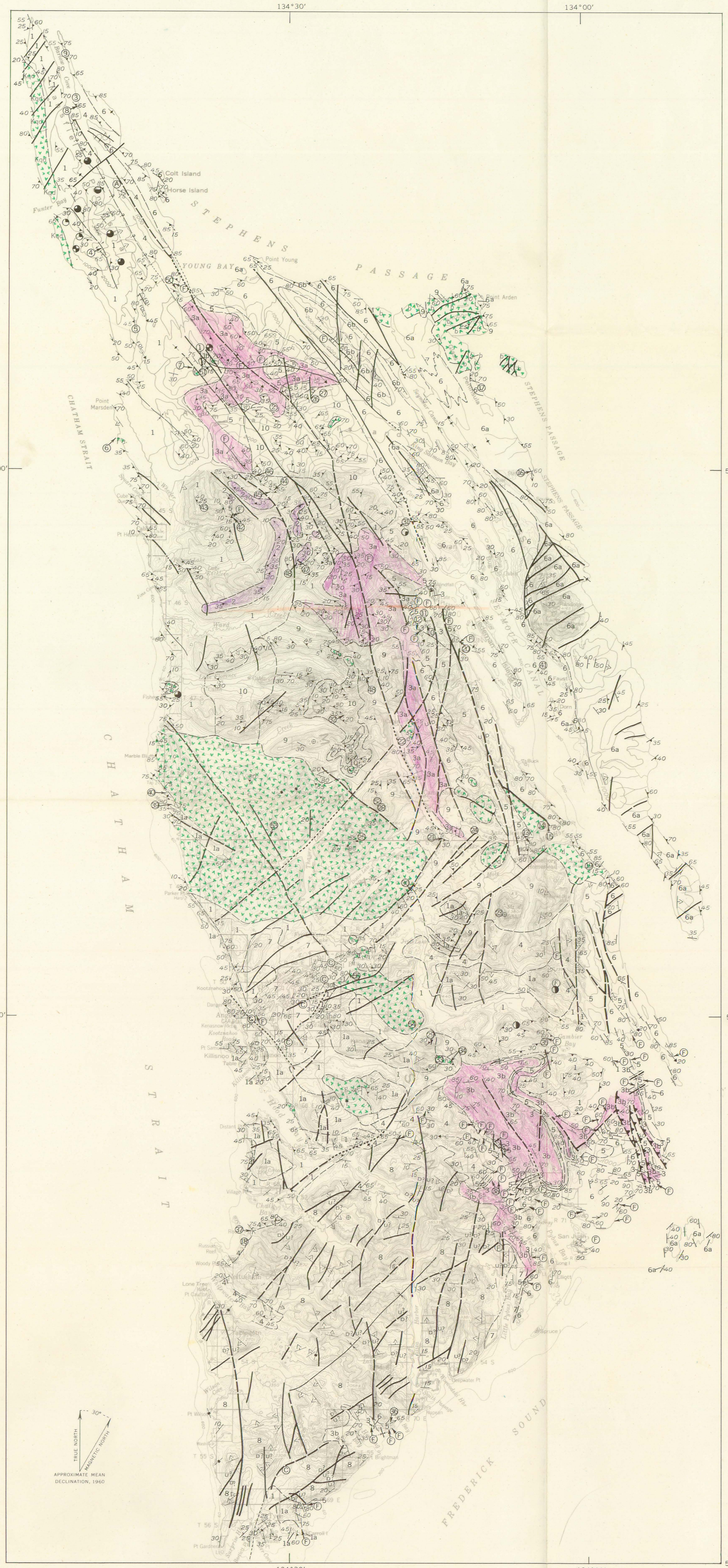


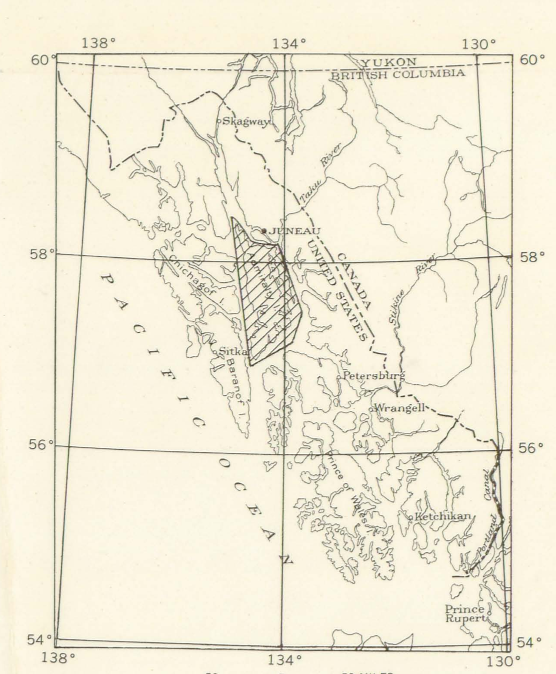

Base map compiled from map by Topographic Division, U. S. Geological Survey, 1959, and from Alaska Reconnaissance Topographic Series, Sitka N. S., 1958

SCALE 1:250 000

5 0 5 10 15 MILES

CONTOUR INTERVAL 200 FEET
DATUM IS MEAN SEA LEVEL
DEPTH CURVES IN FEET—DATUM IS MEAN LOWER LOW WATER

Geology by Ernest H. Lathram, Robert A. Loney, Henry C. Berg, John S. Pomeroy, Dwight W. Hinckley, William H. Condon, 1957, 1959. Geology of northern Mansfield Peninsula by Fred Barker (U. S. Geological Survey map GQ 100, 1957) C. L. Sainsbury




INDEX MAP SHOWING LOCATION OF MAP AREA

# EXPLANATION

Mapped area of each of units described may contain minor areas of other units too small to represent at scale of map

## BEDDED ROCKS

**TERTIARY**

*Eocene or younger*

8

### Basalt

*Light- to dark-gray, gray-green and red basalt in flows 20 to 30 feet thick; some are scoriaceous. Layers of tuff or breccia between some flows. Dips gentle to moderate. Most flows finely crystalline, porphyritic basalt containing phenocrysts of labradorite-bytownite, and of one or more of the following: hypersthene, augite, and olivine; some contain amygdules of calcite or chalcedony or both. Augite andesite rare. Flows cut by numerous dikes of basalt and diabase. Thin beds of coal, arkosic sandstone, cobble conglomerate and breccia interbedded with basalt in Murder Cove area. Thickness of unit may be 9,000 to 10,000 feet in vicinity of Pybus Bay*

UNCONFORMITY (?)

*Eocene*

7

### Sandstone, siltstone, shale, conglomerate, and coal

*Arkosic sandstone; fine-grained to conglomeratic, commonly crossbedded, friable; shaly sandstone; calcareous siltstone; carbonaceous shale; conglomerate; slate; lignite or bituminous coal beds and lenses 1 inch to 3 feet thick, intercalated with fine-grained shaly material, siltstone, and sandstone. Moderately to well-cemented conglomerates contain black, gray, and white chert pebbles, grayish-white quartz pebbles, argillite, phyllite, and schist fragments. Black chert pebbles dominate. Size sorting fair to poor. Cobble conglomerate possibly representing base of section crops out along northeast shore of Mitchell Bay and along Freshwater Lake. Cobbles of plutonic rocks common at Freshwater Lake. Fossil plant remains common at Sullivan Point. Estimated thickness exceeds 10,000 feet. In Little Pybus Bay area nonfossiliferous, bluish-gray, coarse-grained lithic sandstones and conglomerates in beds 10 to 20 feet thick conformably underlie thick basalt flows. Sandstones have slight bluish cast due to abundant phyllite fragments; conglomerates contain rounded pebbles, cobbles of diorite, basalt, graywacke, phyllite, and quartz. Thickness at Little Pybus Bay about 2,000 feet but decreases northward; pinches out south of Cannery Cove*

