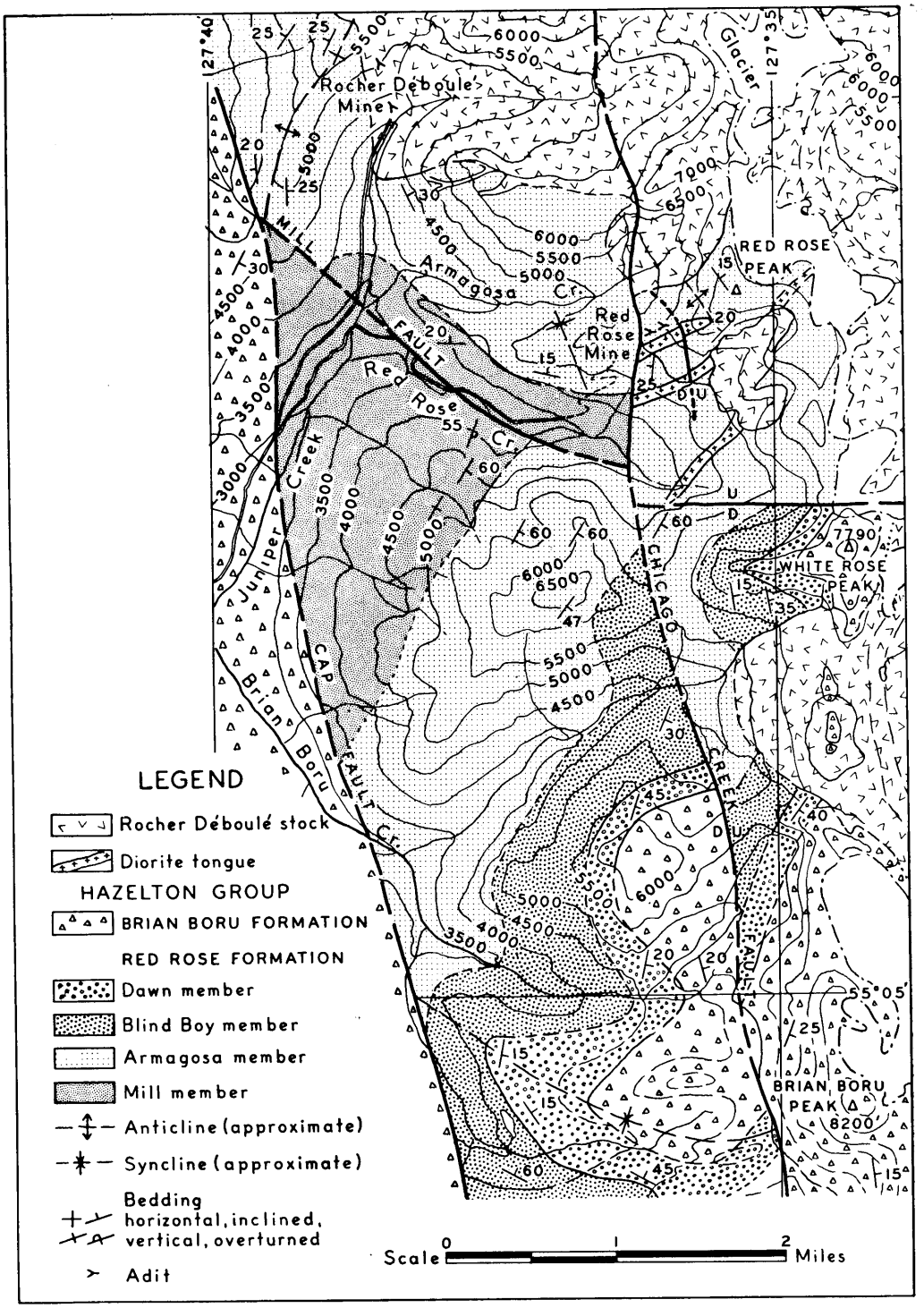


Figure 2. Geology of part of Rocher Déboulé Mountains.

