unique potentialities?" he too was forced to fall back upon mysticism.

(b) Special Pangenetic Theories.—Passing from the early hypotheses, we come to a series of theories, which are in varying degrees scientific, and may be fairly enough described by the general designation pangenetic. They have this in common, that they seek to explain the uniqueness of the germ-cell by regarding it as a centre of contributions from different parts of the organism.

At such different epochs as are suggested by the names of Democritus and Hippocrates, Paracelsus and Maupertuis, incipient theories of pangenesis—prophecies of Darwin's—were suggested. Thus Democritus maintained that the "seed" of animals was elaborated by contributions from all parts of the body. Two thousand years later, Buffon again regarded the germs as mingled extracts from all parts of the body, or as collections of samples from the various organs. If such were indeed the case, Buffon and his predecessors saw no further difficulty, for each contributed sample was supposed to reproduce in the embryo a structure like that from which it originated in the parent.

In 1864, in his *Principles of Biology*, Herbert Spencer suggested the existence of "physiological units", derived from and capable of development into cells, and supposed that they accumulated in the reproductive elements, which thus became, in some conceivable sense, miniature organisms.

The best-known theory of this class is, of course, the "provisional hypothesis of pangenesis" suggested by Darwin in his Variation of Animals and Plants under Domestication:—

(1) Every cell of the body, not too highly differentiated, throws off characteristic gemmules;

(2) These multiply by fission, retaining their characteristics;

(3) They become specially concentrated in the reproductive elements;

(4) In development the gemmules unite with others like themselves, and grow into cells like those from which they were originally given off.