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BIBLIOGRAPHY

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NORTH AMERICAN GEOLOGY

FOR

1915

WITH SUBJECT INDEX

BY

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BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY FOR 1915, WITH SUBJECT INDEX.

By JOHN M. NICKLES.

INTRODUCTION.

The bibliography of North American geology, including paleontology, petrology, and mineralogy, for the year 1915 follows the plan and arrangement of its immediate predecessors. It includes publications bearing on the geology of the Continent of North America and adjoining islands; also Panama and the Hawaiian Islands. Papers by American writers on the geology of other parts of the world are not included. Textbooks and papers general in character by American authors are included; those by foreign authors are excluded unless they appear in American publications.

As heretofore, the papers, with full title and medium of publication and explanatory note when the title is not fully self-explanatory, are listed under the authors, arranged in alphabetic order. The author list is followed by an index to the literature listed. In this index the entries in one alphabet are of three kinds—first, subject, with various subdivisions, to enable the specialist to ascertain readily all the papers bearing on a particular subject or area; second, titles of papers, many of them abbreviated or inverted, under their leading words; and third, cross references, which have been freely used to avoid too much repetition. The subjects have been printed in black-faced type, the titles of papers and cross references in ordinary type. As it may not be always obvious which subject headings have been adopted, an outline of those used immediately precedes the index.

Miss Isabel P. Evans has given efficient assistance in the work.

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OUTLINE OF SUBJECT HEADINGS.

In the following index the subject headings are printed in black-faced type. An outline of these is here given that it may be quickly seen which subject heading of two or more synonyms has been adopted. Thus "petroleum" and not "oil" nor "rock oil" has been chosen. That the specialist may see at a glance under what headings to find cognate literature, subject headings that are more or less closely related have been grouped together under the following heads: Areal or regional, general, economic, dynamic and structural, physiographic, stratigraphic or historical, paleontology, petrology, mineralogy, underground water. In the index the specific entries under the areal or regional subject headings are alphabetized under these same heads arranged in the same order, namely, general, economic, etc.

AREAL OR REGIONAL.

The States and Territories of the Union, Alabama, Alaska, etc.; The Provinces of Canada, Alberta, etc.; Greenland; Arctic regions; Mexico; the countries of Central America; the West Indies, and the single islands; the Hawaiian Islands.

GENERAL.

Associations, meetings; Addresses; Philosophy; History; Biography; Bibliography; Education; Textbooks.

Surveys; Fieldwork; Excursions; Technique; Cartography.

Classification; Nomenclature.

Geochemistry; Chemical analyses (list); Geophysics; Atmosphere; Radioactivity.

Experimental investigations; Borings; Miscellaneous.

ECONOMIC.

Ore deposits, origin; Contact phenomena.

Gold; Placers; Black sands; Silver; Quicksilver; Nickel; Cobalt; Copper; Lead; Zinc; Iron; Magnetite; Manganese; Tin.

Aluminum; Bauxite; Antimony; Bismuth; Tungsten; Vanadium; Uranium; Carnotite ores; Molybdenum; Chromic iron ore.

Platinum; Palladium; Titanium; Rutile; Rare earths; Monazite; Zircon.

Coal; Anthracite; Lignite; Peat.

Petroleum; Natural gas; Oil shales; Asphalt; Albertite; Gilsonite; Bituminous rock.

Stone; Building stone; Granite; Trap; Bluestone; Limestone; Marble; Lime; Gypsum.

Sand; Glass sand; Silica; Quartz; Quartzite; Sandstone; Gravel; Cement and cement materials; Concrete materials; Road materials.

Clay; Kaolin; Bentonite; Fire clay; Ganister; Slate; Shale; Pyrophyllite.

Serpentine; Asbestos; Steatite; Soapstone; Talc.

Precious stones; Diamonds; Sapphires; Turquoise; Tourmaline; Onyx.

Abrasive materials; Corundum; Emery; Garnet; Diatomaceous earth; Tripoli; Volcanic ash; Pumice; Millstones; Whetstones; Novaculite; Feldspar.

