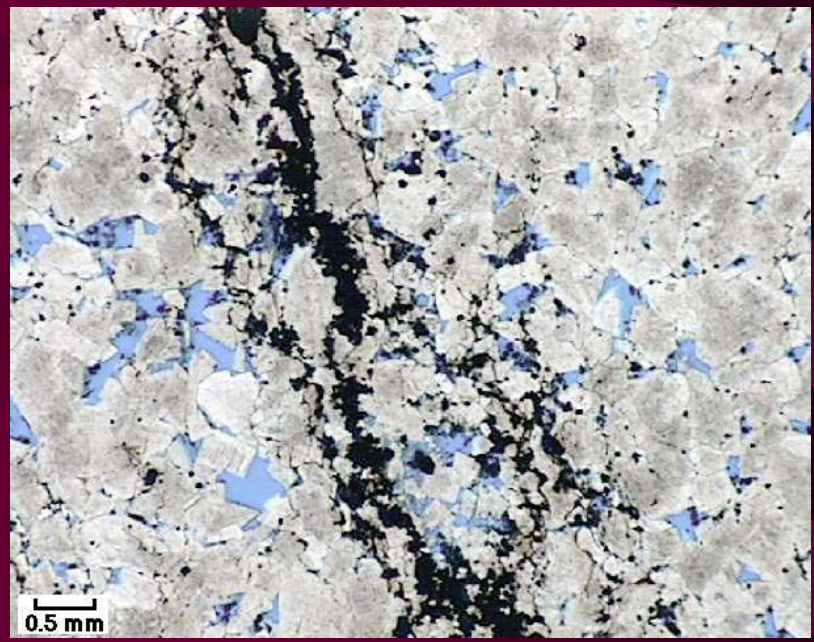
PETROGRAPHY OF TRENTON/BLACK RIVER CARBONATE RESERVOIRS, APPALACHIAN BASIN

PETROGRAPHY - PURPOSE

- Enhance field studies and core descriptions:
  - Identification of constituent grains
  - Detailed classification of reservoir rocks
  - Interpretation of depositional environments
- Diagenesis
  - Timing of significant diagenetic events (i.e., cementation or secondary porosity development relative to the emplacement of hydrocarbons)

PETROGRAPHY - PURPOSE

- Frame of reference for geochemical studies
  - Dolomitization processes:
    - Stable isotopes
    - Fluid inclusions
    - $^{87}Sr/ ^{86}Sr$
    - Trace elements
  - Source rock studies



CORE AND OUTCROP SAMPLING PROGRESS AS OF SEPTEMBER, 2004

CORE AND OUTCROP SAMPLING PROGRESS AS OF September, 2004

- PENNSYLVANIA:
  - Union Furnace outcrop and cores, Blair Co.
  - McKnight #1 well, Mercer Co.
  - Montgomery #4 well, Mercer Co.
- WEST VIRGINIA:
  - Sandhill well, Wood Co.
- OHIO:
  - Strayer #1well, Allen Co.
  - Prudential #1 well, Marion Co.
  - #3267 well, Auglaize Co.
  - Henderson well (#3479), Hancock Co.
  - #2459 well, Wood Co.
- KENTUCKY:
  - Cominco American well, Montgomery Co.

