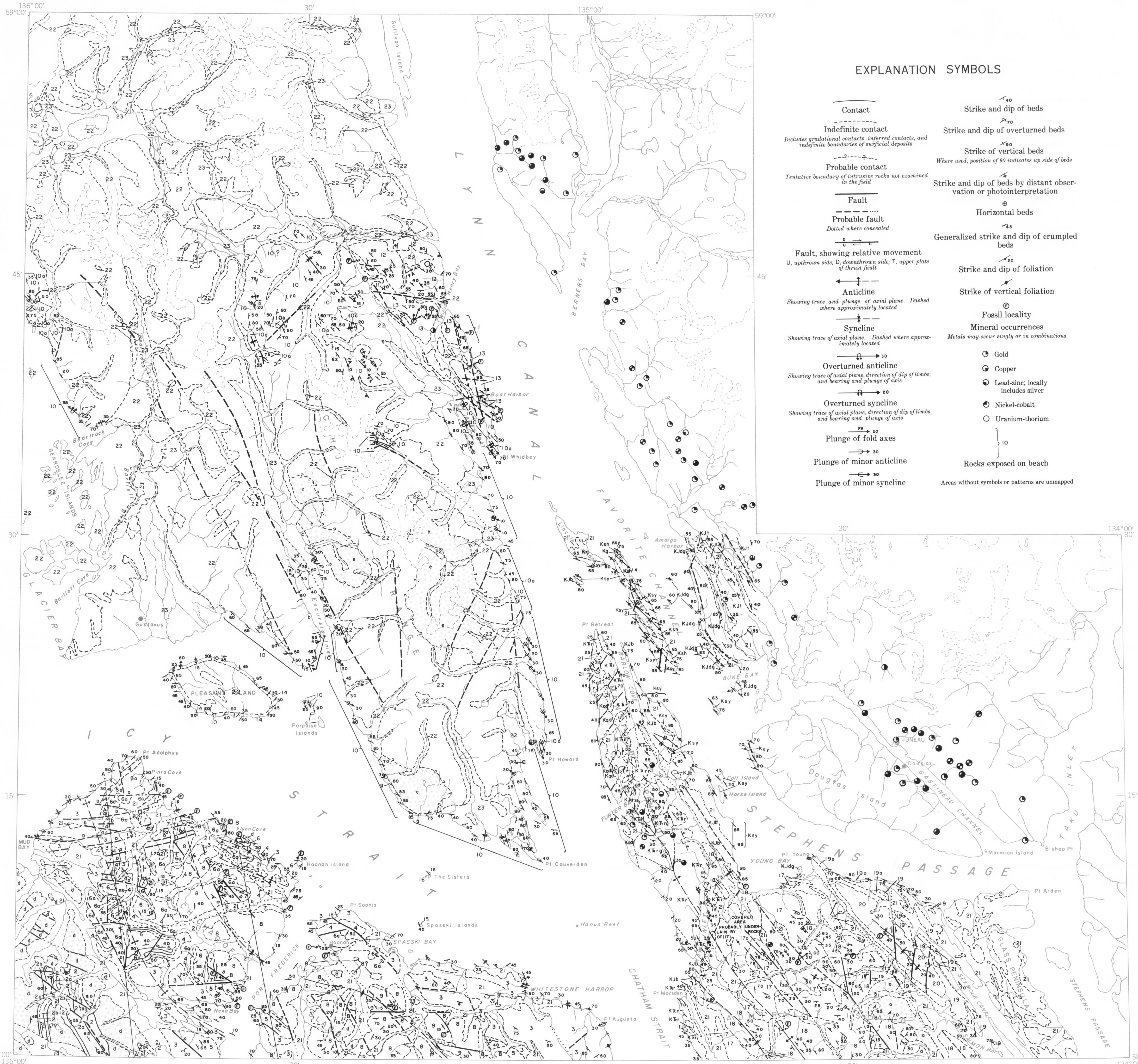


EXPLANATION SYMBOLS

Contact

Indefinite contact
Includes gradational contacts, inferred contacts, and indefinite boundaries of surficial deposits