Phosphate; Apatite; Potash; Alunite; Nitrate; Glauconite; Marl.
 Salt; Salines; Bromine; Calcium chloride; Borax; Fluorspar.
 Barite; Strontium; Mineral paints.
 Arsenic; Fuller's earth; Infusorial earth; Magnesite; Mica; Graphite.
 Phosphorus; Sulphur; Pyrite.
 Soils.

DYNAMIC AND STRUCTURAL.

Earth, genesis of; Earth, age of; Earth, interior of; Earth, temperature of.
 Volcanism; Volcanoes; Earthquakes; Seismology; Seismographs; Mud volcanoes.
 Isostasy; Orogeny; Changes of level.
 Magmas; Magmatic differentiation; Laccoliths; Intrusions; Dikes; Contact phenomena.
 Deformation; Folding; Faulting; Unconformities.
 Conglomerates; Concretions; Stalactites; Jointing; Cleavage.
 Denudation; Erosion; Coast changes; Coral islands and reefs; Weathering; Caves;
 Sink holes; Wind work; Dunes; Loess; Landslides.
 Glaciers; Glacial erosion; Glacial striae; Potholes; Kettle holes.
 Sedimentation; Eskers; Kames; Moraines.
 Drainage changes.

PHYSIOGRAPHIC.

Geomorphy; Relief maps.
 Plains; Prairies; Penepains; Valleys; Cirques; Deserts; Alluvial fans; Deltas;
 Mounds, natural; Sink holes; Karsts; Natural bridges.
 Rivers; Stream piracy; Meanders; Falls; Lakes; Swamps; Marshes; Everglades.
 Terraces; Beaches; Shore lines.

STRATIGRAPHIC OR HISTORICAL.

Geologic history; Geologic time; Paleogeography; Paleogeographic maps; Paleoclimatology.
 Geologic maps; Geologic formations described (list); Tables of formations; Unconformities; Borings.
 Pre-Cambrian; Paleozoic (undifferentiated); Cambrian; Ordovician; Silurian; Devonian; Carboniferous; Mesozoic (undifferentiated); Triassic; Jurassic; Cretaceous; Tertiary; Quaternary; Recent.
 Glacial geology; Glaciation; Drift deposits; Glacial lakes; Erratic boulders; Ice ages (ancient).

PALEONTOLOGY.

Geographic distribution; Evolution; Restorations.
 Vertebrata; Man, fossil; Mammalia; Aves; Reptilia; Amphibia; Pisces; Footprints.
 Invertebrata; Arthropoda; Crustacea; Trilobita; Ostracoda; Insecta; Arachnida; Myriapoda.
 Mollusca; Cephalopoda; Gastropoda; Pelecypoda.
 Molluscoidea; Brachiopoda; Bryozoa; Vermes.
 Echinodermata; Echinoidea; Asteroidea; Crinoidea; Cystoidea.
 Coelenterata; Anthozoa; Hydrozoa; Graptolites.
 Protozoa; Spongida; Foraminifera.
 Paleobotany; Diatoms; Algæ.
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PETROLOGY.

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MINERALOGY.

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UNDERGROUND WATER.

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- Bearpaw shales, Cretaceous, Alberta: Dowling, 371.
- Bearpaw shales, Cretaceous, Montana: Sternberg, 1042.
- Beaver group, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Krebs and Teets, 659.
- Beaverdell quartz monzonite, Eocene(?), British Columbia: Reinecke, 841.
- Becraft limestone, Devonian, New Jersey: Lewis and Kümmel, 687.
- Bedford formation, Mississippian, Ohio: Bownocker, 126; Hyde, 573.
- Bedford limestone, Indiana: Beede *et al.*, 91.
- Bedford limestone, Mississippian, Indiana: Malott, 751.
- Bedford shale, Devonian or Carboniferous, Ohio: Bonine, 117; Hubbard *et al.*, 562.
- Bedford shale, Ohio: Cushing, 294.