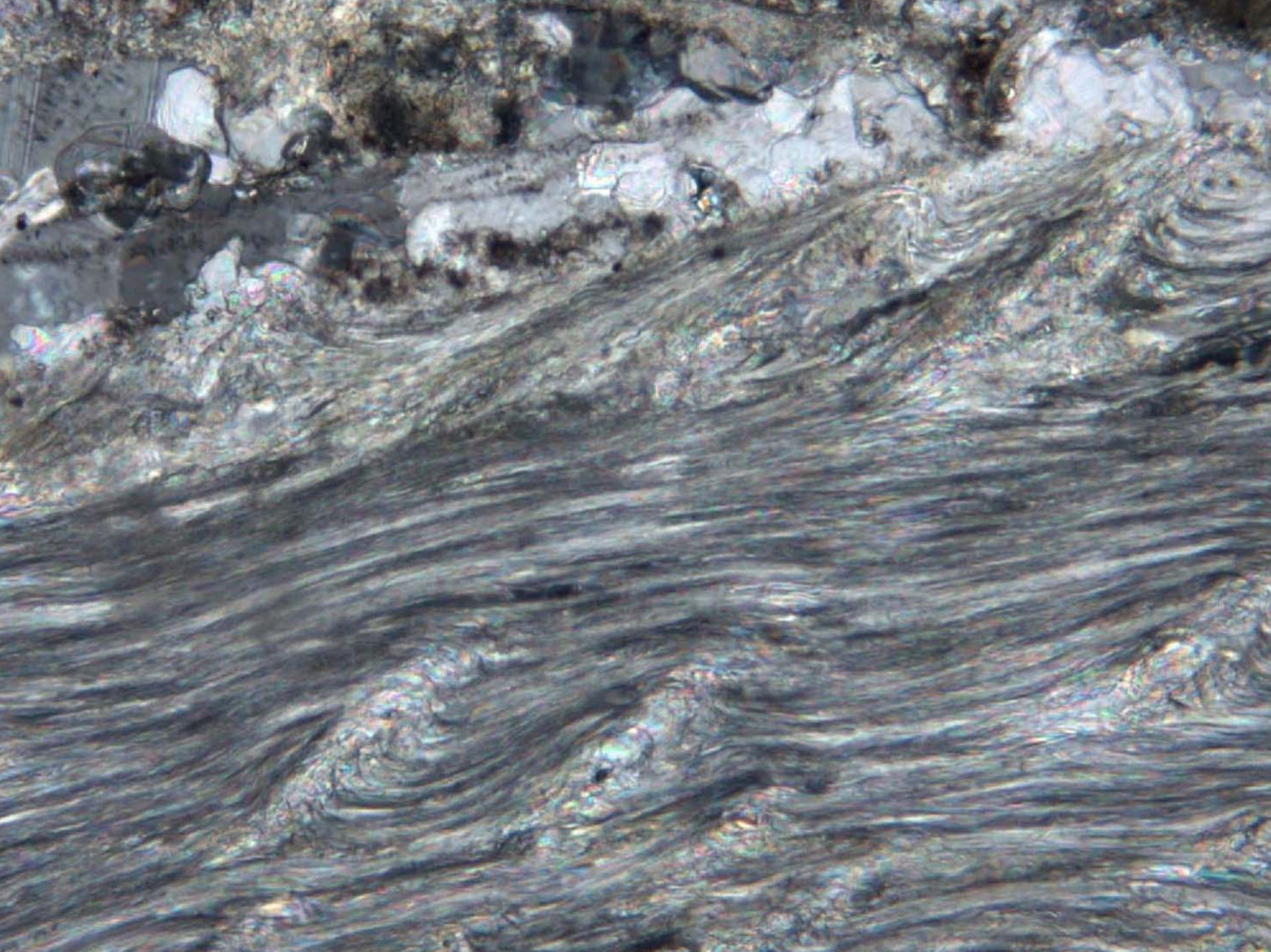
THIN SECTIONS

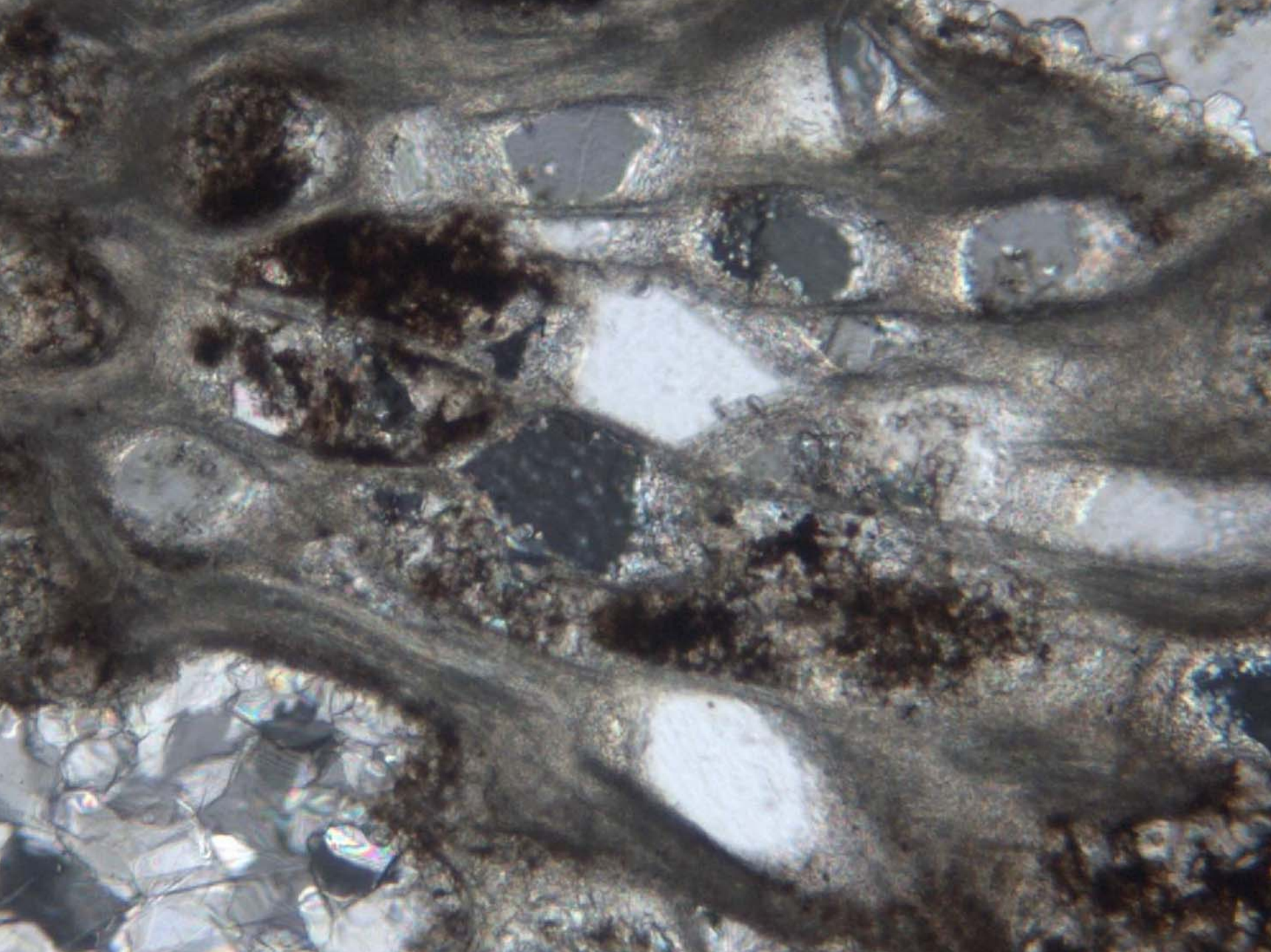
- Prepared 102 thin sections from PA
- Collected 172 thin sections from eight wells in Ohio
- Collected 177 thin sections from the Sandhill well in WV
- Presently preparing 180 thin sections from the wells described this summer in OH, KY, and WV

