

in the individuals of the same species; we have also seen in the earlier chapters of this work how variable secondary sexual characters become under domestication.

*Summary of the three previous Chapters on the Laws of Variation.*

In the twenty-third chapter we saw that changed conditions occasionally, or even often, act in a definite manner on the organisation, so that all, or nearly all, the individuals thus exposed become modified in the same manner. But a far more frequent result of changed conditions, whether acting directly on the organisation or indirectly through the reproductive system, is indefinite and fluctuating variability. In the three last chapters, some of the laws by which such variability is regulated have been discussed.

Increased use adds to the size of muscles, together with the blood-vessels, nerves, ligaments, the crests of bone and the whole bones, to which they are attached. Increased functional activity increases the size of various glands, and strengthens the sense-organs. Increased and intermittent pressure thickens the epidermis. A change in the nature of the food sometimes modifies the coats of the stomach, and augments or decreases the length of the intestines. Continued disuse, on the other hand, weakens and diminishes all parts of the organisation. Animals which during many generations have taken but little exercise, have their lungs reduced in size, and as a consequence the bony fabric of the chest and the whole form of the body become modified. With our anciently domesticated birds, the wings have been little used, and they are slightly reduced; with their decrease, the crest of the sternum, the scapulæ, coracoids, and furculum, have all been reduced.

With domesticated animals, the reduction of a part from disuse is never carried so far that a mere rudiment is left; whereas we have reason to believe that this has often occurred under nature; the effects of disuse in this latter case being aided by economy of growth, together with the intercrossing of many varying individuals. The cause of this difference between organisms in a state of nature, and under domestication, probably is that in the latter case there has not been