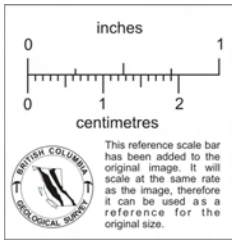


TABLE OF FORMATIONS

Era	Period or Epoch	Formation and Thickness		Lithology
Mesozoic	Upper Cretaceous or later.	Felsite dykes.		
		Intrusive contact.		
		Rocher Déboulé stock.		Granodiorite.
		Intrusive contact.		
		Diorite tongues.		Diorite, porphyritic diorite.
	Intrusive contact.			
	Lower Cretaceous?	Hazelton group.	Brian Boru formation, 4,000+ feet.	Andesitic and dacitic breccias, flows, tuffs, and related sills in Red Rose formation.
			Conformable contact.	
	Upper Jurassic and Lower Cretaceous.		Red Rose format on, 7,500+ feet. — Dawn member.	Argillite, greywacke, conglomerate, and hornfelsic equivalents.
			Red Rose format on, 7,500+ feet. — Blind Boy member.	
			Red Rose format on, 7,500+ feet. — Armagosa member.	
			Red Rose format on, 7,500+ feet. — Mill member.	
			Not observed in contact.	
	Middle or Upper Jurassic.		John Brown formation.	Andesitic, dacitic, and rhyolitic breccias, flows, and tuffs.

The oldest rocks are part of the Hazelton group, which in the Rocher Déboulé Mountains was divided by Armstrong (1944) into three divisions. These were not named by him but are named in this report. The oldest, the John Brown formation, is not known to occur in the area of Figure 2. The Red Rose formation is greater than 7,500 feet thick and is divided into four members: Mill member, non-marine greywacke and siltstone, 1,500+ feet; Armagosa member, marine argillite and siltstone, 4,000 feet; Blind Boy member, non-marine greywacke, argillite, and shale, 1,500 feet; Dawn member, conglomerate and greywacke, 600+ feet. The Brian Boru formation consists of more than 4,000 feet of porphyritic andesite and dacite breccias, flows, and tuffs and related sills and dykes in the Red Rose formation; marine fossils of Late Jurassic or Early Cretaceous age have been found in tuffs near the base of this member. Rocks of the Hazelton group are cut by a succession of minor and major intrusions. First porphyritic andesite sills and dykes associated with the Brian Boru episode of volcanism were emplaced. These were followed by fine-grained diorite tongues, then dykes of feldspar porphyry, and then the major intrusion of the Rocher Déboulé granodiorite stock. This stock truncates fold structures in the older rocks without causing additional deformation. It has altered the otherwise poorly lithified rock of the Red Rose formation to hornfels in an aureole 1 to 2 miles wide. Although the flanks of the stock are steep, its top is relatively flat. Much later than the emplacement of the stock, minor felsite dykes were intruded.

Fold structures are in general large-scale features with few or no dragfolds and no axial plane cleavage. Bedding may be steep or overturned, but the rocks do not appear to be very closely folded. There is a lack of relation between folds in adjacent fault blocks, and some folds may be minor readjustments to major block faulting. There appear to be two major ages of faulting—one prior to the major intrusion, represented by the Mill fault,

