

sexually and asexually, which is very general. The former pass in the course of their development from a very low stage to their highest stage, as we see in the metamorphoses of insects and of many other animals, and in the concealed metamorphoses of the vertebrata. Animals propagated asexually by buds or fission, on the other hand, commence their development at that stage at which the budding or self-dividing animal may happen to be, and therefore do not pass through some of the lower developmental stages.¹⁰ Afterwards, they often advance in organisation, as we see in the many cases of "alternate generation." In thus speaking of alternate generation, I follow those naturalists who look at this process as essentially one of internal budding or of fissiparous generation. Some of the lower plants, however, such as mosses and certain algæ, according to Dr. L. Radlkofer,¹¹ when propagated asexually, do undergo a retrogressive metamorphosis. As far as the final cause is concerned, we can to a certain extent understand why beings propagated by buds should not pass through all the early stages of development; for with each organism the structure acquired at each stage must be adapted to its peculiar habits; and if there are places for the support of many individuals at some one stage, the simplest plan will be that they should be multiplied at this stage, and not that they should first retrograde in their development to an earlier or simpler structure, which might not be fitted for the then surrounding conditions.

From the several foregoing considerations we may conclude that the difference between sexual and asexual generation is not nearly so great as at first appears; the chief difference being that an ovule cannot continue to live and to be fully developed unless it unites with the male element; but even this difference is far from invariable, as shown by the many cases of parthenogenesis. We are therefore naturally led to inquire what the final cause can be of the necessity in

¹⁰ Prof. Allman speaks ('Transact. R. Soc. of Edinburgh,' vol. xxvi., 1870, p. 102) decisively on this head with respect to the Hydroïda: he says, "It is a universal law in the succession

"of zooids, that no retrogression ever takes place in the series."

¹¹ 'Annals and Mag. of Nat. Hist., 2nd series, vol. xx., 1857, pp. 153-455