

## REMARKS ON SOME GENERAL PROPERTIES OF CURVES.

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THE geometric method of investigation, so highly esteemed by Newton and his followers, has experienced considerable vicissitude as regards the amount of attention bestowed upon it by mathematicians at different periods. Having for more than a century held undisputed sway in the universities of Great Britain, it was at length obliged to yield to those more powerful methods of investigation, which, prosecuted with untiring zeal and ingenuity by men possessing unrivalled powers of analysis, had placed the continental mathematicians so far in advance of those in England. Though for a time decried as much as it was before injudiciously extolled, the geometric method has never been utterly neglected. It possesses merits of its own that must ever claim the attention of men of science. It affords solutions of many questions far more concise than can be furnished by the analyst, and occasionally presents us with theorems which, as beautiful as unexpected, shew that its powers have not even yet been developed to the utmost.

1. If two curves lie, the one inside the other, and a right line be drawn cutting the curves so that the sum of the areas of the segments cut off shall be constant, the envelop of the right line is the locus of the centre of gravity of the sum of the chords.

2. Similarly, if the difference of areas is constant the envelop of line is locus of centre of gravity of difference of chords, that is of the portions of the right line enclosed between the two curves.

These theorems have been slightly altered in form so as to exhibit more strongly an analogy to a theorem given by Professor Cherriman, in the *Canadian Journal*, February, 1863.

3. The envelop of chords cutting a curve at equal angles is locus of a point dividing these chords, so that rectangle under segments is constant.

4. The envelop of chords joining points of taction of parallel tangents is locus of a point dividing those chords in a given ratio.

If the curve is a central conic the envelop is a point, the centre of conic.

5. If the curves  $S$  and  $S'$  are so related that tangent at any point