- Beechwood limestone member, Devonian, Kentucky: Butts, 182.
- Beekmantown dolomite, New York: Chadwick, 211.
- Beekmantown formation, Ordovician, Canada: Malcolm, 750.
- Bee Spring sandstone, Pennsylvanian, Kentucky: Crider, 277.
- Bellvale sandstone, Devonian, New Jersey: Lewis and Kimmel, 687.
- Belly River beds, Cretaceous, Alberta: Dowling, 370.
- Belly River series, Cretaceous, Alberta: Dowling, 371; Sternberg, 957.
- Belt series, pre-Cambrian, Montana: Calkins and Emmons, 190.
- Beltian system, pre-Cambrian, British Columbia: Daly, 302.
- Bennington limestone, Cretaceous, Oklahoma: Shannon and Trout, 983.
- Bens Creek sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Hennen and Reger, 511; Krebs and Teets, 659.
- Benton formation, Cretaceous, Colorado: Richardson, 931.
- Benton shale, Cretaceous, Colorado: Beekly, 92.
- Benton shales, Cretaceous, Alberta: Dowling, 374.
- Benton shales, Cretaceous, Saskatchewan: McInnes, 734.
- Benton (Lower) shale, Cretaceous, Wyoming: Hintze, 530.
- Benton (Upper) shale, Cretaceous, Wyoming: Hintze, 530.
- Berea formation, Mississippian, Ohio: Hyde, 573.
- Berea sandstone, Mississippian, Ohio: Bonine, 117; Bownocker, 126; Hubbard *et al.*, 562.
- Berea sandstone, Ohio: Cushing, 294.
- Berne member, Mississippian, Ohio: Hyde, 573.
- Bertie limestone member, Silurian, Ontario: Malcolm, 750.
- Bethany Falls limestone member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Big Blue serpentinous member, Miocene, California: Anderson and Pack, 21.
- Bigby member, Ordovician, Kentucky: Miller, 802.
- Birch Creek schist, Paleozoic, Alaska: Martin *et al.*, 757.
- Black Hand conglomerate, Mississippian, Ohio: Bownocker, 126.
- Black Hand formation, Mississippian, Ohio: Hubbard *et al.*, 562.
- Black Hand member, Mississippian, Ohio: Hyde, 573.
- Black River group, Ordovician, Canada: Malcolm, 750.
- Black Rock cycle, Pleistocene, Wyoming: Blackwelder, 108.
- Blaine formation, Permian, Oklahoma: Shannon and Trout, 983.
- Blanco beds, Pliocene, Texas: Baker, 38.
- Blomidon shale, Triassic, New Brunswick and Nova Scotia: Powers, 894.
- Bloyd shale, Carboniferous, Arkansas: Mather, 763.
- Boggy shale, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Bohio conglomerate, Eocene(?), Panama Canal Zone: MacDonald, 729.
- Bois d'Arc limestone, Silurian, Oklahoma: Shannon and Trout, 983.
- Bokchito formation, Cretaceous, Oklahoma: Shannon and Trout, 983.
- Bolivar fire clay, Pennsylvanian, West Virginia: Hennen and Reger, 511.
- Bonaventure conglomerate, Devonian-Carboniferous, Quebec: Clarke, 232.
- Bone Valley formation, Pliocene, Florida: Sellards, 978.
- Bone Valley gravel, Pliocene, Florida: Matson, 764.
- Boone? chert, Carboniferous, Arkansas: Girty, 449.
- Boone chert member, Mississippian, Arkansas: Girty, 450.
- Boone formation, Mississippian, Oklahoma: Shannon and Trout, 983; Snider, 1019.
- Boone limestone, Mississippian, Arkansas: Girty, 450, 451.
- Bossardville limestone, Silurian, New Jersey: Lewis and Kimmel, 687.
- Bowling Green limestone, Mississippian, Kentucky: Crider, 277.
- Bowling Green limestone, Silurian, Missouri: Keyes, 631.
- Braddyville formation, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Bragdon formation, Carboniferous, California: Ferguson, 409.
- Brandywine formation, Pleistocene, Maryland: Clark, 224.
- Brannon bed, Ordovician, Kentucky: Miller, 802.
- Brassfield limestone, Silurian, Kentucky: Butts, 182.
- Brentwood limestone lentil, Carboniferous, Arkansas: Mather, 763.
- Briceville shale, Pennsylvanian, Tennessee: Glenn, 455.
- Bridgeton formation, Pleistocene, New Jersey: Lewis and Kimmel, 687.
- Brownstown sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Hennen and Reger, 511; Krebs and Teets, 659.
- Brownville limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Brule formation, Oligocene, Colorado: Butler, 180.
- Brunswick formation, Triassic, New Jersey: Lewis and Kimmel, 687.
- Bucks Bridge formation, New York: Chadwick, 211.
- Buena Vista sandstone, Mississippian, Ohio: Bownocker, 126.
- Buena Vista sandstone member, Mississippian, Ohio: Hyde, 573.
- Buffalo sandstone, Pennsylvanian, West Virginia: Krebs and Teets, 659.
- Buffalostage, Pleistocene, Wyoming: Blackwelder, 108.
- Buffalo Creek limestone, Pennsylvanian, West Virginia: Hennen and Reger, 511; Krebs and Teets, 659.
- Bull Lake stage, Pleistocene, Wyoming: Blackwelder, 108.
- Burgen sandstone, Ordovician, Oklahoma: Shannon and Trout, 983.
- Burgen sandstone, Ordovician, Oklahoma: Snider, 1019.
- Burlingame limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Burton formation, Cambrian, British Columbia: Schofield, 962.