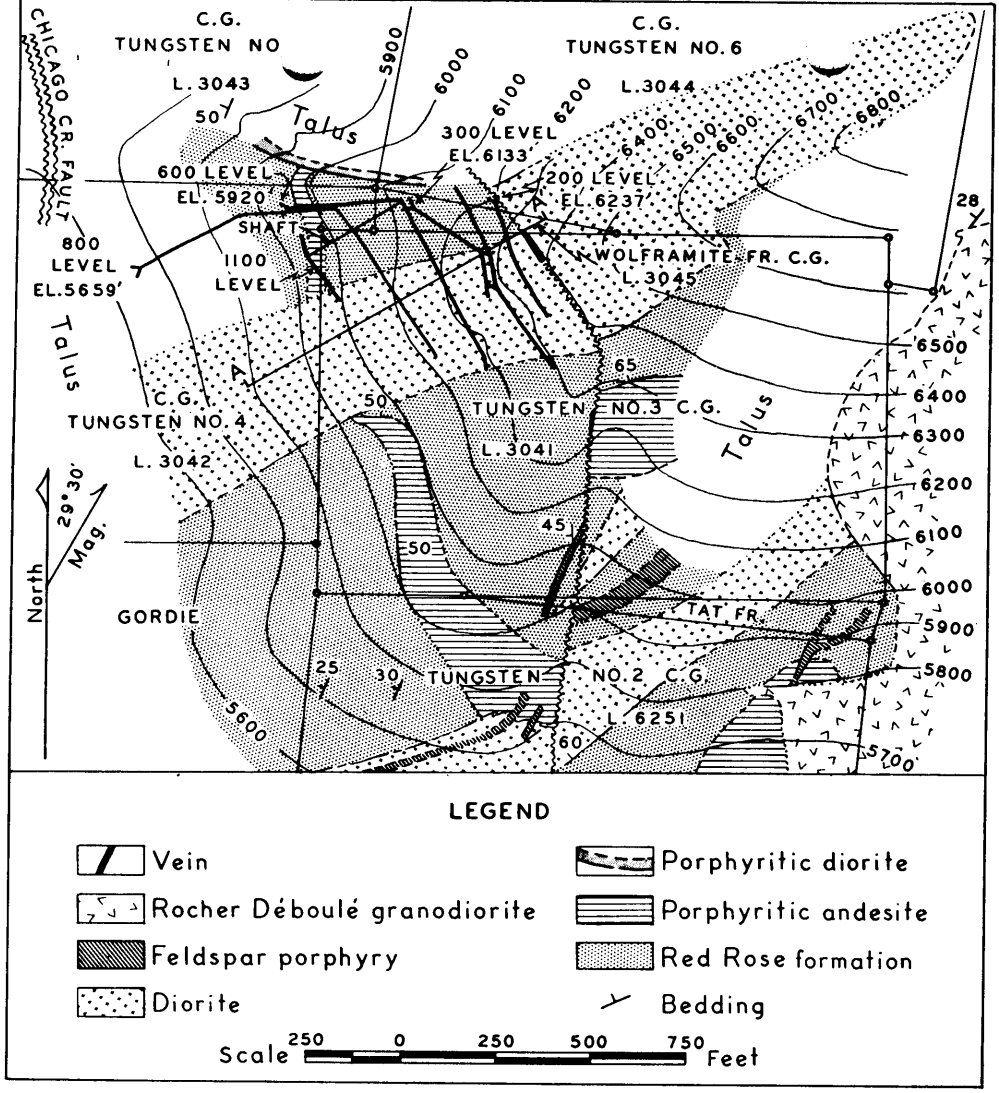
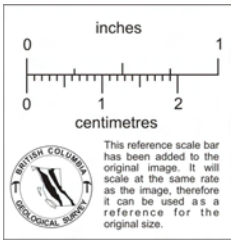


Figure 1. Geology in the vicinity of the Red Rose mine.



and one later than the intrusion, represented by the Chicago Creek fault and two other northerly strik[illegible] faults. Bedding attitudes in the north bloc[illegible] of the Mill fault are relatively gentle and commonly are less than 30 degrees. Th[illegible]block seems to be tilted northward so that the gentle folds in it trend and plunge northward. Attitudes in the south block of the Mill fault are steeper and the block appears to be tilted moderately to the east.

The later faults trend approximately north 10 degrees east and are major features. The last movement on them post-dates the emplacement of the Rocher Déboulé stock, but because displacement in the granodiorite apparently differs greatly from that in the stratified rocks, it is possible that the faults are in part older than emplacement of the stock. The Chicago Creek and Cap faults are shown on Figure 2, and a third fault occurs at an equivalent interval to the east. The Chicago Creek fault dips steeply west and appears to be a normal fault with a dip slip of the order of 2,000 to 4,000 feet.