UNCONFORMITY

**JURASSIC AND CRETACEOUS**

*Upper Jurassic to Lower Cretaceous*

6 | 6a | 6b

### Slate and graywacke, volcanic rocks, and conglomerate

6, *slate, dark-gray to grayish-black, some beds calcareous. Graywacke, medium- to dark-gray, fine- to coarse-grained, lithic, commonly calcareous; graded bedding common. Minor conglomerate, well-bedded, contains pebbles predominantly of slate, limestone, and graywacke, in graywacke matrix. Pebbles rarely exceed half an inch in diameter. Limestone layers, lenses, concretionary nodules locally common. On northern Mansfield Peninsula, includes Symonds formation of Cretaceous (?) age; dark-gray to black carbonaceous plagioclase-quartz-sericite-chlorite graywacke, slate, conglomerate; augite-bearing volcanic flow breccia. At Herring Bay, blocky-weathering, thin-bedded graywacke, fossiliferous argillite and limestone; lenses and layers of dark greenish-gray volcanic rock. In Pybus and Gambier Bays area, dark-gray slaty argillite contains as much as 50 percent of thin-bedded, gray, fine-grained graywacke; upper part contains thick lenses of gray, coarse-grained graywacke and conglomerate. Conglomerate contains rounded clasts of diorite, andesite, graywacke, quartz, and limestone ranging in size from pebbles to boulders. Fossils uncommon. Thickness unknown because of strong folding but probably exceeds 5,000 feet.*

6a, *augite-bearing porphyritic volcanic flow breccia and minor tuff, schistose to massive. Porphyries comprise augite and less common hornblende phenocrysts as much as half an inch in diameter, in dense, grayish-green to green groundmass. Locally interbedded and gradational with slate or slate and graywacke. Equivalent to Douglas Island volcanic group of Jurassic (?) and Early Cretaceous (?) age in Juneau area. Thickness probably exceeds 4,000 feet.*

6b, *conglomerate, medium- to dark-gray, calcareous; consists of rounded to angular pebbles of slate, basalt, graywacke, limestone, in medium-grained graywacke matrix. Grades into and is interbedded with slate and graywacke series. Ridge northeast of Young Lake, massive to very thick-bedded conglomerate; poorly sorted, pell-mell structure, fragments rounded, polished, predominantly pebble size, some cobble size. Pebbles include dark-gray to grayish-black argillite, banded graywacke, light- to medium-gray limestone, some felsite, quartz, chert. Fossils rare. Grades into slate and graywacke series at base. Estimated thickness 3,500 feet, top eroded*

LOCAL UNCONFORMITY

**TRIASSIC**

*Upper(?) Triassic*

5

### Volcanic rocks, slate, chert, limestone, chert breccia

*Massive and thick-bedded, jasper-bearing, red and green amygdaloidal basalt and pillow lava; commonly porphyritic, scoriaceous. Fossiliferous, dark-gray to black, sooty or carbonaceous limestone and slate; dark-gray to black, thin-bedded chert. Brownish-gray, fine-grained calcareous slate, interbedded with thin-bedded argillite, graywacke, conglomerate. Basal unit red, green, or gray chert pebble breccia, and gray chert and limestone pebble conglomerate. In area south of Young Bay, interbedded thin-bedded grayish-black slate, dark-gray limestone, overlain by andesitic and dacitic flows, tuff, and breccia, commonly porphyritic. Greenschist common near contacts with intrusive rocks. Small outcrop 6 miles east-southeast of Square Cove consists of fossiliferous, thin-bedded, gray limestone, interbedded with dark-gray, carbonaceous slate, and light-gray phyllite; unconformably overlies, and probably infolded with, crystalline schists. In Pybus and Gambier Bays area, base of section is chert breccia consisting of bluish-white, angular to subrounded chert fragments, and red and green bedded chert fragments imbedded in carbonate matrix. Thickness variable, maximum probably 300-400 feet. Middle of section consists of thin-bedded grayish black calcareous argillite, black chert, and grayish-black limestone. Locally fossiliferous. Thickness probably less than 300 feet. Pillow lavas and basalt appear to overlie this unit at Gambier Bay. Upper part of section consists of medium-bedded, light-gray weathering, dark-gray limestone. Bedding has undulatory appearance due to stylolitic bedding surfaces. Locally fossiliferous. Probably a few hundred feet thick*

UNCONFORMITY

**PERMIAN AND PERMIAN(?)**

3 (3a | 3b)

### Limestone, chert, graywacke, slate, conglomerate

3, *light brownish-gray to white, medium-bedded (6 inches to 2 feet), fossiliferous, fine- to medium-grained limestone; contains irregular layers and scattered angular fragments of bluish-white chert. Chert content increases to 90 percent near top of section. Maximum thickness about 1,000 feet but unit generally thinner and entirely missing over large areas.*