- Buxton formation, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Byer member, Mississippian, Ohio: Hyde, 573.
- Byram gneiss, pre-Cambrian, New Jersey: Lewis and Kummel, 687.
- Cabot Head shale member, Silurian, Ontario: Malcolm, 750.
- Cache Creek series, Carboniferous, British Columbia: Daly, 302.
- Caddell clays, Tertiary, Texas: Dumble, 377.
- Caddo limestone, Cretaceous, Oklahoma: Shannon and Trout, 983.
- Caimito formation, Oligocene, Panama Canal Zone: MacDonald, 729.
- Calhoun shale member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Callaway limestone, Devonian, Missouri: Branson and Greger, 134.
- Caloosahatchee marl, Pliocene, Florida: Matson, 764.
- Calvin sandstone, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Campbell Creek limestone, Pennsylvanian, West Virginia: Hennen and Reger, 511; Krebs and Teets, 659.
- Caney shale, Mississippian, Oklahoma: Shannon and Trout, 983.
- Cannelton limestone, Pennsylvanian, West Virginia: Hennen and Reger, 511.
- Cannelton (Stockton) limestone, Pennsylvanian, West Virginia: Hennen and Reger, 511.
- Cannonball marine member, Tertiary (?), North and South Dakota: Lloyd and Hares, 696.
- Cantua sandstone member, Eocene, California: Anderson and Pack, 21.
- Cantwell formation, Eocene, Alaska: Moffit and Pogue, 812.
- Cantwell formation, Eocene, Alaska: Pogue, 886.
- Cape May formation, Pleistocene, New Jersey: Lewis and Kummel, 687.
- Capitan limestone, Permian, Texas: Baker, 38.
- Carbondale formation, Pennsylvanian, Illinois: Blatchley, 112; Kay and White, 616; Lee, 672; Morse and Kay, 828; Udden and Shaw, 1097.
- Cardenas formation, Cretaceous, Mexico: Garfias, 434.
- Carlile formation, Cretaceous, Colorado: Butler, 168.
- Carlville limestone member, Pennsylvanian, Illinois: Lee, 672.
- Carolina gneiss, pre-Cambrian, Georgia: Galpin, 429.
- Carrizos sands, Eocene, Texas and Mexico: Dumble, 380.
- Castile formation, Permian, Texas: Baker, 38.
- Castile gypsum, Cretaceous or Jurassic, Texas: Udden, 1095.
- Castle Rock conglomerate, Oligocene, Colorado: Richardson, 931.
- Castle Rock formation, Oligocene, Colorado: Butler, 180.
- Catahoula sand, Oligocene, Texas: Dumble, 377.
- Cedar Creek limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Cedar Grove (Lower) sandstone, Pennsylvanian, West Virginia: Hennen and Reger, 511; Krebs and Teets, 659.
- Cedar Grove (Middle) sandstone, Pennsylvanian, West Virginia: Hennen and Reger, 511; Krebs and Teets, 659.
- Cedar Grove (Upper) sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Hennen and Reger, 511; Krebs and Teets, 659.
- Cedartop gypsum member, Permian, Oklahoma: Shannon and Trout, 983.
- Cedarville limestone, Silurian, Ohio: Bownocker, 126.
- Cement City limestone, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Centennial limestone, Paleozoic, Utah: Crane, 272, 273.
- Cerro till, Pleistocene, Colorado: Atwood, 33.
- Chagrin formation, Devonian, Ohio: Bonine, 117.
- Chagrin shale, Ohio: Cushing, 294.
- Chaney gypsum member, Permian, Oklahoma: Shannon and Trout, 983.
- Chanute shale member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Charlton formation, Pliocene(?), Georgia: Stephenson and Veatch, 1041.
- Chase formation, pre-Cambrian, British Columbia: Daly, 302.
- Chattahoochee formation, Oligocene, Florida: Matson, 764.
- Chattahoochee formation, Oligocene, Georgia: Stephenson and Veatch, 1041.
- Chattahoochee group, Tertiary, Florida: Dall, 301.
- Chattanooga black shale, Devonian, Tennessee: Glenn, 455.
- Chattanooga shale, Devonian, Oklahoma: Shannon and Trout, 983.
- Chattanooga shale, Devonian(?), Oklahoma: Snider, 1019.
- Chattanooga series, Mississippian: Ulrich, 1098.
- Chazy formation, Ordovician, Canada: Malcolm, 750.
- Chehalis formation, Eocene, Washington: Dickerson, 348.
- Chelmsford sandstone, pre-Cambrian, Canada: Coleman, 252.
- Cherokee formation, Pennsylvanian, Oklahoma: Shannon and Trout, 983; Snider, 1019.
- Cherokee shale, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Cherryvale shale member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Chester group, Mississippian, Illinois: Blatchley, 112; Udden and Shaw, 1097.
- Chester group, Mississippian, Indiana: Beede *et al.*, 91; Malott, 751.
- Chester group, Mississippian, Oklahoma: Snider, 1019.
- Chickaloon formation, Tertiary, Alaska: Martin *et al.*, 757.
- Chico formation, Cretaceous, California: Clark, 223.
- Chico group, Cretaceous, California: Anderson and Pack, 21.

