

every succeeding year there appears in that organ a larger and larger set of eggs, each set made up of the usual average number of eggs which this species lays, so that specimens eleven years old, for the first time, contain mature eggs, ready to be laid in the spring.

Now another question arose, When are the eggs fecundated? Field observations soon taught me that this species copulates before it is eleven years old; I have even seen those that were not over seven years old already performing the act, though I have never seen any in copulation younger than these. Thus it appears that the first copulation coincides with a new development of the eggs, in consequence of which, a certain number of them, equal to that which the species lays, acquire a larger size, and go on growing for four successive years before they are laid, whilst a new set is started every year, at the period of copulation in the spring, enabling this species to lay annually from five to seven eggs, after it has reached its eleventh year.

The question was then naturally suggested, whether fecundation is the result of the first act of copulation, or of the second, the third, or the last; or whether the first copulation only determines the further growth of a certain number of eggs, which require a series of successive fecundations to undergo their final development. The second alternative appears the more probable when it is remembered that Turtles were observed¹ which did not lay their eggs as usual, though the yolk had undergone all the regular changes through which it passes, up to the time the egg has entered the oviducts. This is another fact which tends to prove that fecundation is a successive act. Though Turtles lay only once every year, soon after the period of copulation in the spring, copulation itself does not take place once merely, every year, as in all the animals known to bring forth young once annually; it is repeated a second time, every year, in the autumn, shortly before the Turtles retire to their winter-quarters;² and this takes place without apparent connection with any marked change in the growth of the egg at that season. So, in Turtles, fecundation does not appear to be an instantaneous act, resulting from one successful connection of the sexes, as it is with most animals. The facts related above show, on the contrary, that, in Turtles, a repetition of the act, twice every year, for four successive years, is necessary to determine the final development of a new individual, which may be accomplished in other animals by a single copulation.

It may be suggested, that, by an investigation of the spermatic particles, additional light would be thrown upon these remarkable circumstances. But such investigations present greater difficulties in these animals than could be supposed

¹ See below, Ch. 2, Sect. 4.

² Comp. Part II., Ch. 1, Sect. 11, p. 284.