A TABLE TO FACILITATE THE FITTING OF CERTAIN LOGISTIC CURVES

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The most useful generalization of the logistic curve is that having the form

(1) $$y = \frac{k}{1+e^{a+bx+cx^2+gx^3 \cdots}}$$

In practice it will seldom be found necessary to use higher powers of x. This equation may also be written

(2) $$Y = a + bx + cx^2 + gx^3$$

in which $Y \equiv \log \frac{k-y}{y}$.

If we can evaluate the constant k with reasonable accuracy, the value of Y corresponding to each observed value of y can be computed, and then the values of the coefficients $a, b, c,$ and g, in equation (1) may be obtained by fitting equation (2) as a generalized parabola by the method of least squares.

The normal equations necessary to make this fit will be found to be

$$a\Sigma x^0 + b\Sigma x + c\Sigma x^2 + g\Sigma x^3 = \Sigma Y$$
$$a\Sigma x + b\Sigma x^2 + c\Sigma x^3 + g\Sigma x^4 = \Sigma xY$$
$$a\Sigma x^2 + b\Sigma x^3 + c\Sigma x^4 + g\Sigma x^5 = \Sigma x^2 Y$$
$$a\Sigma x^3 + b\Sigma x^4 + c\Sigma x^5 + g\Sigma x^6 = \Sigma x^3 Y$$