we see that any term which does not correspond to an absolute permutation of the n indices $i, j, \cdots, k$ contains an element from the main diagonal and is therefore zero. The value of a term corresponding to an absolute permutation is $+1$ or -1 according as the permutation is even or odd. The value of D is therefore the difference between the number of even absolute permutations, N_e, and the number of odd absolute permutations, N_o, that is

$$(1) \qquad N_e - N_o = (-1)^{n-1}(n-1).$$

Moreover we have*

$$(2) \qquad N_e + N_o = n!\sum_{r=2}^{n} \frac{(-1)^r}{r!}.$$

From (1) and (2) N_e and N_o can be calculated.

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THE ABSOLUTE VALUE OF THE PRODUCT OF TWO MATRICES†

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1. *Introduction.* If $a = (a_{pq})$ is a matrix of order n whose elements are ordinary complex numbers, the absolute value of a is defined as $\sqrt{\sum a_{pq}\bar{a}_{pq}}$, where $\bar{a} = (\bar{a}_{pq})$ is the matrix whose coefficients are the conjugates of the corresponding coefficients in a; we shall denote it here by $\lfloor a \rfloor$, a special symbol being convenient since the absolute value of a scalar matrix λ is not $|\lambda| \equiv \text{mod}\ \lambda$ but $n^{1/2}|\lambda|$. This definition has been freely used by writers on differential equations; but, in spite of this, its properties with regard to multiplication have seemingly escaped notice, or are at least not well known.

* Cf. Seelhoff, ARCHIV DER MATHEMATIK UND PHYSIK, (2), vol. 1, p. 100.

† Presented to the Society, May 2, 1925.