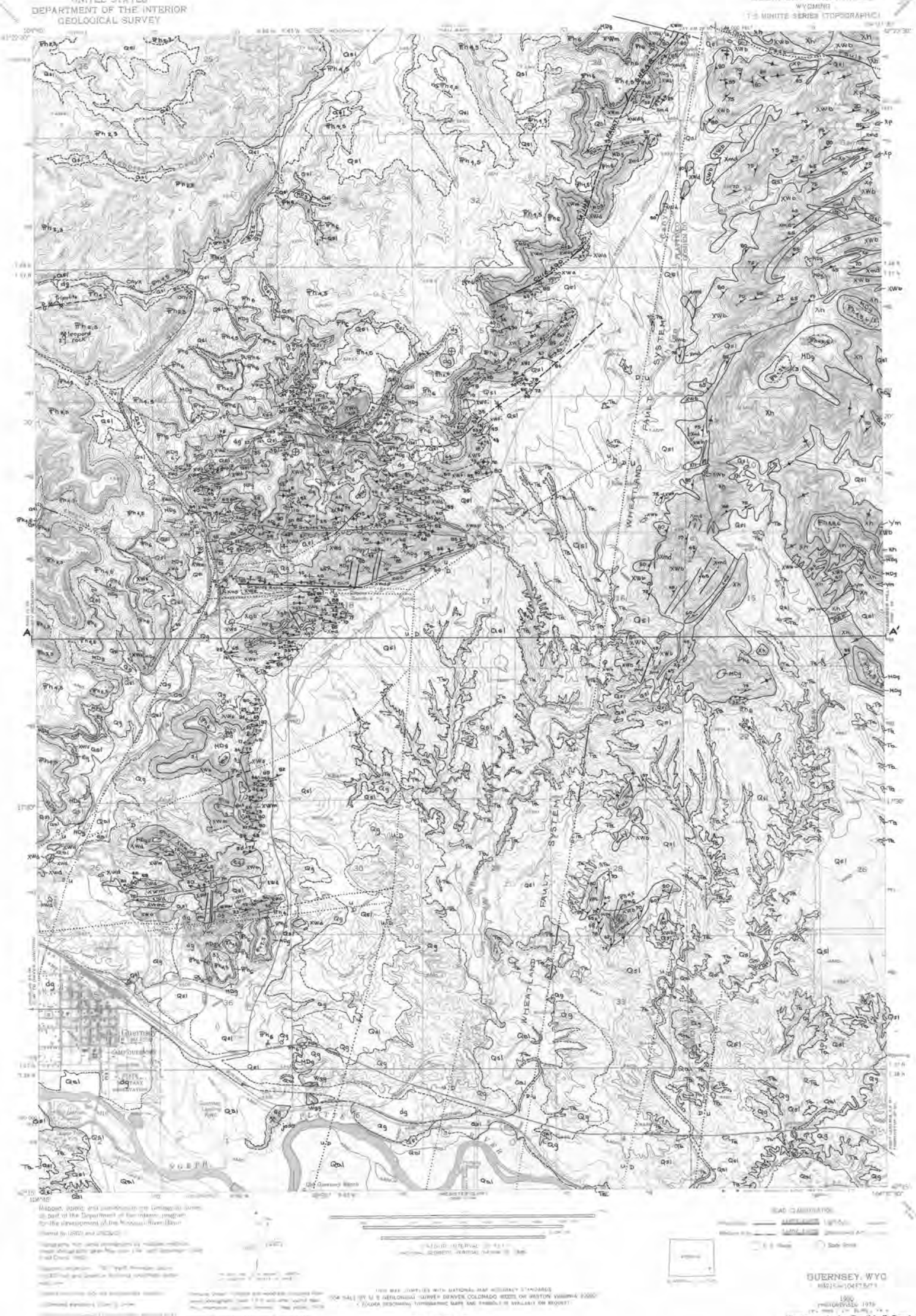
WYOMING STATE GEOLOGICAL SURVEY
Gary B. Glass, State Geologist

