

IN AND IN BREEDING.

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OUTLINE.

Definition.

Principles founded on.

Advantages.

Fixing desirable qualities.

Uniformity.

Prepotency.

Disadvantages.

Constitutional weakness.

Reduction in size.

Lack of Fecundity.

Opinion of Breeders.

I shall perhaps use the term, "in and in breeding", in a broader sense than it has been used by most persons; by some the term has been restricted to the breeding of the nearest relations, such as brother and sister, mother and son, or father and daughter. But as I shall use it, I mean the breeding of related animals; a relation near enough as in the human family would be regarded as a restriction to marriage. The terms "in breeding", "close breeding" and "interbreeding", have been used by many persons with slightly different meaning. I use the term, "in and in breeding", as a term which includes them all, but many persons use it differently.

Although in and in breeding is still practiced to some extent, its use has been mainly confined to the early breeders who were establishing a breed or fixing some qualities in that breed.

It is self evident, that if we consider all the now existing breeds of cattle to have sprung from a common source, that any man picking out animals with qualities which he wished to increase and perpetuate, must have had very few animals which possessed these qualities in degree sufficient to separate them from the rest of the herd. A man wishing to start a breed, and beginning at the bottom must have started with a very few select animals; and the peculiar characteristics which marked them from the rest of the herd could not have been developed to any great extent.

It would seem reasonable that the animals possessing these peculiarities if bred together would be more apt to transmit them to their offspring, than they would if only one of the two possessed them. Again it would seem reasonable that if the animals possessing these qualities and bred together, were related they would be more apt to transmit them, being of the same blood and inheriting the same tendencies. This has been the view taken by our early breeders who laid

the foundation for our present breeds, and it certainly has been attended with a great deal of success.

Every breed if traced back to its beginning, will show that this method has been used to a greater or less extent. In some cases it has been used very little, in others it has been used almost entirely for many years. It would be hard to find an animal that did not show some in and in breeding if its pedigree were traced back to the beginning. Cattle, sheep, horses, chickens and dogs all owe their breed peculiarities to some extent to this method of breeding.

In and in breeding has been used to fix special qualities and to make the animals able to transmit them to their offspring. A male is found that manifests some unusual degree of excellence, a female is selected that manifests the same tendency and the two are coupled together. The first offspring may show no trace of the superior excellence manifest in its parents. In this case it is rejected and the same pair are coupled together again, and perhaps this time the offspring will possess the desired qualities. This product if a female when at proper age is coupled with her own sire, and if this product be a female, she is again coupled with the same sire that is both sire and grand sire. This process is sometimes resorted to for several generations with the view of intensifying or perpetuating some quality for which the sire was particularly noted, and which it is found can be transmitted. It is well known that of two animals bred exactly alike and having the same qualities, one may have the power of transmitting it and the other not. The same thing is sometimes accomplished by coupling the dam with her own son, and again if the offspring be a female, she is coupled with the same male that is both brother and father. This method of breeding has unquestionably been very efficient, and often it has been the only source from

which breeding stock could be obtained that possessed and transmitted the desired qualities.

The theory of in and in breeding rests first, on the view that to obtain the best, we must select the best and breed them and their offspring together over and over again, thus keeping their excellences unmodified by any less excellent blood, and by constant interfusion of blood the animals are made identical, and so preventing the appearance of any feature outside the animals originally selected. And, second, that in and in bred animals are prepotent above all others.

It is generally admitted by breeders that in and in breeding has a refining effect on the animals upon which it has been practiced, such as lightness of bone, smoothness, fineness of hair and reduction of size. In this way some of the dwarf breeds of chickens have been produced and this is the way they are maintained. For this reason if in and in breeding be carried too far, it is apt to produce constitutional weakness that will be objectional.

