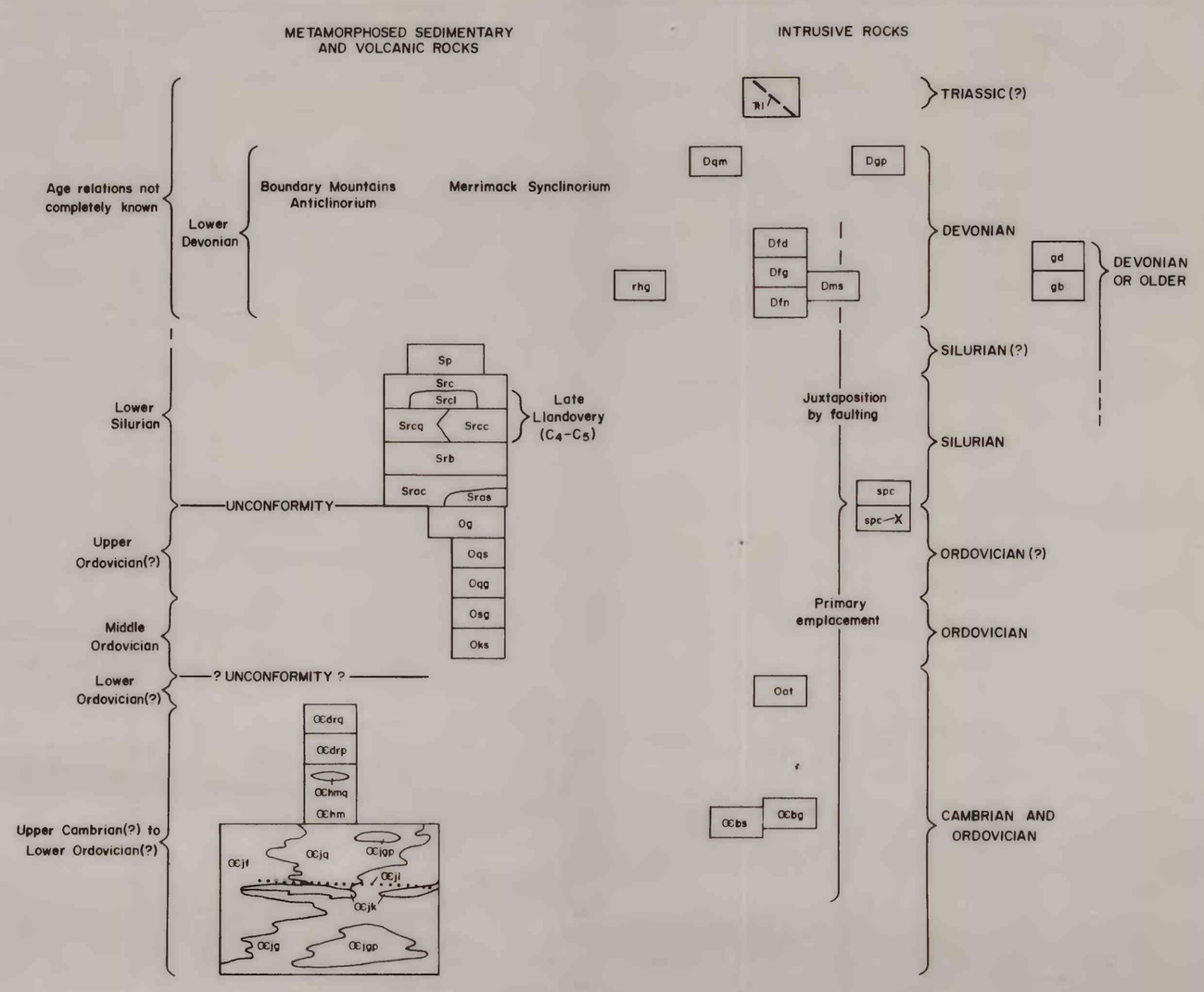
EXPLANATION

Heavy color: areas where bedrock outcrops are abundant

Light color: areas where bedrock outcrops are scarce or absent, mainly because of relatively thick cover of Holocene alluvium and swamp deposits; and Holocene or Pleistocene till, outwash, and ice-channel deposits