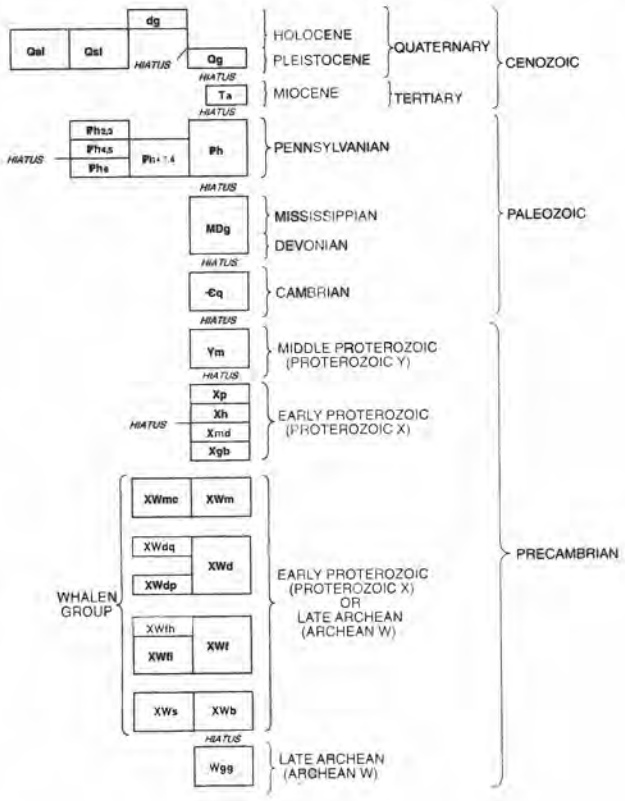
PRELIMINARY GEOLOGIC MAP 97-1
Guernsey Quadrangle
Platte and Goshen Counties, Wyoming

PGM-97-1



EXPLANATION

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

dg **disturbed ground** - areas covered by urban or industrial development.

Qal **Alluvial deposits** - Sand, silt, gravel, and clay deposited mainly along the North Platte River and smaller intermittent streams; includes alluvial terraces and adjoining colluvial deposits.

UNCONFORMITY

Qsl **Silty loess** - Brown to dark brown deposits of windblown silt with minor clay and very fine sand; includes reworked deposits of loess. The thickness may exceed 30 feet in valley deposits in and tributary to Pleasant Valley, Webb Canyon, and Whalen Canyon. Locally called "blow dirt."

UNCONFORMITY

Qg **Gravel deposits** - Boulder to pebble conglomerate deposited in a fluvial environment by the ancestral North Platte River. Contains fluvial cross-bedded sand zones. The boulders include many types of crystalline, metamorphic, and sedimentary rocks including but not limited to granite, monzonite, amphibolite, schist, quartzite, marble, limestone, and sandstone. One fragment of black jade measuring 2" x 3" x 3" was found in a gravel pit east of Guernsey. Includes clasts from the Hartville uplift as well as clasts from the Laramie Mountains and farther west. Found mostly in the southern half of the map area, concentrated near north-south faults. The gravel deposits attain local thicknesses in excess of 150 feet.

UNCONFORMITY

Ta **Arikaree Formation** - Light gray tuffaceous sandstone containing occasional limy concretions. Vertebrate fossils are common in some areas. Only the upper part of the Arikaree Formation (McGrew, 1963), is found in the area. Forms bluffs and narrow canyons with local areas of badland topography.

UNCONFORMITY

Ph **Hartville Formation, undivided** - Limestone, siltstone, sandstone, claystone, black shale, and maroon to red or white orthoquartzite. Subdivided into six divisions, but mapped as three divisions where possible. The Hartville Formation division 1 (of Permian age) is not found in the map area.

