IC MAP
OF
LVANIA

PENNSYLVANIA GEOLOGICAL SURVEY, *FOURTH SERIES*

COMPILED and EDITED
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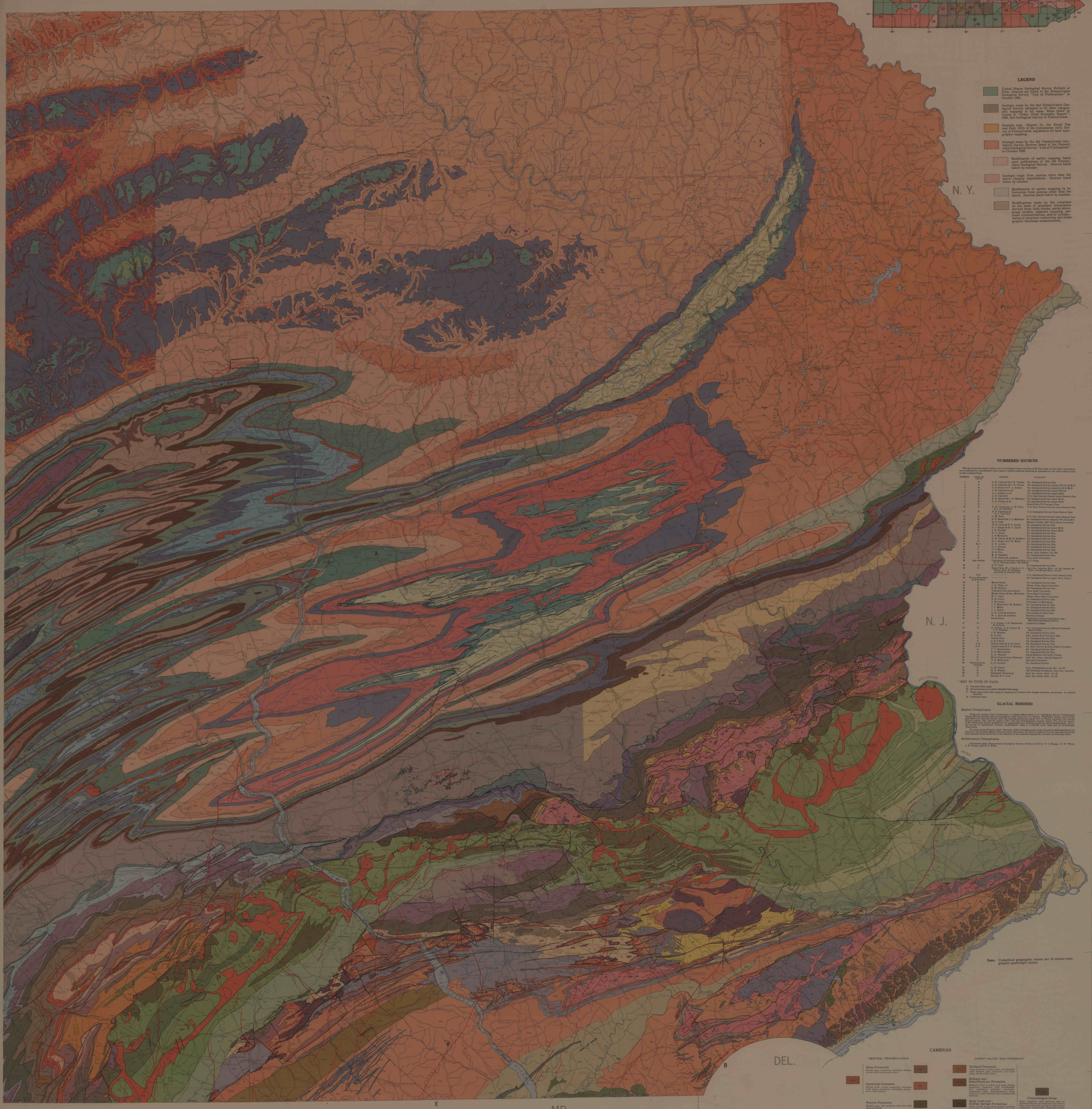

