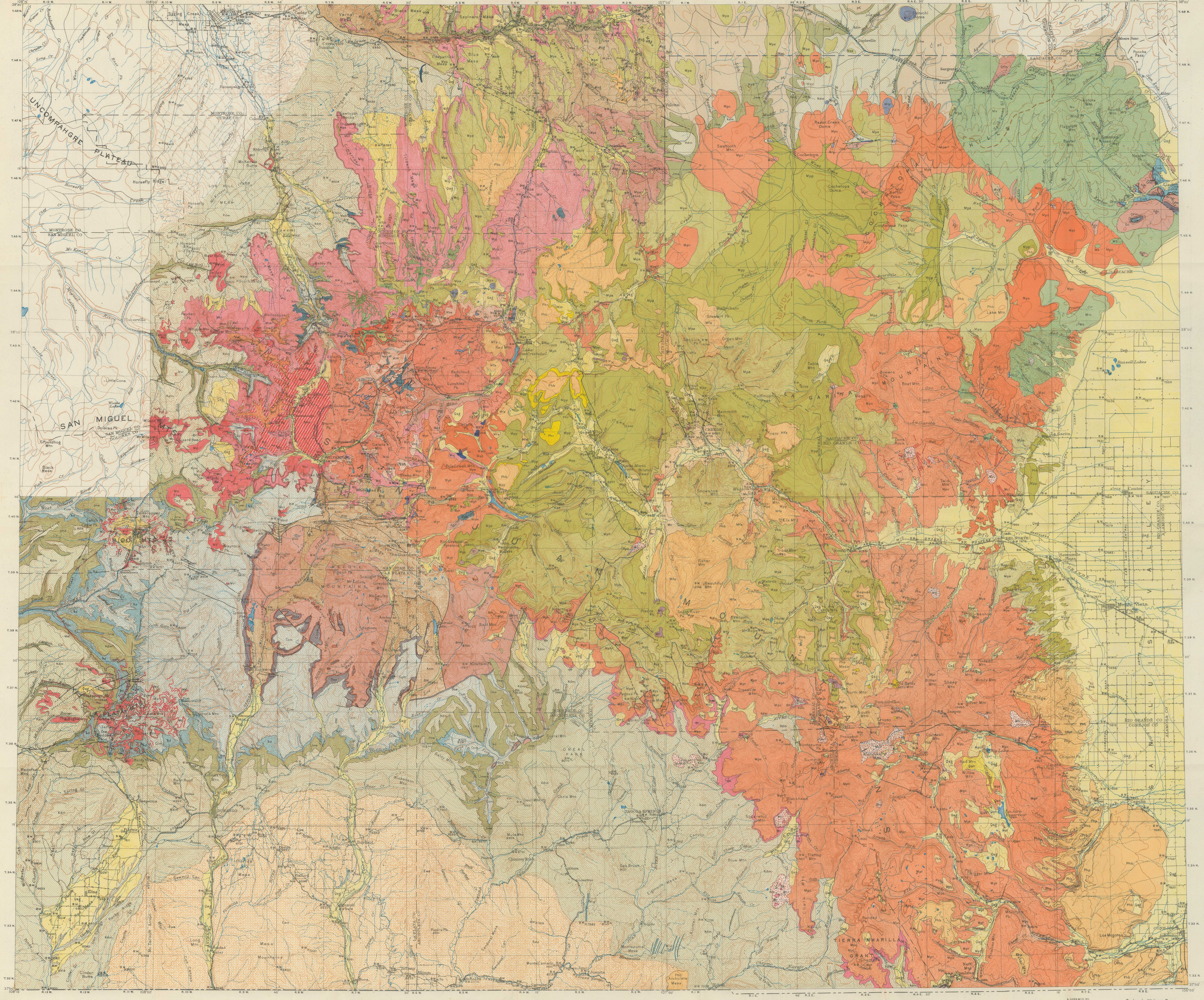


GEOLOGIC MAP OF SAN JUAN REGION, COLORADO

Scale $\frac{1}{250000}$

Contour interval 200 and 1000 feet
Datum is mean sea level
1935

Compiled from maps by U. S. Geological Survey and Hayden Survey and from other sources

