Canada
Department of Mines
HON. W. A. GORDON, MINISTER; CHARLES CAMSELL, DEPUTY MINISTER
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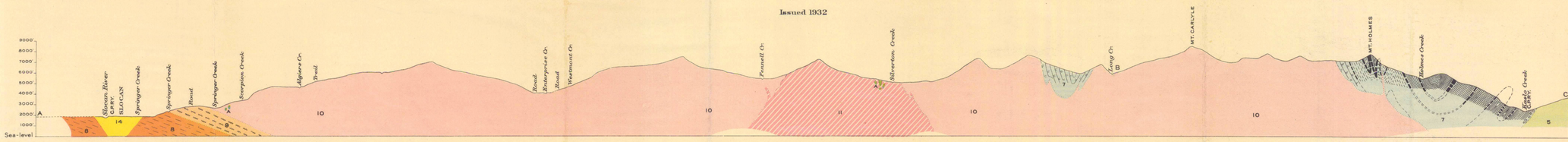


Structural section along line A B C

LEGEND

RECENT

14 — *Delta and stream deposits*

POST-TRIASSIC

13 — *Granite, syenite, granodiorite, quartz diorite and their porphyritic and felsitic equivalents; zones of dykes or sills are represented by dots*

12 — *A complex of coarse (pegmatitic) granite, fine to medium gneissic granite, and inclusions of Precambrian rocks*

11 — *Granite and granodiorite*

10 — *Porphyritic granite*

9 — *Crushed, mostly porphyritic, granite*

8 — *Gneiss (granitized pre-batholithic rocks), crushed granite, and masses of partly altered pre-batholithic rocks*

NELSON BATHOLITH

MESOZOIC

TRIASSIC

SLOCAN SERIES

7 — *Slate, argillite, limestone, quartzite, and tuffaceous sediments*
NOTE.—Limestone shown in structure section thus:—

KASLO SERIES

6 — *Serpentine*

5 — *Extrusives (andesite and dacite) and related intrusives; some intercalated, tuffaceous sediments*

A — *Schists, quartzite, argillite, limestone, altered volcanics and tuffaceous sediments; probably chiefly Slocan series*

MESOZOIC AND PALÆOZOIC

TRIASSIC AND UPPER CARBONIFEROUS

MILFORD GROUP

4 — *Chert (chiefly) traversed by a basic dyke*

3 — *Slate, argillite, quartzite, chert, and limestone*

LATE PRECAMBRIAN

WINDERMERE

LARDEAU SERIES

2 — *Schists, paragneisses, greenstone, crystalline limestone; numerous, small, unmapped bodies of granitic rocks related to the Nelson batholith*

WINDERMERE (?)

LARDEAU SERIES (AND, OR,) OLDER

1 — *Schists, paragneisses, crystalline limestone*

Areas of few rock exposures

Areas of Nelson batholith containing many, mostly small, inclusions (See Notes 1 to 5)

Geological boundary

Geological boundary (position approximate)

Geological boundary (position assumed)

Fault (position approximate)

Glacial striæ

(F) — *Fossil locality*

Pontiac — *Names of mines and mining properties*

Note 1. *Areas known to contain abundant inclusions of Windermere (?) rocks.*

Note 2. *Exposures, along shore only, containing a few, small, inclusions of older rocks.*

Note 3. *Areas known to contain numerous, small, partly granitized inclusions of older Mesozoic and (?) pre-Mesozoic rocks.*

Note 4. *Areas known to contain numerous inclusions of older Mesozoic and (?) pre-Mesozoic rocks.*

Note 5. *Area occupied chiefly by Mesozoic and (?) pre-Mesozoic rocks intimately intruded by bodies of the Nelson porphyritic granite.*