Probable contact
Tentative boundary of intrusive rocks not examined in the field

Fault

Probable fault
Dotted where concealed

Fault, showing relative movement
U, *upthrown side;* D, *downthrown side;* T, *upper plate of thrust fault*

Anticline
Showing trace and plunge of axial plane. Dashed where approximately located

Syncline
Showing trace of axial plane. Dashed where approximately located

Overturned anticline
Showing trace of axial plane, direction of dip of limbs, and bearing and plunge of axis

Overturned syncline
Showing trace of axial plane, direction of dip of limbs, and bearing and plunge of axis

Plunge of fold axes

Plunge of minor anticline

Plunge of minor syncline

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 by distant observation or photointerpretation

Horizontal beds

Generalized strike and dip of crumpled beds

Strike and dip of foliation

Strike of vertical foliation

Fossil locality

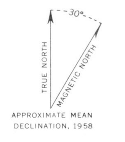
Mineral occurrences
Metals may occur singly or in combinations

- Gold
- Copper
- Lead-zinc; locally includes silver
- Nickel-cobalt
- Uranium-thorium

Rocks exposed on beach

Areas without symbols or patterns are unmapped

Base compiled from map by Topographic Division, U. S. Geological Survey, 1957

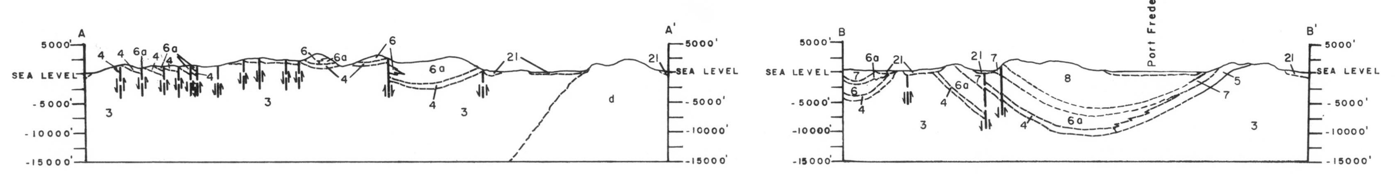


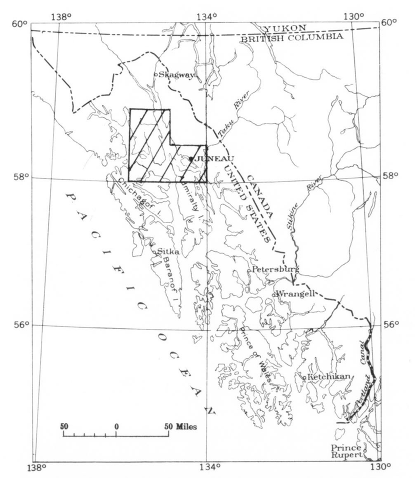
Scale 1:250,000

2 0 2 4 6 8 10 Miles

Geology by Ernest H. Lathram, Robert A. Loney, William H. Condon, Henry C. Berg, Maurice Grolier, J. Thomas Dutro, Jr., 1956–1957

Quaternary geology largely from interpretation of aerial photographs by William H. Condon, 1957





INDEX MAP SHOWING LOCATION OF MAP AREA

PROGRESS MAP OF THE GEOLOGY OF THE JUNEAU QUADRANGLE, ALASKA

By
Ernest H. Lathram, Robert A. Loney, William H. Condon
and Henry C. Berg
1958

EXPLANATION

BEDDED ROCKS

CHICHAGOF ISLAND

21 — Alluvium and glacial deposits (QUATERNARY)

9 — Limestone and shale (MISSISSIPPIAN)
Limestone, medium brownish and dark-gray, thin- to medium-bedded; contains variable amounts of dark-gray, irregular, nodular, bedded chert. Upper part of limestone generally lighter colored, less cherty, locally gypsiferous, contains corals; lower part darker, more thinly bedded, more cherty, contains abundant brachiopods. Minimum thickness 1,500 feet, top not seen. Limestone underlain by dominantly grayish-black shale, containing variable amounts of dark-gray limestone and dark-gray shaly limestone in lower part. Brachiopods, cephalopods, and gastropods in upper part of shale. Thickness may be 1,500 feet, base not seen

