If $f(p, q)$ is the number of different elements of an array, whether symmetrical or with all its elements different, the number of determinants of the mth order is $f({}_pC_m, {}_qC_m)$ and the number of independent conditions in the vanishing of all these determinants is $f(p-m+1,\ q-m+1)$. If the elements are all different, $f(p, q)=pq$; if the array is symmetrical $f(p, q)=pq-\frac{1}{2}q(q-1)$.

7. *Examples*: Given the quadric locus in space of n dimensions

$$\begin{pmatrix} a_{11} & , \ldots, & a_{1,n+1} \\ \ldots & \ldots & \ldots \\ a_{1,n+1}, & \ldots, & a_{n+1,n+1} \end{pmatrix} \between x_1, x_2, \ldots x_n, 1)^2=0,$$

the conditions that it breaks up into two $(n-1)$-dimensional homaloids are

$$\| a_{n+1,n+1} \|_3=0,$$

i.e., $\frac{1}{2}n(n-1)$ conditions.

If the homaloids are parallel, the conditions are

$$\left\| \begin{matrix} a_{11}, & \ldots\ldots, & a_{1,n+1} \\ \ldots & \ldots & \ldots \\ a_{1n}, & \ldots\ldots, & a_{n,n+1} \end{matrix} \right\|_2=0,$$

i.e., $\frac{1}{2}(n-1)(n+2)$ conditions.

If they are coincident, the conditions are

$$\| a_{n+1,n+1} \|_2=0,$$

i.e., $\frac{1}{2}n(n+1)$ conditions.

The conditions that the locus is a cylinder, whose base is a quadric locus of $n-2$ dimensions, are

$$\left\| \begin{matrix} a_{11}, & \ldots\ldots, & a_{1,n+1} \\ \ldots & \ldots & \ldots \\ a_{1n}, & \ldots\ldots, & a_{n,n+1} \end{matrix} \right\|_n=0,$$

i.e., 2 conditions, etc.

Certain Series of Basic Bessel Coefficients.

By F. H. JACKSON, M.A.

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