be linked directly with the general inhibition of lateral buds.

In the south-east of England, flower initiation in 'Wellington *XXX*' takes place just before the cessation of extension growth (ref. 3 and compare with ref. 4). In sectioned buds this was seen to have occurred by June 22 in 1964, that is 23 days before the cessation of extension growth. The first defoliation treatment (June 1) induced vegetative growth only, whereas defoliation on or after June 8 resulted in the emergence of flowers also. These observations suggest that the first irreversible steps towards flower initiation had already occurred in the buds 2 weeks before the first initials could be detected. This conclusion was supported by data obtained in 1965 when plants in the field were maintained in an actively growing condition by artificial illumination or gibberellic acid applied some weeks before extension growth of untreated bushes had ceased. Where the treatments were applied more than 2 weeks before the microscopically detectable onset of flower initiation (early July), the plants continued to grow vegetatively and flower initials were not observed when the buds were examined several weeks later. Buds of untreated control plants carried advanced initials at this time. Where treatments were applied less than two weeks before flower initiation was observed, flowers developed in the lower buds of treated plants despite the continuation of extension growth.

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Biological Activity of Volatile Fungal Metabolites

A RECENT survey has measured the effects of volatile metabolites from sixty-two fungal cultures on chosen characters of growth and reproduction of five assay species, namely: *Rhizopus sexualis* (Smith) Callen, *Chaetomium globosum* Kunze ex Fr., *Stereum hirsutum* (Willd.) Fr., *Aspergillus niger* van Tiegh., and *Botrytis cinerea* Pers. ex Fr. The sixty-two species tested consisted of thirteen Phycomycetes, thirteen Ascomycetes, six Basidiomycetes and thirty Fungi Imperfecti, representing a wide range of habit. These species were tested using the simple apparatus shown in Fig. 1; each test consisted of a comparison of three replicate cultures, each containing the assay fungus on the upper agar plate and the test fungus on the lower plate, with three replicate controls each containing the assay fungus on the top plate and sterile agar on the lower plate.

In these conditions the gases from forty-one of the sixty-two species had a significant effect on the rate of increase of colony diameter of at least one of the assay species. Table 1 summarizes these observations.

The relatively crude measurements have not revealed any interactions affecting rate of increase of diameters of colonies of *R. sexualis*, but two test species (*Saccharomyces cerevisiae*, *Schizosaccharomyces octosporus*) produced at least twice the least significant inhibition of all the other four assay species; one (*Fomes annosus*) produced more than ten times the least significant inhibition of *C. globosum* and of *A. niger*, and almost twice the least significant inhibition of *S. hirsutum* and of *B. cinerea*. There were many more inhibitory than stimulatory reactions, and most of the stimulation was very slight.

Table 1

No. of species having a significant effect ($P = 0.05$)	*Rhizopus sexualis*	*Chaetomium globosum*	*Stereum hirsutum*	*Aspergillus niger*	*Botrytis cinerea*
Inhibitory	0	11	15	4	19
Stimulatory	0	2	3	7	5
No measured effect	62	49	44	52	38

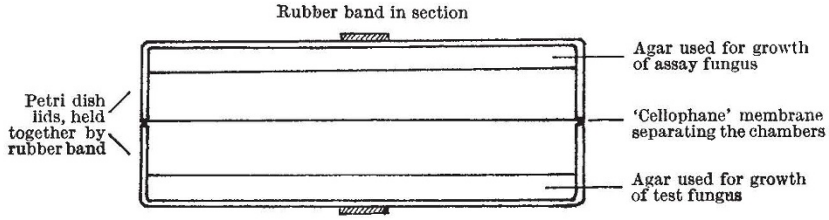

Fig. 1. Assembly used for the tests of effects of volatile metabolites

The survey has also examined the effects on zygospore production by *R. sexualis*, perithecial formation by *C. globosum*, and conidial formation by *A. niger* and *B. cinerea*. The effects on these very different reproductive processes varied, as was to be expected. Sixteen species significantly stimulated zygospore production, six species inhibited it significantly ($P = 0.05$). Empirical observation indicated that two species (*Saccharomyces cerevisiae*, *Ceratocystis coerulescens*) inhibited perithecial production by *C. globosum* by more than 50 per cent, and three species (*Mucor plumbeus*, *Ceratocystis coerulescens* and *Fomes annosus*) stimulated zygospore production in *R. sexualis* but inhibited perithecial production in *C. globosum*. Eight species inhibited conidial production by *A. niger* and/or *B. cinerea* by more than 25 per cent.

This work has been carried out to give a preliminary indication of the likely frequency of occurrence of such metabolites, in expansion of earlier work in these laboratories[1] and by Lösel[2]. These published results are comparisons of means of observations of three replicate dishes in a single series of experiments. The main stimulatory and inhibitory effects have been confirmed by other experiments, but many of the differences are too small to justify discussion without further information. The general pattern, however, suggests that the occurrence may be widespread. No consistent relationship appeared in the range of effects on the measured characters of growth or of reproduction, and the distribution of activity showed no consistent relationship to any standard taxonomic system. The survey is being continued by investigations of the distribution of occurrence of such metabolites, of their effects on fungi and on green plants, and of their chemical structure and mode of action. Individual cases are being examined in detail; for example, active constituents of gas mixtures from cultures of *Saccharomyces cerevisiae* and of *Fomes annosus* have been identified by gas chromatography and biological tests of authentic pure compounds, and full descriptions are being published elsewhere (for example, ref. 3).

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In vitro Development of Microfilariae of *Macacanema formosana* in Mosquito Cell Cultures

EARL[1] reported the maintenance of microfilariae in mixture 199 plus dog serum for 61 days. Sawyer and Weinstein[2] and Weinstein[3] reported development of the microfilariae of *Dirofilaria immitis* and *Wuchereria bancrofti*, respectively, to late first-stage ("sausage-form") larvae. This communication describes the *in vitro* development of