

or selection from year to year of the most desirable individuals results in a gradual improvement in the race until certain limits have been reached.

While natural selection is, without doubt, a potent factor in the developing or creating of new species in nature, and while its action there may suggest the value of artificial selection as a means of improving domestic types, yet, it fails to account fully for the existence of our present species. This assertion is based on the following facts: (1) Natural selection is based upon variations which it cannot explain. (2) Certain of these variations cannot have been of any possible use to the individual and, hence, cannot have operated in its evolution. (3) Life, according to certain authorities has not been possible on the earth for a sufficient length of time to allow the development of all of our present species, had these been developed as slowly as would be required by the action of natural selection. (4) The numerous transitional links between species, which would of necessity exist had evolution come about as gradually as would be required by the natural selection of the "fittest," are not found.

We must, therefore, look to some internal factor upon which to base the laws governing the origin of species. Darwin himself recognized the insufficiency of his theory at a later date, and attempted to supplement it with his theory of "Pangenesis," but failed to contribute much toward the elucidation of the problem.

ATTEMPTS TO FIND INTERNAL CAUSES OF VARIATION.

Passing on from the time of Darwin we find the leading investigators searching for an internal force to explain the origin of variation. The German botanist Nageli was the first to attempt to find within the organism itself a force which might account for the appearance of strange characters in the offspring. He assumed the existence within the organism of a tendency toward progression or perfect development and believed that in accordance with this tendency organisms are continually varying so as to rise in the scale of nature. He failed, however, in explaining the origin of this internal force, so contributed little toward our better understanding of the question involved.

Another theory is advanced by Mivart to the effect that species have arisen suddenly and not by slow modifications hence the theory of "extraordinary births." An instance of the application of this theory is found in connection with an experiment conducted by Dr. Godron, of Nancy, with *Datura Tatula*, (Purple Thorn Apple), the seed capsules of which plant are normally covered with spines. Seeds of this plant were sown and produced plants among which was found a plant whose seed capsules were