DESCRIPTION OF MAP UNITS

TRI — LAMPROPHYRE DIKES (Triassic (?)) - Dark gray fine-grained to aphanitic, porphyritic spessartite and camptonite

Dgp — REDINGTON PLUTON (Lower Devonian) - Light-colored coarse-grained porphyritic binary quartz monzonite characterized by large crystals of K-feldspar; contains minor amount of aplitic quartz monzonite

Dgm — SEVEN PONDS PLUTON (Lower Devonian) - Light-colored medium to coarse-grained biotitic quartz monzonite

Dms — MAFIC SILL ROCK (Lower Devonian) Sills of dark and light colored medium to coarse-grained variably altered gabbro, diorite, and anorthosite. Probably equivalent to the Flagstaff Lake igneous complex and intruded prior to major plutonism

FLAGSTAFF LAKE IGNEOUS COMPLEX (Lower Devonian)

Dfd — Dark greenish-brown medium to coarse-grained mafic biotite diorite

Dfg — Dark greenish-gray medium to coarse-grained troctolite and gabbro characterized by range in mafic mineral composition from predominantly olivine to predominantly orthopyroxene or clinopyroxene; locally amphibole predominates accompanied by a minor amount of quartz. Neither flow structure nor compositional layering is observed. Locally ophitic

Dfn — Dark greenish-gray coarse-grained porphyritic norite shown subdivided at southwest end of the complex

rhg — SPOTTED MOUNTAIN REACTION HORNFELS (Lower Devonian) - Dark-colored medium to coarse-grained hybrid rock commonly with a granitic texture, locally gneissic or schistose characterized by varying amounts of intermediate plagioclase, euhedral garnet, quartz, cordierite, biotite, amphibole, pyroxene, and sillimanite. Local abundant xenoliths and septa of quartzose metasandstone and aluminous metapelite

ELEPHANTS HEAD MAFIC COMPLEX (Lower Devonian or older)

gd — Light-colored medium to coarse-grained quartz diorite and granodiorite

gb — Dark to medium greenish-gray medium to coarse-grained gabbro, diorite, and anorthosite

Sp — PERRY MOUNTAIN FORMATION (Silurian (?)) - Light gray locally olive-brown, muscovite or chlorite-rich metapelite and quartzose metasandstone with some felsic metavolcanic rock. Commonly shows distinctive cross-lamination and grading within beds typically 1-5 inches thick, but ranging up to more than 10 feet thick. Unit is a preferred host to mafic sill rock (Dms)

RANGELEY FORMATION (Lower Silurian)

Part C:

Src — Dominantly gray metapelite in the lower part with light gray fine to medium-grained quartzo-feldspathic metasandstone increasing in abundance toward top. Bedding varies from 2 inches to over 6 feet thick. Commonly internally laminated with cyclic bedding and some cross-lamination near the top. Unit is a preferred host to mafic sill rocks (Dms)

Srcl — Light gray fine to medium-grained thin-bedded and laminated calc-silicate rock and metamorphosed silty limestone containing a shell fauna near Lutton Brook

Srcc — Dominantly polymicitic metaconglomerate containing cobbles and pebbles of granitic and volcanic rocks, quartzite, quartz, chert, and sparse limestone contained in a medium gray fine to medium-grained metasandstone matrix; interbedded with subordinate light to medium gray fine to medium-grained feldspathic metasandstone; unit grades upward into dominantly gray metapelite of part C and downward into the conglomerate facies of part B; part of Srcc could be Srb in the northeast

Srcq — (Blanchard Ponds and vicinity) - Light gray to reddish brown fine to medium-grained thick-bedded, faintly laminated calcareous quartzo-feldspathic metasandstone and calcareous quartz-pebble metaconglomerate; beds commonly 2-6 feet thick and graded containing a shell fauna

