STATE OF MAINE
Joseph E. Brennan, Governor

DEPARTMENT OF CONSERVATION
Richard B. Anderson, Commissioner

BEDROCK GEOLOGIC MAP OF MAINE

Edited by: Philip H. Osberg, University of Maine, Orono
Arthur M. Hussey II, Bowdoin College
Gary M. Boone, Syracuse University

Compilation Coordinator: Marc C. Loiselle, Maine Geological Survey

Cartographic Editor: Robert D. Tucker, Maine Geological Survey

Maine Geological Survey
DEPARTMENT OF CONSERVATION
Walter A. Anderson, State Geologist

Area Compilers: G.M. Boone, Syracuse University
E.L. Boudette, U.S. Geological Survey
W.H. Forbes, University of Maine, Presque Isle
O. Gates, SUNY, College at Fredonia
B.A. Hall, University of Maine, Orono
A.M. Hussey II, Bowdoin College
M.C. Loiselle, Maine Geological Survey
A. Ludman, Queens College
R.H. Moench, U.S. Geological Survey
P.H. Osberg, University of Maine, Orono
K.A. Pankiwskij, University of Hawaii
S.G. Pollock, University of Southern Maine
D.C. Roy, Boston College

Paleontological Consultants: W.B.N. Berry, University of California, Berkeley
W.H. Forbes, University of Maine, Presque Isle
R.B. Neuman, Smithsonian Institution

Reviewed by: R.G. Doyle, State Geologist Emeritus
L.R. Fyffe, Department of Natural Resources, New Brunswick
J.B. Lyons, Dartmouth College
J.R. Rand, State Geologist Emeritus
P. St-Julien, Université Laval, P.Q.
J.M. Trefethen, State Geologist Emeritus

This map is dedicated to Joseph M. Trefethen, Maine State Geologist 1942 to 1956 and pioneer of Maine geology.

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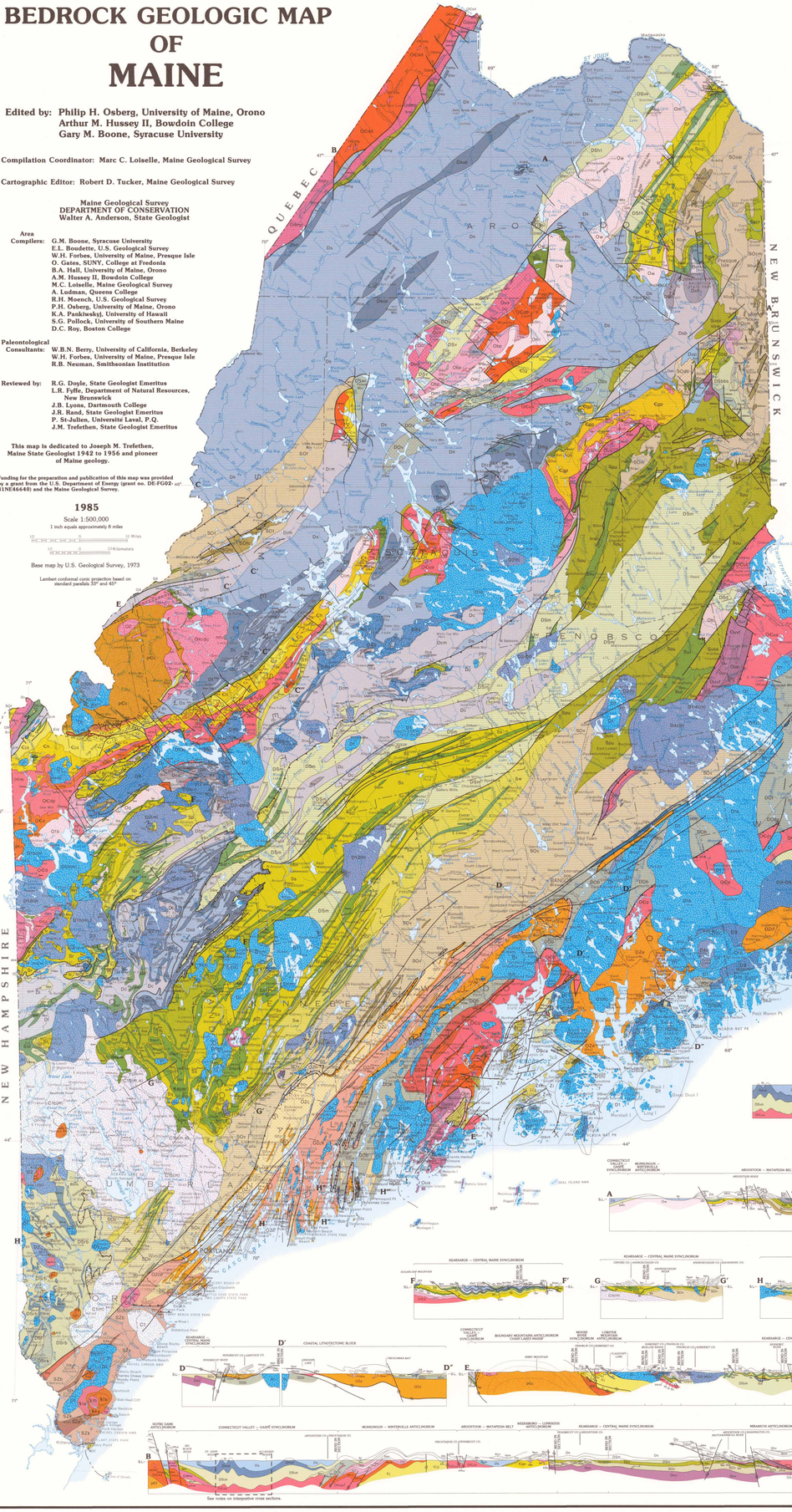
1985

