

for all the measurements in large, clear figures. In that case it is better to resort to the *combination* method.

It is not customary to draw the sketch to scale; indeed it is usually necessary to exaggerate certain portions of it to make room for recording measurements. In some forms of notes no attempt is made to sketch outlines as they appear on the ground. For example, a crooked highway appears in the sketch as perfectly straight. (See Illustration VI, p. 187.)

**234. The Combination Method of Keeping Field Notes,** in the opinion of many surveyors, is the best all-around method. A sketch can be made on one page and such measurements as cannot conveniently be placed on the sketch itself can be recorded on the opposite page in some one of the tabulated forms in common use. As far as possible it is well to put actual dimensions and offsets on the sketch, while angles and the corresponding distances used for locating points are put on the opposite page. For example, if a house is shown in the sketch it is usually well to put dimensions of the house on the sketch itself, while angles and distances taken to locate the corners of the house are given on the opposite page. (See Illustration III, p. 180.)

Points on the sketch are *numbered* or *lettered* when it is necessary to refer to them in the tabulated form on the opposite page. When it can be done readily it is well to number points *in order*; for example, the first one sighted at as the telescope is turned from the backsight is 1, the next 2, and so on. (See p. 134.)

**235. When should the Notes Read from the Bottom of the Page up?** In railway surveys or highway surveys or surveys of a similar character it is more convenient to record the notes *from the bottom of the page up*. This is especially true if the *sketch* method is used, otherwise the note-book must be held upside down to bring the points in the sketch in accord with the points which they represent on the ground. The general rule in making a sketch is to hold the book with its top toward the next transit station, and if a tabulated form on the left-hand page is used in connection with the sketch, this will read from the bottom *up* to correspond. (See Illustration V, p. 184.) On the other hand, in the notes of a closed survey, where the entire sketch is on one page, it may be more convenient to tabulate the corresponding notes on the opposite

page, so that they will read from the top *down*. (See Illustration I, p. 176.)

**236. What should the Field Notes Include?** In taking notes it is well to keep in mind (1) what will be needed for plotting, and (2) what it may be well to have in the note-book even though it may not be necessary for plotting. Measurements of angles and distances, sketches and explanatory notes are of use in plotting, while the date of the survey, names of the men in the party, transit used, weather conditions, and notes indicating methods of work may be of value as a mere matter of record. Common sense should guide one in this.

In ordinary work, for example, the temperature is not recorded because there is no need of it, but in precise surveying it *is* recorded because corrections for temperature are to be made. A note which gives the methods used in a survey may indicate the limits of error, and if there is a chance that such information will be needed, it should be given in the notes, but in the majority of cases it will not be needed. On the other hand the title of the survey, the date, and the name of the man in charge of the party ought to appear in the notes of every survey.

**237. Allow Plenty of Room; do not Crowd the Notes.** Make sketches larger if anything than may seem necessary. Usually there will be more dimensions to put on the sketch than will at first appear; make a generous allowance for this. Especially those portions of a sketch where most of the measurements are to be shown should be large and open so that small crowded figures may be avoided. Buildings, for example, should be sketched large enough to provide for dimensions. If a fence is located by offsets from a building, make the fence in the sketch far enough away so that the offsets may be recorded in clear figures, no matter how near to the building the fence really is. Do not try to put too much on one page; use several pages if necessary for different parts of a sketch. *Note-book paper is cheap compared with time wasted in deciphering crowded notes.*

In tabulated forms it is better to skip every other line when there is room, thus leaving space for corrections.

**238. Repeating Notes on Different Pages.** When tabulated notes extend over two or more pages it is customary to repeat on one page enough of the notes from the preceding page to make the whole continuous. Usually this means sim-