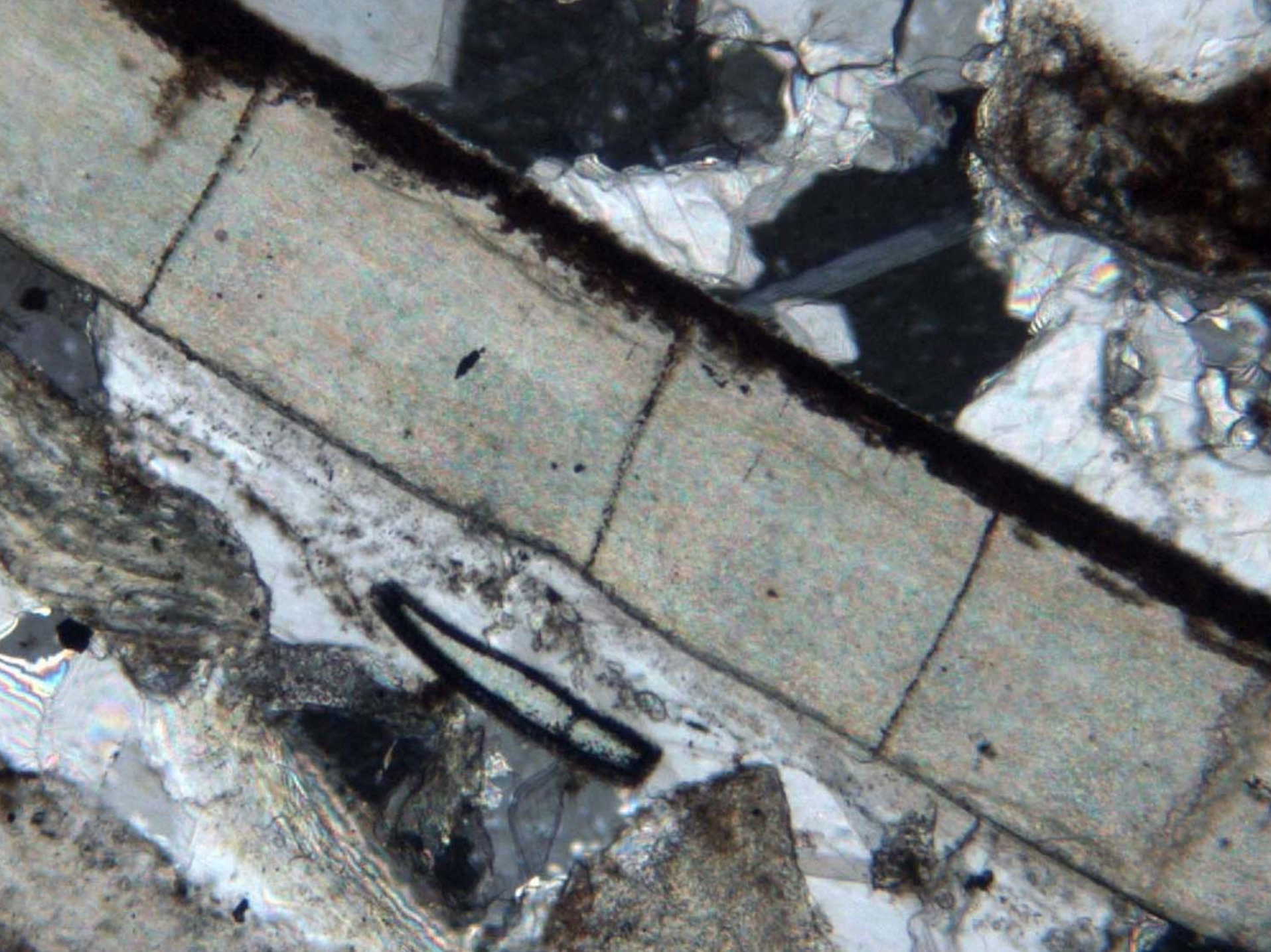
Analytical Procedure

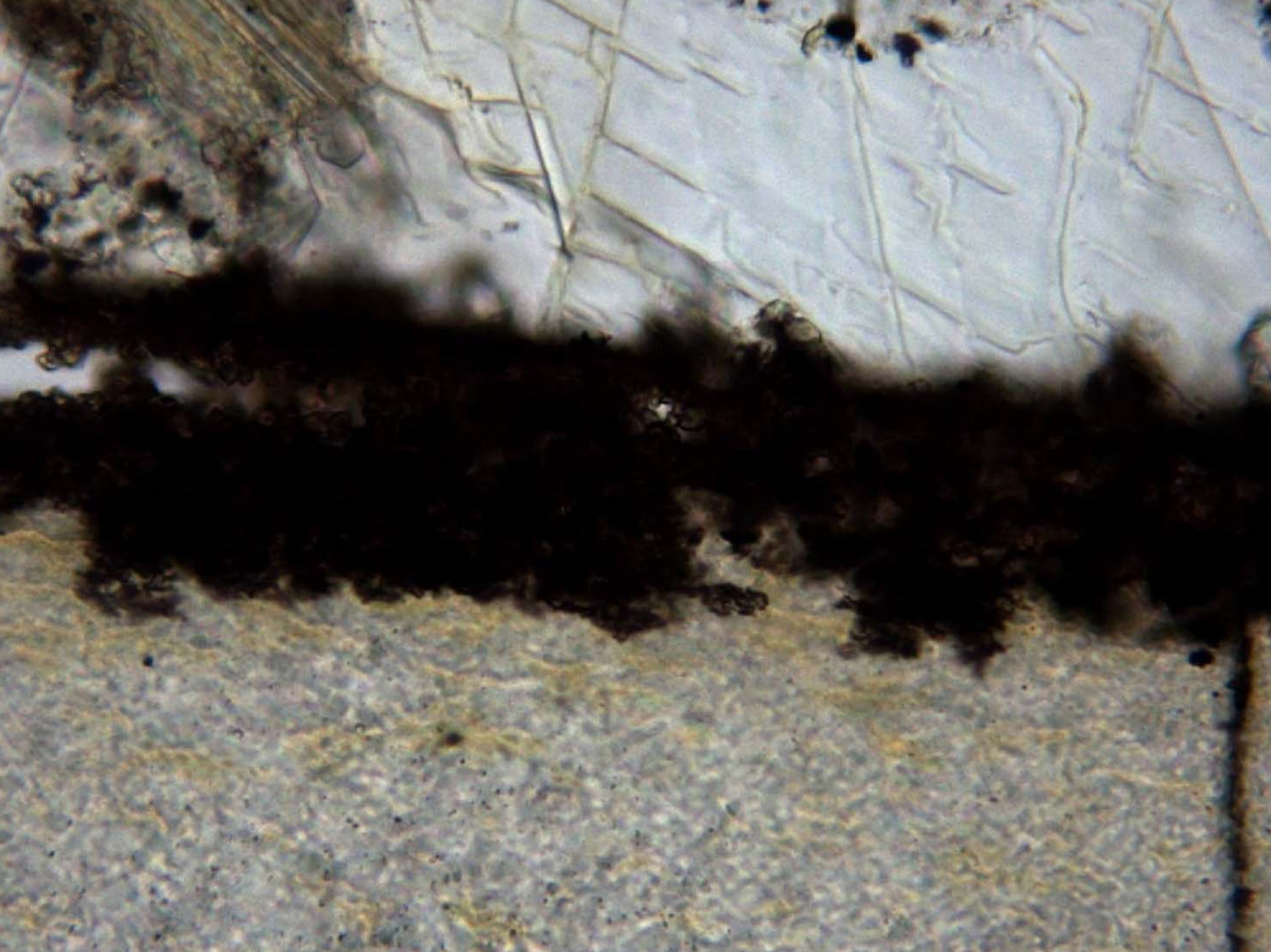
- Skeletal grains
- Micrite
- Matrix
- Cements
- Porosity
- Standard Microfacies
- Compaction and Deformational Features
- Diagenetic Sequence
- Dolomite:
  - Classification (Sibley and Gregg, 1987):
    - Unimodal/Polymodal
    - Planar/Nonplanar
    - Allochems: unreplaced/molds/partial/ replaced (mimic/nonmimic)
    - Matrix: unreplaced/partial/replaced
    - Void Filling

