E. Life cycle—In the life history of the pteridophytes there is a *typical heteromorphic alternation of sporophytic and gametophytic generations*—these two generations alternate with each other in a regular succession i.e., sporophyte to gametophyte and gametophyte to sporophyte. The sporophytic

or asexual generation is diploid, which results from the union of two haploid gametes (i.e,, antherozoid and ovum)—the starting point of this generation is the zygote or oospore (2*n*). The gametophytic or sexual generation is haploid (*n*) and which results from the formation of haploid spores (the starting point) produced by the sporophyte—in this type of alternation, chromosome number is doubled at the time of gametic union and becomes halved at the time of spore formation showing thereby a cytological alternation of diploid and haploid generations.

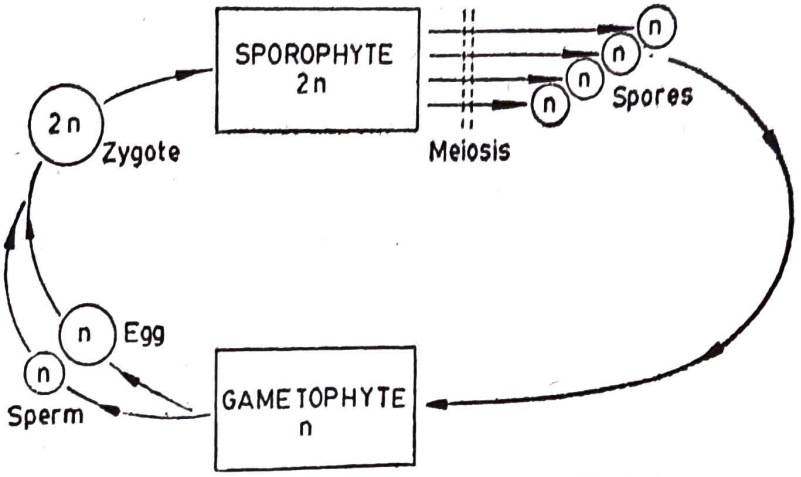

Fig 1.1—Life cycle of a homosporous pteridophyte.

Among pteridophytes the sporophyte is the dominant generation, as it very soon becomes independent of the gametophyte and grows to a much greater size along with greater degree of morphological and anatomical complexity. On the basis of size differences of the spores produced by sporophytes, pteridophytes may be homosporous and heterosporous. In homosporous, spores are of same sizes ; each spore on germination produces monoecious gametophyte (prothallus) bearing both antheridia and oogonia—hence the life cycle (Fig. 1.1) of a homosporous pteridophyte is basically same like that of bryophytes. On the other hand spores produced by heterosporous pteridophytes are of different sizes such as larger *megaspores* giving rise to female gametophyte bearing only archegonia and smaller *microspores* giving rise to male gamatophyte bearing antheridia only. Therefore the

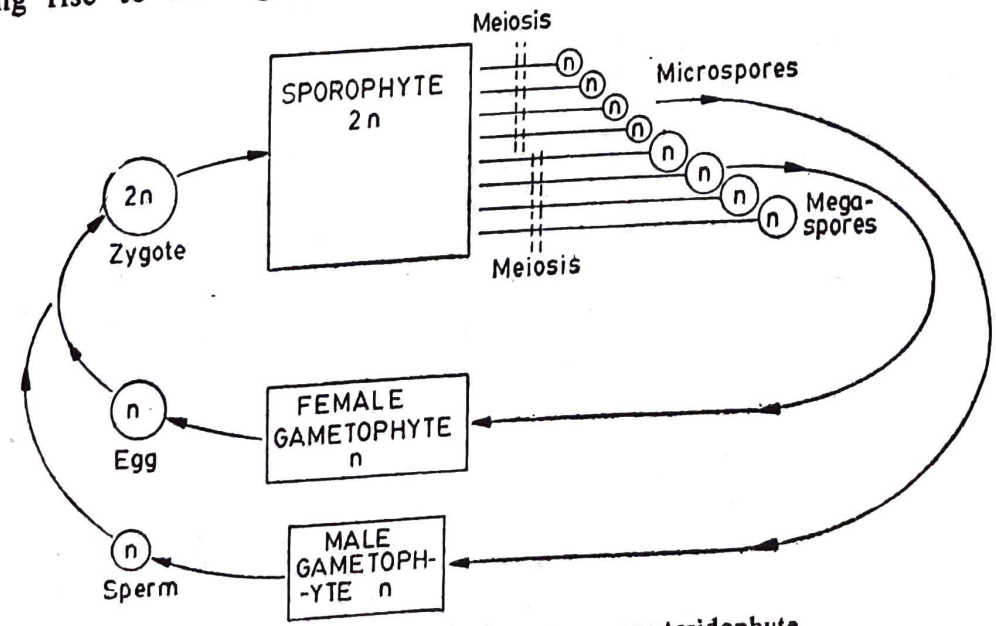

Fig. 1.2—Life cycle of a heterosporous pteridophyte.

life cycle of heterosporous pteridophytes (Fig.1.2) differ markedly from that of homosporous pteridophytes. It is to be noted, that such size difference of spore is well marked wherever the gametophyte is retained within the spore.

Sometimes cytological alternation of generation is hampered due to the formation of the gametophyte directly from the sporophyte without the production of spores (*apospory*) and also sporophyte directly from the vegetative cells of the gametophyte without gametic union (*apogamy*) ; sometimes egg cell may develop apogamously into a sporophyte—this phenomenon is known as *parthenogenesis.*