

ment is greater than may sometimes be supposed, but there can be no gainsaying the influence of heredity. On this point it is of importance to note, that inheritance of every characteristic should in Darwin's opinion be the rule, and non-inheritance the anomaly. Why, then, it will perhaps be asked by some unfortunate breeder, does it happen that the anomaly is so painfully in the ascendant? Perhaps it is because when one is engaged in improving an indifferent race by the use of a member of an improved race, he is very apt to forget that both parents have influence, and unless he has been careful in selecting a representative of the improved race, not improbably the influence of the older and inferior race may be the stronger. The wish here may be father to the thought. The desire is to reproduce the features of the better animal, and the thought is that these will certainly be produced. Hence the disappointment when the opposite result is obtained. Another source of disappointment is to be found in a mistaken notion that by crossing two animals one may infallibly secure progeny having something of the nature and characteristics of each. That is to say, one mates a very fine animal with an indifferent one, and looks for produce better than the worst, although probably not so good as the better parent. Regarding this Darwin says:—"Many cases are on record showing that a race may be modified by occasional crosses if aided by careful selection of the individuals which present the desired character; but to obtain a race intermediate between two quite distinct races would be very difficult. Sir John Sebright experimented with this object and failed. The offspring from the first cross between two pure breeds is tolerably and sometimes (as I have found with pigeons) quite uniform in character, and everything seems simple enough; but when these mongrels are crossed with another for several generations, hardly two of them are alike, and then the difficulty of the task becomes manifest."

How then, it may be asked, is improvement at all to be brought about? It is for one thing clear that a violent cross will fail, and it is further clear that breeding from the result of a violent cross will also fail. Price, the great Hereford improver, has placed the opinion on record that he never arrived at any good result by crossing a medium sized cow with a very heavy, large bull. All such experiments signally failed. The one safe method is to advance step by step: the American word "grade" is in this connection most apt, and he who uses medium-sized Clydesdale sires on Morgan or Texas mares will reach the goal more speedily than the breeder who uses great gross horses, which undoubtedly have their uses but are out of place in attempts to improve stock. An inbred sire is always the most impressive. There is, however, a danger to be guarded against in the use of such, and concerning it Darwin gives no uncertain warning. He says that having collected a large body of facts, and made so many experiments, he has arrived at results which show in accordance with the almost universal belief of breeders, that, with plants and animals, a cross between different varieties, or between individuals of the same variety, but of a different strain, gives vigor and fertility to the off-spring, whereas on the other hand he has found that close interbreeding diminishes vigor and fertility. He, therefore, concludes that it is a general law of nature that no organic being fertilizes itself for

a perpetuity of generations, but that a cross with other individuals is occasionally, although perhaps at long intervals, indispensable.

No doubt the naturalist has in these words chiefly in view such extreme cases as those of hybrids and hermaphrodites, but in another place and in further development of the same line of reasoning, he says: "Both with plants and animals, there is the clearest evidence that a cross between individuals of the same species which differ to a certain extent, gives vigor and fertility to the off-spring; and that close interbreeding continued during several generations between the nearest relations, if these be kept under the same conditions of life, almost always leads to decreased size, weakness, or sterility."