Ph2,3 **Hartville Formation, divisions 2 and 3** - Interbedded gray limestone, buff to chalky white limestone and dolomite, pink dolomite, buff aeolian (Tom Ahlbrandt, U.S. Geological Survey, personal communication, 1995) sandstone, grey, red, and maroon silt and claystones, and thin black shales. Brachiopods are common in limestone and dolomite layers. Fusulinids reported in fine-grained clastic layers (Denson and Bolinelly, 1949). Forms ledged slopes and cliffs commonly covered with Mountain Mahogany. About 300 feet thick in the area.

Ph4,5 **Hartville Formation, divisions 4 and 5** - Interbedded maroon, red, pink, and grey siltstones and claystones, grey, brown, and buff limestone, pink dolomite, and thin grey sandstones. Forms smooth slops with limestone outcrops. About 250 feet thick in the area.

UNCONFORMITY

Ph6 **Hartville Formation division 6** - Well-indurated maroon to red to locally white orthoquartzite. Forms cliffs and rocky knolls. Deposited on a well-developed karst surface, and fills sinkholes and caverns in the underlying Guernsey Limestone. Thickness 0 - 120 feet.

Ph4,5,6 **Hartville Formation divisions 4, 5, and 6** - Mapped together in the Haystack Hills where the Hartville division 6 is present as a thin red band or is locally not present.

UNCONFORMITY

MDg **Guernsey Limestone** - Grey limestone with local beds and zones of chert. Brachiopods common. Thickness 0 to 180 feet. Forms smooth to ledged slopes commonly covered with Mountain Mahogany.

UNCONFORMITY

Єq **Quartzite of probable Cambrian age** - Grey to red to cream-colored coarse grained cross-bedded orthoquartzite found in lenses locally throughout the area. Probably equivalent to the Deadwood Quartzite.

UNCONFORMITY

Ym **Metadiabase** - Dark-green, medium-grained diabase, with marginal chill zones; cuts Haystack Range Granite.

Xp **Pegmatite related to Haystack Range Granite** - White to gray, coarse-grained, zoned to unzoned feldspar-quartz-muscovite-tourmaline granitic dikes; contains accessory biotite, garnet, and beryl. Estimated thickness of unit 100-150 m.

Xh **Haystack Range Granite** - Pink, coarse- to medium-grained, massive to foliated, inequigranular biotite granite and lesser fine-grained granite. Fine-grained phase grades into or forms dikes in the coarse-grained facies. Constitutes a granite dome in the Haystack Range, the type area of the granite. Rb-Sr whole-rock age, 1.72 Ga (Snyder and Peterman, 1982).

Xmd **Metadiabase** - Dark-greenish-black, medium-grained hornblende-plagioclase-quartz metadiabase and lesser hornblendite dikes; granular amphibolite east of Hartville fault. Strike north-northeast except on north side of Haystack Range dome. Estimated age, ~2.0 Ga, based on mafic dikes in the Laramie Range being younger than a 2.05 Ga granodiorite body and dikes in the Hartville uplift being older than the 1.98 Ga granite of Flattop Butte (Snyder, 1993).

Xgb **Metagabbro** - Dark grayish-green, variably fine-to coarse-grained, weakly layered, and weakly to strongly foliated metagabbro containing hornblende and chlorite. Foliation more distinct along vorder zones.

XWm **Metabasalt** - Dark-green, fine-grained actinolite-biotite-chlorite schist; flows are locally pillowed. Estimated thickness, 100-150 m.

XWmc **Calc-silicate rock** - White to light-green pods, commonly 10 to 15 cm in diameter, form 30 to 80 percent of rock, and contain actinolite, diopside, talc, and epidote.

XWd **Metadolomite** - Gray, pink, white, and yellow, medium-grained dolomite and marble, tremolite dolomite, siliceous dolomite, and local limestone. Tremolite occurs as radiating blades resembling turkey tracks. Contains abundant concentrically layered algal stromatolitic mounds. Estimated thickness, 300-350 m.

