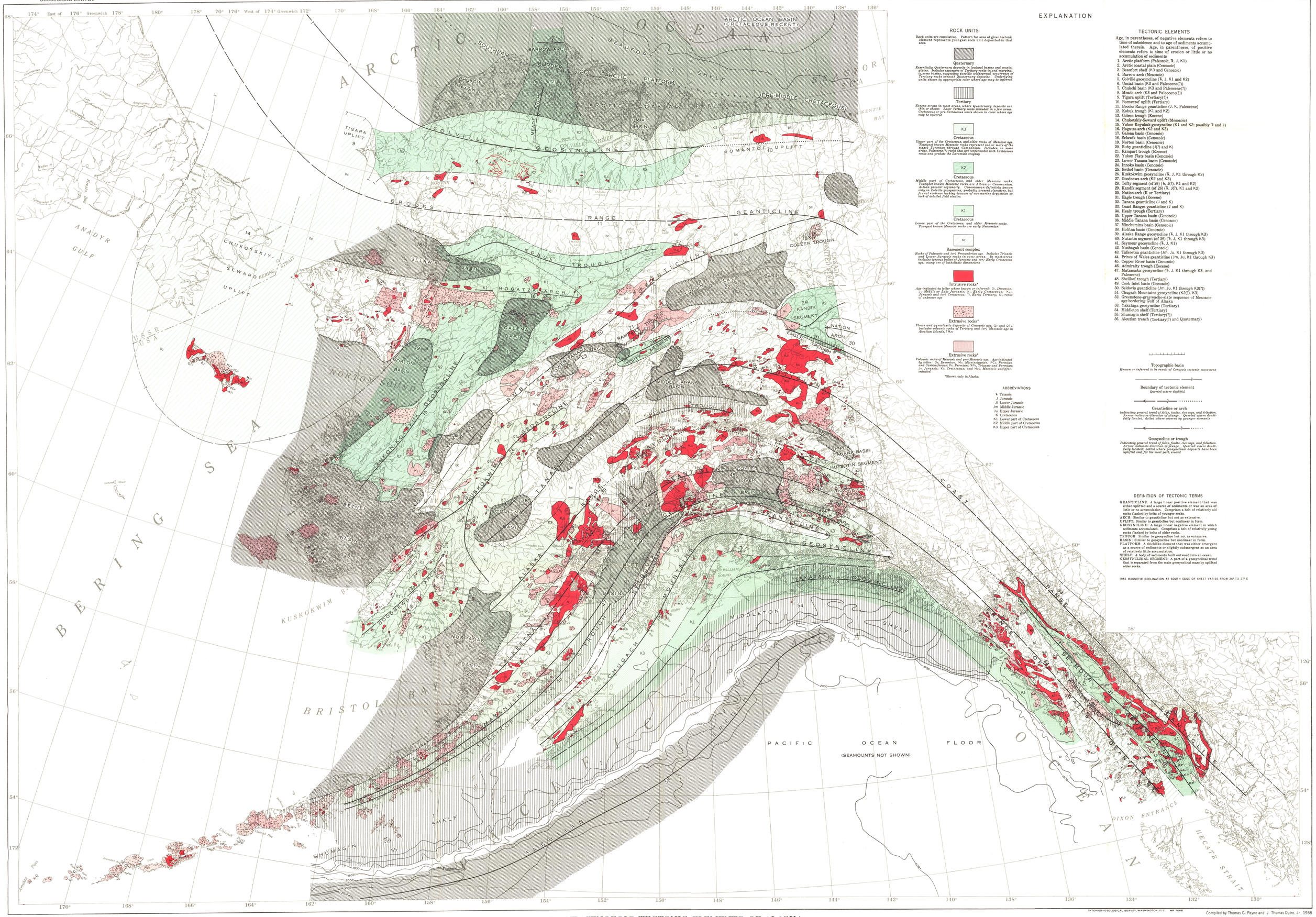

EXPLANATION

ROCK UNITS

Rock units are cumulative. Pattern for area of given tectonic element represents youngest rock unit deposited in that area

