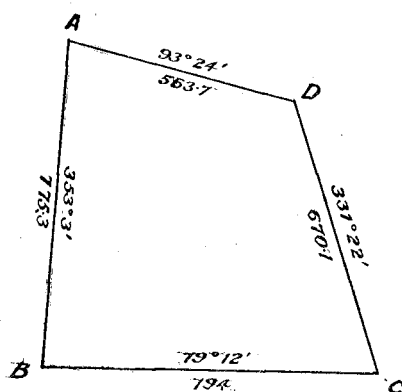


2. The underground workings of a mine are enclosed within the figure below : compute the area contained within the figure. (Note.—The distances are given in links.)

FIG. 2.



3. The rise in the drive from A to B in Fig. 2 was found to be $30^{\circ} 18'$, and from B to C $5^{\circ} 10'$: compute the difference of level, in feet, between the stations A and C.
4. Explain how you would transfer true bearing to the underground traverse in the case of only one shaft, and also when there are two shafts.
5. Explain the advantages of plotting by co-ordinates, and the simple method of check which can be applied to any point.

SUBJECT VI.—*General and Applied Geology.*

1. Explain carefully how you would prospect an area of bush-clad hilly country for auriferous quartz reefs.
2. Where in New Zealand are found—Scheelite, stream tin, stibnite (antimony-sulphide), sulphur, iron-ore, petroleum?
3. Define the terms—Dip, strike, anticline, syncline, igneous rock, dyke.
4. State the principal classes of metalliferous deposits, briefly describe each, and mention one or more examples.
5. Define the terms—Normal fault, reversed fault, throw, heave. Briefly describe two or three faults known to you as occurring in mining districts. Illustrate your answers by sketches.
6. Give a rule (with diagram) for the recovery of a lode lost by faulting. Explain when the rule holds good, and when it does not.
7. Give an account of what is known as the ascension theory for the formation of ore-deposits.
8. What is an "ore-shoot"? How do you account for some portions of ore-bodies being richer in valuable contents than others?
9. Do gold-mines tend to become poorer in depth? Discuss the question as fully as you can.
10. How can the relative ages of rocks in a given district be determined (a) when sedimentary, (b) when igneous? State any instances known to you where it is important from a mining point of view to ascertain the ages of the various rocks exposed or known to exist in a mining field.
11. Describe with some degree of fullness the general geology of any quartz-mining district in New Zealand.
12. Give some account of the increase of temperature with depth in the earth's crust. How can this increase be explained?

QUESTIONS ASKED AT THE EXAMINATION OF BATTERY SUPERINTENDENTS FOR CERTIFICATES.

SUBJECT A.—*The Different Modes of reducing and pulverizing Ores.*

1. Show by neat sketch a crushing-battery of 30 heads of stamps of 11 cwt. each, with ore-breakers, ore-feeders, amalgamating-tables, quicksilver-traps, and Wiffle's concentrating-tables. Also show the battery-foundations, and the relative dimensions in figures of ore-bins, and distances that each portion of the battery requires to be placed below the rail-level where the trucks loaded with quartz come from the mine.
2. Give the quantity of water in cubic feet per minute that is required to work a crushing-battery as described in the foregoing question. Also give the maximum speed and drop of the stamp that can be worked with safety, and the quantity of ore having an average hardness that can be crushed in twenty-four hours by using a 25 mesh.
3. If ore requires to be reduced to a greater fineness after leaving the stamp battery before submitting it to KCN solutions, describe the class of machinery or appliances used to accomplish the work.
4. Give an estimate of the cost of a crushing-battery with appliances as described in question No. 1, showing the cost in full detail.

SUBJECT B.—*Amalgamation Machines.*

1. Describe the different machines used for amalgamation in the Commonwealth of Australasia, their capacity, the power required to work them, the quantity of quicksilver used in each machine, the speed that each machine requires to be worked at, and the chemicals (if any) used, giving the effect they produce.