3a, *in area south of Young Bay, gray, fine-grained, schistose, locally fossiliferous, slightly calcareous graywacke; gray to black slate; gray, siliceous, crenulated phyllite; thin, discontinuous beds of grayish-brown limestone. Conglomerate, containing pebbles of dark-gray slate, chert, limestone, graywacke, and volcanic rocks interbedded with chocolate-brown weathering, gray fossiliferous limestone. In Windfall Harbor area, thin-bedded, dense, dark-gray to black argillite and light- to medium-gray phyllite predominant. Minor grayish-white chert, calcareous sericite schist, siliceous biotite schist, slate, greenschist, fossiliferous limestone, and thin-bedded graywacke.*

3b, *dark-gray chert and volcanic-pebble conglomerate; dark-gray to black, slightly calcareous graywacke, argillite. In Pybus-Gambier Bays area, thin-bedded green and dark-gray chert, dark-gray siliceous argillite, gray to greenish-gray fine-grained graywacke; rare, 10- to 20-foot thick beds dark brownish-gray argillaceous limestone or calcareous argillite, and light-gray, aphanitic volcanic breccia. No fossils found. Thickness unknown because of strong folding, may be several thousand feet thick. Permian age of* 3b *doubtful*

UNCONFORMITY

**SILURIAN OR DEVONIAN**

1 | 1a | 1b

### Schist, marble, phyllite, graywacke, and argillite

1, *chlorite-albite-epidote schist, calc-silicate schist, quartz-mica schist, commonly graphitic; amphibole schist, greenstone, garnet-muscovite-quartz-feldspar schist; light-gray to white quartzite or metachert, silvery-gray phyllite. Schists generally pyritic, locally enclose thick lenses and discontinuous layers of marble which commonly contains epidote, garnet, and magnetite. Complexly folded and faulted; at least two stages of deformation evident in rocks exposed at Hawk Inlet. East of Murder Cove thin- to medium-bedded slightly schistose graywacke and slate, chert, conglomerate conformably (?) underlie* 1a. *In Gambier-Pybus Bays area, unit composed of thick layers of following rock types: albite-chlorite-epidote and albite-calcite-tremolite-chlorite schists; dark-gray, fossiliferous, fine- to medium-grained marble; dark-gray phyllite; light-gray sericite schists; green, very fine-grained impure quartzites (probably metacherts). In northern Mansfield Peninsula consists of sericite schist, greenschist, slate, graywacke, marble; includes most of Retreat group of Barker (1957) previously considered of Late Triassic (?) to Early Cretaceous age but on basis of fossil evidence in* 1a *with which it is correlative, unit 1 is now considered of Silurian or Early Devonian age. Thickness unknown.*

1a, *predominantly marble and limestone; light- to medium-gray, thin-bedded to massive, locally sheared or schistose, commonly crystalline. Fossils uncommon, poorly preserved. Marble contains minor greenschist. Tactite zones common near contacts with intrusive rocks. East of Murder Cove, thin- to medium-bedded siliceous limestone at least 500 feet thick contains abundant fossils. Presence of* Tryplasma *indicates limestone is definitely Silurian or Early Devonian in age (identified by W. A. Oliver, Jr., 1959). Massive to platy limestone at least 1,000 feet and possibly as much as 4,000 feet thick forms highland areas near Gambier and Hood Bays.*

1b, *unit 6.5 miles N. 63° E. of Point Marsden probably serpentinized dolomite (ophicalcite) at least 200 feet thick*