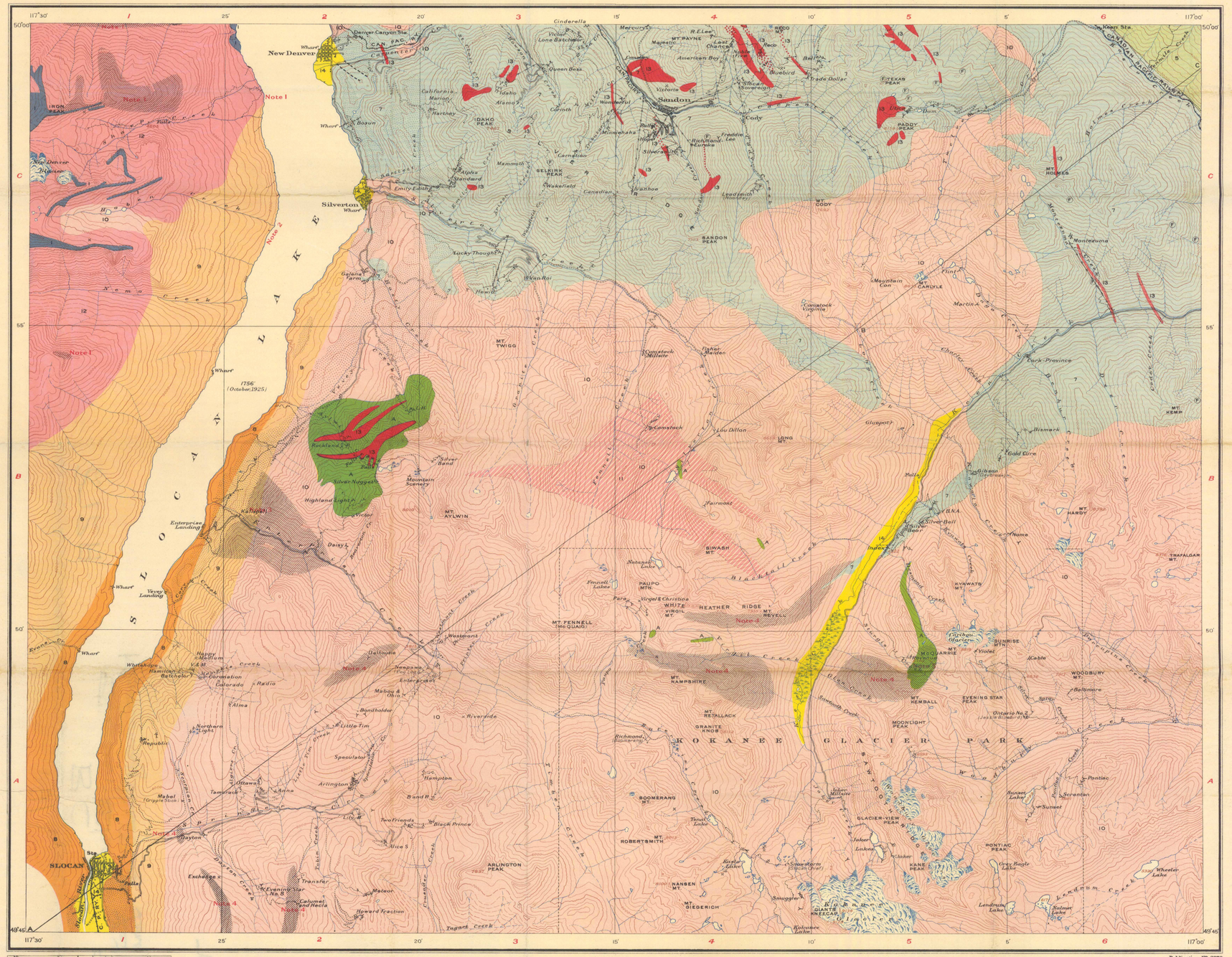
Geology by C. E. Cairnes, 1925, 1926, 1927, and 1928.