These opinions, although stated in quiet language, are not the less on that account strongly put, and it is interesting to find that the writer at a later stage, so far from modifying these opinions seems to have found himself under the necessity of stating them with even greater point. In an interview with a prominent breeder, towards the close of his life, he said that the prevention of free crossing—by which, I suppose, he meant breeding within herd or stud book lines, and the matching of individual animals whose relations to each other were thoroughly understood were the cornerstones of the breeders' art; but he added that with the evidence before him he was convinced that it was a great law of nature that all organic beings profit from an occasional cross with individuals not closely related to them in blood, and that on the other hand long continued interbreeding was injurious. Close interbreeding, he thought, might with some animals be carried on for a considerable period with impunity by the selection of the most vigorous and healthy individuals, but sooner or later evil would follow. The visibility of the evil effects might not in such cases be readily recognized because the deterioration was gradual, but of its existence there could be no doubt. Barrenness was one of the most common forms in which this deterioration manifested itself, and blindness and idiocy has also been known to result from prolonged inbreeding. Now, of course, it would not be difficult to show that many very eminent breeders, whose praise is in all the histories, have acted on lines contrary to those suggested by Darwin's views, but I question whether there has been such a general departure from his principles as on the surface might be supposed. For example, it must not be overlooked that he includes the similarity of the conditions under which inbred animals are reared as one of the determining causes towards the deterioration against which he warns us. I would understand him to indicate by that, that good results might flow from the mating of an inbred male reared in Aberdeenshire with an inbred female reared in Galloway or Yorkshire, even although they were of the same family and closely related. Change of air is a most important element in promoting convalescence, and it is an illustration of the same law, although we might regard it as operating in an opposite direction, that certain animals although in perfect health will not breed in captivity. Farmers and gardeners are frequently found changing seeds, tubers, etc., from one soil or climate to another, and back again, and in this way without any interference with the individual seed or plant interested its health and constitution may be strengthened.

I have not a sufficiently intimate acquaintance with Shorthorn history to warrant me in affirming that this actually was the means whereby the Aberdeenshire Shorthorns were improved as they have been; but it seems to me from the little that I have read that the conditions under which they have been reared have had a great influence in determining their highly appreciated characteristics.

The testimony of Mr. Richard Booth in favor of the principle of line-breeding is an interesting contribution to the discussion. He said: "It is clear that the only consideration which would justify me in having recourse to a cross would be the discovery of a tribe which, besides possessing in an equal degree with my own the good qualities we have been aiming at, are superior to them in utility and symmetry. Where is this tribe? The result of the last three crosses upon which I ventured—Walter King, Exquisite and Lord Stanley—has made me distrust the policy of any further step in that direction. Nor have the results I have witnessed of the experiments of others in crossing animals of my blood with the most fashionable bulls of other strains tended in any instance to remove that distrust." These opinions are not to be confounded with the foolish utterances of gentlemen who are unable to see merit in any animals but their own. They are the matured views of a gentleman who was not averse to experiment, who as a matter of fact did experiment with outside crosses, and as such they must be carefully weighed and compared with Mr. Darwin's views. I imagine that the more one reflects on the whole question the less disposed will he be to dogmatise; and while it is impossible at this time to give the reasons for the view, I cannot close without declaring that after a careful investigation the conclusion has gradually taken shape in my mind that Clydesdale breeders have in this country with a very few exceptions during the past ten years been observing the golden mean—neither going to the extreme against which Darwin warns us, nor neglecting the benefits to be derived from judicious line-breeding.

SCOTLAND YET.

A Wonderful Dairy Record.

To the Editor of the FARMER'S ADVOCATE:

I foolishly took Massena around to the exhibitions. She was travelling for one month, and suffered so, at her age, in a crowded car that I thought I would lose her. I did not think when she came home she would make one pound per day, but resumed her test with the following result:—

1891.	Lbs. Milk.	Butter.
Oct. 7 to Nov. 6, inclusive.	627	50 6¾
Previous to going to the fairs.		
Mar. 6 to Sept. 5, inclusive.	5,413½	416 10
Total in seven months.	6,040½	467 0¾

The cow is nearly 16 years old. She is due to calve again in 4 months. She has travelled nearly 2,000 miles by rail in the past 10 months. Before going to the fairs she was making 70 lbs. butter a month, and after returning 50 lbs. It during September she had been left at home, she would, at the very least, have made 60 lbs., which would have been in 8 months 527 lbs. butter. What would this cow have done 10 years ago on high feed? Her persistence is remarkable. She has now been 8½ months milking, and will calve in 4 months, yet she is averaging 21 lbs. milk daily, and 11½ lbs. butter a week. And it only takes 12½ lbs. of milk to make 1 pound of butter on moderate feed.

Mrs. E. M. JONES.