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On Extraneous Values in Simultaneous Equations.—Mr Ridley's note in the January number giving an algebraic explanation of extraneous values suggests an elementary treatment of the subject on the geometrical side. It must be assumed that the pupil is able to trace from their equations straight lines, circles, and parabolas of the type $y = ax^2 + bx + c$. He should be made to draw the curves in cases like those given here, and to state the geometrical meaning of every distinct step in the algebra.

Ex. 1.	$x - y + 1 = 0$	(straight line)
	$2y + x = 5$	(straight line).
Ex. 2.	$y = x^2 - 3x + 4$	(parabola)
	$y = 2$	(straight line).
Ex. 3.	$(x-2)^2 + (y-1)^2 = 5$	(circle)
	$y = 2$	(straight line).
Ex. 4.	$x^2 + y^2 = 5$	(circle)
	$x - y + 1 = 0$	(straight line).

In these cases the number of solutions is at once fixed from the known character of the curves. The point is to explain why extraneous values are possible in examples 3 and 4, but not in 1 and 2.

The propositions to be learned may be stated thus:

1. If only the first power of y occurs in the equation of a curve, a parallel to the y-axis can cut the curve in only one point. If y^2 is the highest power of y, the parallel cuts the curve in two points (real or imaginary).

2. Solving for x means finding one or more parallels to the y-axis through the points of intersection of the given curves.
3. When only the first power of y is present in both given curves, each parallel to the y-axis cuts each given curve in only one point.
4. When one equation contains the second power of y and the other equation only the first power, each parallel cuts the first curve in two points and the second in one point.
5. The solutions required are given only by the points where *both* given curves meet a parallel; wrong results mean points where *only one* given curve meets a parallel.

It would not be feasible, of course, to introduce to a beginner the hyperbola cited in Mr Ridley's note, but a grasp of the geometrical facts for the simpler curves should help to eliminate the beginner's idea that as every equation is a true statement, "true" results must follow from combining any sets of equations.

(*Cf.* Godfrey and Siddon's "Algebra," § 177).

G. D. C. Stokes.

An Exact Geometrical Construction for the Exponential Curve.—Consider the curve $y = a\epsilon^{-t/t_0}$. (Fig. 1.)

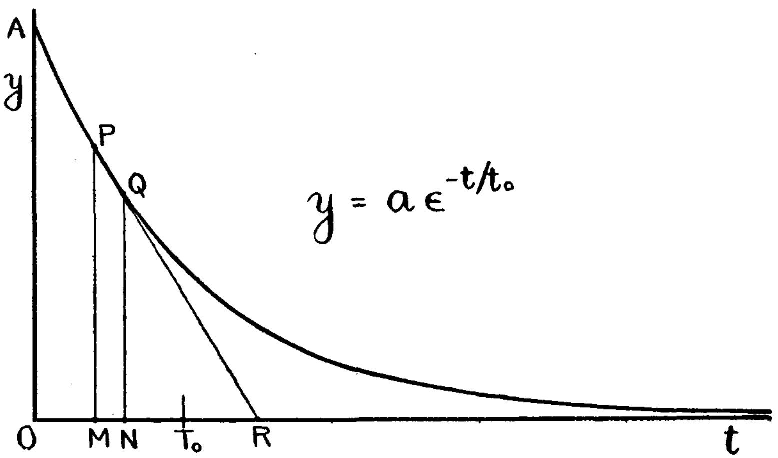

Fig. 1.

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