these reasons, the rules of Sluse and Hudde were perhaps the first methods to exhibit fully the algorithmic approach that is a distinctive feature of the calculus.

Infinitesimal Tangent Methods

The introduction in the 1650s of the algebraic rules of Hudde and Sluse was soon followed by infinitesimal derivations of these and similar methods. These newer derivations and methods owed more to the ideas of Fermat than those of Descartes, and involved the concept of a tangent line at the point P of a curve as the limiting position of a secant line PQ as Q approaches P along the curve.

One such method was described by Isaac Barrow (1630–1677) in his *Geometrical Lectures* that were published in 1670 but delivered at Cambridge in the mid 1660s (and probably attended in 1664–65 by one Isaac Newton). Barrow was appointed in 1663 as the first Lucasian Professor of Mathematics at Cambridge, and resigned this chair in 1669 in favor of Newton (and perhaps also to qualify for administrative advancement).

The bulk of Barrow's published lectures treat tangent and quadrature problems from a somewhat classical and geometrical rather than analytical point of view. For example, he generally adopts the Greek definition of a tangent line to a curve as a straight line that touches the curve at a single point. However, at the close of Lecture X, he writes,

> We have now finished in some fashion the first part, as we declared, of our subject. Supplementary to this we add, in the form of appendices, a method for finding tangents by calculation frequently used by us. Although I hardly know, after so many well-known and well-worn methods of the kind above, whether there is any advantage in doing so. Yet I do so on the advice of a friend [who turned out to be Newton]: and all the more willingly, because it seems to be more profitable and general than those which I have discussed ([2], p. 119).

He proceeds to describe what is apparently his own modification of a method that Fermat had devised (but not published) to construct tangent lines to a curve defined implicitly by $f(x,y)=0$ (for discussions of Fermat's method, see the articles by Coolidge [3], pp. 452–453 and Jensen [4]). Considering an "indefinitely small arc" MN of the curve (Fig. 5), he writes $M(x,y)$ and $N(x+e,y+a)$ for their coordinates, and sets

$$f(x+e,y+a) = f(x,y) = 0, \tag{11}$$

since M and N are both points of the curve. He then deletes "all terms containing a power of a or e, or products of these (for these terms have no value)." Finally, ignoring the distinction between the "indefinitely small arc" MN and the straight line segment $\overline{MN}$, he notes the similarity of the