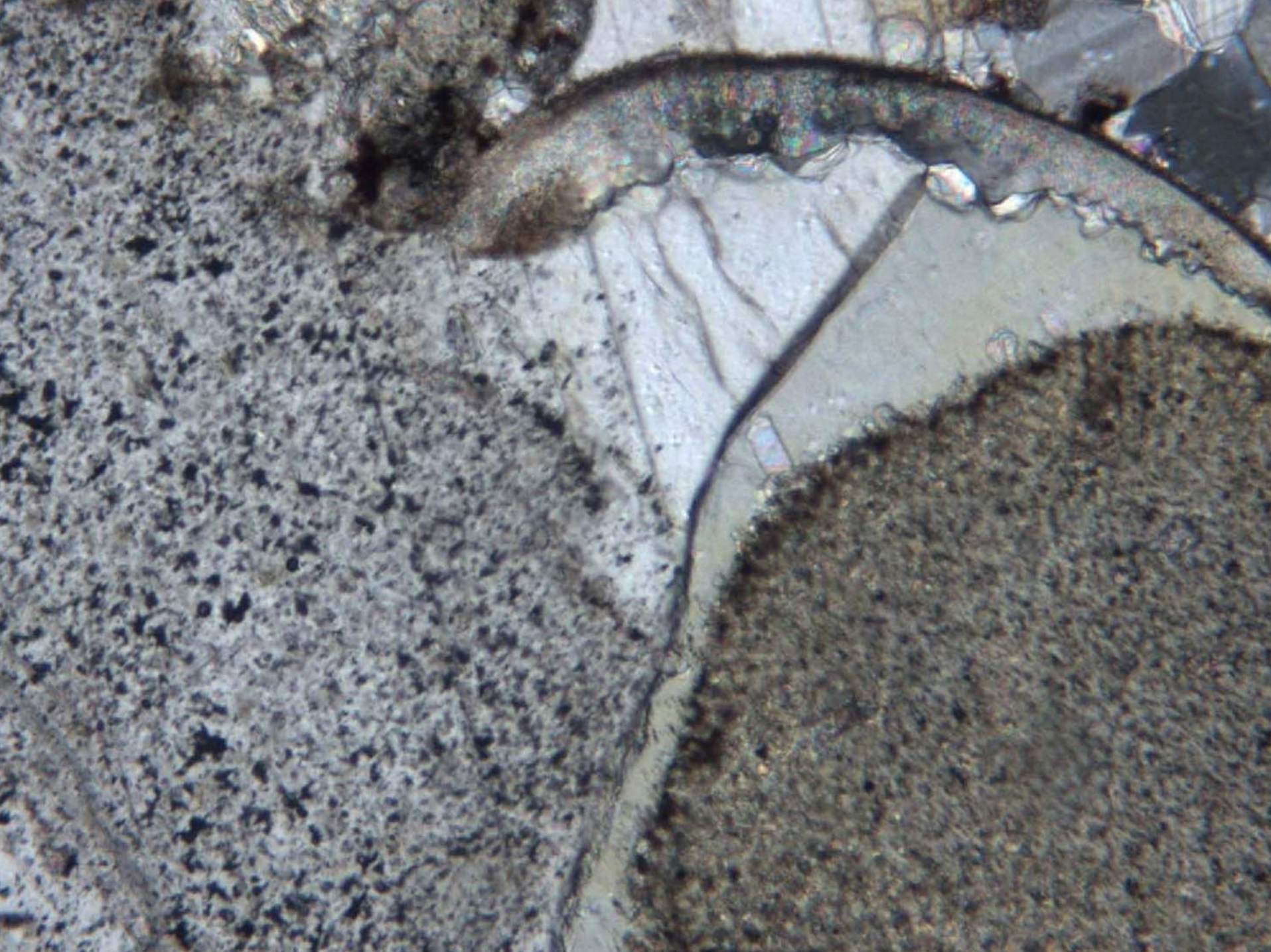
EXAMPLES

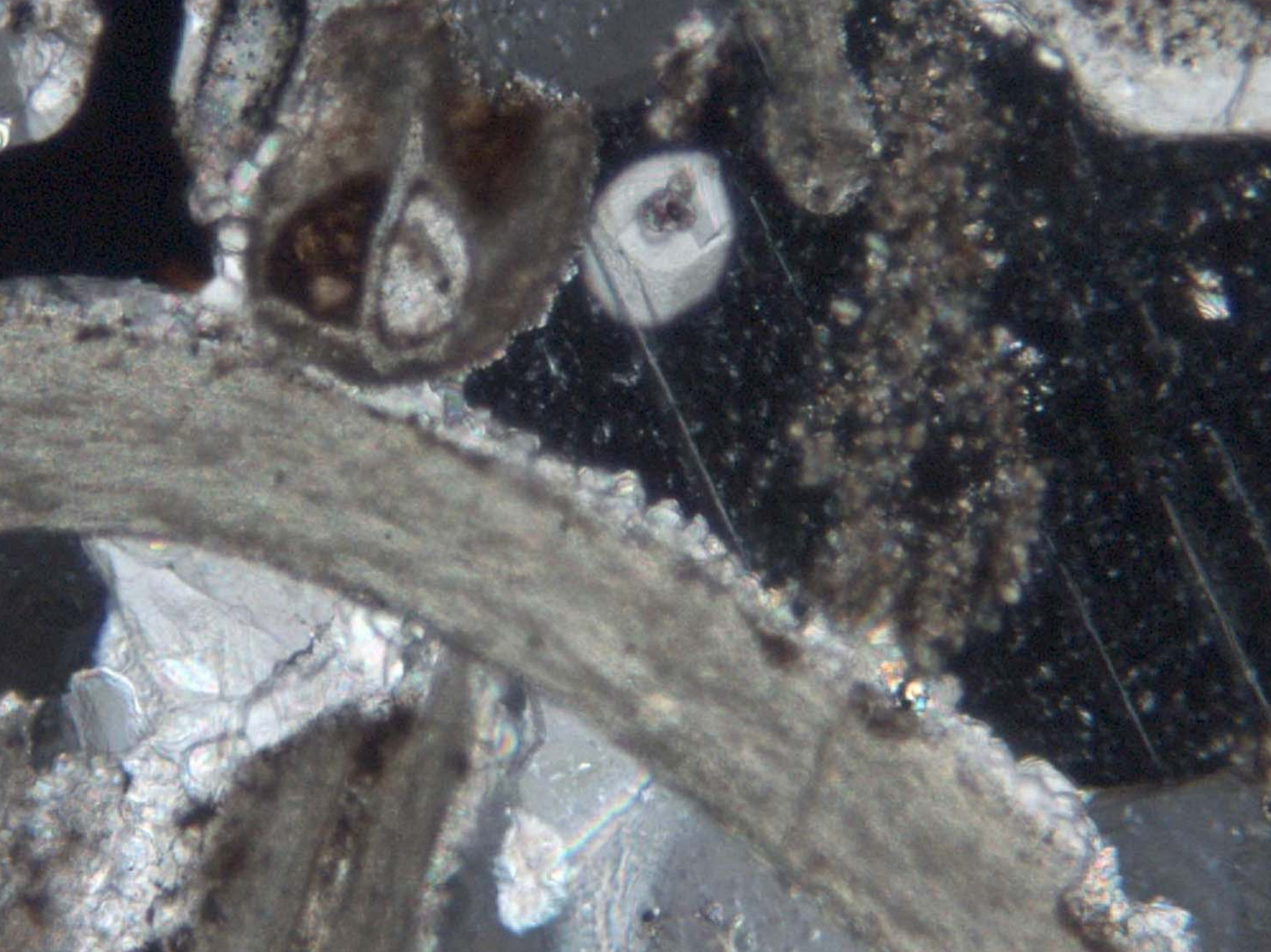













OH3372/1843.4 ft.
FRACTURED
DOLOSTONE

OH3372/1823 ft.

