

SCIENCE

Vol. 101

FRIDAY, APRIL 6, 1945

No. 2623

<i>Microbial Metabolism and Agriculture</i> : DR. R. E. BUCHANAN	341
<i>Obituary</i> : <i>Robert Bennett Bean</i> : MAJOR WILLIAM BENNETT BEAN. <i>Recent Deaths</i>	346
<i>Scientific Events</i> : <i>The British Therapeutic Trials Committee; Memorial Loan Fund for Graduate Students in Science; The Cleveland Physics Society; Medals of the Franklin Institute</i>	348
<i>Scientific Notes and News</i>	349
<i>Discussion</i> : <i>Anaerobic Respiration or Fermentation</i> : PROFESSOR DAVID R. GODDARD. "Photoperiodism" versus "Photoperiodicity": DR. VICTOR A. GREULACH. <i>Sponge Names</i> : DR. M. W. DE LAUBENFELS. <i>Notes on Russian and other European Herbaria</i> : PROFESSOR E. D. MERRILL	352
<i>Scientific Books</i> : <i>Tropical Medicine</i> : DR. ERNEST CARROLL FAUST. <i>Food and Food Products</i> : PROFESSOR ARTHUR W. THOMAS. <i>Fats and Oils</i> : DR. HERBERT E. LONGENECKER	356
<i>Special Articles</i> : <i>New Strains of Penicillium Notatum</i> : DR. WM. G. MYERS and HAZEL JEAN HANSON. <i>Diagnosis of Bovine Brucellosis</i> : DR. I. FOREST HUDDLESON, EVELYN WOOD and AUDREY CRESSMAN. <i>Detoxication of Arsenic Trioxide</i> : DR. JOHN C. FINERTY and DR. JAMES D. GRACE. <i>Depression of Lymphocyte Content of Thoracic Duct Lymph</i> : PROFESSOR WILLIAM O. REINHARDT and PROFESSOR CHOH HAO LI. <i>Susceptibility of Hamsters to Clostridium Chauvei</i> : DR. J. F. RYFF and DR. A. M. LEE. <i>The Germicidal Efficiency of Emulsept and of Chlorine in Washing Dirty Eggs</i> : VIRGINIA J. PENNISTON and PROFESSOR LESLIE R. HEDRICK. <i>Delaying Fruit Abscission of Apples</i> : DR. L. P. BATJER and P. C. MARTH. <i>Infectious Myxomatosis in Malnourished Rabbits</i> : DR. RALPH B. HOULIHAN and W. ANSELL DERRICK	357
<i>Scientific Apparatus and Laboratory Methods</i> : <i>Apparatus for Growing Microorganisms on a Flowing Medium</i> : DR. R. W. LEWIS and DR. E. H. LUCAS. <i>The Estimation of Penicillin in Body Fluids</i> : DR. WM. A. RANDALL, CLIFFORD W. PRICE and DR. HENRY WELCH	364
<i>Science News</i>	10

SCIENCE: A Weekly Journal, since 1900 the official organ of the American Association for the Advancement of Science. Published by the American Association for the Advancement of Science every Friday at Lancaster, Pennsylvania.

Editors: JOSEPHINE OWEN CATTELL and JAMES CATTELL.

Policy Committee: MALCOLM H. SOULE, ROGER ADAMS and WALTER R. MILES.

Advertising Manager: THEO. J. CHRISTENSEN.

Communications relative to articles offered for publication should be addressed to Editors of Science, 34 Gramercy Park, New York 3, N. Y.

Communications relative to advertising should be addressed to THEO. CHRISTENSEN, Advertising Manager, Smithsonian Institution Building, Washington 25, D. C.

Communications relative to membership in the Association and to all matters of business of the Association should be addressed to the Permanent Secretary, A.A.A.S., Smithsonian Institution Building, Washington 25, D. C.

Annual subscription, \$6.00

Single copies, 15 cents

MICROBIAL METABOLISM AND AGRICULTURE¹

By Dr. R. E. BUCHANAN

IOWA STATE COLLEGE

THIS paper is designed to point out certain relationships between fundamental studies on microbial metabolism and the great basic science and art of agriculture, and that these advances in physiology, enzymology and physiological chemistry are significant not only in terms of human nutrition and human physiology and curative and preventive medicine, but also in farm production.

Obviously I am not called upon on an occasion of this kind to explore to the limits all the ramose diverticula of modern findings and theories relative to the uptake, synthesis and breakdown of substances useful or harmful to the microbial cell. Rather I should indicate those studies and advances which seem particularly promising in their application to non-

¹ Address of the retiring vice-president of Section O—Agriculture, American Association for the Advancement of Science, Cleveland, Ohio, September 14, 1944.

microbial organisms. There is a great practical significance to the present and mounting knowledge on microbial metabolism.

Studies on microbial metabolism have stimulated a greater appreciation of the real unity of the basic characteristics of all protoplasm and the wide-spread uniformity of many of its activities. First an example: Until comparatively recently the ability of plants to fix carbon dioxide was conceived to be quite dependent upon the presence of chlorophyll. Then Winogradsky and others found that certain microbes were able to fix carbon dioxide without chlorophyll, and so living things became segregated into those which could not use carbon dioxide and those which could—the latter being subdivided into those which required chlorophyll and light (the photosynthetic forms) and those which utilized reduced inorganic

Science

101 (2623)

Science **101** (2623), 341-366.

ARTICLE TOOLS

<http://science.sciencemag.org/content/101/2623.citation>

PERMISSIONS

<http://www.sciencemag.org/help/reprints-and-permissions>

Use of this article is subject to the [Terms of Service](#)

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. 2017 © The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works. The title *Science* is a registered trademark of AAAS.