SOURCE OF DATA

INDEX MAP

LEGEND

- United States Geological Survey Bulletin or Folio. Sources are listed in the Pennsylvania Geological Survey "List of Publications" to October 1958.
- Geologic maps by the 2nd Pennsylvania Geological Survey- adjusted to fit later topographic mapping in all cases. Maps listed by county in "Index- Final Summary Report", 1886, 2nd Geological Survey of Pennsylvania.
- Geologic map (Report 10, the Broad Top coal field, 1913) of the Commission (3rd) Survey of Pennsylvania- adjusted to fit later topographic mapping.
- Geologic maps by the 4th Pennsylvania Geological Survey. Sources listed in the Pennsylvania Geological Survey "List of Publications" to October 1958.
- Modification of earlier mapping based upon publications of the 4th Pennsylvania Geological Survey. Sources listed below by number.
- Geologic maps from sources other than the above (largely unpublished). Sources listed below by number.
- Modification of earlier mapping by information from sources other than the above. Sources listed below by number.
- Modifications made by the compilers on the basis of scattered information derived from field checks, aerial photograph studies, adjacent mapping, personal communications, and/or extrapolation of structure contouring and stratigraphic thickness measurements.

NUMBERED SOURCES

The list of sources below refers only to numbered items covering solid blue areas on the index map above, as to published or unpublished items used to modify existing mapping as indicated on the index map by blue or red crosshatching.

NUMBER	TYPE OF DATA	AUTHOR	LOCATION
1	D	S. H. Carlstart & I. H. Tanner	Pa. Geological Survey files
2	D	S. H. Carlstart & C. S. Fettke	Pa. Geological Survey reports FT-211 & M-21
3	D	C. S. Fettke & F. A. Dickey	Pa. Geological Survey reports FT-214 & M-21
4	D	S. H. Carlstart et al.	Pa. Geological Survey report M-21
5	D	A. I. Ingham et al.	Pa. Geological Survey report M-26
6	B	L. D. Carswell	U. S. Geol. Survey Ground water Branch files
7	D	R. E. Sherrill & L. S. Matteson	Pa. Geological Survey report M-34
8	D	F. A. Dickey et al.	Pa. Geological Survey report M-25
9	B		Smith Penn Oil Company files
10	B	A. W. Grossman, C. W. Pauli, & L. D. Carswell	U. S. Geol. Survey Ground water Branch files
11	B	R. D. Patterson & A. J. Van Liew	U. S. Geological Survey Finch Branch files
12	A	C. W. Pauli	U. S. Geol. Survey Ground water Branch files
13	D	R. E. Sherrill & L. S. Matteson	Pa. Geological Survey Reports FR 12 & M-7
14	B	R. E. Sherrill	Master's thesis, 1951, Penn State University
15	B	W. S. Lytle & H. V. Gouse	Pa. Geological Survey files
16	D	R. C. Bolger & H. V. Gouse	Pa. Geological Survey report M-32
17	D	J. D. Ebright	Pa. Geological Survey report M-30
18	C	H. V. Gouse	Pa. Geological Survey files
19	D	J. F. McCauley	Pa. Geological Survey files
20	C	G. H. Ashley & M. N. Shaffner	Pa. Geological Survey files
21	B	R. C. Bolger & J. H. Weiss	Pa. Geological Survey files
22	B,C	G. H. Ashley	Pa. Geological Survey files
23	A	H. C. Sheppe	Pa. Geological Survey files
24	A	F. T. Ashley	Pa. Geological Survey files
25	A	R. D. Fox	Assoc. Geol. Testers, col. 100
26	A	M. N. Shaffner	Pa. Geological Survey files
27	B	F. M. Swartz & students	Penn State University
28	Age change	Conversion of surfaces including A. T. Cross, R. M. Thomson, and J. M. Schopf	U. S. Geological Survey files
29	A	M. N. Shaffner	Pa. Geological Survey files
30	B	Royal Chas. W. J. Sands, J. L. Wilson, & R. S. Bowman	Geol. Soc. Amer. Bull., vol. 59, memoir 46; Wilson, Sands, and Bull., vol. 57; compiled by Carlyle Gray
31	A, D		U. S. Geological Survey Finch Branch files
32	Poteau Boundary modification		Pa. Geological Survey report W-4, Plate 1
33	B	Morris Rosse	Pa. Geological Survey files
34	B	J. E. Thaxe, Jr.	Thesis, Penn State University
35	A	D. M. Hoskins	Pa. Geological Survey files
36	B	Wakefield Dort & students	Penn State University
37	B	Lewis Snow & Geo. McCallie	Penn State University
38	B	W. C. Lacy	Thesis, Penn State University
39	A	R. R. Conlin	Pa. Geological Survey files
40	B	J. M. Forsyth	University of Minnesota
41	B	J. T. Miller & D. M. Hoskins	Pa. Geological Survey files
42	A	J. T. Miller	Pa. Geological Survey files
43	A	J. L. Rosier	Pa. Geological Survey files
44	B	R. E. Lowe & students	City College of New York
45	B	W. L. Dean & students	Bowdoin College
46	D	Great Closs	Washington County Geological map, Maryland Geological Survey
47	B	J. L. Dyson, J. E. Beechower, & students	Lafayette College
48	B	H. Klemic, A. R. Taylor, & J. C. Wanless	U. S. Geological Survey Mineral Deposits Branch files
49	A	J. S. Moseley	Pa. Geological Survey files
50	C	S. S. Offutt	New Jersey Zinc Company files
51	A	J. H. Dennison	Pa. Geological Survey files
52	A	C. E. Ferree	Pa. Geological Survey files
53	A,B	Carlyle Gray & A. S. Geyer	Pa. Geological Survey files
54	A,B	Carlyle Gray & J. P. Hudson	Pa. Geol. Survey & Penn State University
55	A	T. V. Stalkwalker	Pa. Geological Survey files
56	A	D. B. McLaughlin	Pa. Geological Survey files
57	A	K. N. Weaver	Johns Hopkins University Thesis
58	D	Great Closs & Anna Hietanen	Geol. Soc. Amer. Special Paper 52
59	D	H. E. McCloskey	Harvard University
60	Nomenclature Changes	A. A. Socolow	Pa. Geological Survey
61	D	A. W. Pauli	Proc. Philadelphia Acad. Sci., vol. 32
62	D	E. R. Waters	100th Pudding Guidebook, Geol. Soc. America
63	D	Elizabeth Armstrong	Geol. Soc. Amer. Bull., vol. 52
64	D	Howell, B. F. et al.	Geol. Soc. Amer. Bull., vol. 66