FRACTURED DOLOSTONE

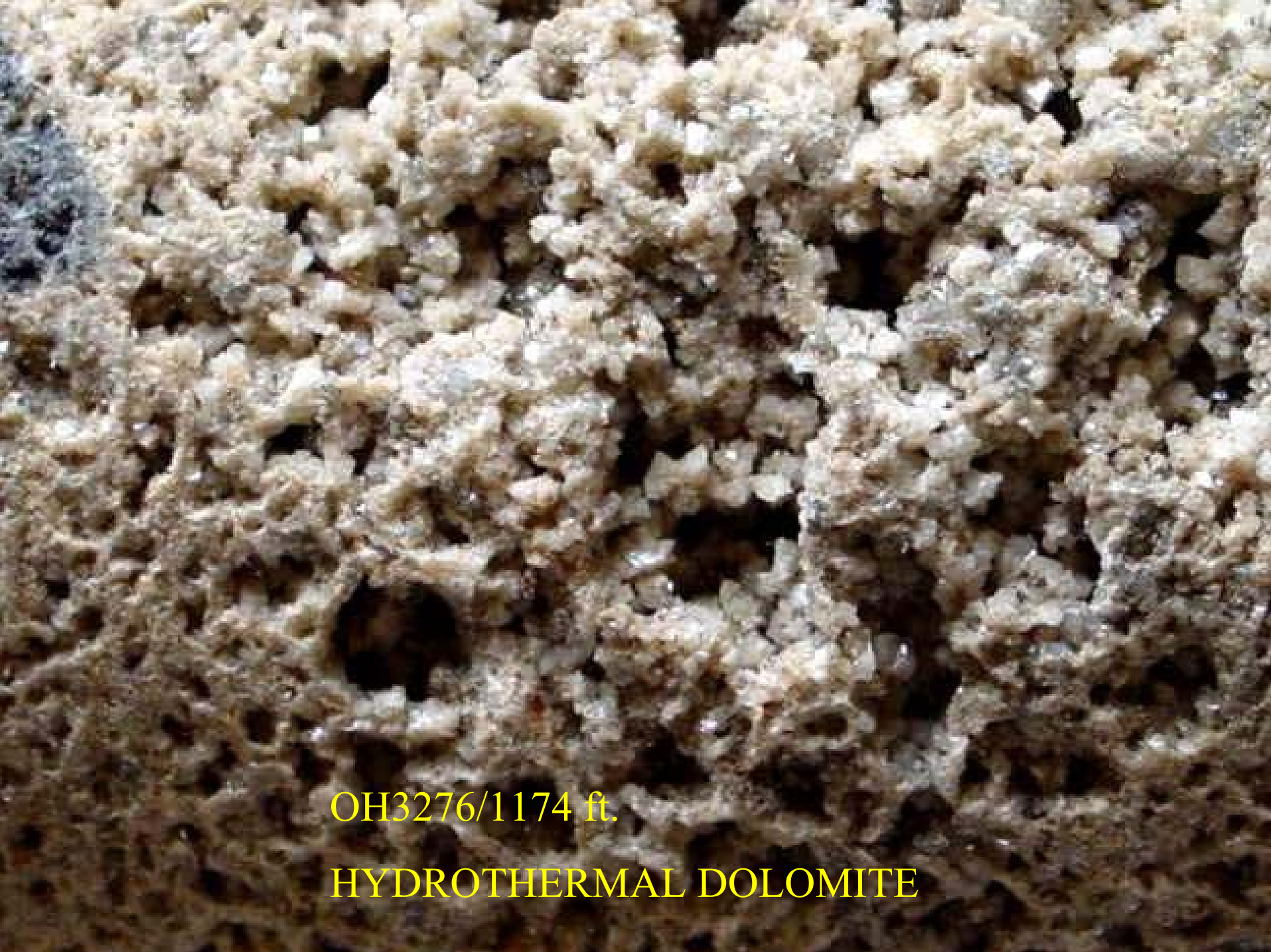
DOLOMITIZED, BIOTURBATED MUDSTONE AND WACKESTONE

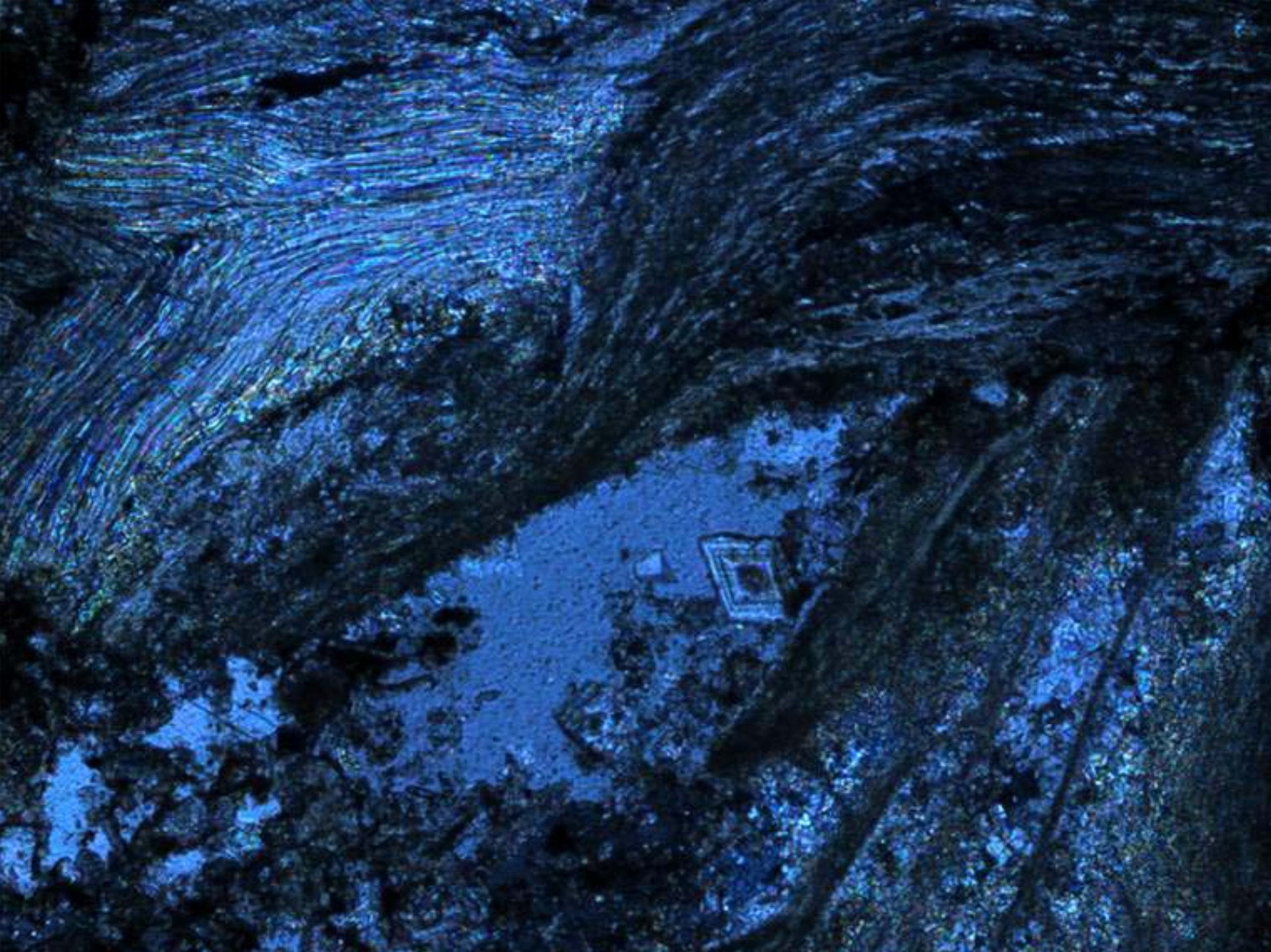
DOLOMITIZED, BIOTURBATED MUDSTONE AND WACKESTONE

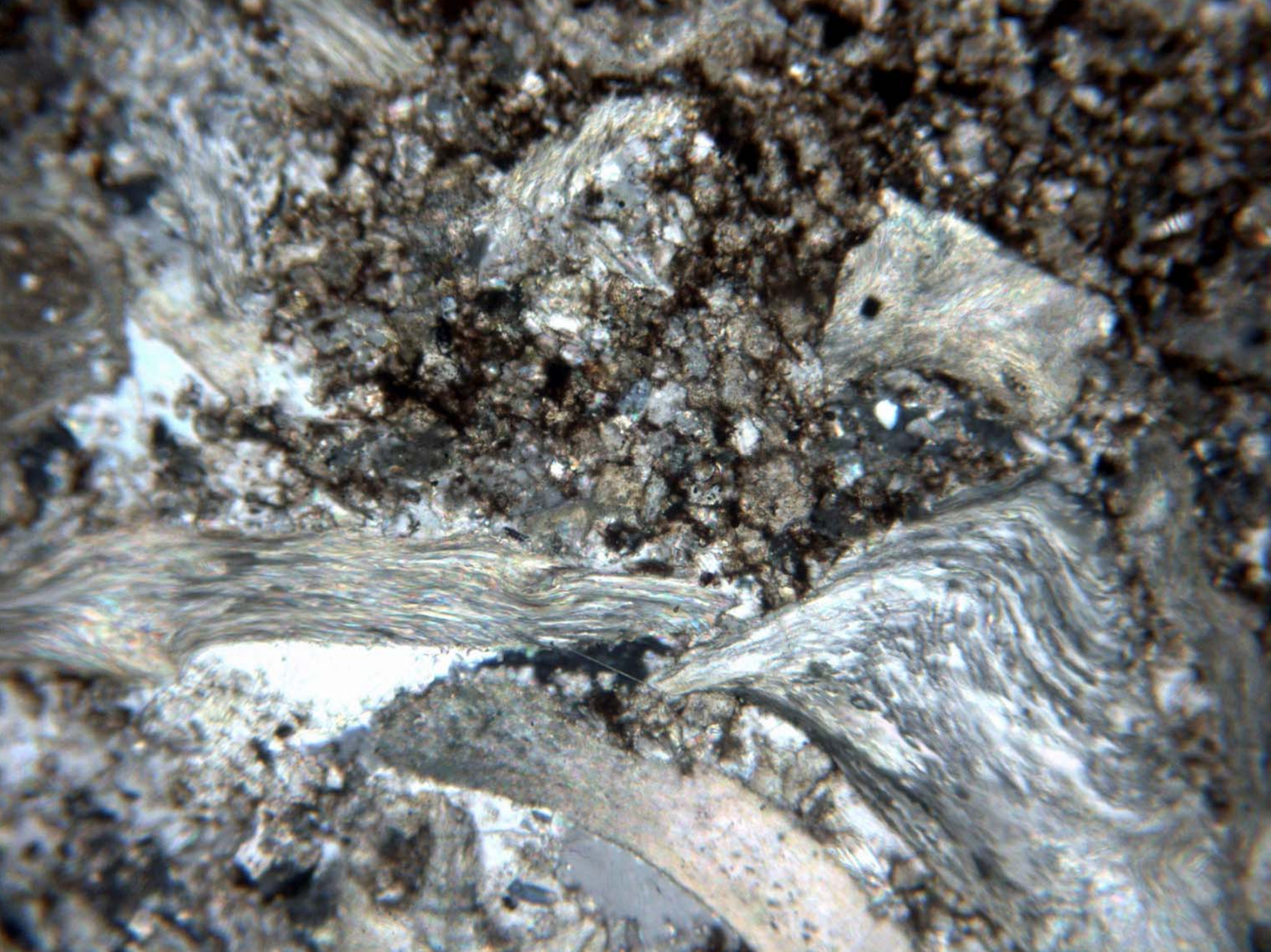
OH3372/1840 ft.

