the analyst and the geometer, the realm of irrational co-
variants.

Upon the question of courses of instruction I wish to
formulate two propositions :

(1) A first or elementary course in invariant theory
ought never to be restricted to binary forms.

(2) Preliminary to or concurrent with an advanced
course, there should be given courses in the theory of sub-
stitution groups or abstract groups, and in the algebra of
modular systems and of entire functions.

EVANSTON, ILL.,
    August, 1898.

REYE'S GEOMETRIE DER LAGE.

Lectures on the Geometry of Position. By THEODOR REYE,
    Professor of Mathematics in the University of Strassburg.
    Translated and edited by THOMAS F. HOLGATE, M.A.,
    PH.D., Professor of Applied Mathematics in Northwestern
    University.   Part I.   New York, The Macmillan Com-
    pany, 1898.   8vo, xix + 248 pp.

THE true geometry of position has hardly been accessible
in English up to the present time.   Townsend's Modern
Geometry and Lachlan's Modern Pure Geometry are
vitiated by the use of the circle, they are essentially metric ;
Cremona's Projective Geometry, in Leudesdorf's translation,
is curiously uninteresting and unattractive, and does not
seem to take the student sufficiently into the heart of the
subject.   Russell's Pure Geometry follows the French
treatment of cross ratio, which is based on apparently
metric relations, though it is shown that these relations
are such that the metric quality is eliminated.   Thus while
it is a thoroughly useful book, it only gradually frees the
student from the limitations of Euclidean geometry, in-
stead of enabling him to walk at liberty from the first.   It
is possibly one of the easiest books to read on the subject ;
grafting the new ideas on to those already established, it ex-
presses the unknown in terms of the known, whereas the
more correct and satisfactory treatment, building up geom-
etry *ab initio*, is apt to strike a student at first as an elaborate
and artificial expression of the known in terms of the un-
known.   But while the grafting of projective geometry on