

cent observations and conclusions of recognized authorities show, however, that this process takes place more often than is commonly supposed, although it is by no means frequent.

When one remembers Mendel's own annunciation, however, that it is only necessary to cross two individuals which differ in ten different characters in order to produce over 1,000 distinctly different hereditary forms, it will readily be seen how great may be the confusion (variation) which must follow within a population through the natural segregation of the heterogenous progeny in successive generations. This dividing up of the progeny of a crossing is now generally regarded as the variation which Darwin described but was unable to explain.

The speaker showed a large number of samples of oats from *Pure Lines* taken out of the old Probestier variety, the common white oats grown in the Baltic region. These samples were arranged to show the gradations in characters from one extreme to the other. Thus there was shown a gradation in *awniness* from an absolutely awnless sort to one which was heavily awned, the gradation between the two conditions being a very gradual one. Other lines out of the same variety were arranged to show the same gradations in size, shape and color of kernel.

A very large number of these pure lines from this variety have been worked with in Sweden and Denmark, the best sorts now in use in these countries having originated in this way. So great had been the multiplicity of distinct hereditary forms in this old variety that the experts in charge of the breeding operations found it difficult to obtain identical progeny from any two individuals. These different forms were *not regarded as mutations* but as the product of natural crossing. The experience in artificial crossing work had led Ehle, of Sweden, to state his conviction that a single crossing between two sorts possessing certain characters was quite sufficient to account for practically all the different forms now found in the above old variety.

STRANGE FORMS.—While the above forms can, without any stretch of the imagination, be regarded as being traceable to a common origin, other forms, more foreign in appearance, occur from time to time which seem more difficult to account for. Thus there may arise bearded heads of wheat in a bald sort, white kernelled individuals may appear in a black oat sort and vice versa, or they may appear in a red kernelled sort; side oats may appear in varieties which have branching panicles, etc.

The above aberrant forms have been called *atavists* by some, being regarded as the sudden reappearance of the character of an ancestor; others have applied the name *mutation*. Experience has shown, however, that the majority of these forms which appear in nature without any apparent preparation may