Scale 1:500,000
1 inch equals approximately 8 miles

Base map by U.S. Geological Survey, 1973

Lambert conformal conic projection based on standard parallels 33° and 45°



INTRUSIVE ROCKS

Numbers following age refer to intrusive rock compositions given below.

- Mesozoic 1
- Mesozoic 2-10 (includes Triassic (TR), Jurassic (J), and Cretaceous (K) rocks where indicated.)
- Carboniferous 1
- Carboniferous 4-9
- Devonian 1
- Devonian 2-8
- Devonian 9
- Devonian 10
- Silurian 1
- Silurian 2-9b
- Silurian 9c
- Silurian-Precambrian Z 9c
- Ordovician 1
- Ordovician 2-9
- Cambrian 6
- Cambrian 9a,b
- Cambrian 9c

STRATIFIED ROCKS

PROTOLITH

Protoliths for the formations are listed below; mineralogy and texture will vary with degree of metamorphism. The letter following the protolith can be used with the List of Formations to determine the protolith of a map unit.

- Pelite (A)
- Calcareous pelite (B)
- Sulfidic/carbonaceous pelite (C)
- Lithic sandstone (D)
- Feldspathic sandstone (E)
- Quartz sandstone (F)
- Sulfidic quartz sandstone (G)
- Lithic sandstone and conglomerate (H)
- Conglomerate (I)
- Calcareous lithic sandstone (J)
- Calcareous feldspathic sandstone (K)
- Calcareous quartz sandstone (L)
- Calcareous sandstone; interbedded sandstone and impure limestone (M)
- Limestone and/or dolostone (N)
- Argillaceous limestone and/or dolostone (O)
- Chert and iron formation (P)
- Interbedded pelite and sandstone (Q)
- Interbedded pelite and limestone and/or dolostone (R)
- Interbedded pelite, sandstone, and limestone and/or dolostone (S)
- Rhyolitic volcanic rocks (T)
- Andesitic volcanic rocks (U)
- Basaltic volcanic rocks (V)
- Mafic to felsic volcanic rocks (W)
- Undetermined volcanic rocks (X)
- Basement (Y)
- Mélange (Z)

AGE

- Cretaceous
- Carboniferous and/or Devonian
- Middle and Upper (post-Emsian)
- D — Lower (Siegenian/Emsian)
- D — Lower (Gedinnian)
- DS — Devonian-Silurian
- DO — Devonian-Ordovician
- DC — Devonian-Cambrian
- DZ — Devonian-Precambrian Z
- S — Upper (post-Llandoverian)
- S — Lower (Llandoverian)
- SO — Silurian-Ordovician
- SZ — Silurian-Precambrian Z
- O — Upper (post-Arenigian)
- O — Lower (Tremadocian-Arenigian)
- OC — Ordovician-Cambrian
- OZ — Ordovician-Precambrian Z
- C — Cambrian
- pC — Precambrian Undivided

Devonian: Mesozoic Undivided; Lower Devonian Undivided
Silurian: Silurian Undivided
Ordovician: Ordovician Undivided

INTRUSIVE ROCK COMPOSITIONS

Labels for intrusive rocks give the age, the primary mineralogical composition, and, for compositions other granite, gabbro, and ultramafic rocks, additional information on the occurrence, mineralogy and texture where known. The number in the intrusive rock label refers to the list below and the modified Streckeisen diagram shown below.

1) granite
 1a) alkali feldspar granite
 1b) granite
2) granodiorite
3) tonalite
4) quartz syenite
 4a) alkali feldspar quartz syenite
 4b) quartz syenite
 4c) quartz monzonite
5) quartz monzodiorite
6) quartz diorite
7) syenite
 7a) alkali feldspar syenite
 7b) syenite
 7c) monzonite
8) monzodiorite
9) gabbro (diorite/ultramafic rocks
 9a) diorite
 9b) gabbro
 9c) ultramafic rocks
10) foid-bearing syenite

Accessory Mineralogy and Metasedimentary Inclusions

All assemblages include biotite; biotite only is present if no other mineral is indicated

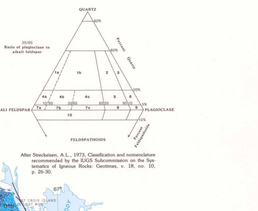
m = muscovite
h = hornblende
p = pyroxene plus hornblende
n = abundant (>5%) metasedimentary inclusions

Examples:

D4c(h)	Devonian hornblende-biotite quartz monzonite
J7b,Z2m	Devonian muscovite-biotite granite, granodiorite
D2 6	Devonian granodiorite by quartz diorite
D10a,sl	Devonian muscovite-biotite granite with abundant metasedimentary inclusions

Texture

a = porphyritic
g = granophyric
s = intrusive breccia



After Streckeisen, A.L., 1973, Classification and nomenclature recommended by the IUGS Subcommission on the Systematics of Igneous Rocks: Geotimes, v. 18, no. 10, p. 26-30.

