

groups lies only in the different manner of viewing them, and I believe that they can, with full justice, be considered as one. The most essential fact in these phenomena of cumulative adaptation is that the change of the organism which manifests itself first in the functions, and at a later period in the form, is the result either of long enduring, or of often repeated, influences of an external cause. The smallest cause, by cumulation of its action, can attain the greatest results.

There are innumerable examples of this kind of direct adaptation. In whatever direction we may examine the life of animals and plants, we discover on all hands evident and undeniable changes of this kind. Let me first mention some of those phenomena of adaptation occasioned directly by nutrition itself. Every one knows that the domestic animals which are bred for certain purposes can be variously modified, according to the different quantity and quality of the food given to them. If a farmer in breeding sheep wishes to produce fine wool, he gives them different food from what he would give if he wished to obtain good flesh or an abundance of fat. Choice race and carriage horses receive better food than dray and cart horses. Even the bodily form of man—for example, the amount of fat—is quite different according to his nutrition. Food containing much nitrogen produces little fat, that containing little nitrogen produces a great deal of fat. People who, by means of Banting's system, lately so popular, wish to become thin eat only meat and eggs—no bread, no potatoes. The important variations that can be produced among cultivated plants, solely by changing the quantity and quality of nourishment, are well known. The