

parts is more than enough, and in that case the alternate points can be taken.

Starting from the B. C.

$$m_1 = \frac{15}{64} m$$

$$m_2 = \frac{28}{64} m$$

$$m_3 = \frac{39}{64} m$$

$$m_4 = \frac{3}{4} m$$

$$m_5 = \frac{55}{64} m$$

$$m_6 = \frac{60}{64} m$$

$$m_7 = \frac{63}{64} m$$

$$m_8 = m$$

Using the above formula, the curve is located on the ground by half-driven stakes or laths, after which the side lines are run to intersection with the curve. Where the stakes happen to fall between points located on the curve, the three nearest stakes are taken. The middle one giving  $m$  with reference to the other two, and by interpolation the required point is very quickly located. All the stakes are then driven down and the distances measured. There are always ample stakes to relocate the curve at any point and for curves in excess of 300 feet radius the abbreviated formula is quite good. The method is very fast in practice, and for long courses over rough, wooded land is of great assistance.

Another method, coming under the same classification, that is sometimes very useful, is that of external ordinates from a produced tangent—the disadvantage being that the external offset increases very rapidly, whereas in the former  $m$  is the maximum offset.

#### Random Location of Lot Corners

A method that is occasionally used is the random location of required lot corners, the principle being to plant stakes at the point flat, will give a desirable layout. Then by eye range in the other stakes at the most suitable places, as far as possible maintaining a street line with an attractive imaginary curve, the located points are then tied in by a series of traverses run from an astronomical base line, care being taken to check back to a base line occasionally. The advantage of the method is the little cutting required, also the definite location of side lines, which is not always the case in some of the other systems.

The disadvantages being the lack of connection between the two sides of a street; the use of imaginary curves leaving room for many interpretations as to the intended street line. The entire survey depends upon the accuracy of every measurement on the plan, a single error in field or clerical work making it impossible to retrace the survey unless other originals can be located by chance.

The greatest test of the methods of laying out curved subdivisions probably will not arise for some years. As yet originals can be found quite readily, but with their disappearance the future task of the surveyor is not a simple one. I am looking forward with considerable interest to the future development of Leaside, where hundreds of acres have been subdivided with curved layouts, and where the work as a whole was well done, the principal points being tied in and located by an extensive triangulation. The curves were laid out by deflection angles and the required closures were quite good.

With reference to the subdivision of larger tracts of land in unsurveyed territory by irregular lines, many of you have probably seen some of the proposed subdivisions drafted by Mr. Adams, of the Conservation Commission, the purpose of which is the endeavor to bring more closely

together, for mutual benefit, the settlers in rural districts.

The present and past systems have done a great deal to open up Ontario, but we all appreciate the isolation of the average farmer under the systems of the past.

With the likelihood of a great influx to the rural sections of partially disabled men, and the unquestionably greater influx there will be if conditions can be made congenial, would it not be advisable for this association to consider amending the present system in certain localities in the endeavor to appeal to the returning soldier. In Ontario the considerations are such that very few men settling on virgin land require anything like 100 acres of land, while many would be satisfied with 10 acres, particularly if they are not rugged enough to stand the steady strain of keeping up a large tract of land.

The design of a tract of land containing a civic centre, playground, school library, church, post office, stores, etc., situated on a stream or railway, with radiating roads, the smaller parcels of land being situated near the centre of the proposed area, and the larger tracts at a distance, drawing on the communities for necessary labor, would be a fitting and worthy proposition for our association to take under consideration at the present time, when Canada as a whole is endeavoring to provide for and to find a way to show her gratitude to the men who have done so much for the Empire.

#### ACREAGES \*

By E. R. Bingham, O.L.S.

SOMETIMES the sole purpose of a survey of a parcel of land or a body of water is to obtain its area; at other times it is an important feature of the survey. To obtain the area of regular surfaces there are various scientific methods which can be pursued, according to circumstances. In the case of irregular surfaces, however, different and less scientific methods have to be used.

If a chained traverse is made, the area of the rectilinear figure can be obtained by latitudes and departures, or by breaking it up into smaller figures and calculating the areas of these separately, while the area of the irregular portion is calculated from the offsets, the final area being obtained from the sum or difference, as the case may be.

In the case of a survey by stadia, micrometer or other method by which the points of the traverse are not directly connected, the area must be taken from the plot of the survey. The plot being made, the quickest and simplest method of taking out the area is by the use of the planimeter. If the plot is too large to be taken in at one setting of the instrument, it can be broke up by straight lines into figures of suitable size. Unfortunately, most planimeters seem to be made with but little thought for the requirements of the land surveyor, the scales being mostly fractional and intended for use on mechanical and architectural diagrams and plans. Consequently, one wastes so much time ascertaining what the various scales and settings are for, to find perhaps that the only scale that can be used is at the short end

\*Paper read before the Ontario Land Surveyors' Association.