

reproduction would likewise affect their product,—that is, the offspring thus generated.

The period of life at which the causes that induce variability act, is likewise an obscure subject, which has been discussed by various authors.<sup>49</sup> In some of the cases, to be given in the following chapter, of modifications from the direct action of changed conditions, which are inherited, there can be no doubt that the causes have acted on the mature or nearly mature animal. On the other hand, monstrosities, which cannot be distinctly separated from lesser variations, are often caused by the embryo being injured whilst in the mother's womb or in the egg. Thus I. Geoffroy Saint-Hilaire<sup>50</sup> asserts that poor women who work hard during their pregnancy, and the mothers of illegitimate children troubled in their minds and forced to conceal their state, are far more liable to give birth to monsters than women in easy circumstances. The eggs of the fowl when placed upright or otherwise treated unnaturally frequently produce monstrous chickens. It would, however, appear that complex monstrosities are induced more frequently during a rather late than during a very early period of embryonic life; but this may partly result from some one part, which has been injured during an early period, affecting by its abnormal growth other parts subsequently developed; and this would be less likely to occur with parts injured at a later period.<sup>51</sup> When any part or organ becomes monstrous through abortion, a rudiment is generally left, and this likewise indicates that its development had already commenced.

Insects sometimes have their antennæ or legs in a monstrous condition, the larvæ of which do not possess either antennæ or legs; and in these cases, as Quatrefages<sup>52</sup> believes, we are enabled to see the precise period at which the normal progress of development was troubled. But the nature of the food given to a caterpillar sometimes affects the colours of the moth, without the caterpillar itself being affected; therefore it seems possible that other characters in the mature insect might be indirectly modified through the larvæ. There is no reason to suppose that organs which have been rendered monstrous have always been acted on during their development; the cause may have acted on the organisation at a much earlier stage. It is even probable that either the male or female sexual elements, or both, before their union, may be affected in such a manner as to lead to modifications in organs developed at a late period of life; in nearly the same manner as a child may inherit from his father a disease which does not appear until old age.

<sup>49</sup> Dr. P. Lucas has given a history of opinion on this subject: 'Héréd. Nat.' 1847, tom. i. p. 175.

<sup>50</sup> 'Hist. des Anomalies,' tom. iii. p. 499.

<sup>51</sup> *Ibid.*, tom. iii. pp. 392, 502. The

several memoirs by M. Dareste hereafter referred to are of special value on this whole subject.

<sup>52</sup> See his interesting work, 'Métamorphoses de l'Homme,' &c., 1862, p. 129.