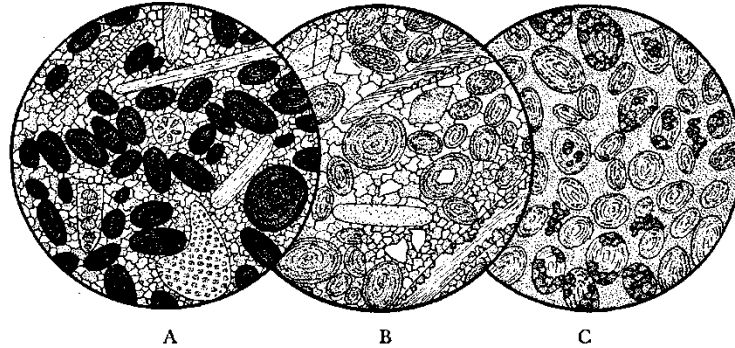


## GY 402 Sedimentary Petrology (2017)

## Carbonate Thin-Sections

## 2: Non-biogenic and skeletal allochems



Oolite grainstones in thin section (field of view for each approximately 2 mm).  
From Williams, H., Turner, F.J and Gilbert, C.M., 1954. Petrography. W.H. Freeman & Co., 406pp.

**Introduction:** It is now time to start looking at more interesting carbonate rocks. As we discussed in the labs, the carbonates differ from their siliciclastic cousins in being 1) mostly monomineralic (i.e.,  $\text{CaCO}_3$  and/or  $\text{CaMg}(\text{CO}_3)_2$ ); 2) texturally-distinguished and 3) much more fun. The task you have in store for you this week is to learn to recognize some of the allochems (e.g., carbonate grains) that comprise the carbonate rocks. In this weeks lab, you will meet an eclectic mixture of non-biogenic grains (ooids, intraclasts and peloids) and biogenic (skeletal) allochems. You might see echinoderms, corals, bryozoans, bivalves, gastropods, foraminifera and God only knows what else. Each beastie has its own characteristics: learn what they are.

**Lab exercise (do in your note books, not re-doable):** This week is a bit different from previous weeks labs. I would like you to do 2 things:

1) Identify and sketch at least one of each of the allochems indicated below. See the list of thin sections on the next page to help you look for these grains:

|            |                   |                     |                      |                 |                |
|------------|-------------------|---------------------|----------------------|-----------------|----------------|
| <i>oid</i> | <i>peloid</i>     | <i>intraclast</i>   | <i>coral(rugose)</i> | <i>bryozoan</i> | <i>mollusk</i> |
|            | <i>brachiopod</i> | <i>foraminifera</i> | <i>echinoderm</i>    |                 |                |

2): Do a proper petrographic description of one of the ooid grainstone thin-sections listed below. All have accompanying hand specimens

Sed 68 (x3), Sed 69 (x4), S-30 (x2), Sed 70 (x4), A3005, Dh27, SX7, S7, S9, Oolite 25, DH 99  
\*-this thin section contains poorly developed ooid (more like coated grains)

**Discussion Question (re-doable):** The isn't assigned discussion question for the labs this week.

**Due Date:** I expect a bunch of allochem sketches and 1 thin section report in your notebooks by the deadline specified on the website and the class calendar.

The following thin sections contain some representatives of the allochems indicated, **but do not limit your selection to just those listed below**. The target allochems are common in most limestones.

