

CHAPTER XXIII.

DIRECT AND DEFINITE ACTION OF THE EXTERNAL CONDITIONS OF LIFE.

SLIGHT MODIFICATIONS IN PLANTS FROM THE DEFINITE ACTION OF CHANGED CONDITIONS, IN SIZE, COLOUR, CHEMICAL PROPERTIES, AND IN THE STATE OF THE TISSUES—LOCAL DISEASES—CONSPICUOUS MODIFICATIONS FROM CHANGED CLIMATE OR FOOD, ETC.—PLUMAGE OF BIRDS AFFECTED BY PECULIAR NUTRIMENT, AND BY THE INOCULATION OF POISON—LAND-SHELLS—MODIFICATIONS OF ORGANIC BEINGS IN A STATE OF NATURE THROUGH THE DEFINITE ACTION OF EXTERNAL CONDITIONS—COMPARISON OF AMERICAN AND EUROPEAN TREES—GALLS—EFFECTS OF PARASITIC FUNGI—CONSIDERATIONS OPPOSED TO THE BELIEF IN THE POTENT INFLUENCE OF CHANGED EXTERNAL CONDITIONS—PARALLEL SERIES OF VARIETIES—AMOUNT OF VARIATION DOES NOT CORRESPOND WITH THE DEGREE OF CHANGE IN THE CONDITIONS—BUD-VARIATION—MONSTROSITIES PRODUCED BY UNNATURAL TREATMENT—SUMMARY.

IF we ask ourselves why this or that character has been modified under domestication, we are, in most cases, lost in utter darkness. Many naturalists, especially of the French school, attribute every modification to the "monde ambiant," that is, to changed climate, with all its diversities of heat and cold, dampness and dryness, light and electricity, to the nature of the soil, and to varied kinds and amount of food. By the term definite action, as used in this chapter, I mean an action of such a nature that, when many individuals of the same variety are exposed during several generations to any particular change in their conditions of life, all, or nearly all the individuals, are modified in the same manner. The effects of habit, or of the increased use and disuse of various organs, might have been included under this head; but it will be convenient to discuss this subject in a separate chapter. By the term indefinite action I mean an action which causes one individual to vary in one way and another individual in another way, as we often see with plants and animals after they have been subjected for some generations to changed conditions of life. But we know far too little of the causes and laws of