CANADA

DEPARTMENT OF MINES AND RESOURCES

MINES AND GEOLOGY BRANCH

BUREAU OF GEOLOGY AND TOPOGRAPHY

GEOLOGICAL SURVEY

HAZELTON

CASSIAR DISTRICT

BRITISH COLUMBIA

Scale: 1 inch to 2 miles

2 0 2 4 6 8

PRELIMINARY MAP 44-24

LEGEND

CENOZOIC

TERTIARY

EOCENE OR LATER

6 — *Andesite and dacite*

CRETACEOUS OR TERTIARY

UPPER CRETACEOUS OR LATER

5 — *Granodiorite, minor diorite (Age relation to 4 uncertain)*

UPPER CRETACEOUS OR PALEOCENE

4 — *Conglomerate, sandstone, shale, and coal*

MESOZOIC

JURASSIC AND CRETACEOUS

LOWER CRETACEOUS OR LATER

3 — *Andesitic dacitic, rhyolitic, and basaltic flows, tuffs, and breccias; minor sandstone, shale, and conglomerate*

UPPER JURASSIC AND LOWER CRETACEOUS

2 — *Greywacke, shale, conglomerate, argillite, tuff, quartzite, hornfels, and coal; 2a, sedimentary rocks containing Blairmore flora*

MIDDLE JURASSIC

1 — *Andesitic, dacitic, rhyolitic, and basaltic flows, tuffs, and breccias*

HAZELTON GROUP

Heavily drift-covered area

Glacier — Gl.

Bedding (inclined, vertical, horizontal)

Anticlinal axis

Fault

FOSSIL LOCALITIES

Plants of Paleocene age — (P)

Plants of Blairmore age — (B)

Plants of Kootenay age — (K)

Plants of Blairmore or Kootenay age — (KB)

Shells of Upper Jurassic age — (UJ)

Shells of Jurassic or Cretaceous age — (JC)

Mine or Prospect

MINES AND PROSPECTS

(Productive Mines are Underlined)

COMPLEX SILVER-LEAD-ZINC DEPOSITS

4. Silver Bell
5. Barber Bill
6. Silver Cup
7. Pole Star
8. Sunrise
9. Lead King
10. Slocan
11. Silver Pick
13. True Fissure
15. American Boy
18. Silver Standard
19. Babine
20. Erie
21. Comet
35. Brunswick
37. Brian Boru
38. Killarney

LEAD-SILVER DEPOSITS

12. O. K.

COPPER-GOLD-SILVER DEPOSITS

22. Daly West
23. Hecla
24. Golden Wonder
25. Cap (Conneau)
30. Highland Boy
31. Rocher Déboulé
32. Great Ohio
33. Spaulding
36. Sultana

LOW GRADE GOLD-SILVER DEPOSITS

1. Fortune Hill
2. Silverton
14. Higgins
17. Surprise
27. Lone Star
28. Macdonald

TUNGSTEN DEPOSITS

29. Black Prince
34. Red Rose

GOLD-COBALT-ARSENIC DEPOSITS

26. Hazelton View

COAL AREAS

3. Kispiox-Shegunia
39. Skeena Crossing
40. Seaton

MARL DEPOSITS

16. Robinson Lake

NOTE. For detailed descriptions of properties see Geological Survey Memoir 223

Geology by J. E. Armstrong and J. G. Gray, 1938; E. D. Kindle, 1938, 1939. Geological compilation and descriptive notes by J. E. Armstrong, 1944.

Road

Trail

Contour interval, 500 feet

56°00′ 45′ 30′ 15′ 55°00′

128°00′ 45′ 15′ 127°00′

COAST DISTRICT, RANGE 5

CASSIAR DISTRICT

Surveyed and compiled by the Topographical Survey. Issued 1944.

