

of the laboratory was sufficient, according to Fitting, to produce abnormally quick shedding of petals, this result following dosage with carbon dioxide, tobacco smoke, chloroform, ether, and other agents. Brown and Escombe (40) found that other organs are similarly affected by disturbance of nutritive relations. Hannig got similar results, except in the case of carbon dioxide. 0.00002 vol. per cent. of illuminating gas caused the abscission of flowers (*Mirabilis*, etc.). A high concentration did not cause this directly up to 14 hours exposure, but indirectly after removal from the gas. Carbon dioxide, in concentrations up to 10 per cent., produced no effect, in accord with experiments of Demoussy (1903, 1904, see Hannig). On the other hand, leaves are shed if kept in air free of carbon dioxide (Loewi). It is evident that more work on this point, as indeed on all others, would be welcome.

Light. Light is the source of energy for green plants, so that much disturbance of this relation would be expected, indirectly at least, to lead to abnormal behaviours. It would be expected that changes in light intensity would have less effect on floral parts than on green parts, but Hannig and Fitting came to different results. Wiesner (39) believes that leaf abscission occurs in early summer in the leaves less favourably exposed to light because of the reduction of the absolute available light supply. I may observe that this kind of leaf-fall, as regards the time of occurrence, takes places whether shade is present or not. I have seen it on young plants of *Negundo*, which were completely illuminated, in which it seems more in accord with the appearances to recall Dingler's paper, earlier cited. Leaves shaded by the outermore foliage nevertheless do become yellow and fall (*Vitis*, *Ampelopsis*, *Euonymus*, etc.), and the earliest leaves in the White Birch in the autumn are those on the inner branches, irrespective of their age. In the climate of Quebec the question of high temperature is probably not important, and in such cases it seems quite proper to explain this, in the absence of more exact experimental observation, as due to the reduction of light.

THE TIME REQUIRED FOR THE ACT OF SEPARATION PROPER.

By this is meant the time occupied by the process of separation itself to the exclusion of the period required to institute it (latent period). It would seem on general grounds that when cell division is involved, the process would require more time than otherwise. In some organs (petals) in which no cell-division occurs, the evidence (Fitting) shows that it may be quite brief, less than 30 seconds indeed, but we cannot say in any case exactly what it is.