- Chief Consolidated limestone, Paleozoic, Utah: Crane, 272, 273.
- Chignik formation, Cretaceous, Alaska: Martin *et al.*, 757.
- Chilton (Lower) sandstone, Pennsylvanian, West Virginia: Hennen and Reger, 511; Krebs and Teets, 659.
- Chilton (Upper) sandstone, Pennsylvanian, West Virginia: Hennen and Reger, 511; Krebs and Teets, 659.
- Chimneyhill limestone, Silurian, Oklahoma: Shannon and Trout, 983.
- Chinitna shale, Jurassic, Alaska: Martin *et al.*, 757.
- Chipola marl, Oligocene, Florida: Matson, 764.
- Chipola marls, Tertiary, Florida: Dall, 301.
- Chisik conglomerate, Jurassic, Alaska: Martin *et al.*, 757.
- Chitstone limestone, Triassic, Alaska: Martin *et al.*, 757; Mertie, 799.
- Choctawhatchee marl, Miocene, Florida: Matson, 764.
- Chugwater formation, Permian-Triassic(?), Colorado: Butler, 180.
- Chugwater formation, Permian and Triassic, Wyoming: Branson, 132.
- Chugwater formation, Triassic(?), Colorado: Beekly, 92.
- Churn Creek member, Mississippian, Ohio: Hyde, 573.
- Circle cycle, Pleistocene, Wyoming: Blackwelder, 108.
- Cisco division, Texas: Dumble, 379.
- City Bluffs (Scranton) shales, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Claggett formation, Cretaceous, Montana: Bowen, 119.
- Claggett shale, Cretaceous, Montana: Bowen, 120.
- Claggett shales, Cretaceous, Montana: Sternberg, 1042.
- Claiborne, Eocene, Texas and Mexico: Dumble, 380.
- Claiborne, Tertiary, Mexico: Dumble, 378.
- Claiborne group, Eocene, Georgia: Stephenson and Veatch, 1041.
- Claiborne group, Eocene, Texas: Burchard, 158.
- Claiborne group, Tertiary, Alabama: Berry, 98.
- Claiborne group, Tertiary, Mississippi: Lowe, 709.
- Claiborne (Lower) formation, Tertiary, Texas: Dumble, 377.
- Claiborne (Upper) formation, Tertiary, Texas: Dumble, 377.
- Clarendon beds, Miocene, Texas: Baker, 38.
- Clarion (Lower) sandstone, Pennsylvanian, West Virginia: Hennen and Reger, 511.
- Clayton formation, Tertiary, Mississippi: Lowe, 709.
- Clear Fork division, Permian, Texas: Richard, 928.
- Clear Fork formation, Permian, Texas: Baker, 38.
- Clear Fork formation, Permo-Carboniferous, Texas: Case, 206.
- Cleveland shale, Devonian, Ohio: Bonine, 117.
- Cleveland shale, Ohio: Cushing, 294.
- Clinton formation, Silurian, Ontario: Malcolm, 750.
- Clinton limestone, Silurian, Ohio: Bownocker, 126.
