

IN his earlier and best-known works—the “Origin of Species” and the “Descent of Man”—Mr. Darwin may be said, in legal phrase, to have formulated the brief which in his subsequent works he has been supporting by detailed evidence drawn from the animal and vegetable kingdoms. As we remarked in our notice of the second edition of the “Variation of Plants and Animals under Domestication,” that voluminous work is a huge collection of material in support of the main proposition of the “Origin of Species,” namely, that “individuals known to be descended from a common ancestor may be made to differ to an indefinite, or at all events to an unknown, extent;” and his newly-published work on “The Effects of Cross and Self Fertilization in the Vegetable Kingdom”<sup>1</sup> fortifies the same argument with a vastly increased range of phenomena and observations. Mr. Darwin himself explains that the present work is a complement to the previously-published “Fertilization of Orchids,” and aims to show that while the adaptations for cross-fertilization are perhaps more obvious in the *Orchideæ* than in any other group of plants, it is an error to speak of them, as some authors have done, as an exceptional case, but that there are immense families of plants that show as perfect or nearly as perfect a structure as can be found in any orchid. Indeed, the outcome of the long series of investigations described in the work is the general law, applicable to the whole vegetable kingdom, that “cross-fertilization is generally beneficial, and self-fertilization injurious; and that this is shown by the difference in height, weight, and constitutional vigor, and fertility of offspring, from crossed as compared with that from self-fertilized flowers, and in the number of seeds produced.” About three-fourths of the volume is devoted to a record of the experiments and observations, extending over eleven years, and embracing many varieties of plants, on which the author’s conclusions are based, and this provides some tough work for non-scientific readers; but the concluding chapters, giving the general results, are eminently striking and attractive, and Mr. Darwin himself suggests a way by which those who are not naturalists can master the principles and methods of the work without reading its entire contents. The bearing of the facts upon the general question of evolution by descent is rather implied than insisted upon; but it is easily made out, and may be stated as follows: If all plants were self-fertilized, or if the advantages lay with self-fertilization as against cross-fertilization, species would remain absolutely fixed. With the introduction of cross-fertilization, accompanied by the fact of greater vigor and fertility in its offspring, a new and vital element is brought in, which, in fact, involves and explains the origin of species. As long as external conditions are uniform, there is no reason why a species should ever vary; but as soon as these conditions are changed, the self-fertilized plants, being the less vigorous, die out or give place to the more vigorous cross-fertilized plants, while at the same time the cross-fertilization takes place between individual plants becoming more and more variable, thus giving rise to new varieties and ultimately to new species.

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How far and in what way an author should “dip down” in order to reach the level of the youthful mind,

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<sup>1</sup> The Effects of Cross and Self Fertilization in the Vegetable Kingdom. By Charles Darwin, M. A., F. R. S. New York: D. Appleton & Co. 12mo, pp. 482.