DEVONIAN — Upper Devonian

8 — Andesite and basalt flows, breccia, and tuff
Contains minor intercalated conglomeratic volcanic graywacke, dark-gray limestone, and grayish-black argillite. Volcanic rocks highly variable in composition, color, and thickness. Upper part dominantly andesite, lower part basalt. Chloritization and epidotization widespread, albitization occurs locally. Brachiopod fauna occurs near base. Thickness may exceed 6,000 feet. Queried where identification doubtful

LOCAL UNCONFORMITY

7 — Limestone
Dark and light brownish-gray cobbly bedded, bedding thin to medium, contains very minor grayish-black shaly layers. Brachiopods in upper part, corals in middle and basal parts. Maximum thickness approximately 2,500 feet, thinner or absent where eroded prior to deposition of overlying volcanic rocks

SILURIAN(?) TO DEVONIAN — Middle(?) Devonian

6, 6a — Conglomerate, graywacke, siltstone and shale
Conglomerate (6), *dark-gray graywacke, siltstone, and shale* (6a) *in highly variable proportions; minor amounts of dark-gray limestone. Rock types interchange within short distances laterally and vertically. Thickens westward; may be as thick as 3,000 feet. Near Pinta Cove distinctive dark-red and greenish-gray sandstone and argillite in upper part contain poorly preserved gastropods. Conglomerate, predominantly cobble- to boulder-size, contains volcanic rock, granite, graywacke, limestone, quartz, chert, and limestone fragments*

4 — Limestone
Dark brownish-gray, medium- to thick-bedded, unfossiliferous; contains conglomeratic layers in lower part; grades downward into dark-gray, thin-bedded calcareous shale and siltstone. Conglomerate layers contain angular and rounded fragments of chert, graywacke, and limestone. Thickness approximately 800 feet

5 — Limestone and marble
Light grayish-brown and dark-gray, thin-bedded to massive; contains scattered minor reddish-brown dolomite beds and limestone breccia. Upper part thin bedded; contains greenish-gray siliceous laminae and a few fossils; lower part thick bedded and fossiliferous. Thickness approximately 1,000 feet. May in part represent temporal equivalent of units (4) *through* (7)

3 — Graywacke and argillite
Dark-gray graywacke and medium-gray argillite; contains subordinate pebble to cobble conglomerate, light- to medium-gray siltstone, and minor dark-gray limestone. Mostly calcareous, generally finer grained than (6). *Conglomerate contains well-rounded to angular fragments of chert, volcanic rock, argillite, and limestone. Unfossiliferous. Thickness approximately 6,000 feet, base not exposed*

2, 2a — Metamorphic rocks (PALEOZOIC)
Undifferentiated metamorphic rocks of probable Paleozoic age. Mostly amphibolite, quartz-sericite-feldspar schist, quartz-feldspar schist, and marble, (2a)

BEDDED ROCKS

CHILKAT RANGE AREA

22 — Glacial deposits (QUATERNARY)
Represents at least two periods of glaciation

14 — Flows, tuff, and breccia
Medium to light-gray, purple and green andesite, dacite, dacite obsidian, rhyodacite, aegerine-augite soda trachyte, and less abundant dark-gray basalt

UNCONFORMITY

12 — Chert and siliceous argillite (PERMIAN(?) TO TRIASSIC(?))
Dark-gray to grayish-black, weathers dark brownish red, contains minor, thin, lighter, colored very fine grained graywacke and siltstone laminae. Approximately 1,000 feet thick. Overlain by volcanic rocks predominantly basaltic, containing agglomerate of gabbro fragments in gabbro groundmass, pyroxene-bearing flows and greenish-gray coarse-grained tuffs containing black argillite fragments, pyroxene, and altered feldspar crystals in basaltic matrix

11 — Limestone (PERMIAN)
Light to medium brownish-gray, fine to medium crystalline, contains sparse paper-thin reddish-brown separations, fossiliferous, 50(?) feet thick; overlain by limestone, nodular-bedded, light brownish-gray, fine- to medium-grained, interbedded with light greenish-brown chert, which varies along strike from interbedded sequence to apparent limestone-chert conglomerate; in turn overlain by dark-gray slate, interbedded with very fine-grained calcareous graywacke and silty calcareous graywacke. Minimum total thickness 1,000 feet .

