Absorption of Fumigants under Reduced Pressure

THE importance of absorption of gases in reducing the effective concentration during fumigation of various materials for the destruction of insects, is now coming to be recognized, but the full effect of this factor in so-called 'vacuum fumigation' does not appear to have been realized.

Some preliminary experiments with a patent flour indicate that, if the bulk of the air be first removed, then most of the gas, which penetrates by virtue of the pressure difference established on admitting the fumigant, is rapidly absorbed, leaving, in the interior of the material, a very low concentration, which may not be effective in killing the insects. Afterwards the concentration in the middle of the material

increases slightly owing to the diffusion, as in a fumigation at ordinary pressure. This is true whether the pressure is brought up to atmospheric by employing a fumigant diluted with an inert gas, or whether the pressure is raised only by the amount due to the pure or slightly diluted fumigant.

The result appears to be that the fumigation of absorbent materials under reduced pressure possesses little advantage over fumigation at normal pressure. This work is being continued and we hope to publish a detailed account in due course.

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Points from Foregoing Letters

COLONEL S. P. JAMES and Dr. P. Tate have found that the life-history of the malaria parasite *Plasmodium gallinaceum*, Brumpt, comprises, in addition to the usual schizogonic cycle of development in the red blood corpuscles of its vertebrate host and the usual sporogonic cycle in its insect host, a hitherto unrecognized vertebrate cycle occurring in cells of the reticulo-endothelial system of the spleen, liver and other internal organs and particularly, in certain cases, in the cells which line the capillaries of the brain. The finding of this endothelial cell cycle, whether or not it occurs in other malaria parasites than those of birds, opens up an entirely new field for chemotherapeutic research and may help to explain some of the clinical, therapeutic and epidemiological problems of malaria which hitherto have remained unsolved.

The usefulness of the Toepler *Schlieren* method for sedimentation observation in the ultra-centrifuge has been demonstrated by A. Tiselius, K. O. Pedersen and Inga-Britta Eriksson-Quensel. The method has the advantage of allowing direct observations, during the experiment, of the number of components in a mixture and their sedimentation velocities.

A method of obtaining liquid crystalline preparations of cucumber viruses is described by F. C. Bawden and N. W. Pirie. The authors compare some of the properties of these viruses (precipitation point in acid and salt solutions, etc.) with those of the tobacco mosaic viruses. The purified cucumber viruses can infect cucumber plants in dilutions of one part in a thousand million, and one eighth of a millionth of a gram will give a specific precipitate with antiserum.

A method of eliminating possible impurities in the electrodes used for spectrographic detection of plant constituents is described by W. A. Roach. It consists in preparing small electrodes from the plant material itself by suitable treatment and carbonization.

Reactions between nitric oxide and haemoglobin, and also methaemoglobin, are described by Prof. D. Keilin and D. F. Hartree, indicating that a very stable compound is formed with haemoglobin and an easily reversible one with methaemoglobin.

Drs. M. Dixon and C. Lutwak-Mann describe results showing that aldehyde mutase and aldehyde oxidase, hitherto believed to be identical, are in reality distinct enzymes. They can be prepared separately, and they show fundamental differences in behaviour.

The use of Chlorazol Black E as a biological stain for general purposes is described by Prof. H. Graham Cannon. It requires no mordant and no differentiation.

The ramming of a whale shark by a steamer near Colombo is described by Dr. E. W. Gudger, who discusses the occurrence of this fish in Ceylonese waters.

Dr. M. L. Huggins points out that hydrogen bridges, which recent work has shown to be of great importance in many chemical and biological fields, are more stable than they would otherwise be if the oscillation of the hydrogen is accompanied by a synchronous oscillation of the electron system in a ring of which the bridge forms a part. Two hydrogen bridges in the same ring tend to oscillate together, each stabilizing the other. Synchronous oscillation of bridging hydrogens suitably connected together in long strings also increases the stability.

Microphotometer records of the Raman spectra of solutions of several amino acids (glycine, *dl*-alanine, *dl*-valine) separately and mixed are submitted by N. Wright and W. C. Lee, and compared with a similar record of a zein hydrolysate, from which the less soluble amino acids had been partially removed. It appears that the Raman effect might be used for quantitative analysis of proteins in solutions containing very few different amino acids, but that it is not applicable to more complex mixtures.

Quantitative measurements by H. Dahl and Dr. Olaf Devik of the intensity of the sound field of fog-horns has shown rapid variations which were not observed by the ear. The cause of these rapid variations is considered to be the turbulence of the air. If this is the case, the study of the attenuation of a sound spectrum in the open air might furnish a method for studying the turbulence of the air.

Dr. R. L. Mitchell and Dr. Alex. Muir direct attention to the high base exchange capacity relative to the clay content of certain soils derived from basic igneous parent materials in Scotland.

A preliminary study of the concentration of gas inside certain materials fumigated by various methods employing reduced pressure shows, according to Drs. A. B. P. Page and O. F. Lubatti, that owing to absorption there is no resultant increase of penetration. It appears that, with these materials, a vacuum process has no advantage over one at normal pressure.