

of local life which remain in parts of an organism, *e.g.* the turtle's heart, which may beat long after the continued life of the entire animal is out of the question, indeed after the bulk of the creature has been made into soup.

In short, here again we face the suggestion that the state of life and the state of death are but the extremes of a long series.

From Treviranus to Verworn, from Claude Bernard to Le Dantec, biologists have endeavoured to state the characteristics of living organisms; but a historical summary is not yet justified, since so little progress has been made. It is not even possible to say that we have got rid of mysticism. We have become more concrete than Linnæus was when he penned his famous aphorism — “*Lapides crescunt; vegetabilia crescunt et vivunt; animalia crescunt, vivunt, et sentiunt*”; and we have probably become more aware of our ignorance.

Characteristics of Living Organisms.

It is not, therefore, with any confidence that we here emphasize three characteristics which distinguish the living from the not-living.

(1) The first is the power of *organic growth*, the power of repairing loss and increasing size at the expense of material more or less different from that which forms the organism. The crystal grows, but it grows only out of material *similar* to itself, while the grass grows at the expense of air, water, and salts, and the horse at the expense of the grass.

(2) The living creature, as long as it is actively alive, is interacting with its environment; it is the subject of more or less continuous chemical changes, some of which are direct reactions to the outside world, while others are only indirect reactions; yet, in spite of this flux and unrest, the organism remains for variable periods much the same, it retains its integrity or unity of character.

(3) An organism is often compared to an engine, and the two are alike in being material systems adapted for the transformation of matter and energy from one form to another. But there are differences. Not only is