* KEY TO TYPE OF DATA

- A- Detailed field maps
- B- Reconnaissance or partly detailed field maps
- C- Field notes other than maps or mapping of limited units (single horizons, structures, or mineral deposits)
- D- Published data

GLACIAL BORDERS

Eastern Pennsylvania

Wisconsin border from Coxsackie, N. Y. to Easton Mapping from U. S. Geological Survey Professional Paper 288 and detailed and reconnaissance field work by U. S. Dept. Wisconsin border south of Easton, Pa. Survey report (Pa. Survey report C-87) and the Northampton County report (Pa. Survey report C-88). Wisconsin border modified to fit topography and checked locally by aerial photographs. Illustrated on map of Pennsylvania without modification from a 1:1,584,000 scale map and in accordance with Pennsylvania.

The area of pre-Illinoian drift (Jerseyan drift including some areas of questionable glaciation) as shown on the map of Pennsylvania, 1931 and in Pa. Survey report (N) is not reproduced on this map because doubts exist as to the identity of the material mapped by Leverett as Jerseyan drift.

Northwestern Pennsylvania

All borders after Pennsylvania Geological Survey Bulletin G-32 by V. C. Shepps, G. W. White, J. B. Droste, and B. F. Stone.

Note: Underlined geographic names are 15 minute topographic quadrangle names.

L E G E N D

QUATERNARY
RECENT
- Sands of Presque Isle

PLEISTOCENE

NORTHWESTERN PENNSYLVANIA
- Border of Ashtabula drift
- Border of Hiram drift
- Border of Lavery drift
- Border of Kent drift
- Border of Illinoian drift

EASTERN PENNSYLVANIA
- Border of Wisconsin drift
- Cape May Formation (Qcm)

Cary Substage; Wisconsin Stage; Illinoian Stage

- Pennsauken Formation (Qtp) *Poorly sorted gravel and sandy clay.*
- Border of Illinoian drift

TERTIARY
PLIOCENE
- Bryn Mawr Formation (Tbm) *Poorly sorted sand, gravel, and clay.*

CRETACEOUS
LOWER ?
- Patapsco? Formation (Kp) *Fluvio colored clay with some sand.*