This is perhaps the greatest objection to in and in breeding. There is always the danger that it will result in the loss of constitutional vigor and fertility of the product, and it should be practiced with great caution. As soon as any constitutional defect or weakness is noticed, as a result of in and in breeding, it must be overcome by the infusion of fresh blood into the herd, by introducing into it animals that are not related, but at the same time have the characteristics which it is desired to obtain. It should be borne in mind that defects are quite as apt to be perpetuated as the desirable qualities. This would in a great measure account for the constitutional weaknesses observed in in and in breeding. While we are fixing a type of superior excellence in one particular, we should be

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careful not to undermine it by perpetuating a serious defect. In the constitutional defects arising from in and in breeding, the lack of fecundity is one of the most important. Upon this subject, Darwin writes as follows, "I will venture to add a few remarks on the general question of close interbreeding. Sexual reproduction is so essentially the same in plants and animals, that I think we may fairly apply conclusions drawn from one kingdom to the other. From a long series of experiments on plants, given in my book, "On the Effect of Cross and Self Fertilization", the conclusion seems clear that there is no mysterious evil in the mere fact of the nearest relations breeding together; but that evil follows (independent of any inherited disease or weakness) from the circumstance of near relations generally possessing a closely similar constitution. However little we may be able to explain the cause, the facts detailed by me, show that the male and the female sexual elements must be differentiated to a certain degree in order to unite properly and to give birth to a vigorous progeny. Such differentiation of the sexual elements follows from the parents and their ancestors having lived during some generations under different conditions of life.

The closest interbreeding does not seem to induce variability, or a departure from the typical form of the race or family, but it causes loss of size, of constitutional vigor in resisting unfavorable influences, and often of fertility. On the other hand, a cross between plants of the same sub-variety, which have been grown during some generations under different conditions, increases to an extraordinary degree the size and vigor of the offspring.

Some kinds of plants bear self-fertilization much better than others; never-the-less, it has been proved that these profit greatly

by a cross with fresh stock. So it appears to be with animals, for Short-horn cattle - - perhaps all cattle - - can withstand close inter-breeding with very little injury; but if they could be crossed with a distinct stock without any loss of their excellent qualities, it would be a most surprising fact if the offspring did not also profit in a very high degree in constitutional vigor. If, therefore, anyone chose to risk breeding from an animal which suffered from some inherited disease or weakness, he would act wisely to look out not merely for a perfectly sound animal of the other sex, but for one belonging to another strain, which had been bred during several generations at a distinct place, under as different conditions, as to soil, climate, etc., as possible, for, in this case he might hope that the offspring, by gaining in constitutional vigor, would be enabled to throw off the taint in their blood.

The view presented here by Darwin would seem to account for many apparent contradictions that result from in and in breeding. The farmer who permits his stock to in and in breed promiscuously without selection, would probably experience no evil results from it, since his stock to begin with, would probably be of a heterogeneous character, and many generations might pass without any evil results being noticed. Then again in many cases, there is no selection, they are allowed to breed promiscuously, and if there is any standard it is apt to change quite often, so that in all probability no evil results would be observed.

If the theory above given be correct, no evil results will necessarily follow until uniformity of type and organism have been secured, which in breeding from a mixed stock is apt to be a very slow process.

Herbert Spencer says:

Relations, must on the average of cases, be individuals whose physiological units are more nearly alike than usual. In the one case, the unlikeness of the units may frequently be insufficient to produce fertilization; or if sufficient to produce fertilization not sufficient to produce that active molecular change required for vigorous development. In the other case both fertilization and vigorous development will be made probable.

Nor are we without cause for the irregular manifestations of these general tendencies. The mixed physiological units composing any organism being, as we have seen, more or less segregated in the reproductive centers it throws off, there may arise various results, according to the degrees of difference among the units, and the degrees in which the units are segregated. Of two Cousins who have married, the common grandparents may have had either similar or dissimilar constitutions; and if their constitutions were dissimilar, the probability that their married grand children will have offspring will be greater than if their constitutions were similar. Or the brothers and sisters from whom these cousins descended, instead of severally inheriting the constitutions of their parents in tolerably equal degrees, may have severally inherited them in different degrees: in which the last case the intermarriage among the grand children will be less likely to prove infertile. Or the brothers and sisters from whom these cousins descended may severally ^{have} married persons very like or very unlike themselves, and from this cause, there may have resulted either an undue likeness or a due unlikemess between the married cousins. These several causes, conspiring and conflicting in endless ways and degrees, will work multiform effects. x x x x x x Hence it may happen that among offspring of nearly-related parents

there may be some in which there is decided want of vigor. So that we are alike shown why in and in breeding tends to diminish both fertility and vigor and why the effects cannot be uniform in effect, but only an average effect.

It follows from the above that the more uniform and purely bred our stock becomes, the more danger there is from in and in breeding. While it is a powerful agent in the hands of a skillful and intelligent breeder in the formation of a breed, it must be used with great caution in animals of uniform type, while in animals of a miscellaneous type, it may be used without any evil results being noticed.