Srcq — (Northwest shore of Kennebago Lake, northwest flank of East Kennebago Mountain, and Lutton Brook-Eustis Ridge area), dominantly light gray to buff vitreous-appearing medium to coarse-grained quartzite, quartz grit, and quartz cobble conglomerate with local patches of polymictic conglomerate grading into subordinate medium brown fine to medium-grained calcareous, chloritic metasandstone and metapelite and light gray fine to medium-grained thick-bedded faintly laminated quartzo-feldspathic metasandstone; lenticular in habit forming topographically distinctive ridges and ledges

Part B:

Srb — Dominantly gray to silver-gray faintly laminated metapelite and subordinate amounts of light gray fine-grained metasandstone; locally greenish to reddish at base on Eustis Ridge and Mud Pond Ridge containing slate chip conglomerate; contains polymictic metaconglomerate resembling Srcc in lenses near the southeast end of Kennebago Lake

Part A:

Srac — Dominantly polymictic metaconglomerate characterized by massive beds up to 30 feet thick deposited in lenticular habit containing rounded clasts up to 3 feet across, but generally less than 12 inches of granitic rocks, diorite, quartz diorite with blue quartz, felsic and mafic metavolcanic rocks, quartzite, vein quartz, and chert in a medium to coarse-grained arkosic to lithic matrix with fragments of distinctive blue quartz; interbedded with subordinate amounts of light gray fine to medium-grained thick-bedded laminated quartzo-feldspathic metasandstone

Sras — Dominantly light gray fine to medium-grained thick-bedded arkosic metasandstone in graded beds up to 30 feet thick; subordinate amounts of polymictic metaconglomerate similar to Srac

Og — GREENVALE COVE FORMATION (Upper Ordovician (?)) - Interlaminated light gray fine to medium-grained quartzose metasandstone, medium gray metasiltstone, and gray metapelite characterized by 1/4 - 3-inch beds which are cross-laminated; sparse lenticular beds of light gray medium to coarse-grained quartzose metasandstone up to 3 feet thick

QUIMBY FORMATION (Upper Ordovician (?))

Oqs — Metashale member: dominantly cyclically bedded gray to black sulfidic metashale and subordinate amounts of graded, commonly parallel-laminated beds of metagraywacke up to 6 inches thick, typically 1-2 inches thick; sparse layers of felsic metavolcanic rock up to 15 feet thick

Oqg — Metagraywacke member: dominantly medium to dark gray fine to medium-grained sulfidic graywacke interlayered with subordinate amounts of black sulfidic metashale, felsic metavolcanic rock, and polymictic metaconglomerate; characterized by bedding varying from 2 inches to as much as 3 feet in metasedimentary rocks and over 10 feet in metavolcanic rock

Osg — UNNAMED ROCKS (Middle Ordovician) - Black sulfidic metashale with 1- to 3- inch beds of gray fine to medium-grained metagraywacke sparse greenstone, and 5-foot beds of metagraywacke; locally calcareous, shows faint to well developed grading and some cross-lamination

Oks — UNNAMED ROCKS (Middle Ordovician) - Dominantly black sulfidic metashale with abundant 1-2-inch beds of metagraywacke

Oat — ATTEAN QUARTZ MONZONITE (Lower Ordovician (?)) - Mottled green-gray and pink medium to coarse-grained quartz monzonite with highly altered plagioclase

spc, spc—X — ALLOCHTHONOUS SERPENTINITE (Intrusive age variable) - Mottled dark green and white talcose chrysotile-bearing highly sheared serpentinite found along faults commonly associated with a border of talc and quartz-Mg-carbonate-fuchsite vein rock

DEAD RIVER FORMATION (Upper Cambrian (?) to Lower Ordovician (?))

Ꞓdrq — Metasandstone member: nearly equal amounts of interbedded light green to buff-colored fine to medium-grained calcareous metasandstone varying from metagraywacke to arkosic metasandstone and chloritic green, variegated red and green, and black phyllite and slate; beds vary from 1-12 inches thick, averaging 5 inches showing faint grading and cross-lamination, slump structures, sand dikes, and other relict soft-sediment deformational features; lamination parallel to relict bedding and foliation and slip cleavage produce characteristic pinstripe appearance; grades well into lower metapelite member

Ꞓdrp — Metapelite member: dominantly green, red, and variegated red and green phyllite and slate interbedded with minor amounts of calcareous metagraywacke in beds 1/2 - 3 inches thick; lamination parallel to relict bedding and foliation produces characteristic pinstripe appearance

HURRICANE MOUNTAIN FORMATION (Upper Cambrian (?) to Lower Ordovician (?))

