

XLV. ANTICIPATION AND RETROSPECT IN LIFE PLANS.

COMPREHENSIVE TYPES.

WHAT I wish now to set forth is a principle of very profound significance. It is a general truth in the nature of the succession of organic types; and I will endeavor to make it plain by citing some of the striking illustrations of it. From the working of this principle, it results that the creatures of any age often unite in themselves some characters of a group actually existing, with characters of a group not yet in existence. This is *anticipation*. Such a union forms a "prophetic type," as Agassiz used to express it. It is also a *comprehensive* type. Also, from the working of this principle, it results that the creatures of any age often unite in themselves some characters of a group actually existing, with characters of a group which was dominant in a former age—whether still existing or not. Such a union forms a *retrospective* type. This is also *comprehensive*. But in some comprehensive types we find a union of characters none of which belong to any fairly circumscribed existing group. They are all prophetic or anticipatory of groups which are destined to be defined in the future.

Take first, the early Ganoids for a good example. Their vertebræ were generally concavo-convex. This is a reptilian character. Nearly all reptiles, living and extinct, possess such vertebræ, while all typical or proper fishes possess bi-concave vertebræ. Now the early Ganoids were not reptiles, and had no claim to concavo-convex vertebræ. There had never been a reptile in existence when these Ganoids first lived—when *O-nych'-o-dus* of Ohio, for instance, flourished. If we may attribute to the ancient Ganoids, certain other characters which belong to modern Ganoids, like the gar-pike, we should say they possessed an opening or glottis in the back part of the mouth, and that a passage existed from this to the air bladder; and that the latter organ was coarsely