

Perhaps the most illuminating chapter in the book is the one dealing with systems of curves on a surface. Here we find a fundamental theorem that two curves are algebraically equivalent if, and only if, they are homologous in the ordinary sense of analysis situs. Another interesting fact, as pointed out by Lefschetz, is that the so-called "virtual" curves, which have a purely symbolic existence from the algebraic point of view, may be interpreted in topological terms as non-algebraic cycles of the surface. The book also contains other interesting chapters on algebraic manifolds of higher dimensions and on abelian functions, not to mention two notes in the form of postscripts.

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*Sophus Lie's Gesammelte Abhandlungen (Samlede Avhandlingar).*

Edited by Friedrich Engel and Poul Heegaard. Volume V: *Abhandlungen über die Theorie der Transformationsgruppen, erste Abteilung (Avhandlingar om Transformationsgruppernes Teori, første Avdeling)*, edited by Friedrich Engel. Leipzig, B. G. Teubner, and Kristiania, H. Aschehoug and Co., 1924. xii + 776 pages.

The fifth volume of Lie's collected memoirs is the second of the series to be published; it is preceded by the third volume which was published in 1922 (and was reviewed in this BULLETIN, vol. 29 (1923), pp. 367-369). The published memoirs of Lie are to be gathered together in six volumes while a seventh is to be devoted to the principal works found among his literary remains. The memoirs on geometry are to go into volumes I and II; those on differential equations into volumes III and IV; and those on transformation groups into volumes V and VI. Naturally these divisions are not rigorously separated from each other; and each volume will contain memoirs belonging in part to all three divisions. In each of the three divisions the arrangement is chronological; and, generally, the material in the first of any two related volumes is that which was first published at Christiania, while the second of these volumes is devoted principally to Memoirs from the MATHEMATISCHE ANNALEN and the publications of the Leipzig Akademie. In this way it is brought about that no volume will contain two memoirs one of which is mainly a reworking of the other.

As the subtitle indicates, the fifth volume is given to memoirs on transformation groups. It contains the earlier of them, up to February 1889. Of the 560 pages required to print the included memoirs, about 320 pages are given to those in which "Transformationsgruppen" is the main word in the title; a large part of the remaining space is given to memoirs dealing with the applications of the theory of transformation groups to differential equations. The notes from the Norwegian (none of them long) are translated into German, so that the whole body of this volume appears in German. On pages 669-673 of the notes an