Thinking that the opinion of some of the successful breeders of today would be of value on this subject, I have endeavored to get the experiences and views of some of them.

Steele Brothers of Douglas County, Kansas, say:

We do not practice in and in breeding, but do line breeding, our aim is to have an outcross, with every in; our object being to get uniform type. We think, breeding in as close as is done by some will do harm in time.

C. A. Stannard, Emporia, Kansas, says:

I will say that I have never practiced inbreeding. I have a few animals here on the place, that were bred before I came here, in which this was practiced. In them, I can see no objections to that line of breeding. They are very good individuals and seem to be as healthy and strong as the other cattle, although I have always believed that it was not policy to practice in and in breeding.

Manwaring Brothers of Lawrence, Kansas, say:

We do not practice in breeding in our herd of swine, although we breed very close sometimes. Last year we had one sow which we bred

to a boar that was almost a full brother in blood, because we had no other boar to breed her to. In chickens, we practice inbreeding, all our pens of chickens but one are being crossed in cock and cocker-al that are related. Our object is to produce a better show bird, one that is nearer perfection in plumage and general make up. In swine, we consider it not safe as a rule as they deteriorate so fast, but in the case cited above, the cross was excellent, it could not have been better, in chickens we are careful to use extra large birds so as not to reduce the size.

Kirk B. Armour of Kansas City, says:

I have never practices in-breeding, and as for actual results, therefore, my opinion would be only from a theoretical point. I do not believe in breeding animals in close relation, because it seems to me that nature is against it. If I should do so, of course, I might have reasons to change my mind. From general information on the subject; by the inbreeding of a number of animals a few very fancy show calves are usually the result but a great majority of them are inferior to what might be expected, when breeding to the usual custom.

The following is from R. S. Cook, Wichita, Kansas.

I will say that I never practiced in and in breeding, but have to some extent practiced what is termed line-breeding, by mating animals that were one-half or one-third sisters and brothers with an out cross between, is what I understand as line breeding. I have practiced that mode of breeding several years with entire satisfaction. Some of the best animals on my farm are line bred. I never mated a full brother to a full sister or sire to his own get, but have mated a one-half's brother to to one-half brother to sire with first class results always being careful that both animals were good individuals, and that both were not faulty in the same points.

For illustration, Lawrence Perfection 27399 was the sire of Gem 73792, Gem raised three extra nice sows sired by Cook Royalty, and out cross World Beater one-half brother to L. P. was mated to Gem's gilts with the best of results. 2 World Beater was also mated to Faultless, a daughter of Gem with best of results. Then I took Banner Boy and mated him to an out cross sow (Banner Boy was a full brother to Gem), and produced Banner Boy second. I mated Banner Boy second to World Beater sow and produced some grand individuals. Tiptop one of this last cross, is one of the best males I ever had the honor of raising. Black Knight is out of one-half sister by Gem and by mating him a grand daughter of Gem also a daughter of Banner Boy second, I get the best of results. I have also mated him an out cross with very poor results, as the blood lines did not mix properly. Where a sow is faulty in some points I mend same by using a male that is extra good in that point and seldom fail to accomplish my object.

Miller & Sibley of Pa., say:

We take pleasure in giving you a few facts on inbreeding of Jersey cattle as these facts have come under our observation. The pedigrees enclosed will help you to a proper understanding. We owned the two cows La Petite Mere 2nd. and Matilda 4th, each of which gave over 16,000 pounds each year. It is said that the average dairy cow gives about 4,000 pounds. Both of these cows were sired by Stoke Pogis 1259 Imp. This latter bull was a son and grandson of Young Rieter 751 English Herd Book. Furthermore, the dam of Young Rieter 751 was sired by Pedlar 631. The maternal grand dam of Stoke Pogis 1259 was sired by son of Pedlar. La Petite Mere 2nd, was both a daughter and grand daughter of Stoke Pogis 1259. If you will refer to the pedigree of Ida's Rieter of St. L. 13656, you will observe that