Quaternary

Essentially Quaternary deposits in lowland basins and coastal plains. Include some Tertiary rocks. Quaternary mapped in some basins, suggesting possible widespread occurrence of Tertiary rocks beneath Quaternary deposits. Underlying units shown by appropriate color where age may be inferred

Tertiary

Eocene strata in most areas, where Quaternary deposits are thin or absent. Later Tertiary rocks included in a few areas. Cretaceous or pre-Cretaceous units shown in color where age may be inferred

K3

Cretaceous

Upper part of the Cretaceous, and older rocks of Mesozoic age. Youngest known Mesozoic rocks represent one or more of the stages, Paleocene through Campanian. Includes, in some areas, rocks of Eocene age in conformable with Cretaceous rocks and predate the Laramide orogeny

K2

Cretaceous

Middle part of Cretaceous, and older Mesozoic rocks. Youngest known Mesozoic rocks are Albian or Cenomanian. Albian present regionally. Cenomanian definitely known only in Colville geosyncline; probably present elsewhere, but faunal evidence lacking because of nonmarine deposition or lack of detailed field studies.

K1

Cretaceous

Lower part of the Cretaceous, and older Mesozoic rocks. Youngest known Mesozoic rocks are early Neocomian

bc

Basement complex

Rocks of Paleozoic and (or) Precambrian age. Includes Triassic and Lower Jurassic rocks in some areas. In most areas includes igneous bodies of Jurassic and (or) Early Cretaceous age; many are of batholithic dimensions

Intrusive rocks*

Age indicated by letter where known or inferred: D, Devonian; J, Middle or Late Jurassic; K, Early Cretaceous; KJ, Jurassic and (or) Cretaceous; T, Early Tertiary; U, rocks of unknown age

Extrusive rocks*

Flows and pyroclastic deposits of Cenozoic age, Qv and QTv. Includes volcanic rocks of Tertiary and (or) Mesozoic age in Aleutian Islands, TMzv

Extrusive rocks*

Volcanic rocks of Mesozoic and pre-Mesozoic age. Age indicated by letter: Dv, Devonian; Mv, Mississippian; PCv, Permian and Carboniferous; Pv, Permian; ŦPv, Triassic and Permian; Jv, Jurassic; Kv, Cretaceous; and Mzv, Mesozoic undifferentiated

*Shown only in Alaska

ABBREVIATIONS

Ŧ Triassic
J Jurassic
Jl Lower Jurassic
Jm Middle Jurassic
Ju Upper Jurassic
K Cretaceous
K1 Lower part of Cretaceous
K2 Middle part of Cretaceous
K3 Upper part of Cretaceous

TECTONIC ELEMENTS

Age, in parentheses, of negative elements refers to time of subsidence and to age of sediments accumulated therein. Age, in parentheses, of positive elements refers to time of erosion or little or no accumulation of sediments