XWdq **Quartzite** - Common near stratigraphic top of dolomite unit in area north of Chicago mine.

XWdp **Metapelite** - Thin, gray to brown, plagioclase-quartz-biotite-muscovite schist, interpreted as pelite; occurs near base of dolomite unit in Graves Ranch anticline.

XWf **Ferruginous schist** - Includes biotite-chlorite schist, phyllite, and ferruginous quartzite.

XWfh **Hematite bodies** - hematite bodies at top of ferruginous schist unit were mined at the Good Fortune, Sunrise, and Chicago mines and consist of specularite and associated colloform hematite.

WXfi **Banded iron formation** - of Lake Superior type

XWs **Quartzofeldepathic schist** - West of Wheatland fault system; locally contains chlorite and garnet; gray, medium- to fine-grained. Estimated thickness, 1,000 m.

XWb **Quartzofeldepathic schist** - East of Wheatland fault system; contains garnet, sillimanite, and rare andalusite and pyrite. Graded beds common east of Hartville fault.

UNCONFORMITY

Wgg **Granite gneiss** - Pink, medium-grained granite gneiss; which has Rb-Sr whole-rock isochron age of 2.66 Ga; granite gneiss in map area is mylonitic.

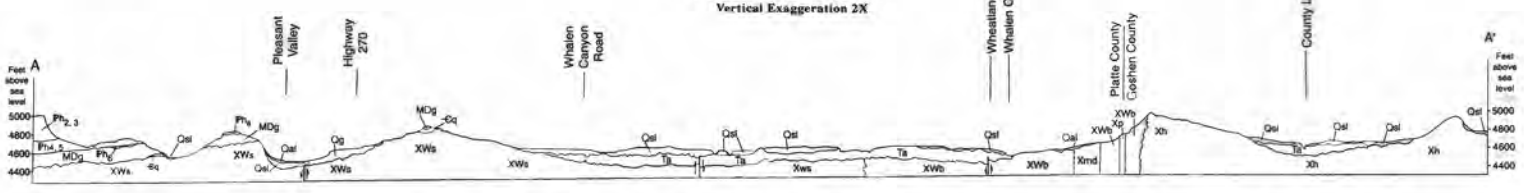
SYMBOLS

- Contact - dashed where covered or inferred, dotted where concealed.
- High-angle fault - dashed where covered or inferred, dotted where concealed; bar and ball on downthrown side.
- 70 High-angle reverse fault - arrow indicates dip of fault plane; dashed where covered or inferred; U, upthrown side; D, downthrown side.
- U D High-angle fault of Laramide age - dashed where covered or inferred; U, upthrown side; D, downthrown side.
- Thrust fault of Early Proterozoic age - arrows indicate relative horizontal movement on fault with oblique slip.
- 15 55 Asymmetrical, downward-facing anticline, showing bearing and plunge of axis; shorter arrow indicates limb of fold with steeper dip; dashed where approximately located.
- Downward - facing syncline, showing plunge of axis.
- 40 Asymmetrical, downward-facing syncline, showing bearing and plunge of axis.
- 85 Inclined bedding, showing dip; direction of stratigraphic top not determined.
- 80 Overturned bedding, showing dip.
- Vertical bedding; top of beds known.
- Vertical bedding; direction of stratigraphic top not determined.
- 65 Foliation, showing dip.
- Vertical foliation.
- 35 Bearing and plunge of lineation. May be combined with foliation or bedding symbol.
- 35 Bearing and plunge of symmetrical fold.
- 55 Bearing and plunge of asymmetrical fold.
- Mine, prospect, or mineral occurrance.

Cartography by Cynthia S. Boyd

CROSS SECTION A-A'

Vertical Exaggeration 2X



Preliminary Geologic Map of the Guernsey Quadrangle, Platte and Goshen Counties, Wyoming

by Ray E. Harris

1997

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