Ꞓhm — Dark gray to black sulfidic metapelite and light to medium gray fine to medium-grained metagraywacke in beds varying from 1/2 inch to 2 feet thick, felsic metavolcanic rocks and metalimestone occur at top of unit northwest of Squirtgun fault; fine parallel lamination, slump structure attributable to soft-sediment deformation and zones of depositional breccia (argille-a-blocs) more than 100 feet thick and of unknown extent are characteristic; contains anomalous amounts of chalcopyrite and other sulfides adjacent to the Elephants Head complex

Ꞓhmq — Light brown to buff-colored fine to medium-grained quartzose metagraywacke and quartzite in beds as much as 3 feet thick; chalcopyrite bearing adjacent to Elephants Head complex

BOIL MOUNTAIN ULTRAMAFIC COMPLEX (Upper Cambrian (?) to Lower Ordovician (?))

Ꞓbg — Dominantly greenish-gray medium to coarse-grained gabbro, epidiorite, and subordinate pyroxenite with small amounts of quartz diorite locally associated with epidiorite as lit par lit injection rock or as autobreccia; local compositional layering and flow structure produced by subparallel plagioclase crystals; metamorphosed and propylitically altered

Ꞓbs — Dominantly mottled dark and light green, medium to coarse-grained sugary-textured, antigorite-bearing serpentinite associated with subordinate amounts of greenish-gray medium to coarse-grained pyroxenite and gabbro; intensely sheared locally and cut by quartz-carbonate veins

JIM POND FORMATION (Upper Cambrian (?) to Lower Ordovician (?))

Ꞓjf — Metagraywacke member: dominantly interbedded dark gray, light gray-green, reddish gray, and green and red variegated fine to medium-grained metagraywacke and chloritic phyllite and slate commonly with parallel lamination in beds 1/2 - 4 inches thick containing subordinate amounts of felsic and mafic metavolcanic rocks in layers more than 10 feet thick; grades well into metaquartzwacke member (Ꞓjq)

Ꞓjq — Metaquartzwacke member: dominantly light gray-green, light gray, and buff-colored medium to coarse-grained chloritic, locally sulfidic metaquartzwacke and phyllite in graded beds 6 inches to 12 feet thick, typically 2-6 feet showing both parallel and cross-lamination with subordinate amounts of quartz metaconglomerate, polymicitic metaconglomerate on Cow Ridge, mafic metavolcanic rock (Ꞓjg), and maroon slate southwest of Tea Pond

Ꞓjr — Iron formation member: maroon to light metallic gray parallel laminated ferruginous and maganiferous metamorphosed chert in beds varying between 2 feet to more than 10 feet thick; occurs in close proximity to keratophyre member (Ꞓjk); occurs only northwest of Squirtgun fault and may be equivalent to maroon slate in the mafic metavolcanic member (Ꞓjg) and quartzwacke member (Ꞓjq) southeast

Ꞓjk — Keratophyre member: light brown to buff fine to medium-grained felsic metavolcanic rock commonly in layers more than 50 feet thick composed of metamorphosed kertophyre, quartz latite, dacite, and felsic ash flows and extrusive volcanic breccias; characteristically interlayered with mafic metavolcanics (Ꞓjg) and to a lesser degree with other members; occurs only northwest of Squirtgun fault

Ꞓjg, Ꞓjgp — Mafic metavolcanic member: dominantly light gray-green to pistachio-green fine to medium-grained metamorphosed basaltic or andesitic flow rocks composed principally of chlorite, epidote, actinolite, and zoisite in layers varying from 10 to more than 50 feet thick with subordinate amounts of gray-green medium to coarse-grained mafic-rich metagraywacke in beds 1-5 feet thick and maroon slate west of Tea Pond; mafic metavolcanics commonly preserve pillows along with aa and pahoehoe textures. Discrete lenses characterized by excellent pillows (Ꞓjgp) occur on Greenbush Mountain

