Such relations are thus derived for certain symmetric six-rowed determinants. D_6, however, is of a highly specialized type; it is the discriminant of the sum of three 6-ary squares. Is the relation (2), established for this special type, valid for all symmetric determinants of six rows? It is; for it involves no constituent from the principal diagonal, so that the 18 parameters of our 6×3 array are available for representing the 15 constituents $\left(\frac{6 \cdot 5}{1 \cdot 2} = 15\right)$, lying outside the principal diagonal of any given symmetric 6-rowed determinant.

The same consideration can be relied upon in adapting this proof to any Kronecker relation among m-rowed minors of a $2m$-rowed symmetric determinant, since always

$$\frac{2m(2m-1)}{2} < 2m^2.$$

For convenience of reference, I subjoin the general form of this relation as enunciated by Kronecker, *loc. cit.*:

$$|a_{gh}| = \sum_r |a_{ik}|,$$

$$\left(\begin{matrix} g=1, 2, \cdots, m; & h=m+1, m+2, \cdots, 2m \\ i=1, 2, \cdots, m-1, r; & k=m+1, m+2, \cdots, r-1, m, r+1 \cdots 2m \end{matrix}\right).$$

NORTHWESTERN UNIVERSITY,
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ON THE LISTS OF ALL THE SUBSTITUTION GROUPS THAT CAN BE FORMED WITH A GIVEN NUMBER OF ELEMENTS.

BY DR. G. A. MILLER.

T. P. KIRKMAN published in 1863 the first extensive list of all the transitive substitution groups that can be formed with a given number of letters. A number of interesting facts are associated with this list. Before entering upon its discussion we shall give a brief account of the more important direct steps towards the formation of such lists.

Paolo Ruffini published a work* in 1799 in which we do

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* The complete title of this work in two volumes is, "*Teoria generale delle equazioni, in cui si dimostra impossibile la soluzione algebraica delle equazioni generali di grado superiore al quarto, di Paolo Ruffini*," Bologna, 1799.