EXPLANATION FOR MAP AND CROSS SECTIONS

Stratigraphic or intrusive contact; queried where location is uncertain.

Fault, interpreted as a high angle normal or reverse fault; queried where location is uncertain. Intermotion on cross sections is based largely on separation of contacts and is indicated by arrows or T (Towards) and A (Away).

Fault, interpreted as a thrust fault; barbs on upper plate. Inferred motion on cross sections is based largely on separation of contacts and is indicated by arrows.

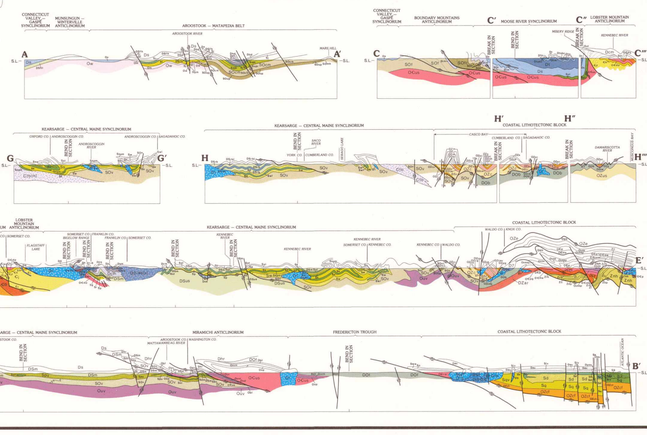
Fault, interpreted as a listric fault; hachures on upper plate. Inferred motion on cross sections is based largely on separation of contacts and is indicated by arrows.

Notes on Interpretive Cross Sections

Scale of the cross sections does not allow showing small, isoclinal, upright folds present in many parts of Maine. A representative example of this small scale folding is shown left for a portion of section B-B'.

On cross section G-G', lenses of Silurian unnamed sulfidic pelite (Sus) have been omitted for clarity.

INTERPRETIVE CROSS SECTIONS



See notes on interpretive cross sections.

LIST OF FORMATIONS

Formations are grouped and listed alphabetically by age or age range, members of a formation are listed beneath each formation. Strict adherence to the Stratigraphic Code has not been attempted owing to variations in usage in different sources. Formations with paleontological control on their ages are indicated by an asterisk; references to the paleontological information are given in the "List of Plutons and Geochronologic References". Units that are entirely metamorphosed or that are metamorphosed beyond recognition does not appear on the geologic map. In such cases a "+" appears in place of the protolith letter designation. In some cases these undivided formations may appear in the cross sections or stratigraphic correlation chart.

Kv — Mafic to felsic volcanic rocks ..... W
Mzr — Granite I
Mzu — Mafic to felsic volcanic rocks ..... W
CZu — Unnamed conglomerates and sandstones I
*Dh — Beck Pond Limestone ..... (33,34) S
*Dcm — Castahanna Formation ..... N
*Dm — Massive pelite member ..... (68) A
*Dmb — Black member ..... A
*Dmt — Thinly layered member ..... Q
*Dch — Chapman Sandstone ..... (36) E
*Dcl — Lower member ..... E
*Dcu — Upper member ..... E
*Dep — Pelite member ..... (15,16) A
*Dpb — Mafic to felsic volcanic member ..... W
Dh — Gilmanton Hill Andesite ..... U
Dhf — Fossil Hill Formation ..... Q
Dhr — Hobbstown Formation ..... (33,34) N
Dhd — Hedgehog Formation ..... W
Dhl — Little Bear Formation ..... Q
Dhm — Dark half member ..... Q
Dhr — Harlin Formation ..... Q
Dl — Littleton Formation ..... (35) Q
Dlm — Littleton Formation ..... (20) Q
Dm — Mapleton Formation ..... (36) H
Dmg — Meguntic Formation ..... (21) B
Dp — Perry Formation ..... Q
Dpb — Basalt member ..... O
Dsc — Seboeis Formation ..... (12,20)a,20)c) V
*Dpr — Parker Brook Formation ..... (33,34) N
*Dgm — Gay Mountain Member ..... N
Dwf — Limestone ..... N
Dwl — Lake member ..... N
Dwr — Temple Stream member ..... N
Dwm — Mount Blue Member ..... Q
Dwp — Unnamed pelite member ..... Q
Dwq — Unnamed conglomerate ..... Q
Dwq — Unnamed quartzite ..... T
Dwu — Unnamed volcanic member V
Dwp — Unnamed pelite ..... (36) N