$$z(x, y) = \int_0^x dx_1 \int_0^y z_{xy}(x_1, y_1)dy_1 + \int_0^y dy_1 \int_0^{y_1} z_{yy}(0, y_2)dy_2$$

$$+ \int_0^x dx_1 \int_0^{x_1} z_{xx}(x_2, 0)\, dx_2 + z_y(0, 0)y + z_x(0, 0)x + z(0, 0).$$

Proceeding as before,

$$U[z(x, y)] = V[z_{xy}(x, y)] + V_1[z_{yy}(0, y)] + V_2[z_{xx}(x, 0)]$$

$$+ z_y(0, 0)U[y] + z_x(0, 0)U[x] + z(0, 0)U[1],$$

where V, V_1 and V_2 are linear and continuous of the zeroth order and $U[y]$, $U[x]$ and $U[1]$ are constants.

C't COLUMBIA UNIVERSITY,
June, 1916.

THE EQUATION OF A PLANE RATIONAL CURVE DEFINED BY PARAMETRIC EQUATIONS.

BY HERBERT WILLIAM RICHMOND.

THE explicit equation $F(x, y, z) = 0$ of a rational plane curve, defined by the parametric equations

$$x : y : z = A(t) : B(t) : C(t)$$

where $A(t)$, $B(t)$, $C(t)$ are polynomials of order n in t, is expressed by Salmon (Higher Plane Curves, § 44) as a determinant of $3n$ rows. In the April number of the BULLETIN Professor J. E. Rowe exhibits this equation as a symmetrical determinant of n rows, in which each element is a linear function of x, y, z. It has been my custom when lecturing upon algebraic geometry to obtain this form of equation as follows:

Let (x, y, z) be the coordinates of the point whose parameter is t, and let s be any value of the parameter; then

$$\begin{vmatrix} x & A(t) & A(s) \\ z & C(t) & C(s) \\ y & B(t) & B(s) \end{vmatrix} \quad (= \Delta \text{ say})$$

vanishes for every value of s. Imagine the determinant expanded and the factor $s - t$ removed. We have now a

polynomial in s of order $n - 1$, which vanishes for all values
of s; the n coefficients of powers of s severally vanish.   But
each coefficient is a polynomial in t of order $n - 1$, every
power of t being multiplied by a linear function of x, y, z.
These powers of t may be eliminated by a determinant of
n rows, which is the equation of the curve.

The linear function of (x, y, z) which in the rth row and
sth column is the coefficient of $s^{n-r}t^{n-s}$ in the expanded form
of $\Delta/(s - t)$, and is readily written down if need be.   Just as
Salmon's method is an adaptation of Euler's (or Sylvester's)
method of eliminating a variable from two polynomials, so
the foregoing is an adaptation of Cayley's statement of
Bezout's method.

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SCIENTIFIC METHOD IN PHILOSOPHY.

*Our Knowledge of the External World as a Field for Scientific
    Method in Philosophy.* By BERTRAND RUSSELL, M.A.,
    F.R.S., Late Fellow of Trinity College, Cambridge.   Chi-
    cago, London, The Open Court Publishing Company,
    1914.   vii + 245 pp.

THE philosophic method in science is a thing familiar
enough, in sound if not in fact.   But what, pray, can be
meant by "scientific method in philosophy"?   That is what
Mr. Russell essays to make clear, in outline at all events,
in this book, and he does it partly by a general critique on
the methodologies of philosophy and science and partly,
indeed mainly, by handling certain specific problems of
philosophy in the spirit and the manner of science.   The
chief ones among these illustrative examples belong to the
general problem of the relation between the data of sense and
the time, space, and matter of mathematical physics.   The
discussion is guided by a highly important and exceedingly
difficult aim.   The aim is to sketch a method available in all
departments of philosophy and "adequate to yield whatever
objective scientific knowledge it is possible to obtain."   Tradi-
tional philosophy, however worthy of studious attention,
has been too impatient; it has been too ambitious; its pre-
tensions and claims have been grossly extravagant; it has not