Plant Ecology of Bombed Sites

MANY of the unsightly scars left by the air-raids on London are now being hidden by a carpet of vegetation. Some notes on its growth on a small bombed site in a terrace in the heart of Kensington may be of interest. A three-storied corner house with a basement area and no front garden of any kind was completely destroyed by a direct hit in September 1940, but the site and that of the adjacent damaged house was not cleared until the autumn of 1941. It was then fenced off by a wooden paling which enclosed the former stretch of pavement in front of the two houses.

At that time there was scarcely a trace of plant growth. Now the site is gay with blossom. For the past six weeks there has been quite a mass of the handsome pink rosebay (*Epilobium angustifolium*) growing 3 ft. tall, which is becoming one of the most abundant weeds of waste ground and neglected gardens in London, no doubt owing to the wide distribution of its light tufted air-borne seeds; but what is more remarkable, there are no less than twenty strong young shrubs of *Buddleia variabilis* coming up, the largest of which, growing on the site of the former pavement, are now coming into flower. One of them is already six feet high and has, in flower and bud, thirty-six heads of bloom, some of them nine inches long. The nearest possible parent plant which I have been able to trace is fully a hundred yards away.

Altogether there are twenty-two different species at present in flower on the site, belonging to ten natural orders (9 composites, 3 grasses, 3 species of *Epilobium*, 1 Crucifer (shepherd's purse), 1 Caryophyllaceæ (chickweed), 1 Leguminosæ (clover), 1 Plantaginaceæ, 1 Chenopodium, 1 Polygonum, 1 Loganiaceæ (*Buddleia*), besides thick patches of moss with fruiting capsules).

MABEL HARTOG.

5 Inverness Gardens,
W.8
August 17.

Change of Sign of the Thermal Diffusion Factor

THE change of sign of the thermal diffusion factor α with composition, which Prof. S. Chapman¹ has pointed out is theoretically possible in certain conditions, has been found to occur in neon-ammonia mixtures recently examined.

In a mixture of molecules differing slightly in mass and interaction, the thermal diffusion factor α may be considered approximately as consisting of three terms. Two of these terms represent the contributions of the mass difference and of the diameter difference of the molecules; the third involves the force index and the departure of the mutual collision diameter s_{12} from the mean diameter $(s_1 + s_2)/2$. This third term, unlike the others, depends on the concentration; although small when the mass contribution and the diameter contribution are of the same order but opposite in sign, it may suffice to bring about a change of sign of α as the composition of the mixture varies. The neon-ammonia mixture is one of few in which the mass difference is small and the heavier molecule is the smaller, so that it satisfies at least the requirement that the mass and diameter contributions should be opposite in sign.

Mixtures of various composition were examined,

a Clusius-Dickel column (made in Pyrex glass) being used to increase the separation due to thermal diffusion alone, as this is too small to measure by the direct method used hitherto. Since the direction of the longitudinal concentration gradient which is set up in the column is determined by the direction of the thermal diffusion transversely, and this in turn is determined by the sign of α , a change in the sign of α would appear as a change in the direction of the concentration gradient. The experimental results are shown in the figure, where the separation, that is,

the difference in percentage composition at the upper and lower ends of the column is plotted for mixtures of varying composition. Between 0 and 75 per cent neon, the neon concentrates at the upper end of the column. This means that the heavier, neon, molecule diffuses up the temperature gradient—a direction of diffusion, it is believed, not hitherto observed. Above 75 per cent neon, the neon concentrates at the lower end, indicating that the sign of α is now changed.

K. E. GREW.

Physics Department,
Heriot-Watt College,
Edinburgh.
August 10.

¹ Chapman, S., NATURE, 146, 431 (1940); Proc. Roy. Soc., 177, 38, (1940).

Abnormality of Flame Gases

It is becoming increasingly recognized that flame gases (that is, the gases left behind after flame has travelled through an inflammable mixture) hold a latent energy (which may amount to as much as 20 per cent of the heat of combustion or even more), and in virtue of this an abnormal amount of dissociation obtains in them¹. In the absence of surface, the latent energy has an exceedingly long life. It has been observed to exist in sensibly undiminished amount for at least 0.5 sec. Luminosity