- Clinton sand, Silurian, Ohio: Bonine, 117.
- Cloverly formation, Cretaceous, Wyoming: Hintze, 530.
- Coalburg (Lower) sandstone, Pennsylvanian, West Virginia: Hennen and Reger, 511; Krebs and Teets, 659.
- Coalburg (Upper) sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Hennen and Reger, 511.
- Coalburg sandstone, Pennsylvanian, West Virginia: Krebs and Teets, 659.
- Coalmont formation, Cretaceous or Tertiary, Colorado: Beekly, 92.
- Coamo tuff limestone, Cretaceous, Porto Rico: Berkey, 96.
- Cobalt series, pre-Cambrian, Canada: Coleman, 252.
- Cobleskill dolomite, Silurian, Ontario: Malcolm, 750.
- Cobocok limestone, Ordovician, Canada: Malcolm, 750.
- Cocksfield Ferry beds, Eocene, Texas: Dumble, 380.
- Coeymans limestone, Devonian, New Jersey: Lewis and Kümmel, 687.
- Coffeyville formation, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Cohansey sand, Tertiary, New Jersey: Lewis and Kümmel, 687.
- Collingwood formation, Ordovician, Canada: Malcolm, 750.
- Collingsworth gypsum member, Permian, Oklahoma: Shannon and Trout, 983.
- Colorado formation, Cretaceous, Montana: Calkins and Emmons, 190.
- Colorado group, Cretaceous, Alberta: Dowling, 367.
- Colorado group, Cretaceous, Colorado: Beekly, 92; Richardson, 931.
- Colorado group, Cretaceous, Wyoming: Hintze, 530.
- Colorado shale, Cretaceous, Montana: Bowen, 119, 120.
- Columbia group, Pleistocene, Georgia: Stephenson and Veatch, 1041.
- Columbus limestone, Devonian, Ohio: Bownocker, 126; Hubbard *et al.*, 562.
- Conemaugh formation, Carboniferous, Pennsylvania: Pa. Top. G. S., 870.
- Conemaugh series, Pennsylvanian, West Virginia: Krebs and Teets, 659.
- Congaree clay member, Eocene, Georgia: Stephenson and Veatch, 1041.
- Conover slates, Algonkian, Michigan: Allen and Barrett, 12.
- Cook Mountain formation, Eocene, Texas: Burchard, 158.
- Copley meta-andesite, Devonian or older, California: Ferguson, 409.
- Copper Cliff arkose, pre-Cambrian, Canada: Coleman, 252.
- Copps formation, Algonkian, Michigan: Allen and Barrett, 12.
- Copps group, pre-Cambrian, Michigan: Allen and Barrett, 13.
- Coquina limestone, Tertiary, Mexico: Dumble, 378.
- Cornwall (Peguanac) shale, Devonian, New Jersey: Lewis and Kümmel, 687.
- Corozal limestone, Cretaceous, Porto Rico: Berkey, 96.
- Corrigan sands, Oligocene, Texas: Dumble, 377.

