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SERIAL SUBDIVISION OF THE EARLY CARBONIC SUCCESSION IN THE CONTINENTAL INTERIOR.

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As the taxonomic consideration of the Early Carbonic formations of the American continent has proceeded during the quarter of a century just passed, complication, rather than simplification, has taken place. Systematic arrangement of the terranes has become less rather than more clearly defined. The recent attempt to amplify one of the subordinate divisional titles so as to cover the whole has been attended by rather incongruous consequences. Small real advancement has resulted from mere change in nomenclature. Bureaucratic authority has been unable to take the place of fact, and its dictates have been as unfortunate, as they have been unsatisfactory and unreal.

That present custom is as unsatisfactory as it is inexpressive of actual genetic relationships between the various terranes represented on the American continent is amply indicated by a number of incidents. For example, Chamberlin and Salisbury[1] propose to give the Early Carbonic interval a taxonomic rank righer than it has been the custom to do, and to have it represent a periodical division, thus paralleling it with Carbonic itself, Cambric or Cretacic. Both Schuchert[2] and Ulrich[3], in recent arguments, strongly support either restriction of the term Mississippian, as now widely applied in America, or abandonment of it altogether. They suggest also new subdivision.

Were the Early Carbonic rocks of the continental interior reviewed anew today, without reference to any arrangement or subdivision already proposed, it is quite likely that a tripartite scheme would be, without much discussion, adopted. Upon grounds faunal, genetic, lithologic, stratigraphical, structural, diastrophic and paleogeographical, there is close agreement upon at least two major divisional lines. It so happens that these lines also correspond to the early subdivision deliminations. If, without too much disturbance in nomenclature and conception, these subdivisions can be readily used and the various local sections adapted to them, great and permanent advancement in provincial stratigraphy will have been made. This appears possible.

[1]Text-book of Geology, Vol. II, p. 160, 1906.
[2]Bull. Geol. Soc. America, Vol. XX, p. 548, 1910.
[3]Ibid., Vol. XXII, p. 608, 1911.

The two divisional lines which are most striking in the Early Carbonic sequence of the Mississippi valley are those at the base of the Burlington or Chouteau limestone and at the bottom of the St. Louis limestone. Both of these lines were pointed out by Owen[4] as early as 1852. Upon strictly faunal grounds, they were especially defined by me[5] in 1889. Two years later Williams[6] also recognized them and proposed new titles for the faunas of these subdivisions thus suggested. In 1892 I again[7] distinctly called attention to the same lines and also another of subordinate importance. Lately Schuchert[8] and Ulrich[9] propose still another grouping of the formations but draw the line of separation at or near the base of the St. Louis limestone. In the Iowa section, as lately reviewed,[10] I do not especially emphasize any subserial grouping.

In view of the fact that in late years two new criteria have come to have a dominant influence in stratigraphic classification and the faunal standard is largely displaced, the conception of rational grouping of terranes is somewhat changed. These two factors are diastrophic record and paleogeographical distribution. The two division lines here noted happen to be products of both diastrophic movement and paleogeographical limitation. They mark provincial effects, not continental or universal changes. The sections which they limit therefore have a taxonomic rank that is neither higher nor lower than that of series.

The three series thus demarcated are already designated by special names which, with slight modification in scope, may be appropriately retained.

The nethermost set of terranes corresponds to the section which in Ohio was early defined as the Waverly formation, in Michigan as the Marshall group, in Illinois and Iowa as the Kinderhook beds, and in Missouri latterly as the Chouteau section. Since the main and most widely distributed limestone section constitutes the middle series, the term Mississippian is appropriately restricted to it; and this also is very nearly Winchell's original use of the title. The lately proposed name, Tennessean, for the uppermost series, is useful and valid because the term Ste. Genevieve was already preoccupied for one of the subordinate limestones.

Little need be said here concerning the Waverlyan or the Tennessean series. Regarding the term Mississippian, a word or two may not be

[4]Rept. Geol. Surv. Wisconsin, Iowa, and Minnesota, p. 92, 1852.
[5]Am. Jour. Sci., (3), Vol. XXXVIII, p. 186, 1889.
[6]Bull. U. S. G. S., No. 80, p. 169, 1891.
[7]Bull. Geol. Soc. Vol. III, p. 263, 1892.
[8]Ibid., Vol. XX, p. 548, 1910.
[9]Ibid., Vol. XXII, p. 608, 1912.
[10]Iowa Geol. Surv., Vol. XXII, p. 154, 1913.

out of place. The formations of the Rocky mountains, which are commonly called by this title, probably represent little more than the Burlington and Keokuk limestones of the continental interior. Hence, the use of the term in a somewhat restricted sense is not out of place and will give rise to but small confusion.

As it now appears, the correlation of the Iowa section of Early Carbonic, with other characteristic sections, is given below:

CORRELATION OF EARLY CARBONIC TERRANES.

	Iowa.	Missouri.	Illinois.	Indiana.	Ohio.	Pennsylvania.
	Unconformity	Unconformity	Unconformity			
	Wanting	Chester Sh.	Chester Sh.	Birdville Sh.		
	Wanting	Kaskaskia Li.	Kaskaskia Li.	Tribune Li.		
TENNESSEAN.	Wanting	AuxVases Ss.	Cypress? Ss.			
			Ohera Li.			
	Wanting	Ste. Genevieve	Rosiclare Li.	Mitchell Li.	Maxwell Li.	Greenbrier Ss.
			Fredonia Li.			
	Pella Sh.					
	St. Louis Li.	St. Louis Li.	St. Louis Li.			
	Verdi Ss.					
	Unconformity		Unconformity			
	Spergen Li.	Spergen Li.	Spergen Li.	Spergen Li.		
	Warsaw Sh.	Warsaw Sh.	Warsaw Sh.	Warsaw Sh.		
	Keokuk Li.	Keokuk Li.	Keokuk Li.	Keokuk Li.	Logan Ss.	Pocono Ss.
MISSISSIPPIAN.	Montrose Ch.	Montrose Ch.	Montrose Ch.			
	Burlington Li.	Burlington Li.	Burlington Li.			
	Chouteau Li.	Chouteau Li.	Chouteau Li.			

WAVERLYAN.					
Unconformity?	Unconformity?	Unconformity?			
Hannibal Sh.	Hannibal Sh.	Hannibal Sh.	New Providence	Cuyahoga	Grainger Sh.
Louisiana Li.	Louisiana Li.	Louisiana Li.	Rockford Li.		(Upper part)
Saverton Sh.	Saverton Sh.	Chattanooga		Sunbury Sh.	
				Berea Ss.	Chattanooga Sh.
Grassy Sh.	Grassy Sh.		New Albany Sh. (Upper part)	Bedford Sh.	
				Cleveland	
Unconformity	Unconformity	Unconformity			