1 — Slate (SILURIAN — Upper(?) Silurian)
Dark-gray to grayish-black, carbonaceous, with subordinate medium dark-gray, calcareous, very fine grained graywacke laminae. Contains graptolites

13 — Sedimentary and volcanic rock complex (SILURIAN TO TRIASSIC(?))
Rocks of (1), *limestone and volcanic rocks of Upper(?) Devonian age, and rocks of* (11) *and* (12), *in exceedingly complex structural relation; mostly covered by vegetation and surficial deposits*

BEDDED ROCKS

CHILKAT RANGE AREA

23 — Recent alluvium and glaciofluvial deposits (QUATERNARY)
Includes glacial lacustrine deposits and wave-reworked deposits

TERTIARY

16 — Basalt (MESOZOIC(?))
Flows, flow breccia of dark greenish-gray basalt; rocks slightly epidotized. Less than 100 feet exposed

15 — Conglomerate and graywacke
Predominantly conglomerate, medium pinkish-gray, well indurated, with subangular fragments of felsite, pink granite, graywacke, basalt, chert, argillite, and limestone embedded in coarse graywacke matrix. Graywacke, dark-gray, medium to coarse grained, thick bedded, beds generally lenticular and graded. Limestone boulders fossiliferous

10, 10a — Graywacke, argillite, and volcanic rocks (PALEOZOIC)
Thick sequence of undifferentiated rocks, including graywacke, argillite of various types, and some basalt and andesite flows and tuff. Some graywacke beds highly feldspathic, some highly calcareous. Some argillite sections contain up to 50 percent of limestone nodules. Also includes one or more limestone units (10a)

ADMIRALTY ISLAND

(Area exceedingly complex, structure and rock distribution generalized)

21 — Alluvium and glacial deposits (QUATERNARY)

20 — Conglomerate (CRETACEOUS(?))
Massive to very thick-bedded, 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, and chert. Fossils rare. Estimated thickness 3,500 feet, top eroded

19, 19a — Slate, graywacke, and conglomerate
Upper part of unit apparently transitional with overlying (20). *Slate, dark gray to grayish-black, some beds calcareous. Graywacke, gray to medium dark gray, fine- to coarse-grained, lithic, commonly calcareous, graded bedding common. Conglomerate* (19a), *gray to medium dark gray, calcareous, contains rounded pebbles of slate, basalt, graywacke, limestone, in medium-grained graywacke matrix*

18 — Greenschist and amphibolite (PERMIAN(?) TO CRETACEOUS(?))
Includes calc-silicate granulite, quartzo-feldspathic schist, marble, and phyllite. Greenschist contains chlorite, epidote, sericite, actinolite, variable amounts quartz, albite, rarely potash feldspar. Amphibolite contains hornblende, epidote, oligoclase, variable amounts quartz, potash feldspar, commonly quartzo-feldspathic. Calc-silicate granulite contains diopside, calcite, quartz, andesine, potash feldspar, locally garnet. Quartzo-feldspathic schist contains quartz, oligoclase-andesine, potash feldspar, biotite, hornblende, and hypersthene; grades into granulite of similar composition. Minor silvery-gray phyllite, lenticular marble beds occur near base in zone transitional with underlying (17). *In general metamorphic grade increases toward quartz monzonite bodies. In Eagle Peak area rocks are less metamorphosed. Dominantly andesite flows, tuff, breccia; greenish-gray to dark greenish-gray and minor purple; hornblende and augite phenocrysts common, plagioclase phenocrysts rare. At places intercalated thin grayish-black slate and dark gray limestone. Fossils collected from rocks cropping out at Young Bay indicate a possible Late Triassic age (J. T. Dutro, Jr., written communication, 1958) for the lower part of this unit*

