DEVELOPMENT OF SILURIAN AND DEVONIAN LITHOSTRATIGRAPHIC NOMENCLATURE, CENTRAL–WESTERN AND NORTHWESTERN OHIO

Glenn E. Larsen, 1991

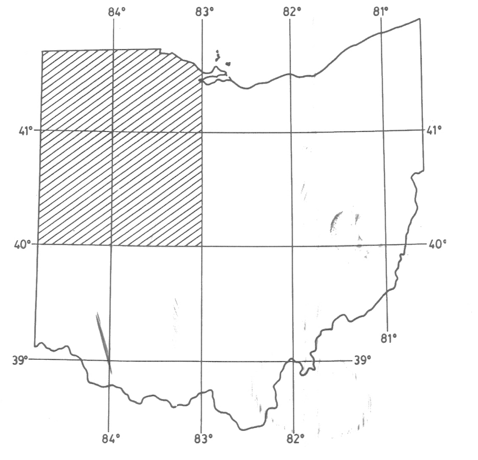

Figure 1. Map of Ohio with hatchured area showing the area which this chart applies.

EXPLANATION

In early 1990 the Ohio Division of Geological Survey began the task of remapping the geology of the State of Ohio with support from the U.S. Geological Survey through the National Cooperative Geologic Mapping Program (COGEOMAP). The Ohio Division of Geological Survey initiated the COGEOMAP project in western Ohio. In preparation for geological mapping, this chart summarizing the historical development of the lithostratigraphic nomenclature, applied to the rocks of central-western and northwestern Ohio (fig. 1), was constructed. The chart was designed to provide a means to evaluate the significance of the existing nomenclature of central-western and northwestern Ohio, to correlate the antiquated nomenclature first published in the 1800's with the modern-day nomenclature, and to help develop a suitable stratigraphic framework when stratigraphic problems occur.

The succession of columns of stratigraphic names which make up the chart are arranged in chronological order so that the historical development of the lithostratigraphic nomenclature can be traced. Annotations are included and numbered to correspond with numerals in the columns on the chart for easy reference. The chart only traces the published Silurian and Devonian lithostratigraphic nomenclature considered to be significant to previous stratigraphic work done in central-western and northwestern Ohio. The nomenclature for the Ordovician rocks was excluded because detailed historical summaries have already been done by Weiss and Norman (1960) and Tobin (1986).

The vertical scale generally corresponds to time, following Shaver et al. (1984, 1986) and Hull (1990). The absence of beds or hiatuses are indicated by parallel vertical lines. Boundary lines between units are shown as horizontal solid, dashed, or wavy lines. Solid lines indicate definitely defined boundaries. Dashed lines and question marks indicate the boundary of the unit was not definitely defined. Wavy lines represent unconformities as noted by the author listed on the column. Diagonal lines indicate interval not seen or not described.

