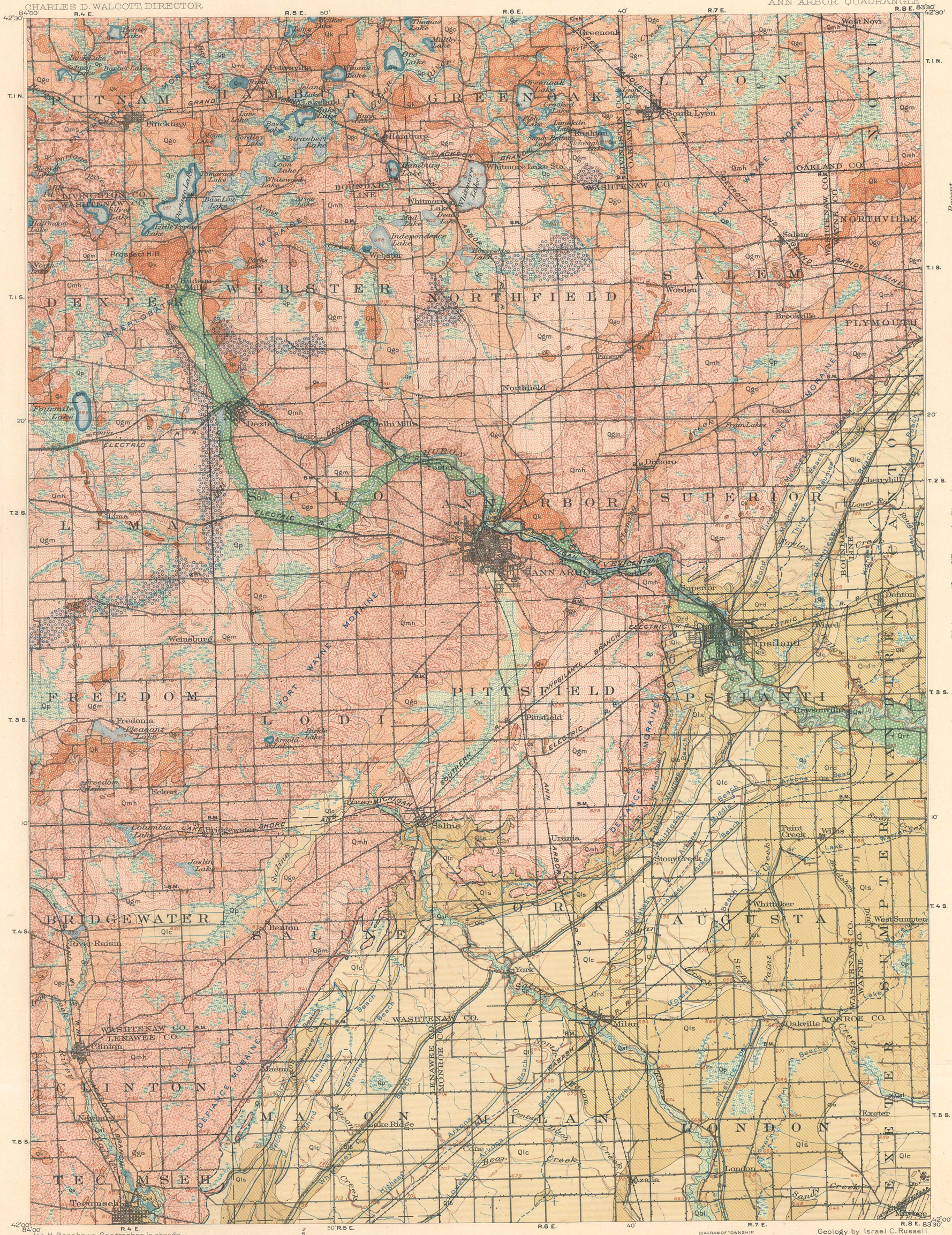
U. S. GEOLOGICAL SURVEY
CHARLES D. WALCOTT, DIRECTOR

# AREAL GEOLOGY

MICHIGAN
ANN ARBOR QUADRANGLE




## LEGEND

### SEDIMENTARY ROCKS

*(Areas of subaqueous deposits are shown by patterns of parallel lines; subaerial deposits by patterns of dots and circles)*

**Recent**

- Qal — **Alluvium** *(in the broader stream bottoms)*
- Qm — **Marl** *(bog lime deposited on lake borders)*
- Qp — **Peat and muck** *(in marshes and swamps; only the larger areas shown)*
- Qrt — **River terraces** *(including abandoned channel of Huron River)*

**Pleistocene (Later Wisconsin Stage)** — QUATERNARY

*Lakes Maumee, Arkona, Whittlesey, and Warren*

- **Shore lines of glacial lakes** *(broken lines indicate indefinite location)*
- Qlb — **Glacial lake beaches** *(gravel and sand)*
- Qrd, Qls — **Lake sand and river deltas**, Qrd
- Qlc — **Lake clay and till** *(glacial lake bottoms and ponded drainage channels)*
- Qgo — **Glacial outwash** *(gravel deposited by glacial drainage)*

*Huron, Erie, and Saginaw glacial lobes*

- Qgm — **Ground moraine** *(chiefly till plain)*
- **Bowldery tract in till plain** *(possibly a terminal moraine)*
- Qe — **Esker** *(low ridge of sandy gravel)*
- Qk — **Kames** *(irregular hills of gravel)*
- Qms, Qmh — **Terminal moraines** (Qms, *Saginaw lobe*; Qmh, *Huron-Erie lobe*)

**SILURIAN**

- Sm — **Monroe formation** *(chiefly dolomite)*

*Glacial striae*

Economic data.—*Crushed rock and building stone can be obtained from Monroe formation; clay for brick and tile manufacture from* Qlc; *gravel for roads and concrete from* Qlb, Qe, Qk, *and* Qgo; *building sand from* Qls; *marl for lime and cement manufacture from* Qm; *and peat for fuel from* Qp.

*Limestone quarry*
*Clay pits, brick and tile*
CEMENT *Cement plant*

Jno. H. Renshawe, Geographer in charge.
Control by U. S. Lake Survey and Geo. T. Hawkins.
Topography by Robert Muldrow and E. C. Bebb.
Surveyed in 1901-1902 in cooperation with the State of Michigan.

APPROXIMATE MEAN DECLINATION 1902.
MAGNETIC NORTH
TRUE NORTH

Scale $\frac{1}{125000}$
1 ½ 0 1 2 3 4 5 Miles
1 ½ 0 1 2 3 4 5 Kilometers

Contour interval 20 feet.
*Datum is mean sea level.*

Edition of Dec. 1907

DIAGRAM OF TOWNSHIP

| | | | | | |
|---|---|---|---|---|---|
| 6 | 5 | 4 | 3 | 2 | 1 |
| 7 | 8 | 9 | 10 | 11 | 12 |
| 18 | 17 | 16 | 15 | 14 | 13 |
| 19 | 20 | 21 | 22 | 23 | 24 |
| 30 | 29 | 28 | 27 | 26 | 25 |
| 31 | 32 | 33 | 34 | 35 | 36 |

Geology by Israel C. Russell and Frank Leverett, assisted by Chas. A. Davis.
Surveyed in 1903.