

important consideration; although it will still be desirable to use a large female of the breed we seek to improve. Thus the Southdowns have greatly improved the larger Hampshires, and the Leicester the huge Lincolns and the Cotswolds. 5th. Although the benefits are most evident in the first cross, after which, from pairing the crossed animals, the defects of one breed or the other, or the incongruities of both, are perpetually breaking out, yet, unless the characteristics and co-operation of the two breeds are altogether adverse to each other, nature opposes no barrier to their successful admixture; so that in the course of time, by the aid of selection and careful weeding, it is practicable to establish a new breed altogether. This, in fact, has been the history of our principal breeds. The Leicester is as notoriously a cross of various breeds in the first instance, although the sources which supplied the cross is a secret. The Cotswold has been crossed and improved by the Leicester; the Lincoln, and indeed all the long-wooled breeds have been similarly treated. Most of the breeds are received a dash of better blood, and the short-wooled sheep have also been generally so bred. The Hampshire and the present Wiltshire Downs have been extensively crossed; the Leicesters of the Shropshire cannot deny the 'soft peachment;' and the old black-faced Norfolk, have been pretty well crossed out altogether. The Dorsets and Somersets remain pure as a breed, although they are continually crossed to improve their lambs. The Southdown is perhaps one of the purest breeds we have. No one doubts that the immense improvement of this breed by Ellman was due to any crossing; whether the increased size and further improvement which it has received in other countries have been effected in all cases without a cross of any kind, may be in the minds of some a matter of doubt; yet it is only right to give the advantage, in the absence of any proof to the contrary, the benefit of such doubt, and consider them still as pure as ever.

We recommend the following remarks, with which Mr. Spooner concludes his paper, to the attention of those who resort to cross-breeding in any other view than that of feeding the produce of that cross:—"When equal advantages can be attained by keeping a pure breed of sheep, such pure breed should unquestionably be preferred; and though crossing for the purpose of the butcher may be practised with impunity, and even with advantage, yet no one should do so for the purpose of establishing a new breed, unless he has clear and well defined views of the object he seeks to accomplish, and has duly studied the principles on which it can be carried out, and is determined to bestow for the space of half a life-time his constant and unremitting attention to the discovery and removal of defects." And we may add that there is no instance of any one establishing a new breed, which has attained a permanent type. Where new breeds have been established, as, for instance, the Wiltshire and Hampshire Downs, it has been the result of a *general change* by all the farmers of a district, working under similar natural circumstances in one direction; but, after all, they are but sub-varieties of a pure breed, and gradually more and more approach the characteristics of that breed

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The Mutual Relations of the Vegetable and Animal Kingdoms.

(Continued from page 426.)

In considering the principles of feeding, I may cite, as a special instance of adaptation, that the plant and animal were composed of the same chemical elements. Hence the food supplied by the latter invariably contains all the substances it requires for the maintenance of its functions; and not only is this the case, but these elements are to a great extent combined together in a similar manner, the fibrine, caseine, albumen, and fatty matters contained in animals, corresponding in all respects with the compounds extracted from plants under the same name. It is not within our province, and it is far beyond my ability, to prejudge the solution of those difficult and abstruse problems which have so long engaged the laborious research of the masters of science and practice. Still, whether we incline to adopt the respiratory or the nitrogenous theory of manures—whether we go with Lawes or Liebig—I think we may discern such a modification of views as will authorize us, in practice, to adopt a middle course, which has already shown itself in the advocacy of mixed food, so long established in practice—the flesh and fat forming constituencies combined, as in cake, turnips, and straw, the deficiencies of one being counterbalanced by the other. Without dispute, science and practice are cordially agreed—whatever may be said in support of the use, or condemnatory of the abuse, of special manures