TRIASSIC
- Diabase (Td) *Dark gray, medium to coarse grained; composed chiefly of gray plagioclase feldspar and black or green augite.*
- Brunswick Formation or Gettysburg Formation (Tbr, Tg) *Brunswick and Gettysburg Red to brown, fine to coarse grained quartzose sandstone with red shale interbeds; interbedded shale and arkosic sandstone; locally contains considerable conglomerate. Inc. Stockbridge Member. It consists of gray arkosic sandstone, gray shale, and red shale; includes pebble conglomerate and limestone conglomerate.*
- Lockatong Formation (Tl) *Dark gray to black, thick bedded argillite with occasional zones of thin bedded black shale; locally has thin layers of impure limestone or calcareous shale.*
- Stockton Formation or New Oxford Formation (Ts) *Stockton and New Oxford. Light gray to buff, coarse grained arkosic sandstone and conglomerate; red and brown fine grained, micaceous sandstone, and red shale.*

PERMIAN
- Greene Formation (Pg) *Cyclic sequences of sandstone, shale, red beds and coals with clay and silt at the top of the Upper Washington Limestone.*

PERMIAN AND PENNSYLVANIAN
- Washington Formation (PPw) *Cyclic sequences of sandstone, shale, limestone and coal; zones rich in fossil plants with coal; base at the top of the Waynesburg Coal.*

PENNSYLVANIAN
APPALACHIAN PLATEAU
- Monongahela Formation (Pm) *Cyclic sequences of sandstone, shale, fireclays and coal; limestone prominent in lower part; base at the top of the Pittsburgh coal; Waynesburg (uppermost coal present) base at the bottom of the Pittsburgh Coal.*
- Conemaugh Formation (Pc) *Cyclic sequences of red and gray shale and sandstone; limestone prominent in upper part; coal seams present but not commonly present at base; Ames Limestone base at the top of the Brookville-Clarion Coal; Limestone in lower part of section.*
- Allegheny Group (Pa) *Cyclic sequences of sandstone, shale, limestone and coal; numerous commercial coal seams; Brookville-Clarion Coal; Vanport Limestone in lower part of section; includes Freeport, Kittanning, and Brush Creek Formations.*
- Pottsville Group (Pp) *Predominantly sandstone and conglomerate with thin shales and coals; some coals minable locally.*

ANTHRACITE REGION
- Post-Pottsville Formations (Ppp) *Brown or gray sandstone and shales with local conglomerate and numerous minable coals.*
- Pottsville Group (Pp) *Light gray to white, coarse grained sandstone and conglomerate with some minable coal; includes Sharp Mountain, Sharpsville and Tumbling Run Formations.*

MISSISSIPPIAN
- Mauch Chunk Formation (Pmc) *Red shales with brown to grayish gray flaggy sandstone; include Greenville Member in Fayette, Westmoreland, and Allegheny Counties; Greenville Member at the base in southeastern Pennsylvania.*
- Pocono Group (Mp) *Predominantly gray, hard, massive, cross-bedded conglomerate and sandstone with minor red shale; includes Burgoon, Mauch Chunk, Pocono, Burgoon, Cuyahoga, Cussewago, Corry, and Knapp Formations in Western Pennsylvania; Mississippian of M. L. Fisher in Potter and Tioga counties.*

DEVONIAN
UPPER
- Susquehanna Group (Ds) *Barbed line is "Chemung-Catskill" contact of Second Pennsylvania Survey. Catskill reports; barbs on "Chemung" side of line.*

WESTERN PENNSYLVANIA
- Oswayo Formation (Mos) *Greenish gray to gray shales, siltstones and sandstones; includes Knapp and locally shale; mostlyed, consolidated equivalent to Spoon Oswayo, Knapp Formation (C to Mis) Chemung Formation (Dc) in Mis Distinguishable north of Corte.*
- Cattaraugus Formation (Dcr) *Red, gray and brown shale and sandstone; red, gray and brown shale and flaggy sandstone; includes Conneaut Member of Girdler and Salamanca sandstone and conglomerate; Salamanca in Cattaraugus and Erie counties.*
- Conneaut Group (Dcn) *Alternating gray, brown, greenish and purple shales; Girdler and Conneaut Members of Girdler and Conneaut Formations; "Sliver" Formations of northwestern Pennsylvania.*
- Canadaway Formation (Dc) *Alternating brown shales and sandstones; Canadaway Formation of northwestern Pennsylvania.*

CENTRAL AND EASTERN PENNSYLVANIA
- Oswayo Formation (Mos) *Greenish and greenish gray, fine and medium grained sandstones with some shales and mottled calcareous zones; Knapp, Oswayo, Pocono Formations; Mississippian; conformity; Sinbelow to Spin Oswayo not proved.*
- Catskill Formation (Dcn) *Chiefly red to brownish shales and sandstones; includes gray and greenish sandstones; Catskill, Catskill, Catskill,