Isograd

Long dashed where approximately located; short dashed where probable

A/BG, BG/B, S/A, A/B, B/C, B/S

Metamorphic zones

Regional metamorphism

C, *Chlorite zone. Chlorite appears in both pelitic rocks and metasandstone on side of isograd marked by C*

BG, *Biotite-garnet zone. Garnet appears usually with biotite as the indicator of metamorphic grade in pelitic rocks on side of isograd marked by BG*

Contact metamorphism

B, *Biotite Zone. Biotite occurs in pelitic rocks usually with cordierite and in metasandstone on side of isograd marked by B*

A, *Andalusite-amphibole zone. Andalusite appears in pelitic rocks and amphibole in limey rocks and metasandstone on side of isograd marked by A. Pelitic rock is commonly metamorphosed to andalusite-biotite-muscovite quartz hornfels. Undeformed schistosity and relict bedding are characteristic*

S, *Sillimanite-muscovite-cordierite zone. Sillimanite and cordierite occur together or separately, ususally with garnet on side of isograd marked by S. Pelitic rock is metamorphosed to plagioclase-cordierite-biotite-garnet-sillimanite-quartz reaction hornfels (rhg). Sandy rocks are metamorphosed to plagioclase-amphibole (or pyroxene)-biotite-cordierite-garnet-quartz reaction hornfels. (rhg). Granitic texture or contorted schistosity and relict bedding are characteristic, and small pegmatitic lenses (containing quartz, feldspar, biotite, and tourmaline) are common*

Contact

Long dashed where approximately located; short dashed where location is arbitrary owing to gradation between units; dotted where concealed; queried where probable, and location is based upon topography or aeromagnetic data

Thrust or reverse — *Sawteeth on upper plate showing dip where exposed*

Unclassified — *Bar and ball on downthrown side showing direction of relative strike slip movement*

Faults

Long dashed where approximately located; short dashed where probable or location is inferred from topographic lineaments or aeromagnetic data; dotted where concealed

Upright; Probable relict — *Within reaction hornfels and gabbro associated with the roof zone of the Flagstaff Lake igneous complex*; Overturned

Anticlines

Showing crestline and direction of plunge; long dashed where approximately located; short dashed where probable; dotted where concealed

Upright; Probable relict — *Within reaction hornfels and gabbro associated with the roof zone of the Flagstaff Lake igneous complex*; Overturned

Synclines

Showing crestline and direction of plunge; long dashed where approximately located; short dashed where probable; dotted where concealed

Inclined; Vertical

Strike and dip of early foliation
Includes slatey cleavage and foliation in phyllite and schist

Inclined; Vertical

Strike and dip of compositional layering
In gabbroic rocks and mafic diorite

Inclined; Vertical

Strike and dip of slip cleavage and fold bands
Fold bands shown (FB) where distinction is significant

Inclined; Vertical

Strike and dip of fracture cleavage

Bearing and plunge of fold axis
Head of arrow shows point of observation where shown singly

Inclined; Horizontal; Vertical — *Numeral shows direction of top of beds*; Overturned

Strike and dip of beds
Tops of beds known from sedimentary structures

Inclined; Vertical

Strike and dip of beds
Direction of tops unknown

Horizontal; Inclined

Bearing and plunge of lineation
M, *mineral streaking;* P, *intersection of planar features*

Head of arrow on inclined symbol shows point of observation where shown singly

Several planar structures, or planar and linear structures at one locality may be combined; juncture shows point of observation

Prospect pits

dominantly sulfide minerals

Fossil shell-fauna locality

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EXPLANATION FOR THE GEOLOGIC MAP OF THE KENNEBAGO LAKE QUADRANGLE, MAINE

By
E.L. Boudette

1973

U. S. Geological Survey
OPEN FILE MAP
This map is preliminary and has not been edited for conformity with Geological Survey standards or nomenclature.