Local Geology.—The geology in the vicinity of the mine is shown in Figure 3. The oldest rocks are part of the Armagosa member of the Red Rose formation. They are purplish-brown hornfels (altered siltstones) composed of varying proportions of detrital quartz and feldspar with much porphyroblastic biotite. Commonly detrital quartz and feldspar make up 60 to 80 per cent of the rocks (quartz more abundant than feldspar), and biotite most of the remainder, with a few per cent of iron ores and rare detrital zircon grains. The detrital grains are all silt size. Adjacent to the Red Rose vein some quartz-tourmaline veinlets ramify through the rock.

The hornfels is cut by a series of intrusive rocks in the following sequence:—

1. Porphyritic andesite.
2 (*a* and *b*). Diorite and porphyritic diorite.
3. Feldspar porphyry.
4. Granodiorite.
5. Felsite.

Modes of these rocks are as follows:—

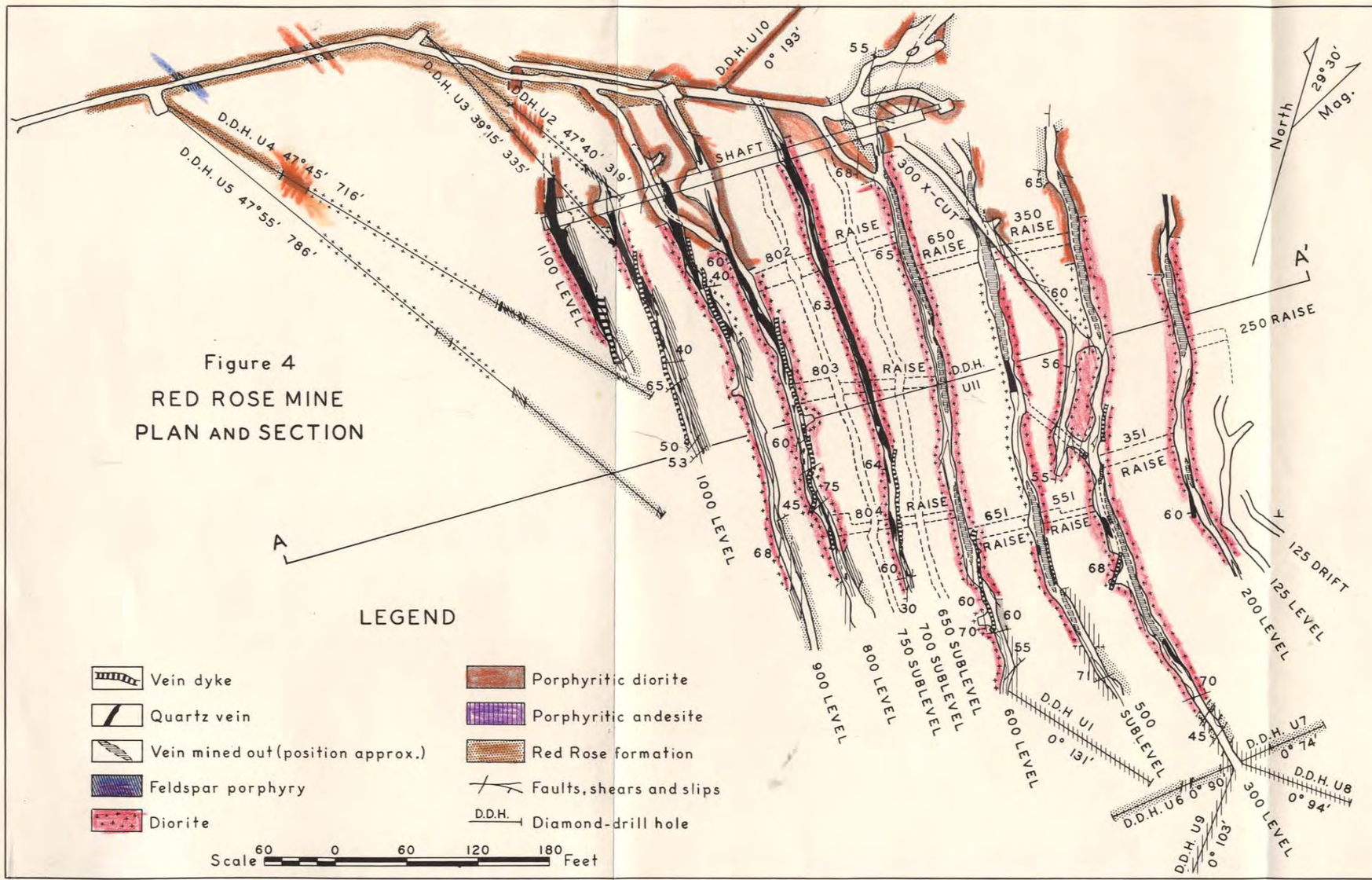
	1	2*a*	2*b*	3	4	5
Quartz	3	....	1	3	20	....
Calcite	....	....	....	....	....	5
Orthoclase	....	....	....	}	{ 23	5
Plagioclase	75	62	74	70	{ 45	55
Hornblende	2	10	18	5	7	15
Biotite	19	12	5	20	3	4
Chlorite	....	15	....	....	....	15
Iron ores	0.5	2	2	1	2	1

