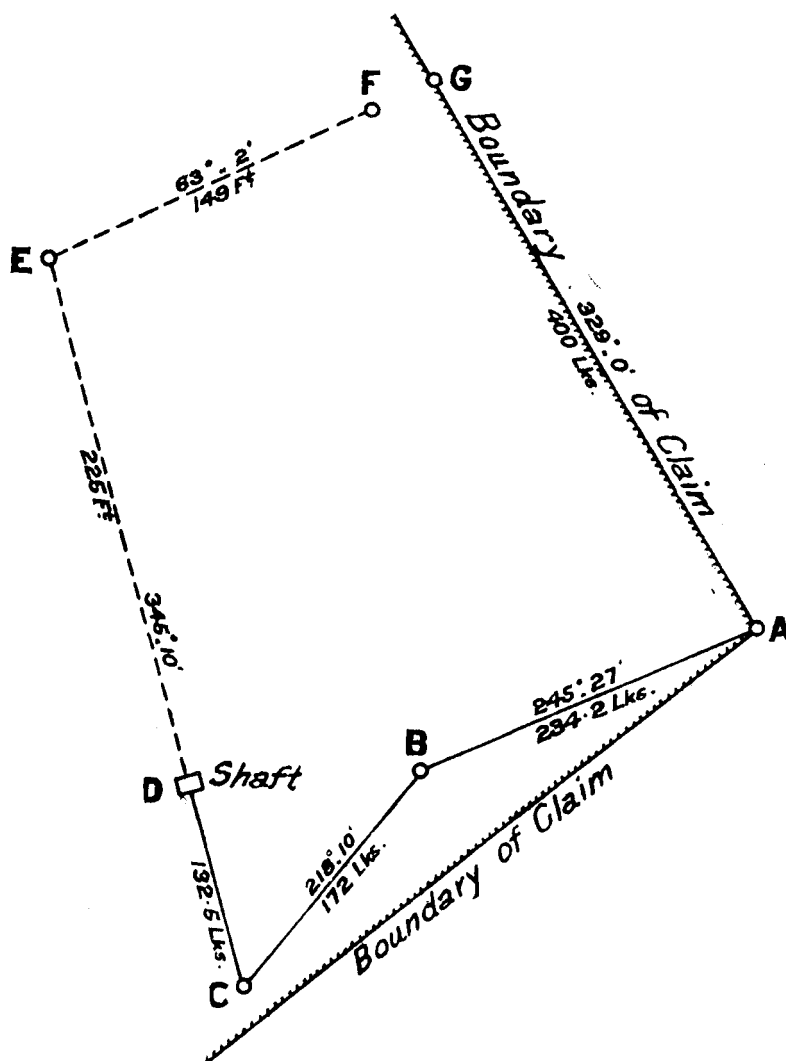


SUBJECT K.—*A Knowledge of Underground Surveying, and of making Plans of Underground Working showing the Dip or Inclination and Strike of Reefs or Lodes.*



A, corner of claim. A to B, $2^{\circ} 10'$ rise. B to C, $4^{\circ} 4'$ fall. C to D, $2^{\circ} 4'$ fall. D, shaft, 83 ft. deep. D to E, $7^{\circ} 12'$ rise. E to F, $4^{\circ} 6'$ rise. A to G, $16^{\circ} 23'$ rise.

The above diagram represents a mining survey of underground workings, and its connection with a corner of the claim. The surface traverse is shown by firm lines with distances in *links*; the underground by dotted lines with distances in *feet*.

1. What distance would have to be driven from F, and on what bearing, to reach the boundary of the claim at G? (Maximum marks, 30.)
2. Compute the depth below the surface at G of the bottom of the drive at F. (Maximum marks, 20.)
3. Explain how you would transfer the bearing of a surface traverse to an underground traverse, and also assure its accuracy throughout the latter, in a case of there being but one shaft. (Maximum marks, 15.)
4. Make a rough sketch-plan of some underground workings (imaginary) illustrating the dip or inclination and strike of reefs or lodes. (Maximum marks, 20.)

The candidate will be required to undergo an oral examination on the use and adjustment of the theodolite and other instruments used in mining surveys. (Maximum marks, 15.)

SUBJECT L.—*A Knowledge of the Different Rocks where Gold, Silver, Tin, Copper, Zinc, Lead, and Antimony are found, and the Formation of Lodes and Leads.*

[Candidates need only answer three out of the five questions.]

1. Name the chief New Zealand localities in which gold, silver, and copper are found, in each case mentioning the mineral form in which the metal occurs, and the nature of the rock enclosing the deposit.
2. It is often stated that one kind of rock is more favourable to the occurrence of a certain metal (say, gold) than another: to what extent do you consider the statement true (a) generally speaking; (b) as regards special localities—e.g., any mining district or districts known to you?