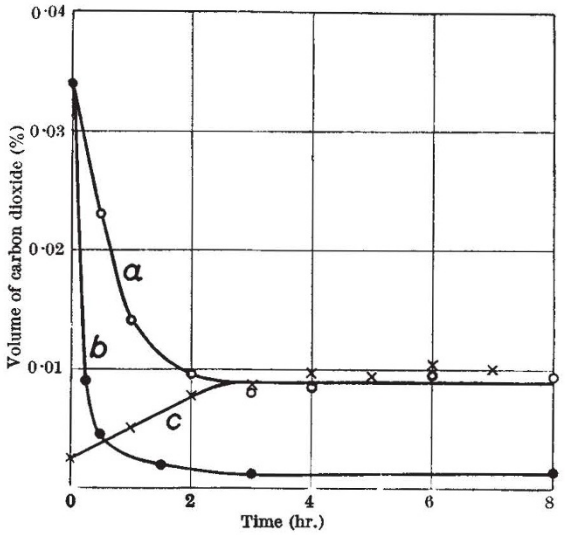

plants in a chamber inside a closed system through which a vigorous circulation of air was maintained. When the leaves were illuminated with 2,050 foot-candles, they found that the carbon dioxide concentration in no case (thirty-four plants from ten species were employed) could be brought below 0·010 vol. per cent.

However, in Miller and Burr's experiments carbon dioxide was produced inside the apparatus from respiration of roots and stems, and from micro-organisms in the soil. The results, therefore, became expressions of a balance between production and consumption, and did not give correct information about the actual lowest concentration at which photosynthesis can take place.

Aiming at an exact determination of this value, I have, in the summer months of 1947, carried out two series of experiments with leaves of elder (*Sambucus nigra* L.). Stress was laid upon using leaves with fully opened stomata. In the first series (fourteen experiments) leaflets about 30 cm.² in area with the stalk immersed in a little carbon dioxide-free water were placed in a 6,000 ml. separating funnel filled with atmospheric air. After exposure to incandescent light (10,000 lux) from 30 min. to 8 hr., the leaves were taken out through an air trap, and the non-assimilated carbon dioxide shaken out with barium hydroxide. The titration allowed determinations within an accuracy of ± 0·0002 vol. per cent carbon dioxide. The results are shown in the accompanying figure (Curve *a*). In two hours the carbon dioxide concentration was brought down to 0·0090 vol. per cent ± 0·0004 (lowest determination 0·0073), and maintained at this level for at least 8 hr. The temperature of the air around the leaves was 24–28° C. Curve *b* shows the results of control experiments, in which 30 cm.² of filter-paper moistened with 0·8 ml. 10 per cent sodium hydroxide was inserted instead of the leaves.

In the second series (twelve experiments) the leaflets were inserted through the air trap and exposed in air poor in carbon dioxide (mean value 0·0024 vol. per cent). Light and temperature were maintained as in the first series. Under these conditions carbon dioxide was liberated at a steady rate until a level at 0·0089 vol. per cent ± 0·0004 was reached (Curve *c*). The production-rate was calculated from the linear part of the curve and the value found (1·40 mgm. CO_2/dm.² hr.) agreed closely with the rate of carbon dioxide production in respiration of elder leaves in the dark (1·45 ± 0·03).

From these preliminary investigations two facts are clear: (1) There exists a threshold value for carbon dioxide concentration in photosynthesis, which for elder leaves is about 0·0090 vol. per cent. Below this threshold no carbon dioxide assimilation takes place. Thus, it seems that only about two-thirds of the atmospheric carbon dioxide is available for photosynthesis. (2) The rate of carbon dioxide production from respiration is the same in light as in the dark. This finding contradicts the theory of Warburg[4], Miller and Burr[3], and others, according to which an intermediate product of respiration is re-utilized in photosynthesis before any carbon dioxide is liberated.

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Extermination of *Aëdes ægypti* in Khartoum

IN the note referring to Lewis's paper on mosquitoes and yellow fever in the Sudan which appeared in *Nature* of August 9, 1947, p. 186, it is stated that the disease has been exterminated from Khartoum as a result of mosquito control measures. This is not entirely correct. Khartoum is some distance north of the northern boundary of the yellow fever endemic area in the Sudan. Yellow fever has never been recorded in Khartoum, and immunity surveys reveal no evidence of the infection having occurred there during the life-time of the present inhabitants. Any suggestion that the disease has ever been identified in Khartoum might greatly increase the confusion of those who are at present devising regulations to prevent the international spread of yellow fever.

The entity which has been virtually exterminated in Khartoum is not yellow fever but *Aëdes ægypti*. This was apparently first accomplished in 1906 by the energetic anti-mosquito campaigns of the late Sir Andrew Balfour. Since then the mosquito situation in Khartoum has been under constant observation. From records extending over forty years it seems probable that at Khartoum, which is in the southern border of a desert tract unfavourable to the species, *A. ægypti* has never been very abundant, and has been eradicated, to reappear on infrequent occasions and be rapidly destroyed. It is very probable that the infrequent reappearances of *A. ægypti* were due to re-importation, since in the early days this mosquito was regularly brought to Khartoum by river steamers. Lewis states that the mosquito control measures at present in force in the Sudan have had the effect, among others, of very greatly reducing the numbers of mosquitoes, particularly those with domestic breeding habits, carried on steamers. *A. ægypti*, in particular, has not now been reported in steamers for several years.

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