Geology by Whitman Cross and E. S. Larsen

A. HOEN & CO. INC.

EXPLANATION

BEDDED ROCKS

QUATERNARY

Qag — Alluvium, landslides, rock streams, mud flows, and glacial deposits of Wisconsin, Durango, and Cerro stages

UNCONFORMITY

Qan — Andesite (*Local flows*)

EROSION SURFACE

TERTIARY

Pliocene (?) — Hinsdale formation

Phb — Andesite-basalt (*Uniform widespread flows*)

Phr — Rhyolite (*Local flows and tuff beds*)

Php — Los Pinos member (*A local volcanic pile of latite-andesite made up of flows and clastic beds in the northern part of the Conejos quadrangle grading southward to sand, gravel, and tuff beds made up chiefly of latite-andesite fragments*)

EROSION SURFACE

Miocene (?)

Mfa — Fisher latite-andesite (*Local accumulations of flows and tuff beds of coarsely porphyritic rocks*)

EROSION SURFACE

Miocene

Mc — Creede formation (*Local sand, gravel, and shaly tuff carrying plant remains. Some flows of rhyolite*)

EROSION SURFACE

Potosi volcanic series

Mpp — Piedra rhyolite (*Uniform and widespread flows of latite near top, underlain successively by latite tuff and local andesite, tridymite latite, and thick rhyolite flows with some tuff*)

EROSION SURFACE

Mph — Huerto andesite (*Three volcanic piles composed of irregular flows and breccia beds of hornblende and pyroxene andesite*)

Mpa — Alboroto quartz latite (*Mostly quartz-hornblende latite in thick regular flows and tuff beds; on the north and east margins of the mountains below the latite thin widespread flows of tridymite rhyolite alternate with tuff beds*)

EROSION SURFACE

Mps — Sheep Mountain andesite (*Several volcanic bodies of andesite and latite-andesite*)

Mpt — Treasure Mountain quartz latite (*Uniform and widespread flows and tuff beds*)

EROSION SURFACE

Mpc — Conejos andesite (*A great complex of flows and clastic beds of andesite with some of quartz latite. Gravel near the margin of the mass*)

EROSION SURFACE

NORTHWESTERN AREA

Ms — Sunshine Peak rhyolite (*Great flows of rhyolite with quartz phenocrysts; some intrusives included*)

EROSION SURFACE

Silverton volcanic series

Msh — Henson tuff (*Well-bedded fine-grained andesite tuff*)

Msg — Pyroxene andesite (*Flows and clastic beds of dark-colored andesite*)

Msb — Burns latite (*Flows and fine bedded tuff*)

EROSION SURFACE

Mse — Eureka rhyolite (*Chiefly flows*)

Msp — Picayune volcanic group (*Flows and tuff beds*)

Msv — Silverton volcanic series (*Undifferentiated*)

EROSION SURFACE

Miocene (?)

Msj — San Juan tuff (*Bedded tuff-conglomerate and breccia made up of andesitic and latitic material*)

Mlf — Lake Fork andesite (*Local volcanic pile of irregular flows and breccia beds*)

NORTHEASTERN AREA

Miocene (?) — *Pre-Potosi age*

Mtc — Tracy Creek andesite (*Mostly flows*)

Mb — Beidel latite-andesite (*Flows and clastic beds*)

Mv — Undifferentiated volcanics mostly of pre-Conejos age, but include some Conejos and some Sheep Mountain (*Mostly andesite and latite*)

Oligocene (?)