he is a grand son and a great grand son of Stoke Pogis 3rd, the latter by the way, being of Stoke Pogis 1259 Imp. Ida's Rieter of St. L. leads all other bulls that ever lived in the average butter yield for 33 tested daughters. They have made approximately twenty pounds of butter apiece a week. The same bull, Ida's Rieter of St. L. sired the cow Ida Marigold, that won the sweep stakes prize in the show ring at the World's Fair and the sweep stakes prize in the fifteen day contest for cheese. There were twenty-five cows each from three different breeds. She also won the greatest net profit for the combined period of the fifteen day cheese contest and the ninety day butter contest of any cow that reached home alive. One cow surpassed her but did not have vitality enough to get her much farther than half the way along towards her home. Referring again to the inbreeding Ida's Rieter of St. L., we would call your attention to the fact that Lord Lisgar is the double great grand sire, and appears again as an ancestor one generation farther back, and furthermore, that the bull Victor Hugo, the sire of Lord Lisgar, appears an additional time as an ancestor. The object of inbreeding is to fix certain desirable characteristics. If there are any elements of weakness common to two related animals, of course, this weakness will be intensified in the offspring. It is therefore only animals of the very best type that can be inbred without great danger. We enclose your pedigree of two young bulls that we now have in service, viz., Ida's Rieters of St. L. 30th and Chancellor of Prospect. The former is by Ida's Rieter of St. L. and his dam is a grand daughter of the dam of Ida's Rieter of St. L. The cow Ida of St. Lambert that appears twice as an ancestor, was one of the greatest cows ever produced in the Jersey breed. She made in an official test 30 pounds 2 1/2 ounces

of butter in seven days. She gave nearly 1900 pounds of milk in thirty-one days in mid-winter. Her daughter, Pomona's Ida of St. L. made 23 pounds and 11 ounces of butter in seven days when a twelve year old. In the pedigree of Ida's Rieter of St. L. 30th on the dam's side of this young bull and once on the dam's side. In short, there is very little of the elements in this bull on the dam's side that are not also found, though of course in varying proportions, on the sire's side.

Chancellor of Prospect, another one of our superior service bulls, is much inbred. The bull, Gipsy's Lorne Pogis, is his double great-grand sire. Stoke Pogis 5th, the maternal ancestor, is a full brother to Stoke Pogis 3rd, who appears four times as an ancestor on the sire's side. Both of these service bulls have sired for us very superior stock out of animals closely related. We do not make a practice, nor do we approve, of breeding a sire onto his own daughters. One of our best sons of Stoke Pogis 5th was Ida of St. Lambert's Bull. His dam was sired by Stoke Pogis 3rd, a full brother of Stoke Pogis 5th. Another son of Stoke Pogis 5th that is famous as a sire is Stoke Pogis of Prospect, who has over 30 tested daughters. By the word test in this connection we mean animals that have actually made by the churn 14 pounds of butter or more in a week. Stoke Pogis of Prospect is out of a dam that was sired by Ida's Rieter of St. L. You will recall that we stated that Stoke Pogis 3rd was a grandsire and great-grandsire of Ida's Rieter of St. L.

While we have had unusual success with inbred bulls of the Stoke Pogis or so called St. Lambert family, we met with failure with inbred bulls of the St. Helier family. We enclose you a pedigree of King of St. Helier. This young bull was of royal lineage, tracing 14 times to St. Helier 45, and having $78 \frac{1}{8} \%$ of the blood of that

noted aniaml. There were twenty-five cows in his pedigree that had records of 14 pounds or more of butter a week. We used this bull of well bred stock and gave him every advantage possible, but we think we never had more than three or four of his calves that came to maturity. Such as he did sire were lacking in vitality and he himself was a very unsure getter. Now we believe that the reason for the failure of King of St. Helier as a sire was that the constitution had all been bred out of him. This is a point which must be considered and watched. You appreciate that this is a great subject and that it cannot all be summed up in a few words.

Stoke Pogis. 5th 5987	Stoke Pogis. 846	Young Rieter 751	Rieter.	Pedlar.	Paladin.
			746	631	618
	Essay.	Young Rieter. 751	Grief.	Pedlar.	
				Gin.	Dormouse. 254
		Tattle.	Wapiti.	Pedlar.	
			927	631	
		Magnet.	Tingtang.	Fowler.	
				335	
	Marjoram. Imp. 3239	Dr. Syntax. 240	Tindal.	Blossom.	
			874		
		Maggie.	Meteor.		
			554		
		Maggie.	Gipsy.	Gipsy. Imp.	
			354		
		Maggie.	Imp	Brigand.	
				118	
		Maggie.	Maggie.		
		Maggie.			

IDA'S RIOTER OF ST. L. 13,656



