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CERTAIN BIOLOGICAL PRINCIPLES AND THEIR PRACTICAL APPLICATION IN THE IMPROVEMENT OF THE FIELD CROPS OF CANADA.

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THE MUTATION THEORY.

From the evidence brought forth in connection with the theories held by biologists since Darwin's time, it is apparent that the efficacy of natural selection and of the use of fluctuating variations in explaining the facts of evolution, have been steadily losing ground. On the other hand there has been a gradual tendency to regard the part played by "discontinuous" variations or "mutations" as being of more importance in this connection. The supporters of the latter idea have received much encouragement from the work of DeVries of Amsterdam, which work with that of Mendel has served to place the problems of heredity in an entirely new light. The law of Mendel respecting the transmission of characters when two plants are crossed is a large subject in itself and shall not be discussed now. Suffice it to say that the hybridization of varieties as effected in the light of this law is probably the most potent means of producing new varieties that is now within the reach of the expert breeder. The work of DeVries is worthy of special consideration since his discoveries may be said to have marked a new epoch in the long line of investigations of the factors in evolution.

DeVries' idea is that plants and animals are made up of "distinct units" which correspond to atoms in chemistry. By crossing one individual with another the units involved may be combined but never split, just as combinations may be made in chemistry. Transitional forms do not exist between the elements themselves, which assumption goes to support the theory of