DESCRIPTIVE NOTES

Bedrock is well exposed above timberline, at an elevation of about 5,000 feet, but elsewhere rock outcrops occupy less than 5 per cent of the map-area and are found mainly in cliff and stream canyons. Drift deposits, chiefly of glacial origin, mantle the timbered slopes and spread out widely and deeply in most of the lowland areas.

The cores of the mountains are composed of igneous rocks and these have metamorphosed and hardened the enveloping formations, thus forming massifs resistant to erosion, whereas the valleys are for the most part carved from softer, unmetamorphosed rocks.

The Hazelton group consists of an apparently conformable succession, possibly 10,000 feet thick, of interbedded sedimentary and volcanic rocks ranging in age from pre-Middle Jurassic to Lower Cretaceous, and including what have been called Hazelton group and Skeena formation or series. In the adjoining Smithers map-area to the south a five-fold division of the Hazelton group has been made, namely: a pre-Middle Jurassic volcanic division; a Middle Jurassic marine sedimentary division; a Middle or Upper Jurassic volcanic division; an Upper Jurassic and Lower Cretaceous marine and continental sedimentary division; and a Lower Cretaceous or later volcanic division. In the Hazelton area the first two of these divisions are either missing or have not been recognized. The rocks of the upper two volcanic divisions (1 and 3) are lithologically similar and can be separated only on the basis of stratigraphy. The age of the volcanic rocks outcropping on the west slopes of Rocher Déboulé Range has not been established definitely, but the rocks there have been correlated provisionally with the youngest volcanic division (3). The Upper Jurassic and Lower Cretaceous sedimentary division (2) consists of at least 5,000 feet of interbedded continental and marine strata. Fossil plants were collected from more than forty localities. These plants represent two distinct floras correlated provisionally with the Kootenay and Lower Blairmore of Alberta and, presumably, of Lower Cretaceous age. Fossil fauna were collected from at least twenty localities, but only two of the collections contained diagnostic specimens. These are of late Upper Jurassic age. They were collected from beds that apparently lie stratigraphically above beds containing fossil plants of Kootenay age. Strata of Blairmore age (2a) have been mapped separately in a few places, but elsewhere in the area they are included with older Hazelton strata. Coal is found associated with continental strata throughout the Hazelton group, although the best coal appears to occur in rocks of Blairmore age. These continental, coal-bearing members of the Hazelton group have hitherto been thought to comprise the Skeena formation or series and to overlie the Hazelton group conformably, according to some geologists, or unconformably according to others. Recent studies in this and the adjoining Smithers map-areas have, however, indicated that no satisfactory stratigraphic division can be made, and that continental strata comparable with the Skeena appear at various horizons in the Hazelton group. Near the larger bodies of granodiorite the strata have been indurated, and impregnated with pyrite.

Continental strata with coal and fossil plants of Upper Cretaceous or Paleocene age (4) occur in Bulkley Valley between Seaton and Moricetown. These rocks are lithologically similar to rocks in the Hazelton group (2), and it is quite probable that they occur elsewhere in the map-area but have not been recognized.

The granodiorite bodies (5) cut Lower Cretaceous strata and probably were intruded at the close of the Mesozoic era. Their relation to the Upper Cretaceous or Paleocene (4) sedimentary rocks is not known.

The Upper Cretaceous or Paleocene strata (4) are cut by andesitic dykes and are overlain unconformably by andesitic flows (6).

Dykes of andesite, dacite, rhyolite, aplite, and lamprophyre also cut the granodiorite and older rocks. Those dykes are most abundant along the railway west of Skeena Crossing.

Within each local mountain range the bedded formations have been folded in a fairly uniform direction, which, however, in most places, does not persist across intervening valleys to neighbouring ranges. Further, the sedimentary strata in the main valleys are intensely deformed and the structures there exhibit no regular pattern. These facts suggest that the principal valleys lie along major fault zones, and that each individual mountain range or massif, as for example Rocher Déboulé Range, may represent a fault block. Much of the folding is asymmetrical, and in places overturned folds have developed into overthrust faults. Both normal and reverse faults are numerous throughout the map-area. Only those fold axes and faults that were actually mapped in the field are shown on the map. Many others were seen from a distance but are not mapped.

