

SCIENCE

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The Influence of Chemical Thought on Biology: SIR
FREDERICK GOWLAND HOPKINS 255

Scientific Events:

*Viscount Grey Memorial; In Honor of William
Hallock Park; Investigations of Tropical Storms
by the U. S. Weather Bureau; Courses in Applied
Physics at the Massachusetts Institute of Tech-
nology; The Last Week of the Harvard Tercen-
tenary Celebration. Recent Deaths* 260

Scientific Notes and News 264

Discussion:

From the Correspondence of Oliver Wolcott Gibbs:
RICHARD HEATHCOTE HEINDEL. *Ordovician Fossils
from Labrador:* DR. HOMER P. LITTLE. *The An-
nual Science Exhibition:* DR. F. C. BROWN 266

Special Articles:

*Ovum Age and the Course of Gestation in the
Guinea Pig:* PROFESSOR WILLIAM C. YOUNG and
RICHARD J. BLANDAU. *The Blood in Hemophilia:*
DR. ARTHUR J. PATEK, JR. and DR. F. H. L. TAY-

LOR. *The Etiology of Ulcerative Enteritis in Up-
land Game Birds:* L. C. MORLEY and P. W. WET-
MORE 270

Scientific Apparatus and Laboratory Methods:

Vinegar as a Soil Disinfectant: PROFESSOR WIL-
LIAM L. DORAN. *A Method for the Measurement
of Activity of Small Animals:* KARL M. WILBUR 273

Science News 8

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THE INFLUENCE OF CHEMICAL THOUGHT ON BIOLOGY¹

By Sir FREDERICK GOWLAND HOPKINS

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THE ROYAL SOCIETY, LONDON, AND OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

THE latter half of the last century, though a period of such rapid progress alike in physical and biological science, saw inadequate contact between the thought of the chemist and that of the biologist.

It is true, and a familiar circumstance to those with an interest in the history of science, that, when that half century began, organic chemistry and what we now term biochemistry were both yet in embryo and were hardly to be distinguished. Justus von Liebig fathered them both.

It was the genius of Liebig that started modern organic chemistry on a triumphant career, and Liebig's great desire and one which directed his own efforts was to see chemistry render full service to animal physiology and to agriculture. This desire,

¹ Given at the Harvard Tercenary Conference of Arts and Sciences, September 8, 1936.

in satisfactory measure, was not fulfilled during Liebig's own lifetime, and it is, I think, of some historical interest to decide why during years when scientific minds were so alert so promising a field was cultivated by so few. At first I think certain personal attributes in leaders of thought contributed to the separation of chemistry from biology. Liebig himself, for instance, though so brilliant a chemist, lacked biological training and, as I have always felt, a biologist's instincts. When with great enthusiasm he came to apply his chemical knowledge to the living plant and animal his thought often went obviously astray, and much of his theoretical teaching was instinctively and rightly rejected in biological thought. What was really so valuable in that teaching lost therefore some of its influence. Strange as it may seem, the influence of that other dominant mind of the time, that of

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