, he has substantially purified his stock relative to the characters which interest him. But he sees that the stock of some other breeder is measurably better than his. If A is to get his stock up to the B level he must introduce some B blood. This has long been the breeder's procedure, and if done in the right way, it is found to be as successful in practice, as it is justifiable in theory in the light of modern ideas respecting inheritance. The danger in the matter in such a case as this under discussion all turns on the way in which the thing is done. If one feels it to be desirable, for the reason specified, to introduce "new blood" let him by all means do it gradually, and not swamp the whole stock with the new germinal combinations all at once. For if he does he may destroy in this way at one blow results which have taken years of careful breeding to build up.

We Should Save Our Breeding Stock

To maintain fertility: The application of manures from live stock has proved to be the best and most economical way of maintaining production. Land that is not manured frequently becomes so depleted in fertility that profitable yields cannot be obtained. On light sandy lands or lands that are subject to drouth especially, it is important to apply manures. Therefore, even those who this year are short of feed owing to drouth, should manage, if possible, to maintain their foundation stock.

To convert waste products into cash: Waste land and stubble fields may be pastured, corn stalks, straw, and other coarse feeds, otherwise unmarketable, may be turned into cash for the farmer by cattle or sheep. Through the pasturing process it will be possible at the same time to retain on the farm valuable fertilizing material.

To supply meat products: The meat supply of America is shrinking. Good prices for live stock are likely to prevail for some time and it will be possible to make good profits from properly conducted stock raising.

While there are other reasons which might be advised for keeping live stock, the three mentioned are fundamental and sufficient, warranting every land owner in borrowing money to buy feed and going to almost any extreme to preserve his foundation of breeding stock.—Andrew Boss.

Dairying in the Prairie Provinces

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TO one who has an intimate acquaintance with the progress of the diary industry in Western Canada a visit to that country cannot fail to reveal wonderful advancement. This advancement can be classed under four heads: 1, Increased output; 2, Improved quality of products; 3, Businesslike management; and 4, Increased demand for improved stock, especially sires.

The increased output of butter, cheese, cream and milk is phenomenal, especially when we take into consideration the conditions under which such products were produced a few years ago. The examination of statistics shows an increased output of all these products of over 300 per cent. since 1911. This has been done by a well-organized system, carried out successfully by the Departments of Agriculture, under the supervision of the Dairy Commissioners of the three provinces in question. Also, the organization of large dairy companies in the largest centres, to which the cream is sent from their many receiving stations on the various lines of railway. The bulk of the milk which supplies the cities is also brought in by these companies by rail. Through all the hard times that the west has lately passed through, the dairyman felt the pinch the least of any. He had his monthly cheque, which enabled him to pay his bills (which was, and is, perhaps the best argument in favor of dairy farming), while the grain farmer had to secure credit from his local bank or merchant to tide him over. His returns are sure and regular.

The quality of butter and cheese now made is high-class, and according to the awards at western exhibitions this year, western butter was superior to that made in Ontario and Quebec, as there were numerous exhibits from all these provinces. Primarily this is due to the cool climate of the west, but principally to the system of grading the cream, to pasteurization, and the churning the cream sweet. This gives a mild-flavored butter with splendid keeping qualities, and requires less salt. Such a quality of butter sells for the highest market price anywhere. Herein the eastern provinces could take a lesson. I mention the business end, as this is of great importance. Business methods have been adopted from the start. The producer is paid regularly and for what he gives. If he delivers 40 per cent. cream he is paid accordingly. If he delivers milk, whether for cheesemaking or city trade, he is paid according to the quality of his milk, such as butterfat and other solids. If the basis is