17, 17a — Graywacke semischist, slate, and phyllite
Includes marble and greenschist. Graywacke semischist, medium to light-gray, medium-grained, somewhat calcareous. Slate, dark-gray to grayish-black, some beds calcareous. Phyllite, medium to dark silvery-gray, siliceous, commonly finely crenulated. Marble, grayish-brown, massive, lenticular. Greenschist contains chlorite, epidote, sericite, and albite. Marble and greenschist near top in zone transitional with (18) *overlying.* (17a) *is body of probable serpentinized dolomite at least 200 feet thick. Graywacke beds near middle of unit contain brachiopods and pelecypods, including* Muirwoodia *(identified by G. A. Cooper, 1957). that indicate a probable Permian age for a part of unit*

BEDDED ROCKS

MANSFIELD PENINSULA, ISLANDS IN FAVORITE CHANNEL AND AUKE BAY—AMALGA HARBOR AREA

(Largely after Barker, Fred, 1957, Geology of the Juneau B-3 quadrangle, Alaska: U. S. Geol. Survey Geol. Quad. Map GQ-100)

21 — Alluvium and glacial deposits (QUATERNARY)

Ksh — Shelter formation (CRETACEOUS(?))
Black slate and greenstone; conglomerate with pebbles of slate, chert, felsite, and graywacke, in graywacke matrix

Ksy — Symonds formation
Dark gray to black carbonaceous plagioclase-quartz, sericite-chlorite graywacke, slate, and conglomerate; augite-bearing volcanic flow breccia

(PERMIAN(?) TO CRETACEOUS(?))

SOUTHWEST LIMB OF SHELTER SYNCLINE (TRIASSIC(?) TO CRETACEOUS(?))

KJb — Barlow Cove formation
Chlorite-epidote-albite schist, with minor augite-bearing flows; greenschist, graywacke, slate, and conglomerate. Considered to be Jurassic(?) to Early Cretaceous(?) in age (Barker, 1957)

KTRr, KTRg — Retreat group
Sericite schist, greenschist, slate, and graywacke; some gray marble. South of Funter Bay contains zone predominantly greenschist (KTRg). *Considered Late Triassic(?) to Early Cretaceous(?) in age (Barker, 1957)*

NORTHEAST LIMB OF SHELTER SYNCLINE (JURASSIC(?) TO CRETACEOUS(?))

KJdg — Douglas Island volcanic group
Augite-bearing volcanic flow breccia with minor tuff; dark-gray to black plagioclase-quartz graywacke

KJt — Treadwell formation
Slate, augite-bearing volcanic flow breccia, graywacke, tuff, and sericite schist

INTRUSIVE ROCKS

(Rocks are grouped according to lithology, may represent more than one episode of intrusion, and no age relationship is implied by position in column)

Kg — Gabbro
Sericitized hornblende-uralite gabbro; sericitized uralite gabbro on Shelter Island. Considered to be Cretaceous(?) in age (Barker, 1957)

Kqd — Quartz diorite
Lineated, foliated, sheared albite-oligoclase-quartz-biotite quartz diorite. Considered to be Cretaceous(?) in age (Barker, 1957)

a — Granite and quartz monzonite
Biotite-allanite granite, biotite granite, biotite quartz monzonite, quartz-albite-microcline pegmatite

b — Diorite and quartz diorite
Hornblende diorite, hornblende quartz diorite; locally at Excursion Inlet contains pigeonite-hornblende andesite dikes and sills

c — Granodiorite and quartz monzonite
Hornblende granodiorite, biotite quartz monzonite

d — Diorite and quartz diorite
Hornblende-biotite diorite, hornblende-biotite quartz diorite, lesser amounts quartz monzonite, quartz monzonite gneiss, granodiorite, and hornblendite

e — Probable intrusive rocks
Identified from aerial photographs and aerial reconnaissance. Not examined in the field

f — Ultramafic rocks
Serpentinite body near Point Marsden, containing antigorite, carbonate, and talc; probably a sill at least 500 feet thick. Bodies on Admiralty Island serpentinized periodotite or pyroxenite, probably more than 200 feet thick, appear layered

g — Andesite dikes and sills
Altered hornblende basaltic andesite, hornblende-pigeonite andesite, and hornblende andesite

U. S. GEOLOGICAL SURVEY WASHINGTON AUG 2 1958 LIBRARY
M(200) I 276 c.1
Alaska (Juneau quad). Geol. 1:250,000. 1958
cop. 1.

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON
For sale by U. S. Geological Survey

3 1818 00174007 3