their average and multiply by the total acreage. Usually, however, the timber is not uniform, and it is necessary to estimate the lower slopes of a mountain separately from the upper, the north slopes separately from the south, and the water-sheds, swamps and other special types, separately also. To meet this difficulty, the plan of estimating the timber on sample areas aggregating a given percentage of the whole tract has been devised. If properly distributed they give a very close average for the timber on the whole tract.

SAMPLE PLOT METHODS.

Many methods have been devised for the proper location and rapid laying out of sample plots. Usually they are laid out in the form of circles, squares or rectangular strips, and in area generally vary from one-quarter of an acre to a whole acre. A quarter acre circle has a radius of 19.62 yards, and an acre circle a radius of 39.24 yards. In the form of a square, each edge of the acre is 69.57 yards, and of the quarter acre 34.78 yards.

In open stands of timber one of the quick methods is to travel in parallel lines a quarter of a mile apart and stop every quarter of a mile to lay out an acre (with a radius of 39 yards or a side of 69 yards), and estimate the timber upon it. This would give us 16 sample acres equally spaced over each square mile, and therefore represents one-fortieth, or $2\frac{1}{2}\%$, of its area. Wth a little practice the estimator soon learns to judge whether a tree is within 39 yards or not of the centre of the circle where he stands. Another plan is to place a flag at the centre and walk through the timber within 39 yards of it, making the estimate by eye, by counting trees, or by measuring. Returning to the flag he can then pick up his compass direction, pace a quarter of a mile, and estimate the next acre. In dense stands it is not easy to see all trees within 39 yards, and it is preferable to use either half acre or quarter-acre circles instead, with radii of 24.75 yards and 19.62 yards, respectively. For rough estimating it is customary to use circular plots, but for more accurate work square plots are preferable, because they are generally laid out more carefully. They may be laid out by either pacing or measuring their sides and turning the corners with a magnetic compass or a cross-staff head.

THE ESTIMATION OF FORTY ACRE SQUARES.

In fairly even aged timber growing on land comparatively easy to travel, it is often a good plan to block out forty acre squares here and there and estimate all the timber on each "forty." Each edge of a "forty" is 440 yards long, and it is advisable to blaze the boundaries so the estimators will know when they come to them. For convenience in estimating, the large square is usually divided into 16 smaller squares of $2\frac{1}{2}$ acres each, and therefore with edges 110 yards long. Starting