Trees	Woody climbers	Shrubs	Acaulescents	Climbing herbs	Other perennials	Annuals biennials
11.9	5.6	9.4	15.0	1.2	44.0	12.5
0.0	0.0	1.2	0.0	8.0	71.6	19.1

The first set has 1.7 species to the genus and 3 to the family, the second 2.8 to the genus and 5 to the family. The phenological specialization of the first set is marked by an average of 38.9 days, while the second shows an average of 59.5 days. Of the former 72.9 per cent. are in bloom on May 12, while of the latter 81.9 per cent. are in bloom on August 22. The Sympetalae change from 22.0 to 68. 5 per cent. The diversification of the early flora was also manifested in the production of anemophilous plants. These belong to early groups. Of Illinois anemophiles about 95.4 per cent. are monocotyledons and Archichlamydeae. In a similar way, most of the aquatics, though blooming late, belong to monocotyledons and Ranales. The early flora, along with its age, shows the diversification effected by natural selection.

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FACTORS WHICH INFLUENCE THE APPEARANCE OF THE SEXES IN PLANT LICE

THE observations of Marcovitch (SCIENCE, No. 1913, p. 537, December 28, 1923), on the influence of the relative length of day on the production of the sexes in aphids raise the important questions of the parts played by the influence of food and temperature.

It appears from the article referred to above that Marcovitch is of the opinion it is the relative length of time the insects are exposed to daylight which is the important factor. It seems to the present writer, however, that, since reduction of the time period in which the plants are exposed to the light will reduce the photosynthetic activity of the plant, the feeding value of the sap will be affected.

Artificial light can be produced rich in those rays which are of value in photosynthesis and one would expect that, since it is the short hours of daylight which stimulate the production of the sexuales in autumn, by increasing the hours of light over the period when normally sexual forms appear, one would inhibit their appearance.

The present writer, holding the view that the light factor may be important in so far as it affects the photosynthetic activity of the plant, carried out an experiment in 1922 with colonies of a pure line of *Aphis rumicis* L. reared on *Vicia faba.*

The experiment was carried on over a period of three months, November, 1922, to January, 1923, and artificial lighting was obtained by means of two 500 c. p. tungsten filament lamps. The aphids were exposed to eight hours' illumination daily, beyond the ordinary hours of daylight. Control colonies only received the ordinary daylight. Temperature charts were kept throughout the experiment. It is interesting to note that although sexual forms had appeared in the colonies in October, only agamic individuals were produced throughout the experiment. Reproduction was fairly rapid, and practically all the aphids produced were apterous agamic females. An examination of the results indicates that temperature was an important factor in this experiment. The experiment was stopped on January 15, and the aphids were kept under normal daylight conditions at a lower temperature. Under these conditions sexual forms appeared in the generations from February 10 to June 10, after which date only agamic forms were produced. On October 3 sexual forms again appeared.

It will be noted that sexual forms were obtained in the colonies in early June, the evidence indicating that temperature was the factor concerned. In any case the hours of daylight were almost at the maximum.

Experiments have been carried out at Rothamsted during the past three years with a pure line of *Aphis rumicis,* the detailed results of which will shortly be published. The results afford considerable evidence that, at any rate with this species in Britain, the appearance of the sexes is associated with a periodic rhythm. The period from middle October to the middle of April is the period during which there is a strong tendency for sexual forms to appear in the colonies.[1] On the other hand, during the period from the middle of April to the Middle of October, the tendency is for agamic females only to appear. This periodic rhythm under experimental conditions is somewhat elastic, and sexual forms have in fact been obtained in most generations extending from the end of September to the beginning of June.

It is clear that the maximum agamic reproduction occurs over the favorable months of the year, and it seems highly probable that sunshine, temperature and length of day are influential factors.

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[1] It will be understood of course that normally out of doors the agamic individuals die out in the autumn, owing to climatic conditions; the winter eggs having been laid, hatch out the following April. Experimentally, however, with favorable food and temperature conditions, a few agamic individuals are usually produced together with the sexuales and these carry on the next generation.