Roads and buildings
Road not well travelled
Trail
Railway
Bridge
Mine tramway
Aerial tramway
Shaft
Mine or prospect
Park boundary
Intermittent stream
Lake and stream (position approximate)
Stream (Flow disappears in places)
Glacier
Marsh
Contours
Contours (position approximate)
4223 — Height in feet

TOPOGRAPHY
W. H. Boyd, *Chief Topographical Engineer.*
Surveys and topography by W. H. Boyd, 1909, 1910, 1911, assisted by W. E. Lawson and A. C. T. Sheppard and by A. C. T. Sheppard, 1923, 1924, assisted by J. A. Macdonald.

Approximate magnetic declination, 1924.

Scale, 1 Inch to 300 Miles



Publication Nº 2278

GENERAL GEOLOGY

Up to elevations of 6,000 feet bed rock is largely concealed by drift consisting of morainic materials, slide debris and talus, up to 100 feet thick, at the higher elevations; sorted sands and gravels in the form of terraces along the lower slopes of the main valleys; and deltas at the mouth of the principal streams entering Slocan lake. These terrace and delta deposits are agriculturally important.

IGNEOUS INTRUSIONS. The Nelson batholith is the probable source of the mineral deposits. It presents a variety of granite phases. A massive, porphyritic granite, distinguished by the presence of large feldspar crystals, grades into and, in other places, is cut by a non-porphyritic granite. A foliated granite that is chiefly a crushed phase of the porphyritic granite passes, along either side of Slocan lake, into a complex composed of the granite and gneissic, partly granitized bodies of older rocks interleaved with and cut by aplitic granite. West of Slocan lake the porphyritic granite passes into a complex composed, in large measure, of thinly-banded, gneissic granite that, in places, grades into a massive phase. The gneiss is associated with numerous, large and small, dyke-like and more irregular bodies of pegmatite and pegmatitic granite. This pegmatite-gneiss complex carries many inclusions of crystalline limestone and of crystalline schists and gneisses presumably representing sediments.

Besides the stocks and larger dykes shown on the map, innumerable smaller dykes cut the Slocan series, but, except for pegmatitic types, are less common in the Nelson batholith. Many of the larger dykes end by splitting into belts of closely spaced, smaller dykes (represented on the map by a pattern of Vermilion dots). The stocks and nearly all the dykes are older than the veins and are, presumably, late phases of the Nelson batholith. The dykes belong to two groups, an older group of light coloured, acidic rocks, and a younger group of dark, mostly basic rocks. They appear to have partly controlled the formation of fissures and the courses followed by vein-forming solutions. Many of the ore bodies occur where acidic dykes are most numerous and, in several places, particularly in the batholithic areas, more basic dykes are closely associated with veins. A few, small, basaltic dykes cut the veins.

SLOCAN SERIES. This series is about 6,800 feet thick. The strata change from chiefly massive, argillaceous and quartzitic beds in the west to, in the east, mainly fissile, slaty beds associated with conspicuous limestone members. Most of the many mineral deposits developed in this series occur in the more massive, more rigid strata or where the strata have been buttressed by numerous dykes. Important ore deposits also occur as replacements of the heavier limestone beds.

UNDIVIDED MESOZOIC AND (?) PRE-MESOZOIC. These rocks occur as inclusions in the Nelson batholith. Many such bodies are too small to be represented but where they are numerous, their presence is indicated on the map by a pattern of Black ruling. In some places the rocks of the inclusions are highly altered. Elsewhere they resemble the Slocan series, and perhaps most, if not all, are remnants of this series. Many mineral occurrences, for the most part of no economic significance, are associated with these inclusions.

KASLO SERIES, MILFORD GROUP, LARDEAU SERIES. The Kaslo series is underlain to the east, by the Milford group, chiefly of sediments, and this group is underlain by sediments of the Lardeau series, in part highly altered. The three series dip westerly. The Kaslo series passes westward beneath the Slocan series without much evidence of structural unconformity. Erosion intervals probably separated the successive periods of deposition.

