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No. 2

THE CONSTRUCTIVE DEVELOPMENT OF GROUP-THEORY

WITH A BIBLIOGRAPHY

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PREFATORY NOTE

The purpose of this monograph is to present in a consecutive form the principal features of abstract and substitution group theory. The development of this branch of mathematics has been very rapid, especially in the last few years, and consequently there is much of great value to be found in a more or less fragmentary form throughout the various mathematical journals that has yet to be collected and discussed. It has been my purpose to examine in detail all memoirs dealing directly with such group theory (excluding, in particular, that of linear groups) and to construct from this material a continuous treatise on the subject.

In order to secure uniformity of terminology and method I may seem to have taken liberties with the work of others, I trust that such will not be found unwarranted. The amount of space at my disposal has compelled me to omit all proofs; instead I have given with each theorem or definition a reference to nearly every source, original or secondary. Corrections or additions will be most gratefully appreciated.

It is proper to add that as I was granted a Harrison Senior Fellowship to obtain opportunity for revising this work, its present form differs materially from that presented in May of 1901 to the Faculty of Philosophy of the University of Pennsylvania as a dissertation in partial fulfilment of the requirements for the degree of Doctor of Philosophy. The original draft was devoted to substitution theory alone and contained full proofs, with references to only the principal treatises.

* * *

To the authorities of the Columbia College Library and the Munich Staatsbibliothek I wish to express my acknowl-

edgment of many courtesies extended to me. My deepest thanks are due to Dr. G. H. Hallett, under whose direction this dissertation was written and to whose inspiration it owes whatever merit it may possess. And I wish to acknowledge my especial gratitude to Prof. E. S. Crawley for his continual assistance and encouragement, without which this work would have been impossible.

BURTON SCOTT EASTON.

October 22, 1902.

ABSTRACT GROUPS AND SUBSTITUTION GROUPS

LIST OF PERIODICALS

AB Bulletin of the American Mathematical Society. New York.

AF Association française pour l'avancement des sciences. Paris Comptes Rendus. Paris.

AJ American Journal of Mathematics. Baltimore.

AT Transactions of the American Mathematical Society. New York.

AcM Acta Mathematica. Stockholm.

AiM Annali di matematica pura ed applicata. (Known as Brioschi's "Annali.") Milan.

AmM American Mathematical Monthly. Springfield, Missouri.

AnM Annals of Mathematics. Cambridge (Mass.).

Arc Archiv der Mathematik und Physik. ("Grunert's" or "Hoppe's.") Leipsic.

BB Sitzungsberichte der Kgl. Preussischen Akademie der Wissenschaften. Berlin. ("Monatsberichte" prior to 1882.)

CJ (Crelle's) Journal für die reine und angewandte Mathematik. Berlin.

CP Mathematical papers read at the International Mathematical Congress held in connection with the World's Columbian Exposition, Chicago, 1893. New York.

CR Comptes rendus hebdomadaires des séances de l'Académie des Sciences. Paris.

DB (Darboux') Bulletin des sciences mathématiques. Paris.

DV Jahresbericht der Deutschen Mathematiker-Vereinigung. Leipsic.

ET Educational Times. London.

EW Encyclopädie der mathematischen Wissenschaften mit Einschluss ihrer Anwendungen. Leipsic.

ÉcN Annales scientifiques de l'École Normale Supérieure. Paris.

ÉcP Journal de l'École Polytechnique. Paris. (References to *cahiers.*)

FB Bulletin de la Société Mathématique de France. Paris.

FM Jahrbuch über die Fortschritte der Mathematik. Berlin.

GM Giornale di matematiche di Battaglini. Naples.

GN Nachrichten von der Königlichen Gesellschaft der Wissenschaften zu Göttingen.

IM Memorie della società italiana delle scienze. Modena.

LJ (Lionville's) Journal de Mathématiques pures et appliquées. Paris.

LP Proceedings of the London Mathematical Society.

LnM Memorie della Reale Accademia dei Lincei. Rome.

LnR Atti della Reale Accademia dei Lincei. Rendiconti. ("Transunti" prior to 1885.) Classe di scienze fisiche, matematiche e naturali. Rome.

M The Messenger of Mathematics. London.

MA Mathematische Annalen. Leipsic.

Mh Monatshefte für Mathematik und Physik. Vienna.

NA Nouvelles Annales de mathématiques. Paris.

NY Bulletin of the New York Mathematical Society.

NpR Rendiconti dell'Accademia delle scienze fisiche e mathematiche. Naples.

PM The London, Edinburgh, and Dublin Philosophical Magazine. London.

PlR Rendiconti del Circolo Matematico del Palermo.

PRS Proceedings of the Royal Society of London.

QJ The Quarterly Journal of pure and applied mathematics. London.

TlA Annales de la Faculté des Sciences de Toulouse pour les sciences mathématiques. Paris.

TlM Mémoires de l'Académie des sciences, inscriptions et belles lettres de Toulouse. Toulouse.

ToA Atti della Reale Accademia di Torino. Turin.

ToM Memorie della Reale Accademia delle scienze di Torino. Turin.

ZM Zeitschrift für Mathematik und Physik. ("Schlömilch's.") Leipsic.