1 The porphyritic andesite is a dark-grey aphanitic to fine-grained rock with

Figure 4

RED ROSE MINE

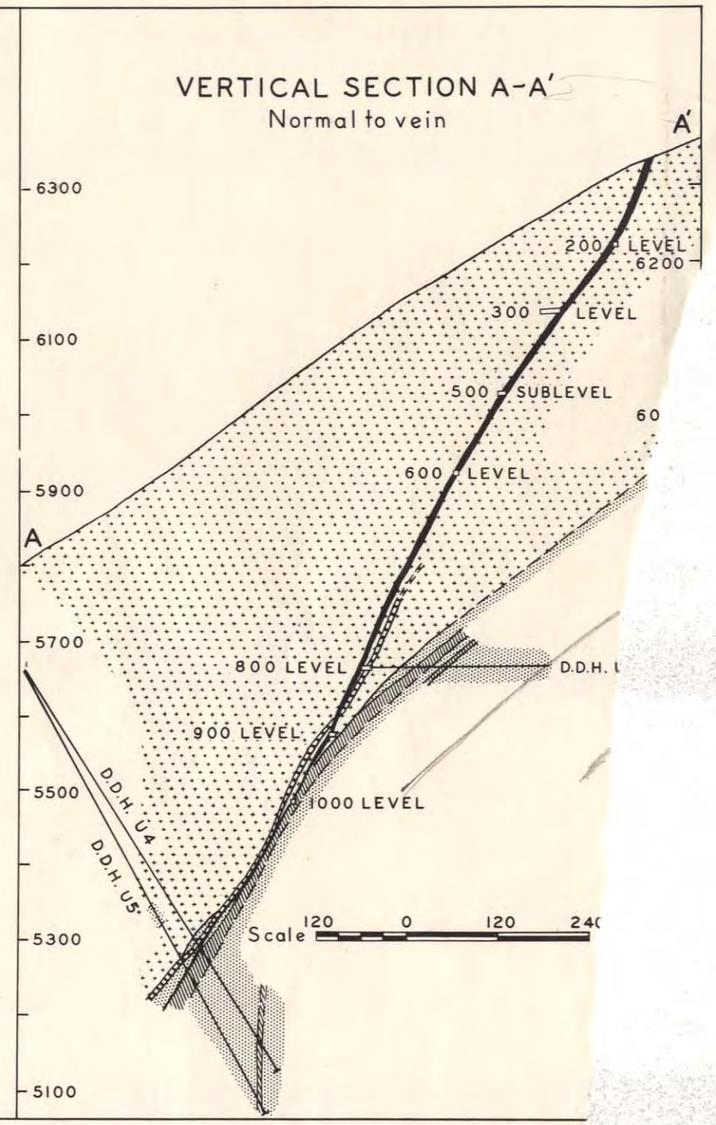
PLAN AND SECTION



LEGEND

- Vein dyke
- Quartz vein
- Vein mined out (position approx.)
- Feldspar porphyry
- Diorite
- Porphyritic diorite
- Porphyritic andesite
- Red Rose formation
- Faults, shears and slips
- D.D.H. — Diamond-drill hole

Scale 60 0 60 120 180 Feet



inches
0 1
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centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.