UNDIVIDED WINDERMERE (?). The strata so classified resemble the Lardeau series but are probably older. They and the granites cutting them are notably poor in mineral deposits.

STRUCTURAL GEOLOGY

The Slocan series has been strongly folded along northwesterly axes and in a lesser degree along axes more nearly east and west. The folds are complex and the strata are greatly faulted, sheared, and brecciated particularly along planes striking northwesterly. A prominent set of fractures strikes northeast across the main structures. These fractures have been invaded by vein-forming solutions.

The undivided Windermere (?) rocks are nearly horizontal or dip gently northward. Overturned folds are, however, locally developed and minor contortions are common. The porphyritic granite of the Nelson batholith is, in part, crushed to form the foliated granite member. It and the more massive and more widespread porphyritic granite are traversed by numerous, narrow, persistent zones of brecciation and shearing which, in places, have afforded important loci for mineralization. The pegmatite-gneiss complex is, for the most part, undeformed. The stocks and dykes are locally fractured and strongly sheared.

ECONOMIC GEOLOGY

The mineral deposits are chiefly fissure-veins whose walls have also been mineralized in varying degree depending on the strength and character of the fissuring and, especially, the composition of the wall rock. Most of the mineralized fissures strike northeasterly and dip southeasterly; this feature is particularly characteristic of veins in the Slocan series. The ores are chiefly valuable for their silver and secondly for their lead and zinc content. In some deposits, mostly within Nelson batholithic rocks, gold is also important.

Most of the important deposits occur in the Slocan series and the principal area of mineralization surrounds Sandon with a radius of 3 miles. Within this area 6 properties have each produced ore valued at over $1,000,000 and the aggregate production of 55 properties has exceeded $28,000,000. Argentiferous galena, grey copper (freibergite) and zinc blende are the chief ore minerals; siderite, quartz and, more locally, calcite are the more abundant gangue minerals. Ore bodies occur at irregular intervals along the vein-filled fissures. Vein outcrops are generally rusty as a result of oxidation of pyrite and siderite.

The ore-bearing veins in the Nelson batholithic rocks are mostly smaller but richer than those in the Slocan series. Few have produced over $100,000 worth of ore. Grey copper is generally the important ore mineral but native silver, ruby silver, argentite, stephanite, etc., may be present. Argentiferous galena and sphalerite are nearly always present but values in lead or zinc rarely approach those of silver. Quartz is generally the most abundant gangue mineral and commonly occupies the greater part of the fissures. More rarely siderite, calcite, or barite may be plentiful. Fluorite is conspicuous on one property.

RELATED PUBLICATIONS.

MAP 792: West Kootenay Sheet, British Columbia; scale, 1 inch to 4 miles; 1904.

MAP 1667: Slocan Mining Area, Kootenay District, British Columbia; scale, 1 inch to 1 mile; 1916 (out of print).

SUMMARY REPORT, 1928, PART A: Kootenay Lake District, British Columbia; by J. F. Walker.

MEMOIR: Sandon and Slocan map-areas, Kootenay District, British Columbia; by C. E. Cairnes.

MAP 273A: Sandon (Slocan and Ainsworth Mining Divisions), Kootenay District, British Columbia; scale, 1 inch to 4000 feet; 1932.

PUBLICATION No. 2277: Figure 3. Structure sections of the Slocan Series (accompanying "Map 273A—Sandon") scale, 1 inch to 4000 feet; 1932.

MAP 272 A

SLOCAN SHEET

KOOTENAY DISTRICT
BRITISH COLUMBIA

Scale, 63360 or 1 Inch to 1 Mile
Miles
Kilometres
Contour interval 200 Feet
Elevations referred to Mean sea-level.

NOTE
Names of mining properties and mineral claims are listed in accompanying Memoir and are indexed with reference to the Grid letters and figures shown in red along map border, thus: "Montezuma" is located in area C6

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