

grades, and more expensive construction. Routes will be compared upon the value of total cost, both in constructing and operating. Short sections of expensive work, when averaged with the balance of a line, may show less cost per mile than a line of more uniform character.

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When checks cannot be made on known elevations, and reliance is to be placed on barometer reading, two or more barometers should be used, one barometer being stationary, observations of which should be made every half hour, and a daily curve plotted or calculated showing difference between readings and true elevations, the readings of the exploration barometers may then be reduced.

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If it is impracticable to have a regular stationary barometer, the changes morning, noon and night, when barometer is stationary will be noted, from which the variation at any time during the day may be approximately figured, and elevations reduced. This will also be done as a check on stationary barometer.

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The form of notes will be as per standard (see note book forms).

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The Engineer will also keep a diary, which should preferably be entered into note book. This should include all items of interest pertaining to the work.

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A complete sketch map of the country, showing the principal water courses and divides, should be made as the reconnaissance proceeds; this should show where each stream crossed joins another, until both have passed beyond the possible limit of the area under consideration.

After the first reconnaissance, the Engineer can usually decide that one or two lines are preferable to the others within the area surveyed. Over this line, or lines, he should make a second reconnaissance, so as to obtain more detailed information respecting grade, alignment, cost, etc., and to obtain check on first elevations.

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The Engineer should note determining features of the line, and reasons for avoiding prominent objects, and sections of location, noting particularly the physical difference between the two sides of the same valley, and their effect on construction and operation.