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DEPARTMENT  
OF  
MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

PAPER 50-9

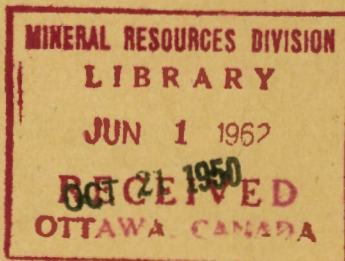
PRELIMINARY MAP  
ZEBALLOS  
BRITISH COLUMBIA

(MAP AND DESCRIPTIVE NOTES)

*Scale 1 m. to 1 inch  
Lat. 48°45' - 50°00'; Long. 126°30' - 127°00';*

By

J. W. Hoadley



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Preliminary Map  
ZEBALLOS  
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(Descriptive Notes)

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## Descriptive Notes for Zeballos Map, B.C.

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### INTRODUCTION

The map-area is on the west coast of Vancouver Island, 90 nautical miles northwest of Victoria. It includes an area of about 450 square miles of mountainous coastal terrain deeply penetrated by three, north trending and two, east trending fiords. The villages of Zeballos, Tahsis, Esperanza, Hecate, and Ceepeecee lie within the area.

The area is accessible by Canadian Pacific Steamship from Victoria, British Columbia, or by Queen Charlotte Airlines from Vancouver. Travel between settlements within the area is entirely by boat. A motor road, 4 miles long, connects the town of Zeballos with mining properties to the north, and a logging road extends 4 miles up Tahsis River Valley. Trails are few and for the most part in poor repair.

Precipitation is heavy throughout the entire area, but varies considerably from north to south. Along the coast the annual precipitation averages about 100 inches. Inland, at the heads of the fiords, it is more nearly 150 inches and may reach 200 inches.

The area is covered by a luxuriant vegetation. The abundant trees are hemlock, Douglas fir, red cedar, spruce, and balsam. Less common are yellow cedar, alder, poplar, maple, and yew. Spruce and cedar predominate in the wet stream bottoms; Douglas fir and hemlock predominate on the well-drained hillsides, and balsam and yellow cedar are largely restricted to the higher elevations near timberline, which has an elevation of about 4,500 feet. Salal, huckleberry, sidehill alder, and devil's club are common.

Within the area, relief varies from about 2,000 feet along the coast to 6,000 feet in the northeastern corner. Below 4,000 feet, the hills have been rounded by glacial action, and have a subdued appearance; above 4,000 feet, the mountains have been sculptured by alpine glaciers, and are extremely rugged.

#### GENERAL GEOLOGY

Zeballos map-area is underlain mainly by volcanic and sedimentary strata of early Mesozoic age, and by younger granitic rocks of the Coast intrusions, which are believed to have been emplaced during late Jurassic or early Cretaceous time. Later than the Coast intrusions are a few, small, basic dykes.

The surficial formations have been divided into three conformable parts, which, from oldest to youngest, are: the Karmutsen group of volcanic rocks, the Quatsino limestone formation, and the Bonanza group of sedimentary and volcanic rocks.

The Karmutsen group(1)<sup>1</sup>, the base of which is not

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<sup>1</sup>Numbers in parentheses are those of map-units on accompanying map.

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exposed, consists of a thick series of intermediate to basic, highly amygdaloidal, volcanic flows, with very little sedimentary material. Fossils found in minor intercalated sedimentary beds in the upper part of the group have been determined as fairly certainly Upper Triassic.

Conformably above the Karmutsen volcanic rocks is the Quatsino formation(2), which consists of 1,500 to 3,600 feet of light blue-grey crystalline limestone. Throughout

northern Vancouver Island, it forms a prominent horizon marker between the dominantly volcanic assemblages that constitute the underlying Karmutsen and overlying Bonanza groups.

The Quatsino limestone is overlain conformably by the Bonanza group(3-5), which consists of a mixture of tuffs, breccias, agglomerates, flows of intermediate composition, and sedimentary rocks. The last, apart from minor intercalations of limestone, are almost entirely confined to the first 500 feet above the Quatsino formation. They(3) contain Upper Triassic fossils. The upper part of the Bonanza group(4, 5) is largely composed of intermediate volcanic flows and associated pyroclastic rocks. It is considered probable that most, if not all, of them are of Lower Jurassic age. The top of the group is not exposed within the map-area.

#### STRUCTURE

The structures of Zeballos map-area probably owe their origin to several periods of deformation. Evidence obtained within the area and elsewhere on Vancouver Island indicates the occurrence of two major orogenies, one in late Jurassic or early Cretaceous time and the other in Tertiary, probably Eocene, time.

The prevailing structure in the Zeballos area appears to be a relatively simple northwesterly striking monocline, with westerly dips generally in excess of 40 degrees and commonly as much as 60 to 80 degrees. However, it is thought that this regional attitude does not represent a true monoclinial structure, but, rather, the eastern limb of a large syncline whose trough and western limb originally



lay in the southwestern part of the area and have since been largely destroyed by batholithic intrusions.

All the rocks of Zeballos map-area have been strongly faulted in at least three major directions, which form the bedrock control of the present main physiographic features. These principal faults strike northwest, north, and east. In addition, numerous minor faults were observed, and these are probably subsidiary to one or other of the major systems.

#### MINERAL DEPOSITS

There are few known mineral deposits in Zeballos map-area. Most of those that have been discovered are similar in structure, composition, and even vein texture to those of Zeballos mining camp to the north, but none, as yet, has proved commercial.

The most favourable prospecting area would seem to be along the contacts of the Quatsino limestone with the adjacent Bonanza and Karmutsen groups from Nomash River to the southeast corner of the map-area, especially near where the formations have been intruded by granitic rocks. The limestone should be carefully prospected for possible magnetite bodies, and the limestone-granitic contacts for possible copper-lead-zinc replacement deposits. Evidence of such mineralization was encountered on the high ridge to the west of Nomash River and at the headwaters of Sucwoa River. In addition, the contact aureoles of the main batholithic bodies should not be disregarded.