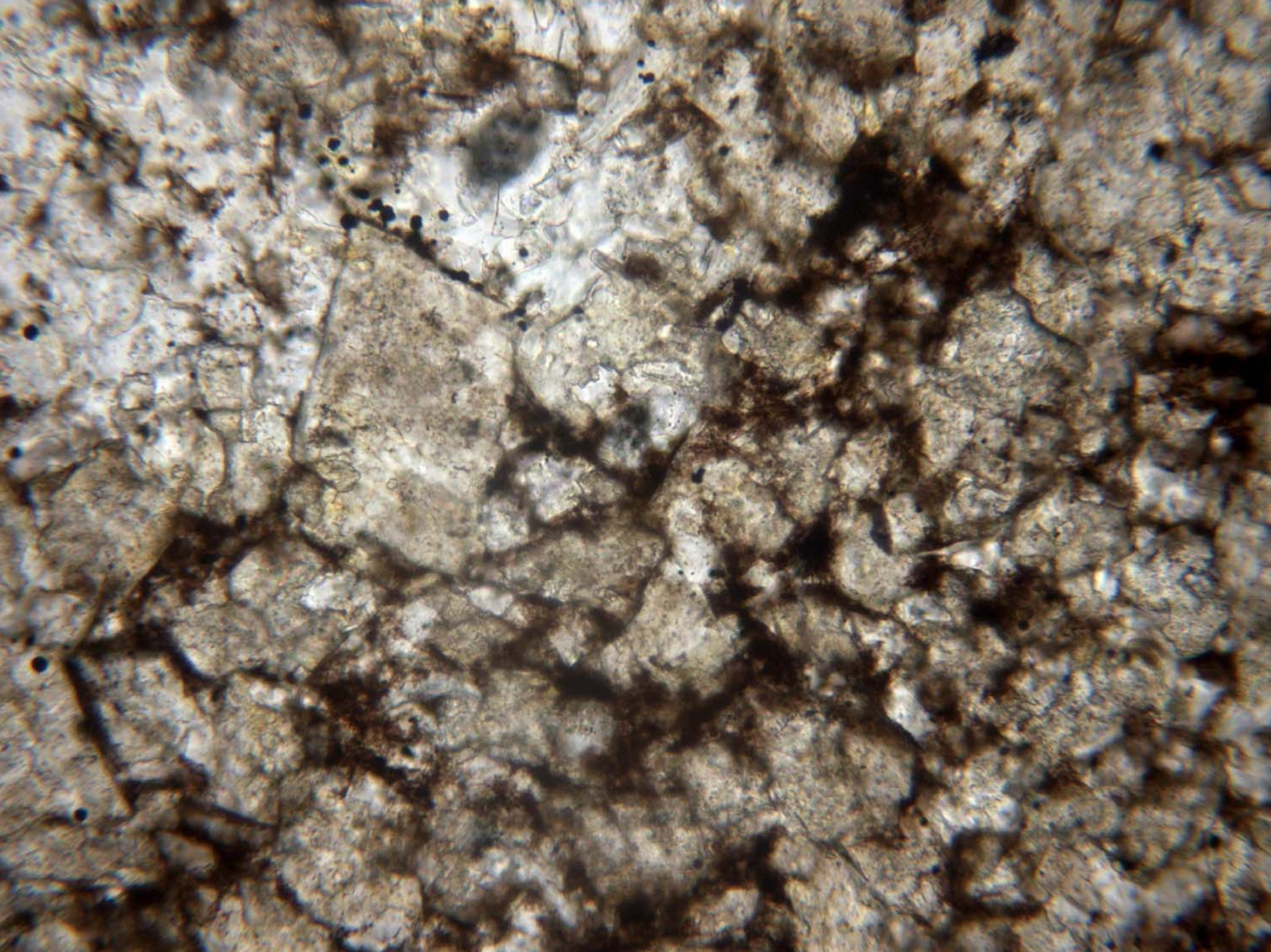

OH3479/1337.8 ft
HYDROTHERMAL
DOLOSTONE


OH3276/1174 ft.
HYDROTHERMAL
DOLOMITE
1500
0.5 mm