LOCAL UNCONFORMITY

**PERMIAN AND TRIASSIC(?)**

4

### Chert, argillite, volcanic rocks, and conglomerate

*Dark-gray to black thin-bedded chert; black slate and slaty argillite; siliceous or cherty argillite; siltstone; limestone; and graywacke. Minor greenstone, greenschist, and greenstone breccia. Conglomerate and breccia contain pebbles of chert, cherty graywacke and argillite, and volcanic rocks in graywacke or volcanic wacke matrix. North and northwest of Gambier Bay, grayish-green andesite (?) flows, tuffs; some flows with feldspar phenocrysts. Rare pillow structure. Dense aphanitic red and green flows south of Yellow Bear Mountain; minor black chert and micaceous schist interbedded with volcanic rocks. In northern Mansfield Peninsula consists of albite-epidote-chlorite schist, minor augite-bearing volcanic flow breccia and andesite flows, graywacke, slate, conglomerate, and phyllite. These rocks mapped by Barker (1957) as Barlow Cove formation of Jurassic (?) to Early Cretaceous age and part of Retreat group of Late Triassic (?) to Early Cretaceous (?) age are correlative with rocks of units* 3 *and* 5 *south of Young Bay which contain* Muirwoodia *(identified by G. A. Cooper, 1957) of probable Permian age, and fossils of possible Late Triassic age (J. T. Dutro, Jr., written communication, 1958) and in this report are considered Permian and (or) Triassic in age. In southern Mansfield Peninsula consists of greenschist, greenstone, marble, phyllite, argillite, slate, and graywacke. Marble contains lenses of quartz conglomerate and breccia. In vicinity of Pybus Bay, consists of thin-bedded, grayish black to black chert; siliceous argillite; medium- to dark-gray, fine-grained graywacke; sparse thick beds (20 to 30 feet) of dark-gray to grayish-black, sooty, fine- to medium-grained limestone, and grayish-black argillite. Few poorly preserved fossils. Thickness unknown because of structural complexity; probably very thick*

**SILURIAN(?) TO PERMIAN(?)**

2

### Phyllite, marble, chert, greenschist

*Laminated, crinkled, fine-grained, silvery-gray phyllite and fine-grained, light-gray quartzo-feldspathic schist; thin-bedded, gray, medium-grained crystalline marble and massive, chocolate-brown weathering, gray marble. Marbles interbedded with fine-grained, cross-crinkled, partly graphic phyllite or sericite schist, light-gray sheared chert, dark-gray chert lenses, and pyritic greenschist. Top of section largely dark-gray to black, contorted phyllite; in area east of Point Hepburn forms crests of ridges. As marker horizon, appears to define broad, isoclinal, nearly recumbent, gently south-plunging folds, overturned to east and northeast*

**SILURIAN TO CRETACEOUS**

9

### Undifferentiated metamorphic rocks

*Contact metamorphosed equivalents of rocks ranging in age from Silurian (?) to Cretaceous; includes hornfels, greenstones, schists, metacherts, marbles, slates, phyllite; minor tactite or skarn, and quartzite; excludes migmatite and gneiss*

10

### Migmatite and gneiss

*Migmatite and plutonic breccia consisting of fractured hornblende-rich rock and quartz-feldspar rock, generally hornfelsic or schistose, in a matrix of granitic-textured plutonic rock of several varieties. Grades into gneissose diorite, hornblendite, and unoriented plutonic rock. Gneiss consisting of chlorite-albite-epidote schist, amphibole schist, and quartz-feldspar-mica schist, interlayered with granular quartzo-feldspathic rock; grades into quartz-feldspar pegmatite and fine-grained granitic varieties of plutonic rock*

## INTRUSIVE ROCKS

Rocks are grouped according to lithology, and any symbol may represent more than one episode of emplacement. No age relationship is implied by position in column

**CRETACEOUS(?)**

Kqd

### Quartz diorite

*Lineated, foliated, sheared albite-oligoclase-biotite quartz diorite. Considered to be Cretaceous (?) (Barker, 1957)*

Ka

### Granite and quartz monzonite

*Biotite-allanite granite, biotite quartz monzonite, and quartz-albite-microcline pegmatite*

Kb

### Quartz diorite

*Foliated hornblende quartz diorite, biotite quartz diorite, and hornblende-biotite quartz diorite*

