

Period of airing before infestation, weeks	2		10		16	
Count made.....days after infestation	10	28	10	28	10	28
Treatments and corresponding absolute mortalities, %						
Benzene hexachloride, gamma isomer, 1.0 p.p.m.	100	—	87	97	86	94
Benzene hexachloride, gamma isomer, 0.5 p.p.m.	95	97	43	61	10	17
Pyrethrins, 27 p.p.m.	76	81	28	38	3	1
Pyrethrins, 10 p.p.m.	8	12	9	8	—	0
Control, no dust	2	7	4	8	0	5

Results, detailed in the table, show not only that gamma benzene hexachloride at 0.5 p.p.m. is more toxic than 27 p.p.m. pyrethrins, but also that it is more persistent. The Agricultural Research Council finds that gamma benzene hexachloride at this dosage is free from health hazard.

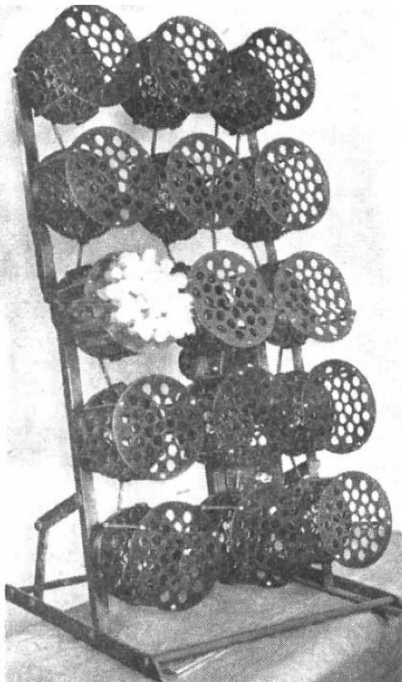
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¹ Beckley, V. A., *Nature* 162, 737 (1948); *E. Afric. Agric. J.*, 14, 71 (1948).

A Rotating Test-Tube Apparatus for Experimental Fermentations

THE examination of different species or mutants of moulds calls for a simple and compact apparatus in which fermentations can be conducted in large numbers. The 'shaken flask' technique¹ has proved of great value, but even this requires a good deal of space if many tests are to be carried out at the same time.

To meet this special need a simple apparatus has been devised by which a large number of test-tube cultures can be satisfactorily aerated by rotation.



Each unit consists of a rack composed of two 6-in diameter disks separated by supporting rods $3\frac{1}{2}$ in long. Both disks are drilled with 31 oversize $\frac{1}{8}$ -in holes to carry test-tubes of that size. The units are mounted on ball races to reduce friction and are driven from a pulley by a suitable drive. A convenient apparatus consists of fifteen such units mounted on a steel frame, as shown in the photograph. Such an apparatus will fit into a laboratory incubator and will permit 465 fermentations to be made simultaneously. The degree of aeration can be changed by altering the inclination of the tubes through 16° .

From numerous trials we found that, with 5-ml. media in each tube, an angle of inclination of 11.5° and a speed of rotation of 100–120 r.p.m. gave satisfactory conditions for growing *Streptomyces griseus*.

The growths and titres obtained in this way were comparable with those obtained by other methods of carrying out small-scale fermentation.

I wish to thank Dr. A. J. P. Martin for his suggestions, and Mr. L. C. Maltby for making the apparatus.

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¹ Elser, H. M., and McFarlane, W. D., *Can. J. Res.*, 26c, 164 (1948).
Kossler, H., Emerson, R. L., Perlman, D., and Burris, R. H., *J. Bact.*, 50, 517 (1948). Prescott, S. C., and Dunn, C. G., "Industrial Microbiology", 378 (1940 edit.). Seustel, Irvin C., and Humfeld, H., *J. Bact.*, 52, 229 (1946).

Another Little-known History of Botany

THE recent review by Prof. F. E. Fritsch¹ of "A Forgotten History of Botany" by Karl F. W. Jessen has reminded me of another little-known book on the same subject, published in 1871 in Paris, under the signature of "L. G.". It is entitled "Précis de l'Histoire de la Botanique", and is one of the seventeen volumes of the botanical encyclopædia "Le Règne Végétal" published by a group of botanists of that period. The author of the "Précis" is perhaps the editor of the encyclopædia, L. Guerin, whose name appears at the bottom of the title-page; but this is merely a guess based on the initials which are used. The book seems to have been inspired mainly by Pritzel's first edition of "Thesaurus literaturæ botanicæ" (1851), but the "Précis" is stated to contain the titles of numerous publications unknown to Pritzel, especially French publications.

The book contains 535 pages, and some supplementary maps on plant geography. Its subject-matter is chronologically arranged and covers the whole field of history, beginning with "Before the Greek Civilization" (Chapter 1) to the nineteenth century (Chapter 7). There is an index comprising the names of all the authors cited in the book.

This history of botany is probably not as readable as Jessen's, since long lists of names are rather frequent, especially lists of titles of publications. However, I feel that the book is useful for purposes of reference, and I have often made use of it. If some person could give me precise information about its author, I should be grateful.

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¹ *Nature*, 163, 115 (1949).