

SCIENCE

VOL. LVII FEBRUARY 2, 1923 No. 1466

The American Association for the Advancement of Science:
Geometry and Physics: PROFESSOR OSWALD VEBLEN 129
Pasteur—the Man: PROFESSOR GRAHAM LUSK 139
Scientific Events:
The Pan-Pacific Scientific Congress; International Conference of Phytopathology and Economic Entomology; Appalachian Field Trip; Report of the Director of the New York Botanical Garden..... 141
Scientific Notes and News..... 144
University and Educational Notes..... 147
Discussion and Correspondence:
Balancing Chemical Equations: DR. JAMES H. RANSOM. *A "Spindling-tuber" Disease of Irish Potatoes:* EUGENE S. SCHULTZ, DONALD FOLSOM. *Nicotine Sulphate, an Effective Vermicide for Sheep:* GEORGE H. LAMSON, JR. *Swarming Insects simulating Smoke:* PROFESSOR CARL HARTMAN..... 147
Quotations:
A Super-university 150
Problems in the Determination of Physical Properties 151
Special Articles:
Glue Bubbles: PROFESSOR CARL BARUS..... 151
The American Association for the Advancement of Science:
Botanical Sciences 153

SCIENCE: A Weekly Journal devoted to the Advancement of Science, publishing the official notices and proceedings of the American Association for the Advancement of Science, edited by J. McKeen Cattell and published every Friday by

THE SCIENCE PRESS

100 Liberty St., Utica, N. Y. Garrison, N. Y.

New York City: Grand Central Terminal

Annual Subscription, \$6.00 Single Copies, 15 Cts.

Entered as second-class matter January 21, 1922, at the Post Office at Utica, N. Y., Under the Act of March 3, 1879.

GEOMETRY AND PHYSICS¹

TWENTY years ago the abstract point of view in geometry was becoming a familiar one to mathematicians. The essential element in the movement of thought at that time seemed to be the freeing of geometry from all reference to physical reality. Geometry as studied by mathematicians must be a set of propositions arranged in a sequence of logical deduction, proceeding from a set of unproved propositions (the axioms, or postulates) which are stated in terms of undefined elements. If the undefined elements are points and lines, for instance, the mathematician does not inquire what is a point or line. All he cares to know about them is stated explicitly in the axioms.

This point of view made it possible for the first time in history to see geometry as a clear-cut whole. It was definitely separated from philosophy on the one side and from other branches of physics and mathematics on the other. The result was a great gain for clearness of thought in all these fields, a gain which has not been accompanied by any loss of mutual contact or support.

During the following years mathematicians have continued to develop the postulational or logistic method, so that by now it has demonstrated its value as a practical scheme of arrangement and exposition in the most diverse branches of mathematics. While doing this it has, of course, lost in freshness what it has gained in respectability. But during the same period a series of brilliant discoveries in physics has been making the abstract point of view a vital issue in that science also.

If we examine the classical branches of physics we shall find that the main elements of the abstract point of view have been im-

¹ Address as retiring vice-president and chairman of Section A—Mathematics, American Association for the Advancement of Science, Boston, December, 1922.

Science

57 (1466)

Science **57** (1466), 129-158.

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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. The title *Science* is a registered trademark of AAAS.

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