**AGE UNKNOWN**

c

### Granodiorite, quartz diorite, and diorite

*Hornblende-biotite granodiorite, biotite granodiorite, hornblende-biotite quartz diorite, hornblende quartz diorite, biotite quartz diorite, augite diorite, augite-biotite diorite, hornblende diorite, hornblende-biotite diorite, locally well foliated. Scattered small bodies of hornblendite*

d

### Hornblendite, gabbro, and diorite

*Hornblende, foliated and saussuritized augite-hornblende gabbro, augite-uralite diorite, augite-hornblende diorite*

e

### Diorite and quartz diorite

*Augite-biotite diorite, augite quartz diorite, lesser amounts hornblende granodiorite, augite-uralite gabbro*

f

### Ultramafic rocks

*Serpentinite body near Point Marsden, containing antigorite, carbonate, and talc, probably a sill at least 500 feet thick. Other bodies serpentinized peridotite or pyroxenite, probably more than 200 feet thick, apparently layered*

g

### Granodiorite

*Hornblende-biotite granodiorite and augite granodiorite*

h

### Diorite

*Foliated, porphyritic hornblende diorite*

i

### Probable intrusive rocks

*Identified from aerial photographs and aerial reconnaissance. Not examined in the field*

## RESULTS OF X-RAY SPECTROSCOPIC EXAMINATION OF SULFIDE, OXIDE, AND RARE EARTH MINERAL-BEARING SAMPLES COLLECTED 1957, 1959

[Specimens represent grab samples, and except where otherwise noted under Remarks, data are for unconcentrated material]