1. Arctic platform (Paleozoic, Ŧ, J, K1)
2. Arctic coastal plain (Cenozoic)
3. Beaufort shelf (K3 and Cenozoic)
4. Barrow arch (Mesozoic)
5. Colville geosyncline (Ŧ, J, K1 and K2)
6. Umiat basin (K3 and Paleocene(?))
7. Chukchi basin (K3 and Paleocene(?))
8. Meade arch (K3 and Paleocene(?))
9. Tigara uplift (Tertiary(?))
10. Romanzof uplift (Tertiary)
11. Brooks Range geanticline (J, K, Paleocene)
12. Kobuk trough (K1 and K2)
13. Coleen trough (Eocene)
14. Chukotskiy-Seward uplift (Mesozoic)
15. Yukon-Koyukuk geosyncline (K1 and K2; possibly Ŧ and J)
16. Hogatza arch (K2 and K3)
17. Galena basin (Cenozoic)
18. Selawik basin (Cenozoic)
19. Norton basin (Cenozoic)
20. Ruby geanticline (JC?) and K)
21. Rampart trough (Eocene)
22. Yukon Flats basin (Cenozoic)
23. Lower Tanana basin (Cenozoic)
24. Innoko basin (Cenozoic)
25. Bethel basin (Cenozoic)
26. Kuskokwim geosyncline (Ŧ, J, K1 through K3)
27. Goodnews arch (K2 and K3)
28. Tofty segment (of 26) (Ŧ, JC?, K1 and K2)
29. Kandik segment (of 26) (Ŧ, JC?, K1 and K2)
30. Nation arch (K or Tertiary)
31. Eagle trough (Eocene)
32. Tanana geanticline (J and K)
33. Coast Ranges geanticline (J and K)
34. Healy trough (Tertiary)
35. Upper Tanana basin (Cenozoic)
36. Middle Tanana basin (Cenozoic)
37. Minchumina basin (Cenozoic)
38. Holitna basin (Cenozoic)
39. Alaska Range geosyncline (Ŧ, J, K1 through K3)
40. Nutzotin segment (of 39) (Ŧ, J, K1 through K3)
41. Seymour geosyncline (Ŧ, J, K1)
42. Nushagak basin (Cenozoic)
43. Talkeetna geanticline (Jm, Ju, K1 through K3)
44. Prince of Wales geanticline (Jm, Ju, K1 through K3)
45. Copper River basin (Cenozoic)
46. Admiralty trough (Eocene)
47. Matanuska geosyncline (Ŧ, J, K1 through K3, and Paleocene)
48. Shelikof trough (Tertiary)
49. Cook Inlet basin (Cenozoic)
50. Seldovia geanticline (Jm, Ju, K1 through K3(?))
51. Chugach Mountains geosyncline (K2(?), K3)
52. Greenstone-gray wacke-slate sequence of Mesozoic age bordering Gulf of Alaska
53. Yakataga geosyncline (Tertiary)
54. Middleton shelf (Tertiary)
55. Shumagin shelf (Tertiary(?))
56. Aleutian trench (Tertiary(?) and Quaternary)

Topographic basin
Known or inferred to be result of Cenozoic tectonic movement

Boundary of tectonic element
Queried where doubtful

Geanticline or arch
Indicating general trend of folds, faults, cleavage, and foliation. Arrow indicates direction of plunge. Queried where doubtfully located; dotted where covered by younger elements

Geosyncline or trough
Indicating general trend of folds, faults, cleavage, and foliation. Arrow indicates direction of plunge. Queried where doubtfully located; dotted where geosynclinal deposits have been uplifted and, for the most part, eroded

DEFINITION OF TECTONIC TERMS

GEANTICLINE: A large linear positive element that was either uplifted and a source of sediments or was an area of little or no accumulation. Comprises a belt of relatively old rocks flanked by belts of younger rocks.
ARCH: Similar to geanticline but not as extensive.
UPLIFT: Similar to geanticline but nonlinear in form.
GEOSYNCLINE: A large linear negative element in which sediments accumulated. Comprises a belt of relatively young rocks flanked by belts of older rocks.
TROUGH: Similar to geosyncline but not as extensive.
BASIN: Similar to geosyncline but nonlinear in form.
PLATFORM: A shieldlike element that was either emergent as a source of sediments or slightly submergent as an area of relatively little accumulation.
SHELF: A body of sediments built outward into an ocean.
GEOSYNCLINAL SEGMENT: A part of a geosynclinal trend that is separated from the main geosynclinal mass by uplifted older rocks.

1955 MAGNETIC DECLINATION AT SOUTH EDGE OF SHEET VARIES FROM 26° TO 27° E

Base from U. S. Geological Survey Alaska Map E, 1946

MESOZOIC AND CENOZOIC TECTONIC ELEMENTS OF ALASKA

Scale 1:2 500 000
1 inch equals approximately 40 miles

50 0 50 100 150 Miles

50 0 50 100 150 Kilometers

Submarine contours in fathoms

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