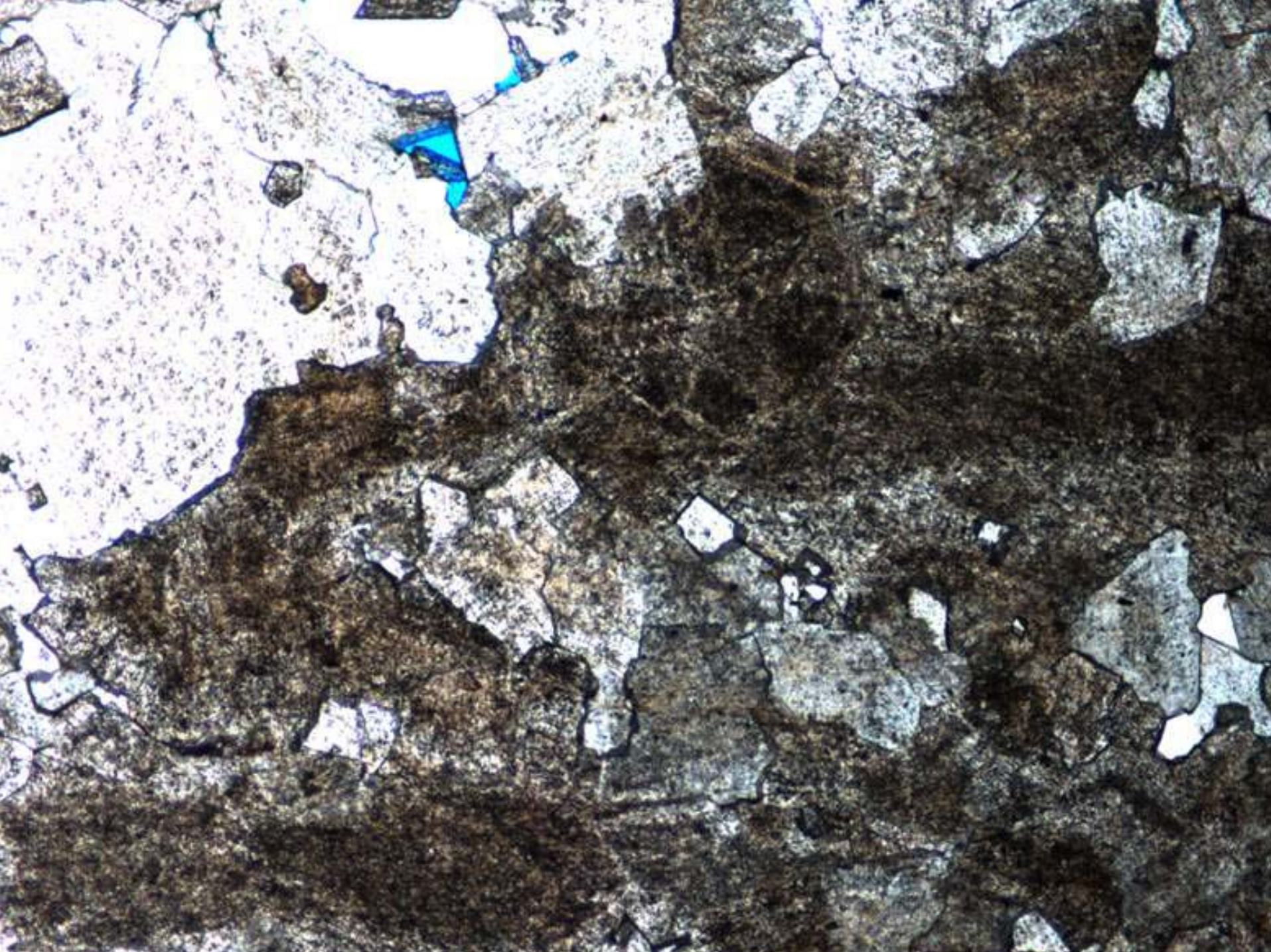

OH3276/1174 ft.
HYDROTHERMAL DOLOMITE

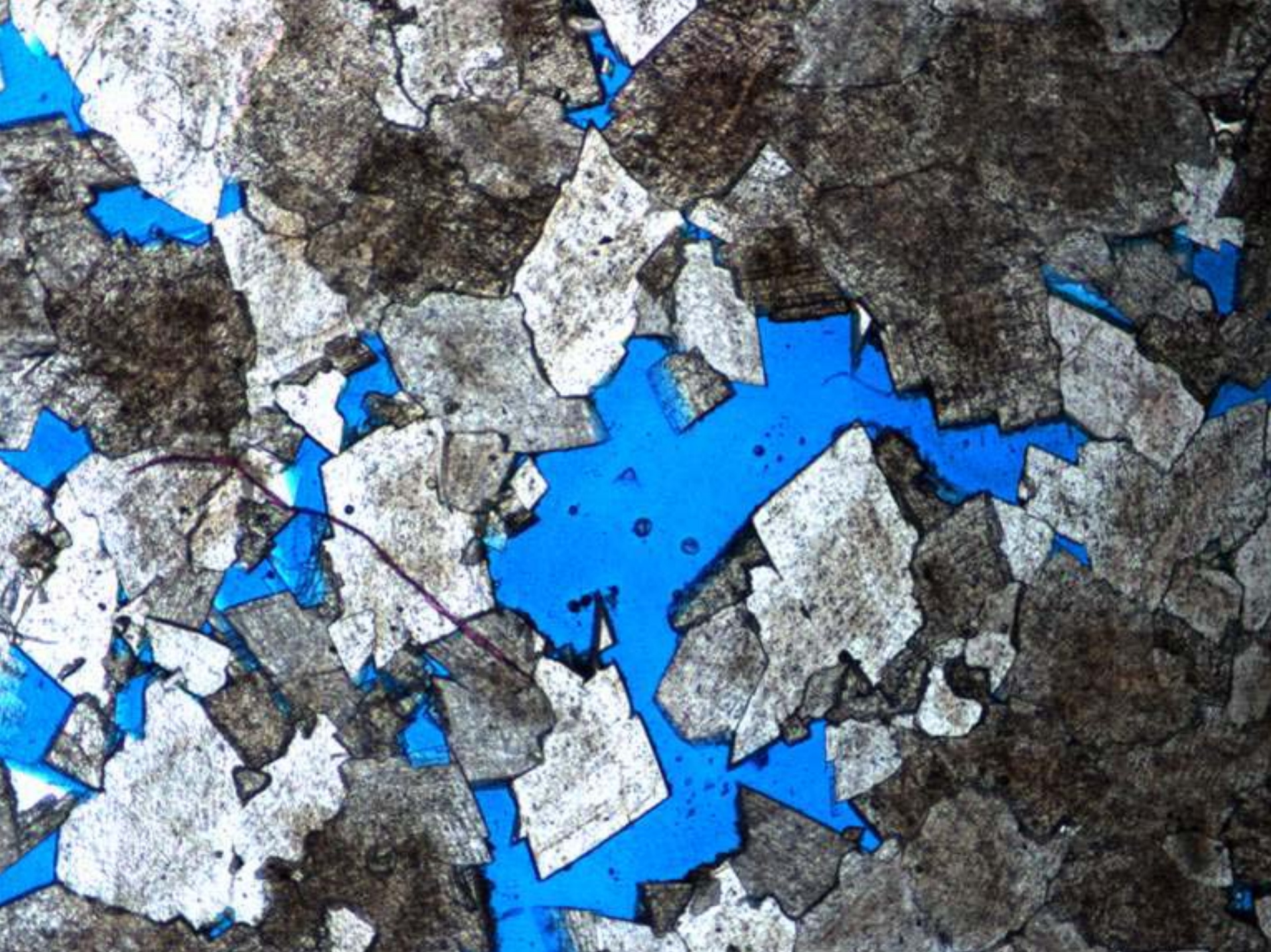