Θt — Telluride conglomerate in the northwestern part (*Boulders of pre-Cambrian rocks and limestone*)

Blanco Basin formation in the southeastern part (*Red and white sands and pebbly sands derived from pre-Cambrian rocks; Ridgeway till of Eocene age included in places*)

UNCONFORMITY

Eocene

Ewa — Wasatch and Torrejon formations (*Fluviatile deposits with no volcanic fragments*)

Animas formation (Eocene ?) (*Sand and gravel derived partly from volcanic rocks of Cretaceous or Eocene age*)

UNCONFORMITY

CRETACEOUS

Upper Cretaceous

Kdm — McDermott formation (Cret.?), Kirtland shale, Fruitland formation, Pictured Cliffs sandstone, Lewis shale, Mesaverde group, Mancos shale, and Dakota (?) sandstone (*McDermott formation, sandstone and conglomerate made up mostly of volcanic fragments; Mesaverde group comprising Cliff House sandstone, Menefee formation, and Point Lookout sandstone*)

JURASSIC

Upper Jurassic

Jme — Morrison formation and Entrada sandstone (*In early reports called †La Plata sandstone and †McElmo formation*)

UNCONFORMITY

A dagger (†) preceeding a geologic name indicates that the name has been abandoned or rejected for use in classification in publications of the U. S. Geological Survey.

(Explanation continued at right)

INTRUSIVE ROCKS

Phi — Intrusive andesite-basalt of Hinsdale age (*Small stocks and irregular bodies*)

Ppi — Intrusives of Los Pinos age (*Dikes of latite-andesite*)

Mfi — Intrusives of Fisher age (*Stocks and dikes of diorite, quartz latite porphyry, etc.*)

Mai — Intrusives of Alboroto age (*Dikes and less regular bodies of rhyolite and latite*)

Msi — Intrusives of Sheep Mountain age (*Small stocks of grano diorite and diorite*)

Mci — Intrusives of Conejos age (*Stocks, sills, laccoliths, and dikes of various rocks*)

Mbi — Intrusives of Beidel age (*Small bodies of andesitic rocks*)

Miocene

Mgr — Rhyolite and granite porphyry (*Various intrusive bodies of rhyolite, micro-granite, and granite porphyry*)

Mql — Quartz latite (*Dikes, sills, and other intrusive bodies. Quartz latite and grano-diorite*)

Mab — Andesite and basalt (*Dikes, stocks, and other intrusive bodies*)

Msl — Stocks, laccoliths, and sheets (*Granite to gabbro, granular to porphyritic*)

Mld — Lamprophyre and diabase (*Dikes and less regular bodies*)

Mli — Intrusives of Lake Fork age (*Volcanic neck and other intrusives of dioritic rock*)

Late Cretaceous or early Eocene

Kmp — Intrusive quartz monzonite porphyry (*Laccoliths, sills, and other bodies*)

BEDDED ROCKS

TRIASSIC

Ɍd — Dolores formation (*Jurassic ? and Upper Triassic*) (*Red grit and sandstone with beds of fossiliferous limestone conglomerate at base*)

UNCONFORMITY

CARBONIFEROUS

Ccm — Cutler formation and Rico formation (*Red beds of Permian age*)
Hermosa formation (*Limestone, shale, sandstone, and grit of Pennsylvanian age*)
Molas formation (*Red calcareous shale of Pennsylvanian age*)
Erosion interval
Leadville limestone (*Of early Mississippian age*)

UNCONFORMITY

DEVONIAN

Upper Devonian

Doe — Ouray limestone (*Leadville limestone, of Mississippian age, included in places*)
Elbert formation (*Limestones and quartzite*)

CAMBRIAN

Upper Cambrian

Ꞓi — Ignacio quartzite (*Fine bedded quartzite*)

AGE UNKNOWN

Ih — Limestone of Iron Hill (*Massive limestone, probably of hydrothermal origin*)

UNCONFORMITY

ALGONKIAN

Anm — Needle Mountains group (Uncompahgre formation (*Quartzite and schist*) Vallecito conglomerate)