ANNOTATIONS

1 The Bedford Shale may have been incorporated with the Bituminous Shale as used by the 1st Ohio Geological Survey in the 1838 2nd Annual Report (see Briggs, 1838b, and Locke, 1838).
2 Newberry (1870) and Orton (1870) considered the Cliff Limestone of Locke (1838) as the interval from the base of the Clinton to the base of the Huron Shale. Locke restricted the term to the Niagara Limestone.
3 Briggs (1838b, p. 121) first described the dolomite exposures along Tymochtee Creek, Wyandot County, which later became the type section of Winchell's (1873) Tymochtee Slate (Tymochtee Dolomite in modern usage).
4 New York stratigraphy was adopted by the Ohio Geological Survey in the 1870's. The New York stratigraphic section was the standard for other state surveys during the later 1800's.
5 Newberry (1870, p. 18) applied the term Hamilton Group to a bluish, marly limestone, which probably is either the lower limestone facies of the Olentangy Shale or a lateral equivalent.
6 Newberry (1870, p. 15) applied the term Water-Lime on the basis of correlations made using fossils.
7 Newberry (1870, p. 16) applied the term Salina Group to the gypsum- or salt-bearing rock found in Sandusky and Lucas Counties. Later Gilbert (1871, p. 493), Orton (1871, p. 287; and 1887), and Newberry (1873, p. 63, 132-135) only used this term to classify the salt/gypsum sequences in northern Ohio. Orton (1888, p. 15-16) abandoned the use of Salina because the gypsum/salt sequences occurred within the middle of the Lower Helderberg Formation and not below it, as in New York. Kahle and Floyd (1971) contend Newberry's (1870) Salina was equivalent to the Greenfield and Tymochtee Dolomites in western Ohio.
8 The term Greenfield was first introduced by Orton (1871, p. 288, 292) for an economic bed of dolomite within the Water-Lime Group. The stratigraphic position of the Greenfield was poorly defined.
9 The term Cedarville was first introduced by Orton (1871, p. 277-278, 297-306) but was used synonymously with the term Guelph (see Nicholson, 1875, p. 344). The term Pentamerus Limestone was used for a lateral facies containing an abundance of *Pentamerus* brachiopods.
10 The term Springfield was first introduced by Orton (1871, p. 271, 297). However, he did not fully describe or give a type location for the Springfield until later (Orton, 1873, p. 467-468).
11 Newberry (footnote to Winchell, 1874, p. 289, 290) considered the Olentangy Shale as a facies of the Huron Shale. However, Winchell (1874, p. 287-289) considered it as an independent formation underlying the Huron Shale.
12 Hamilton Group follows usage of Winchell (1874, p. 189-296).
13 Corniferous Group follows usage of Newberry (1873).
14 According to Keroher et al. (1966), Mather (1859, p. 25) first introduced the name Columbus Limestone.
15 In 1873 the Ohio Geological Survey used Helderberg Group for this interval. In 1874 Lower Helderberg Formation was used.
16 In 1874 the Ohio Geological Survey considered the Waterlime as a member of the Lower Helderberg Formation.
17 Winchell (1873 and 1874) subdivided the Waterlime into three units termed "Phases." According to Winchell, only the lower two Phases (Phases 2 and 3) are present in western Ohio. Phase 3 is equivalent to Winchell's (1873), Tymochtee Slate. Winchell's Phase 2 is equivalent to the undifferentiated Salina dolomite of Janssens (1977).
18 Orton (1873, p. 467-468) defined the type area and lithology of the Springfield Limestone from exposures around the city of Springfield, Clark County, Ohio.
19 The stratigraphic interval of the Tymochtee was poorly defined by Orton (1888). He described it as occurring slightly below the middle of the Waterlime Formation and 100-200 feet above the top of the Niagara Group.
20 Foerste (1896, p. 188-189) named the Clinton Limestone the Montgomery Formation in Montgomery County, Ohio.
21 Prosser (1903, p. 537) gave priority to Sandusky Limestone as a stratigraphic term. Newberry (1873) introduced the term Sandusky Limestone. Orton (1878) introduced the term Delaware Limestone.
22 Prosser (1903) proposed the name Lucas Limestone Member for the interval between the Columbus Limestone and the Sylvania Sandstone Member in northwestern Ohio. Stauffer (1909) followed Prosser's definition of Lucas Limestone. Sherzer and Grabau (1909) restricted the Lucas when they divided the lower portion of the interval into the Amherstburg Dolomite and Anderdon Limestone.
23 Prosser (1903, p. 539) considered the entire interval between the Cedarville Limestone and the Sylvania Sandstone as the Tymochtee Member of the Monroe Formation. According to Prosser, the Greenfield "Limestone" is laterally equivalent to the Tymochtee in southern and central Ohio.
24 Correlation of Prosser's usage of West Union Limestone with usage by earlier workers is based in part on correlation chart by Wilmarth (1930).
25 Usage of Osgood Beds follows Foerste (1900).
26 Placement of the Dayton Limestone within the Osgood Beds follows Foerste (1900, p. 80). In 1916 Prosser restricted the term Osgood, in Ohio, by separating the Dayton Limestone from the interval.