| Thin section | ooids | peloids | intraclasts | corals | bryozoans | molluscs  | brachiopods | forams | echinoderms |
|--------------|-------|---------|-------------|--------|-----------|-----------|-------------|--------|-------------|
| A2006 (2)    |       |         |             |        |           |           | ♦           |        | ♦           |
| A4127        |       |         |             | ♦      |           |           |             |        |             |
| ART (3)      |       |         |             |        | ♦         |           |             |        | ♦           |
| BG2 (4)      | ♦     |         | ♦           |        |           |           |             |        |             |
| Burdekin 8   |       |         |             | ♦      |           |           |             |        |             |
| C1           | ♦     |         |             |        |           |           |             |        |             |
| C24          |       | ♦       |             |        |           |           |             |        |             |
| C29          |       | ♦       |             |        |           |           |             |        |             |
| C33          |       | ♦       |             |        |           |           |             |        |             |
| C34          |       | ♦       |             |        |           |           |             |        |             |
| DE2-4        |       |         |             |        |           | ♦         |             |        |             |
| DH 24        |       |         |             |        | ♦         |           | ♦           |        | ♦           |
| DH 28        | ♦     |         |             |        |           |           |             |        |             |
| DH 27        | ♦     |         |             |        |           |           |             |        |             |
| DH 99        | ♦     |         |             |        |           |           |             |        |             |
| MAS S3       |       |         | ♦           |        |           |           |             |        |             |
| Justin 2     | ♦     | ♦       |             |        |           |           |             |        |             |
| L1           |       |         |             |        |           |           |             |        |             |
| OAKVILLE 1   |       |         |             |        |           | ♦(snails) |             |        |             |
| RI 3151 (2)  |       |         |             | ♦      |           |           |             |        |             |
| RI 5012 (7)  |       |         |             |        |           |           | ♦           | ♦      | ♦           |
| S1           | ♦     |         | ♦           |        |           |           |             |        |             |
| S3 (2)       | ♦     |         |             |        |           |           |             |        |             |
| S4           | ♦     |         |             |        | ♦         |           | ♦           |        | ♦           |
| S5           | ♦     |         |             |        | ♦         | ♦         | ♦           |        | ♦           |
| S7           | ♦     | ♦       |             |        |           |           |             |        |             |
| S8           | ♦     |         | ♦           |        |           |           |             |        |             |
| S9           |       |         |             |        |           | ♦         |             | ♦      |             |
| S10*         | ♦     |         |             |        |           |           |             |        |             |
| S13(2)       |       |         |             |        | ♦         |           | ♦           | ♦      | ♦           |
| S15          |       |         |             |        |           | ♦         |             |        |             |
| S19a         |       |         |             |        |           |           | ♦           |        | ♦           |
| S30          | ♦     | ♦       |             |        |           |           |             |        |             |
| S37          |       |         |             | ♦      |           |           |             |        |             |
| S73          |       |         |             |        |           | ♦         |             |        |             |
| SED 20a      |       | ♦       |             |        |           |           |             |        |             |
| SED 20b      | ♦     | ♦       |             |        |           |           |             |        |             |
| SED 82 (2)   |       |         |             | ♦      |           |           |             |        |             |
| SED 98       | ♦     |         |             |        |           |           |             |        |             |
| SED 214      |       |         |             |        |           |           | ♦           |        | ♦           |
| SED 215      |       |         |             |        |           |           | ♦           |        | ♦           |
| SED 216      |       |         |             |        |           |           | ♦           |        | ♦           |
| SED 222      |       |         |             |        |           |           | ♦           |        | ♦           |

|                     |              |                |                    |               |                  |                 |                    |               |                    |
|---------------------|--------------|----------------|--------------------|---------------|------------------|-----------------|--------------------|---------------|--------------------|
| SED 300 (2)         |              |                |                    |               |                  |                 |                    | ♦             |                    |
| SED 921             |              |                |                    | ♦             |                  |                 |                    |               |                    |
| <b>Thin section</b> | <b>ooids</b> | <b>peloids</b> | <b>intraclasts</b> | <b>corals</b> | <b>bryozoans</b> | <b>molluscs</b> | <b>brachiopods</b> | <b>forams</b> | <b>echinoderms</b> |
| SED 999             |              |                |                    |               | ♦ archimedes     |                 |                    |               |                    |
| SED 1412 (2)        |              |                |                    |               | ♦                |                 | ♦                  |               |                    |
| SX                  | ♦            |                |                    |               | ♦                |                 | ♦                  |               | ♦                  |
| SX2                 | ♦            |                | ♦                  |               |                  |                 |                    |               |                    |
| SX3 (2)             | ♦            |                |                    |               | ♦                |                 | ♦                  |               | ♦                  |
| SX4                 |              |                |                    |               | ♦                |                 | ♦                  |               | ♦                  |
| SX5                 |              |                |                    |               | ♦                |                 | ♦                  |               | ♦                  |
| SX6                 |              |                |                    |               |                  | ♦               |                    | ♦             | ♦                  |
| 96-40               |              |                |                    |               |                  | ♦               |                    | ♦             |                    |
| SX21 (4)            | ♦            |                |                    |               |                  |                 |                    |               |                    |
| 1004                |              |                |                    |               |                  |                 |                    | ♦             |                    |
| 3099-1-5            |              |                |                    |               |                  |                 |                    | ♦             |                    |
| 3099-1-7            |              |                |                    |               | ♦                |                 | ♦                  |               | ♦                  |