

La théorie des groupes finis et continus et la géométrie différentielle traitées par méthode du repère mobile, by Élie Cartan, Cahiers Scientifiques, no. 18, Gauthier-Villars, Paris, 1937, 6 + 269 pp.

This book, which originated from a course of lectures given in 1931–1932 at the Sorbonne, covers in a somewhat more explicit form essentially the same material as no. 194 (1935) of the *Actualités Scientifiques et Industrielles* (see the review, this Bulletin, vol. 41 (1935), p. 774). By means of the method of the repère mobile the author studies arbitrary manifolds M_λ in a Klein space R whose geometry is described by its group of automorphisms. The chief aim of this review shall be to bring out the axiomatic foundations of the theory.

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The book under review pursues a three-fold purpose: it contains (1) an exposition of the general theory of finite continuous Lie groups in a terminology adapted to its differential geometric applications; (2) a general description of the method of repères mobiles; and (3) its application to a number of important examples. The arrangement is didactic rather than systematic.

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All of the author's books, the present one not excepted, are highly stimulating, full of original viewpoints, and profuse in interesting geometric details. Cartan is undoubtedly the greatest living master of differential geometry. This review is incomplete in so far as it has tried to lay bare the roots, rather than describe the rich foliage of the tree which his book unfolds before its reader. We should not let pass unmentioned Jean Leray's merit in molding the lecture notes he took into something which is a true book and yet catches some of the vividness of the original lectures. Nevertheless, I must admit that I found the book, like most of Cartan's papers, hard reading. Does the reason lie only in the great French geometric tradition on which Cartan draws, and the style and contents of which he takes more or less for granted as a common ground for all geometers, while we, born and educated in other countries, do not share it?

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