| Sample No. | Ti | Cr | Mn | Co | Ni | Cu | Zn | As | Se | Rb | Sr | Y | Zr | Nb | Mo | Sb | Ba | La | Ce | Pr | Nd | Au | Pb | Th | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | t | t | | | | | | | | | ? | | | | | | t | | Dark-brown cellular "limonite" gossan. |
| 2 | t | | t | | | | t | | | | t | | | | | | | | | | | | | | Disseminated pyrite in granulite-gneiss. |
| 3 | | | t | | | | | | | | t | | | | | | | | | | | | | | Pyrrhotite, pyrite in calcite veinlets in schist. |
| 4 | | | t | | | t | | | | | | | | | | | | | | | | | t | | Disseminated pyrite, chalcopyrite, galena in siderite-cemented quartz breccia. |
| 5 | t | | | | | t | | | | | | | | | | | | | | | | | | | Pyrite crystals in schist. Pyrite locally contains chalcopyrite. |
| 6 | | t | t | | T | | t | | | | | | | | | | | | | | | | t | | Disseminated sulfide and oxide minerals in altered (serpentinized) ultramafic sill. |
| 7 | t | | t | | | | t | t | | | | | | | | | | | | | | | t | | Pyrite in spongy quartz associated with serpentinite. |
| 8 | | | | | | t | t | ? | | | | | | | | | | | | | | | | | Disseminated magnetite, pyrite, chalcopyrite in brown weathering schist. |
| 9 | | | t | | | | | | | | t | | | | | | | | | | | | | | Magnetite crystals in gneissic calc-silicate marble. |
| 10 | | | | | | M | | | | | T | | | ? | | | T | | | | | | | | Chalcopyrite, minor pyrite veinlets in chert. |
| 11 | | | t | | | M | ? | | | | | | | | | | | | | | | | | | Pyrite, chalcopyrite veinlets in calcite-cemented greenstone breccia. |
| 12 | | | t | | | | | | | | t | | | | | | | | | | | | | | Copper-colored graphite(?) on shear surfaces of amygdaloidal volcanic rocks. |
| 13 | | | t | | | | | ? | | | t | | | | | | | | | | | | | | Sparse pyrite veinlets in chert. |
| 14 | t | | t | | | | | | | | T | | | | | | | | | | | | | | Disseminated pyrite, pyrrhotite in siliceous greenstone or hornblendite. |
| 15 | | | t | | | T | | | | | t | | | | | | | | | | | | | | Disseminated pyrrhotite, pyrite, minor chalcopyrite in rust weathering siliceous hornfels. |
| 16 | t | | t | | | | t | | | | | | ? | | | | | | | | | | | | Pyrite crystals in bleached, actinolitic greenstone. |
| 17 | | | | | | | | t | | | | | | | | | | | | | | | | | Pyrite crystals as much as one inch long in black slate, phyllite. |
| 18 | ? | | t | | | | ? | | | | t | | | | | ? | t | | | | | | | | Small pyrite crystals in brecciated chert. |
| 19 | | | t | ? | | ? | | | | | t | | t | | | | t | | | | | | | | Quartz, pyrite, minor chalcopyrite(?) veins as much as one inch thick in fractured diabasic igneous rock. |
| 20 | t | | t | ? | | | t | ? | | | t | | | | | | t | | | | | | | | Pyrite and calcite veinlets, disseminated pyrite in chert pebbles from sheared conglomerate. |
| 21 | | | | | | M | t | t | | | | | | | | | t | | | | | | ? | | Pyrite, chalcopyrite in bands as much as 3 inches thick, interlayered with chert or cherty hornfels. Sulfide-rich layers locally contain quartz or chert. |
| 22 | | | t | | | | | | | | t | ? | t | | | | t | | | | | | | | Disseminated pyrite in plutonic igneous rock. |
| 23 | t | | t | | | | t | | | | t | | | | | | t | | | | | | | | Pyrrhotite, pyrite veinlets in sheared, mafic volcanic rock. |
| 24 | ? | | t | | | | t | | | | | | | | | | | | | | | | ? | | Veinlets, disseminated crystals of pyrite in sheared, serpentinous greenstone. |
| 25 | | | M | | | | t | | | | | t | T | | | | | | | | | ? | | | Heavy mineral concentrate (bromoform) of garnet-bearing pegmatite. |
| 26 | T | | t | | | | t | ? | | ? | t | t | T | T | | | | t | t | | | | | ? | Heavy mineral concentrate (bromoform) of rare earth-bearing pegmatite. |
| 27 | T | | t | | | | t | t | | | | t | T | t | | | | t | T | t | t | | | ? | Do. |