Most of the metalliferous deposits consist of sulphide-bearing quartz veins and vein-like replacements occupying fissure, fault, or shear zones in or near granodiorite intrusions. As a rule the higher temperature deposits, those carrying copper and tungsten ores, occur in or close to the larger stocks, whereas the lower temperature, silver-lead-zinc deposits lie either farther from these stocks or are found in or close to only the smaller intrusive bodies. Many of the known veins are both wide and long. The main veins on the Rocher Deboule (31) and Highland Boy (30) properties exceed 3,500 feet in length and range up to 8 feet in width. On the Silver Standard property (18) ten veins range from 100 to 1,500 feet in length and from a few inches to 10 feet in width. Veins on many of the other properties are 100 to 500 feet long and up to 5 feet wide.

The lead-zinc-silver deposits consist of varying amounts of galena, sphalerite, tetrahedrite, argentite, freibergite, jamesonite cosalite, arsenopyrite, and pyrite in a quartz gangue with minor amounts of carbonates. Principal values are in lead, zinc, and silver, but some properties, such as the Silver Standard (18) contain appreciable gold and arsenic, and others, including the Sunrise (8) and Lead King (9), contain significant amounts of antimony and bismuth. The Silver Standard (18) was operated intermittently from 1910 to 1922. In that period 14,500 tons of ore were mined and milled and 1,100 ounces of gold, 626,000 ounces of silver, 1,225,000 pounds of lead, and 1,400,000 pounds of zinc were recovered. Approximately 5,710 tons of ore were treated at the Silver Cup (6) mine in 1929. The Sunrise (8), Lead King (9), and American Boy (15) have made small shipments of hand-sorted ore.

The more important copper deposits consist of vein-like replacements along fissure or shear zones in granodiorite. These replacements contain chalcopyrite and lesser amounts of pyrite, magnetite, pyrrhotite, arsenopyrite, tetrahedrite, and molybdenite in a gangue of hornblende, actinolite, chlorite, and quartz. Safflorite, a cobalt diarsenide, is found in places in the Rocher Déboulé mine (31). From 1915 to 1918 the Rocher Déboulé produced 39,833 tons of ore containing 4,214 ounces of gold, 62,865 ounces of silver, and 5,746,306 pounds of copper. A small shipment of hand-sorted ore was made from the Highland Boy (30) in 1917.

One of the more promising of the low-grade gold-silver deposits is the Higgins (14). A vein on this property, 2,000 feet long and 2 to 7 feet wide, is sparsely mineralized with galena, sphalerite, tetrahedrite, pyrite, and scheelite.

The Black Prince (29) and Red Rose (34) tungsten deposits consist of quartz veins occupying shear zones in or close to granodiorite and diorite stocks. The tungsten occurs as wolframite, ferberite, and scheelite, and is associated with molybdenite, chalcopyrite, and tourmaline. The main vein on the Red Rose property is up to 12 feet wide and about 400 feet long. The property was in operation from January 1942 to November 1943, during which time approximately 625,000 pounds of tungsten were recovered.

The ore in the Hazelton View property (26) is essentially gold-bearing arsenopyrite, and occurs as shoots along a strong fault fissure, from a few inches to 3 feet wide, in granodiorite. Where ore shoots occur the altered granodiorite along the fissure is replaced by quartz and hornblende and by metallic minerals, which, in order of their abundance, are: arsenopyrite, safflorite, molybdenite, and chalcopyrite. Several carloads of ore have been shipped from this property.

The Kispiox-Shegunia (3) and Seaton (40) coal fields contain seams up to 5 feet thick, but these commonly include shale bands and are crushed and discontinuous. Various analyses show that the coal contains 10 to 20 per cent volatile matter, 40 to 70 per cent fixed carbon, and 20 to 30 per cent ash.