U.S. GEOLOGICAL SURVEY
CHARLES D. WALCOTT, DIRECTOR

STATE OF PENNSYLVANIA
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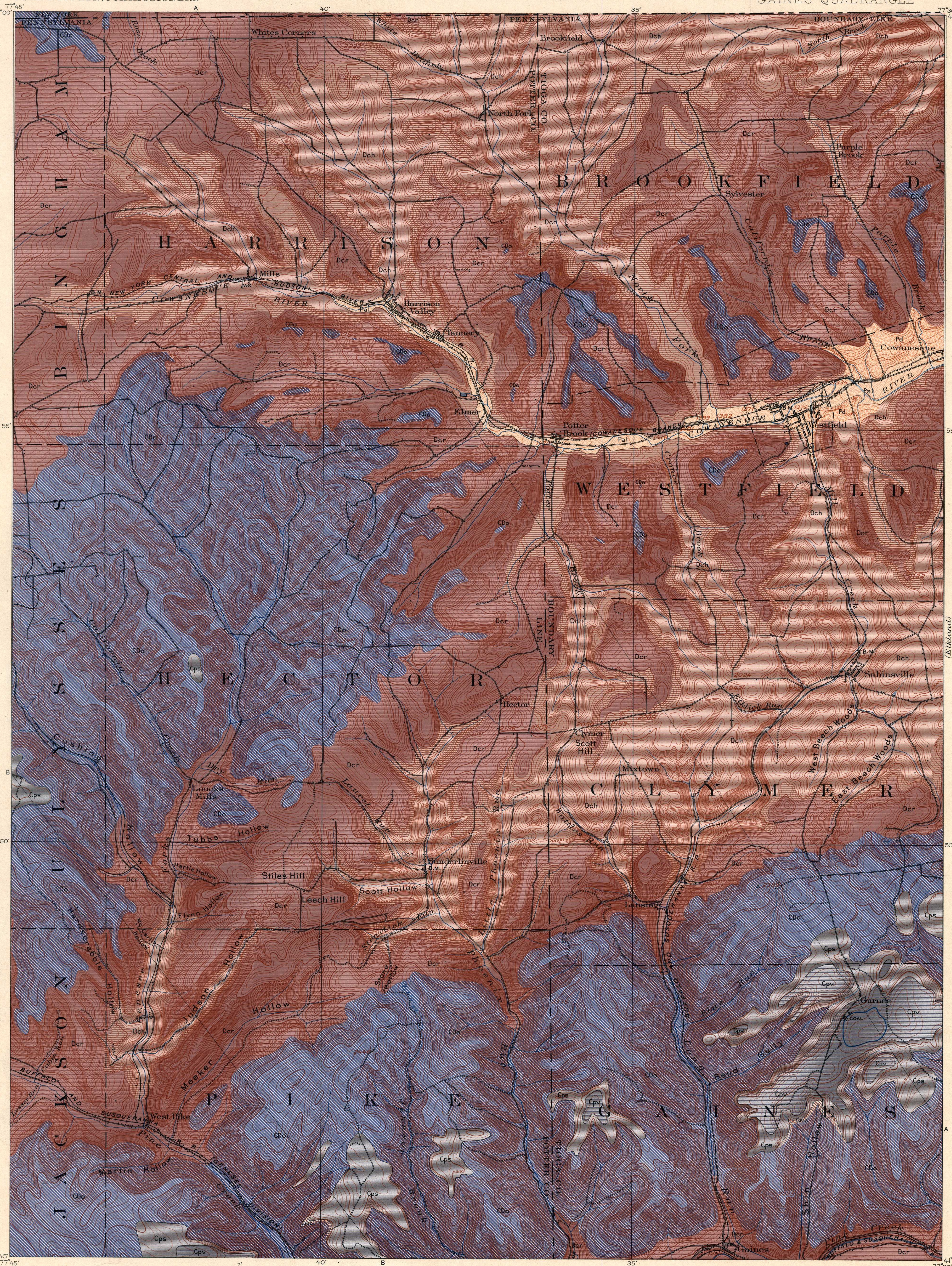
AREAL GEOLOGY

PENNSYLVANIA – NEW YORK
GAINES QUADRANGLE



LEGEND

SURFICIAL ROCKS
(Areas of Surficial rocks are shown by patterns of dots and circles.)

PLEISTOCENE

- **Pal** — Valley alluvium *(gravels, sands, and silts in the larger valleys)*
- **Pd** — Deposits other than alluvium *(shown only where deeply covering the boundaries between underlying formations)*

SEDIMENTARY ROCKS
(Areas of Sedimentary rocks are shown by patterns of parallel lines.)

CARBONIFEROUS

Pennsylvanian series

- **Cpv** — Pottsville formation exclusive of Sharon conglomerate *(buff sandstone and gray to black shale)*
- **Cps** — Sharon conglomerate member of Pottsville formation *(white quartz conglomerate at the base of the formation)*

UNCONFORMITY

Mississippian series

- **Cmc** — Mauch Chunk shale *(red shale.)*

Catskill-Pocono group

- **CDo** — Oswayo formation *(green sandstone and shale)*

DEVONIAN

- **Dcr** — Cattaraugus formation *(red shale and sandstone)*
- **Dch** — Chemung formation *(buff and gray shale, sandstone, and impure limestone)*

⚒ *Coal mines*

Sections

Known productive formations

Coal outcrop *(workable bed in Pottsville formation)*

H.M. Wilson, Geographer in charge.
Control by S.S. Gannett, Oscar Jones, and J.H. Wheat.
Topography by J.H. Jennings and J.W. Thom.
Surveyed in 1899 in cooperation with the State of Pennsylvania.

7° TRUE NORTH MAGNETIC NORTH
APPROXIMATE MEAN DECLINATION 1902.

Scale $\frac{1}{62500}$

1 ½ 0 1 2 3 4 Miles

1 ½ 0 1 2 3 4 5 Kilometers

Contour interval 20 feet.
Datum is mean sea level.

Edition of May 1903.

M.R. Campbell, Geologist in charge.
Geology by M.L. Fuller, J.D. Irving, and Charles Butts.
Surveyed in 1900.