

anything but a metaphysical conception of development. "Not only is there", he said, "a soul or vital principle present in the vegetative part, but even before this there is inherent mind, foresight, and understanding, which, from the very commencement to the being and perfect formation of the chick, dispose and order and take up all things requisite, moulding them in the new being, with consummate art, into the form and likeness of its parents."

It was well, indeed, that it should be pointed out that development is a marvellous progressive process, in the course of which the obviously complex arises from the apparently simple, and the dissimilar or heterogeneous from the similar or homogeneous; but Harvey overshot the mark, and made development miraculous. It is a mistake, he said, to look for any "prepared matter" in the egg; but by exaggerating this he left no material basis for the inherent potentialities, and was forced to conceive of them mystically. Moreover, he was so far from understanding the egg, that he suggested that the primordium might proceed from parents, *or* arise spontaneously, *or* out of putrefaction. As Huxley points out, Harvey believed in spontaneous generation as firmly as Aristotle did. That he did great service must be freely allowed, but there has been a tendency to read the experience of the nineteenth century into some of his sentences.

Charles Bonnet (1720-1793) may be taken as the most thoroughgoing representative of the preformationist school, whose erroneous doctrines greatly inhibited the progress of embryological research for more than a century. He was the discoverer of the parthenogenesis of green-flies or Aphides, and made many interesting concrete observations on polypes and worms, but after the failure of his eyesight he became more exclusively a speculative thinker. He pondered over the phenomena of generation and development, and ended, strange to say, by virtually denying them both. His central idea was the "preformation" or asserted pre-existence of the organism and all its parts within the germ. Not that he supposed

Bonnet and
the Prefor-
mationists.