| 28 | t | | t | | | t | t | | | | t | | | | | | | | | | | | | | Veinlets and disseminated grains of pyrite, chalcopyrite in orange and brown weathering sheared and brecciated hornfels. |
| 29 | t | | t | ? | | | t | | | | t | | ? | | | | | | | | | | | | Disseminated pyrite, pyrrhotite in biotite-rich hornfels. |
| 30 | t | | t | | | t | t | | | | t | | t | | | | | | | | | | | | Veinlets and disseminated grains of pyrite, minor chalcopyrite in schistose, serpentinous greenstone. |
| 31 | | | t | | | | t | | | | t | | | | ? | | | | | | | | | | Pyrite, pyrrhotite, calcite, quartz veinlets in brecciated, slightly schistose argillite. |
| 32 | t | | t | | | | t | | | | t | | | | ? | | | | | | | | | | Magnetite, pyrrhotite in schistose greenstone. |
| 33 | | | t | | ? | | | | | | T | | | | | | | | | | | | | | Pyrrhotite, pyrite, magnetite in porphyritic igneous rock. |
| 34 | ? | | t | | | | t | | | | T | | | | ? | | | | | | | | | | Disseminated pyrite, pyrrhotite in foliated plutonic rock. |
| 35 | | | t | | | M | | | | | | | | | | | | | | | | | | | Chalcopyrite, malachite in quartz- and calcite-cemented silicified limestone breccia. |
| 36 | | | t | | | | t | | | | t | | t | | | | | | | | | | | | Sparse sulfide (pyrite?) in mafic dike. |
| 37 | t | | t | | | t | t | | ? | | t | | | | | | | | | | | | | | Sparse chalcopyrite, pyrite in schistose greenstone. |
| 38 | | | | | | | t | t | | | | | t | | | | | | | | | | | | Rust-weathering "limonite" gossan in black chert and argillite. |
| 39 | | | t | | | t | t | | | | t | | | | | | | | | | | | | | Pyrite, minor chalcopyrite in calcite and quartz veinlets in mica schist. |
| 40 | | | t | | | t | | | | | ? | | | | | | | | | | | | | | Pyrite- and chalcopyrite-rich pods in amphibolite near contact with plutonic igneous rock. |
| 41 | ? | | t | | | | ? | | | | t | | | | | | | | | | | | | | Pyrrhotite veinlets in greenstone. |
| 42 | | | | | | t | | t | | | | | | | | | | | | | | | | | Pyrite crystal in greenschist inclusion in large quartz lens in schist. |
| 43 | | | t | | | M | t | ? | | | | | | | | | | | | | | | ? | | Pyrite, chalcopyrite, quartz veins in rust weathering quartz-mica schist. Minor secondary copper salts. |
| 44 | | | t | | | t | | | | | t | | | | | | | | | | | | | | Pyrite, chalcopyrite, minor pyrrhotite(?) veinlets in light-brown weathering marble and calcareous greenschist. |
| 45 | t | | t | | | | t | | | | | | t | | | | | | | | | | | | Disseminated pyrite cubes in dark-brown weathering quartz-feldspar-mica schist |
| 46 | | | | ? | | M | t | | | | | | | | | | | | | | | | | | Pyrite, chalcopyrite, malachite in laminated quartzite, marble, schist. |
| 47 | | | | | | | | t | | | | | t | | | | | | | | | | | | Disseminated pyrite in quartzite and mica schist. |
| 48 | | | | t | | | t | t | | | | | | | | | t | | | | | | | | Pyrite crystals, veinlets in brown weathering quartzite or chert, phyllite, schist. |
| 49 | M | | t | | | | | | | | | | | T | | | | | | | | | | | Crystals of niobian rutile as much as 4 inches long in breccia, migmatite, and gneiss. |
| 50 | | t | t | | | | t | t | | | t | | | | | | | | | | | | | | Bright-green mica (mariposite?), serpentine veinlets in foliated marble. Marble contains white mica, sparse pyrite. |
| 51 | | T | t | | t | | t | | | | | | | | | | | | | | | | | | Bright-green mica (mariposite?) interlayered with serpentine, calcite. Associated with ophicalcite. |
| 52 | t | | t | | | | | | | | t | ? | | | | | | | | | | | | | Disseminated pyrite in feldspar-mica-hornblende schist. |
| 53 | t | | t | | | t | t | | | | t | | | | | | | | | | | | | | Sparse chalcopyrite, pyrite in schistose greenstone. |
| 54 | t | | t | | | | t | | | | t | | | | | | | | | | | | | | Disseminated magnetite in mafic igneous rock. |
| 55 | | | t | | | | t | | | | t | | | | | | | | | | | | | | Disseminated pyrite, minor magnetite, pyrrhotite(?) in greenstone. |