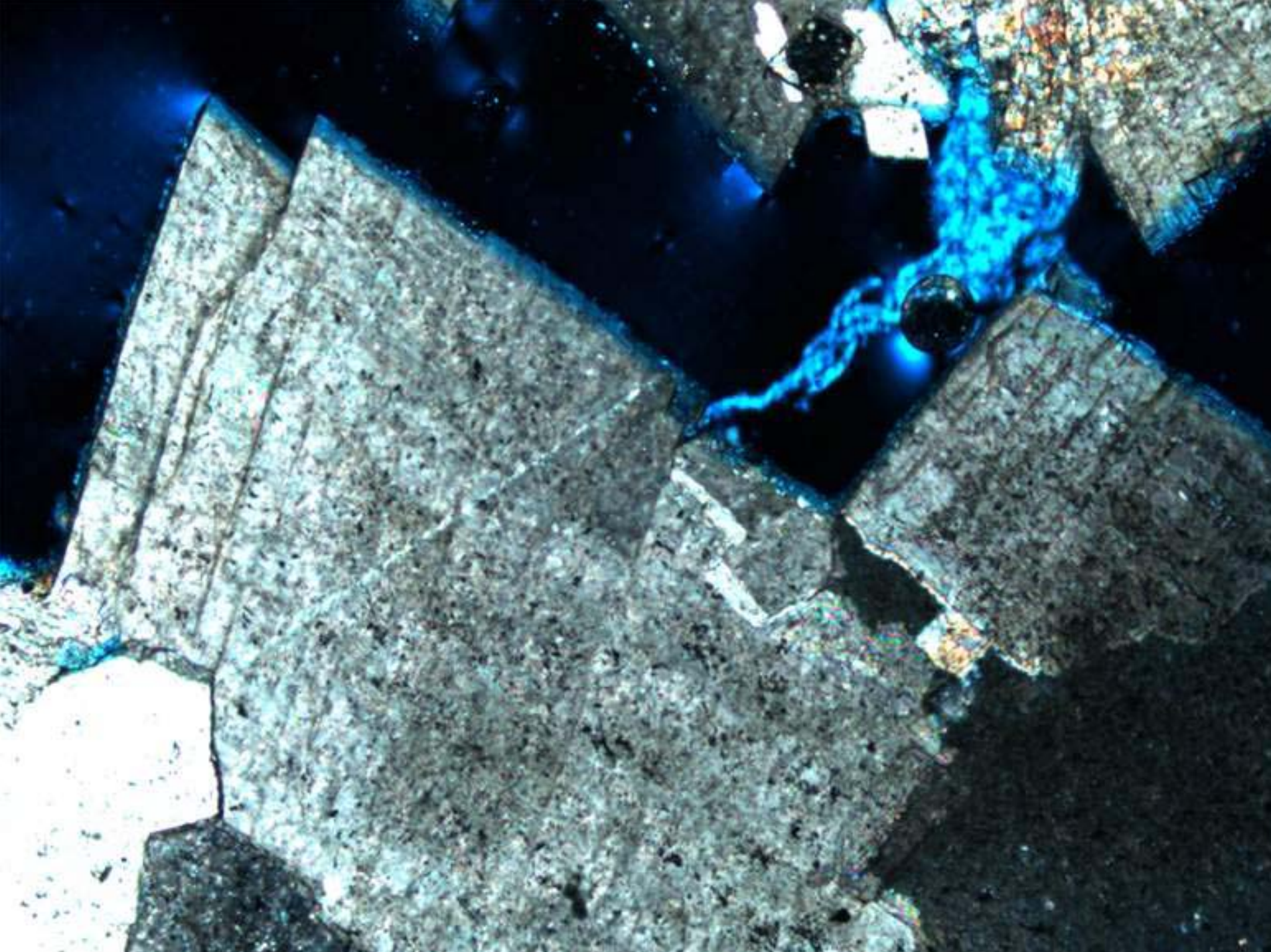


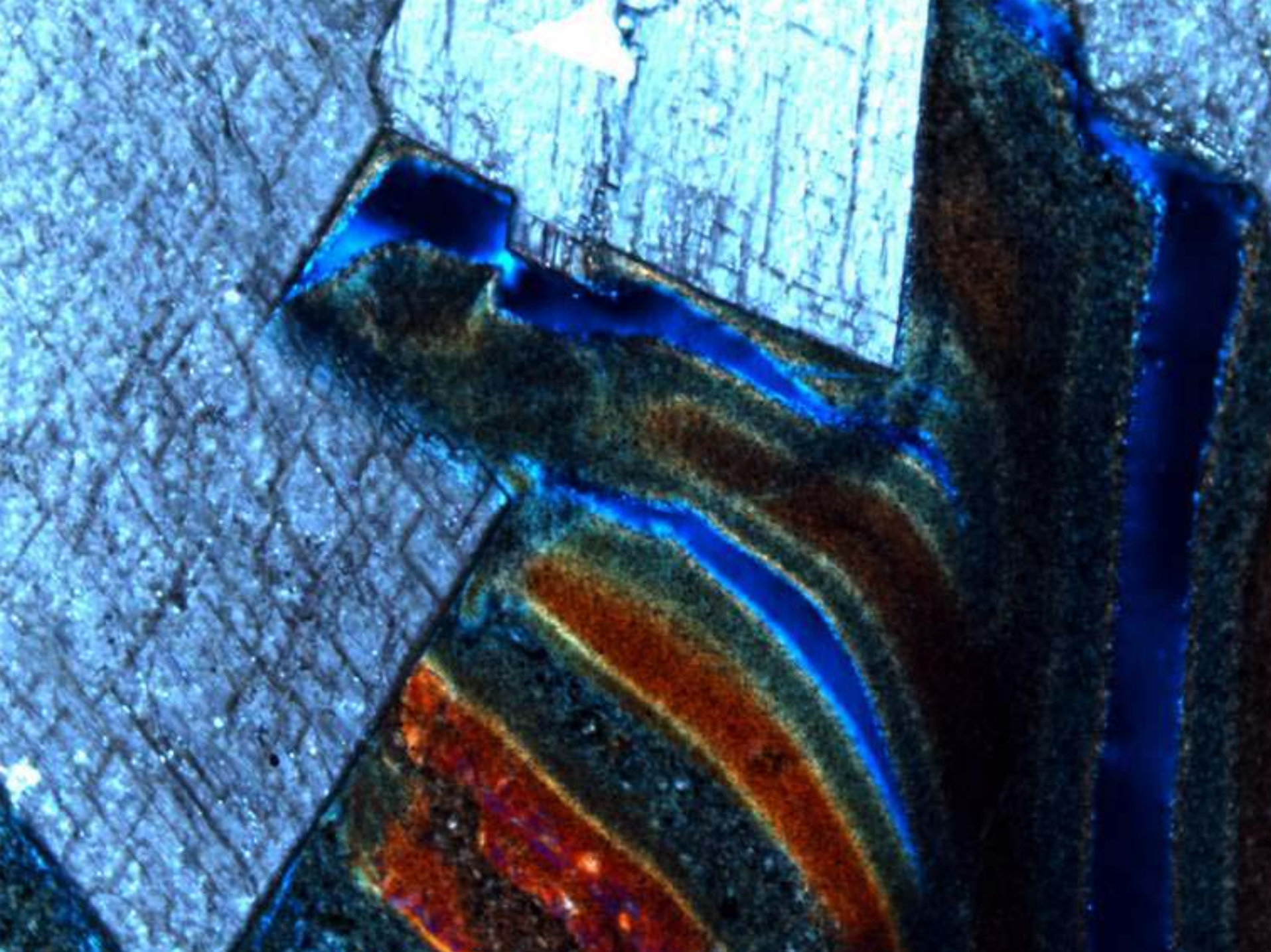



OH3372/1822.9 ft.
SADDLE DOLOMITE IN VUG









CONCLUSIONS