surface. Can such a tetrad vary while its points remain upon a twisted cubic curve? Professor White showed that while this is not possible for every cubic and quadric, it can occur for special quadrics invariantively conditioned by the cubic curves. Given the curve and two polar tetrads upon it, the equation of the surface was explicitly determined, a surface triply tangent to the curve. The problem was extended to polar pentads of a cubic surface, to forms of all orders above the first in 4-space, and to cubics, quartics, etc., in the plane, the vertices moving always upon the rational norm-curve of the space under consideration.

THOMAS F. HOLGATE,
Secretary of the Section.

EVANSTON,
February 4, 1905.

MATHEMATICS AT THE ST. LOUIS CONGRESS, SEPTEMBER 20, 22, AND 24, 1904.

IN the scheme of the Congress of Arts and Science connected with the Louisiana Purchase exposition, mathematics was classified as a department under the division of normative science, philosophy being the other department of that division. At 10 o'clock on Tuesday, September 20, both departments met and listened to the divisional address entitled " The science of the ideal," by Professor Josiah Royce, of Harvard University. An abstract of a paper itself so condensed as this is hardly a possibility; the paper has been published in *Science* (October 7, 1904).

Immediately following this joint session was the opening session of the department of mathematics, later to be subdivided into three sections. The officers of this session were Professor H. S. White, chairman, and Professor G. A. Bliss, secretary. Two addresses had been provided for this session, both of a highly general character, as distinguished from the more special discussions of sectional meetings. The first, by Professor Maxime Bôcher of Harvard University, was upon " The fundamental conceptions and methods of mathematics "; the second, by Professor James Pierpont of Yale University, on " The history of mathematics in the nineteenth century." Both have appeared already in this BULLETIN.* The auditors at this, as

* This volume, pages 115–135 and pages 136–159 respectively.