M, major constituent; T, major trace constituent; t, minor trace constituent; ?, presence of element is questionable. Iron is major constituent in all samples. X-ray analyses by H. C. Berg

## SYMBOLS

Contact, showing dip
*Includes gradational or inferred contacts. Dashed where approximately located, queried where doubtful or probable, dotted where concealed*

Fault, showing relative movement
*Dashed where approximately located, dotted where concealed. U, upthrown side; D, downthrown side*

Thrust fault
*Saw-teeth on upper plate*

Anticlinal structure
*Showing crest line. Dashed where approximately located. Indicates general upward convergence of bedding, foliation, or composition layering in structurally complex rocks*

Overturned anticline
*Showing crest line, direction of dip of limbs, and direction of plunge of axis*

Syncline
*Showing trace of axial plane. Dashed where approximately located*

Synclinal structure
*Showing position of trough. Dashed where approximately located. Indicates general downward convergence of bedding, foliation, or composition layering in structurally complex rocks*

Overturned syncline
*Showing position of trough and direction of dip of limbs*

Anticlinal fold in foliation
*Showing trace of axial plane and bearing and plunge of axis*

Plunge of minor anticline

Plunge of minor syncline

Overturned synclinal fold in foliation
*Showing position of trough and direction of dip of limbs*

Strike and dip of beds

Strike and dip of overturned beds

Strike of vertical beds
*Where used, position of 90 indicates up side of beds*

Strike and dip of beds and plunge of lineation

Strike and dip of beds by distant observations or photo-interpretation

Horizontal beds

Strike and dip of foliation

Strike and dip of foliation and plunge of lineation

Vertical foliation

Lineation
*Showing bearing and plunge of small (drag) fold axes, crenulations, striations, grooves, mineral alignment, boudinage, mullions, bedding-cleavage-foliation intersections*

Horizontal lineation

Strike and dip of joints

Strike of vertical joints

Fossil locality

Mineral occurrences
*Metals may occur singly or in combinations*

Gold

Copper

Lead-zinc; locally includes silver

Nickel-cobalt

Coal prospect

Asbestos prospect

Location of X-ray spectroscope sample

# PROGRESS MAP OF THE GEOLOGY OF ADMIRALTY ISLAND, ALASKA

By
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