27 Prosser (1903) correlated the Columbus Limestone with the Dundee Limestone of Michigan. Stauffer (1909), Sherzer and Grabau (1909), Carman (1927), and Stewart (1927, 1938) made the same correlation as Prosser. Cooper et al. (1942) correlated the Dundee Limestone to the Delaware Limestone of central Ohio, the currently accepted interpretation (Hull, 1990).
28 Sherzer and Grabau (1909) and Lane, Prosser, Sherzer, and Grabau (1909) proposed the Amherstburg Dolomite and adopted the Anderdon Limestone as subdivisions of the Upper Monroe. The Raisin River and Put-in-Bay Dolomites were proposed as subdivisions of the Lower Monroe.
29 Sherzer and Grabau (1909) placed the Silurian-Devonian contact at the base of the Sylvania Sandstone. Prior to 1909 the contact had been placed either at the base of the Greenfield Dolomite or the top of the Sylvania Sandstone.
30 Lane, Prosser, Sherzer, and Grabau (1909) renamed the Lower and Upper Monroe the Bass Islands and Detroit River Series, respectively. Prior to the introduction of the time-rock classification by the American Commission of Stratigraphic Nomenclature (1947), series was used as a rock-stratigraphic unit higher in rank than group. However, series were defined primarily on fossil content.
31 The term Greenfield was originally introduced by Orton (1871, p. 288-292). According to Prosser (1903, 1905), Orton did not use the term as a formal stratigraphic name. Orton formally used the Helderberg Limestone to identify rocks within this interval. Prosser gives Grabau (1898, p. 800) credit for introducing the term Greenfield as a formal stratigraphic name.
32 Brassfield Limestone as originally used by Foerste (1905, p. 156; and 1906, p. 10, 27).
33 Foerste (1917) named Prosser's (1916) Mottled Zone the Euphemia Dolomite.
34 Carman (1927) considered the Bass Island and the Detroit River as formations. According to Carman the Detroit River Formation in Ohio is represented by the Lucas and Amherstburg Dolomites. Note that Carman dropped the "s" on Islands. Term was restored to Bass Islands by Oliver et al. (1969).
35 Centerville Shale as originally named by Foerste (1931) from exposures around Centerville in Montgomery County, Ohio; underlies the Belfast bed.
36 Silurian correlations from Swartz et al. (1942), Devonian correlations from Cooper et al. (1942).
37 On Calvert's (1960) stratigraphic column the Anderdon was moved from underlying the Amherstburg to overlying the Lucas Dolomite, following Ehlers' (1950) revisions. Keroher et al. (1966) classified the Anderdon as a member of the Lucas Formation.
38 Summerson (1963, p. 48, 51) described the Guelph Dolomite in Ohio as being composed of reef, reef-flank, and inter-reef facies. According to Summerson, the Guelph serves as a general-purpose term as the Huntington did in Indiana. The term Guelph was restricted to northwestern Ohio.
39 Stratigraphic rank of the Belfast bed was uncertain until Rexroad et al. (1965, p. 7-11) designated it a member of the Brassfield Limestone.
40 According to Shaver et al. (1970, p. 44), the correlation of the Pendleton Sandstone with the basal sandstone of the Detroit River Group in Ohio and Michigan is uncertain.
41 Pinsak and Shaver (1964) defined Niagaran-age biohermal or reef-facies rocks of northern Indiana as the Huntington Lithofacies.
42 Burger et al. (1971) apparently followed Pinsak and Shaver (1964) in considering the Cedarville Dolomite as pre-Guelph in age and correlated the Ohio Guelph Dolomite to the Huntington Lithofacies of Indiana.
43 Salamonie Dolomite as defined by Pinsak and Shaver (1964).
44 Limberlost Dolomite introduced by Droste and Shaver (1976).
45 Janssens (1977, p. 18) redefined Lockport using nomenclature from Ontario, Canada. Lockport is used as a group when the cherty Goat Island Dolomite is present. In areas where the Goat Island Dolomite does not occur, the overlying Guelph Dolomite and underlying Gasport Dolomite cannot be differentiated, thus the term Lockport is used as an undivided formation. Janssens considered the biostromal or biohermal dolomites as Lockport Dolomite (Formation).
46 Placement of Niagaran-Cayugan Series boundary according to Shaver et al. (1984, 1986).
47 Placement of Alexandrian-Niagaran Series boundary according to Shaver et al. (1984, 1986).
48 Placement of Alexandrian-Niagaran Series boundary according to Janssens (1977).
49 The term Tenmile Creek Dolomite was introduced by Stewart (1938, p. 6 and 7). Stewart, however, credits J. E. Carman as the originator of the name Tenmile Creek Dolomite in an unpublished manuscript.
50 The name Silica Shale was proposed by Stewart (1927, p. 5).

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LEGEND TO CHART

- Intervals not included in individual investigations.
- Intervals considered absent by individual investigators.
- Unconformity
- Reef or bioherm facies.

ABBREVIATIONS ON CHART

Dolo. — Dolomite
Fm. — Formation
Grp. — Group
Ls. — Limestone
Mbr. — Member
Ss. — Sandstone

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