UNCONFORMITY

Aig — Irving greenstone (*Metamorphosed andesitic and diabasic rock*)

UNCONFORMITY

ARCHEAN

Arsg — Ancient schists and gneisses (*Banded crystalline rocks, mostly of igneous origin*)

NORTHEASTERN AREA

Cmk — Maroon formation (*Permian and Pennsylvanian ?*)
Kerber formation (*Pennsylvanian*) (*In the extreme northeastern corner of area*)

Dc — Chaffee formation (*In the extreme northeastern part of area*)

ORDOVICIAN

Ofm — Fremont limestone (*Upper Ordovician*)
Harding sandstone (*Middle Ordovician*)
Manitou limestone (*Lower Ordovician*)

pꞒ — Undifferentiated pre-Cambrian (*Includes granitic rocks, schists, and gneisses*)

INTRUSIVE ROCKS

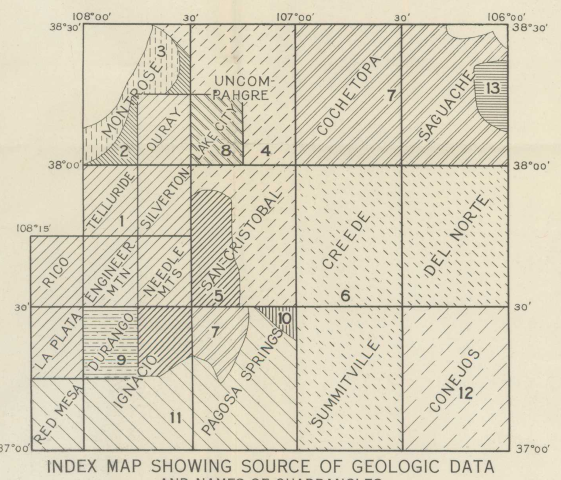
Ihi — Intrusives of Iron Hill (*Mostly pyroxenite; some uncompahgrite, ijolite, nepheline syenite, syenite, diabase, and theralite*)

Agr — Pre-Cambrian granitic intrusive rocks (*Gabbro, diorite, syenite, granodiorite, quartz monzonite, granite, etc., of different ages. In part late Algonkian [post-Needle Mountains] and in part older Algonkian*)

Fault

Inferred fault

Fault concealed by surface deposits



INDEX MAP SHOWING SOURCE OF GEOLOGIC DATA AND NAMES OF QUADRANGLES

1 — Published folios on a scale of 1:62,500 by Cross and associates. (Geology revised in places)

2 — Reconnaissance by Larsen assisted by J. W. Vanderwilt

3 — Reconnaissance by W. W. Atwood and assistants

4 — Detailed mapping on a scale of 1:125,000 by Cross and Larsen assisted by J. Fred Hunter. Pre-Cambrian of Uncompahgre and Montrose quadrangles from published map by J. Fred Hunter.

5 — Detailed mapping on a scale of 1:125,000 by Cross and Larsen assisted by L. F. Noble

6 — Detailed reconnaissance on a scale of 1:125,000 by Cross and Larsen assisted by J. Fred Hunter.

7 — Rapid reconnaissance on a poor base map by Cross and Larsen assisted by J. Fred Hunter.

8 — Detailed mapping on a scale of 1:62,500 by Cross assisted by L. H. Woolsey, Albert Johannsen, Howland Bancroft, W. H. Emmons, and G. F. Kay.

9 — Detailed mapping on a scale of 1:62,500 by Cross assisted by A. C. Spencer, Ernest Howe, and W. H. Emmons.

10 — Detailed reconnaissance on a scale of 1:125,000 by Larsen assisted by J. W. Vanderwilt

11 — From published map by J. B. Reeside, Jr.

12 — Detailed reconnaissance on a scale of 1:125,000 by Cross and Larsen assisted by C. S. Ross

13 — From U. S. Geological Survey Prof. Paper 169, by W. S. Burbank

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