

## CHAPTER XXII.

## CAUSES OF VARIABILITY.

VARIABILITY DOES NOT NECESSARILY ACCOMPANY REPRODUCTION—CAUSES ASSIGNED BY VARIOUS AUTHORS—INDIVIDUAL DIFFERENCES—VARIABILITY OF EVERY KIND DUE TO CHANGED CONDITIONS OF LIFE—ON THE NATURE OF SUCH CHANGES—CLIMATE, FOOD, EXCESS OF NUTRIMENT—SLIGHT CHANGES SUFFICIENT—EFFECTS OF GRAFTING ON THE VARIABILITY OF SEEDLING-TREES—DOMESTIC PRODUCTIONS BECOME HABITUATED TO CHANGED CONDITIONS—ON THE ACCUMULATIVE ACTION OF CHANGED CONDITIONS—CLOSE INTERBREEDING AND THE IMAGINATION OF THE MOTHER SUPPOSED TO CAUSE VARIABILITY—CROSSING AS A CAUSE OF THE APPEARANCE OF NEW CHARACTERS—VARIABILITY FROM THE COMMINGLING OF CHARACTERS AND FROM REVERSION—ON THE MANNER AND PERIOD OF ACTION OF THE CAUSES WHICH EITHER DIRECTLY, OR INDIRECTLY THROUGH THE REPRODUCTIVE SYSTEM, INDUCE VARIABILITY.

We will now consider, as far as we can, the causes of the almost universal variability of our domesticated productions. The subject is an obscure one; but it may be useful to probe our ignorance. Some authors, for instance Dr. Prosper Lucas, look at variability as a necessary contingent on reproduction, and as much an aboriginal law as growth or inheritance. Others have of late encouraged, perhaps unintentionally, this view by speaking of inheritance and variability as equal and antagonistic principles. Pallas maintained, and he has had some followers, that variability depends exclusively on the crossing of primordially distinct forms. Other authors attribute variability to an excess of food, and with animals to an excess relatively to the amount of exercise taken, or again to the effects of a more genial climate. That these causes are all effective is highly probable. But we must, I think, take a broader view, and conclude that organic beings, when subjected during several generations to any change whatever in their conditions, tend to vary; the kind of variation which ensues depending in most cases in a far higher degree on the nature or constitution of the being, than on the nature of the changed conditions.