- Coryell batholith, Miocene, British Columbia: Drysdale, 375.
- Cottonwood limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Cottonwood limestone, Permian, Kansas: Shannon and Trout, 983.
- Cougar formation, pre-Cambrian, British Columbia: Daly, 302.
- Couthiching series, pre-Cambrian, Canada: Coleman, 252.
- Cowlitz formation, Eocene, Washington: Dickerson, 348.
- Craghead Creek shale, Devonian, Missouri: Branson and Greger, 134.
- Creston formation, pre-Cambrian, British Columbia: Schofield, 962.
- Crownsnest volcanics, Cretaceous, Alberta: McLearn, 743.
- Cuchara formation, Eocene, Colorado: Butler, 180.
- Cucuracha formation, Oligocene, Panama Canal Zone: MacDonald, 729.
- Culebra formation, Oligocene, Panama Canal Zone: MacDonald, 729.
- Cullom limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Curdsville member, Ordovician, Kentucky: Miller, 802.
- Curry Creek series, Oligocene, British Columbia: Reinecke, 920.
- Cusseta sand member, Cretaceous, Georgia: Stephenson and Veatch, 1041.
- Cuyahoga formation, Mississippian, Ohio: Bonine, 117; Bownocker, 126; Hubbard *et al.*, 562; Hyde, 573.
- Cynthiana formation, Ordovician, Kentucky: Miller, 804.
- Cynthiana member, Ordovician, Kentucky: Miller, 802.
- Cypress (Brewerville) sandstone, Mississippian, Illinois: Blatchley, 112.
- Dakota formation, Cretaceous, Alberta: McLearn, 743.
- Dakota formation, Cretaceous, Colorado: Butler, 180.
- Dakota sand, Cretaceous: Huntley, 568.
- Dakota sands, Cretaceous, Alberta: Dowling, 367.
- Dakota sandstone, Cretaceous, Colorado: Beekly, 92; Richardson, 931.
- Dakota sandstone, Cretaceous, Saskatchewan: McInnes, 734.
- Dakota series, Cretaceous, Alberta: Dowling, 371.
- Dawson arkose, Eocene, Colorado: Richardson, 931.
- Dawson formation, Eocene, Colorado: Butler, 180.
- Day Creek dolomite, Permian, Oklahoma: Shannon and Trout, 983.
- Day Creek shales, Permian, Oklahoma: Shannon and Trout, 983.
- Dayton limestone, Silurian, Ohio: Bownocker, 126.
- Deadman limestone, Triassic, Idaho: Mansfield, 752.
- Decker formation, Silurian, New Jersey: Lewis and Kummel, 687.
- Decota sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Hennen and Reger, 511; Krebs and Teets, 659.
- Deer Creek limestone member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Delaware formation, Devonian, Ontario: Malcolm, 750.
- Delaware limestone, Devonian, Ohio: Bownocker, 126.
- Delaware limestone, Devonian, Ontario: Stauffer, 1035.
- Delaware mountain formation, Permian, Texas: Baker, 38.
- Denver formation, Eocene, Colorado: Butler, 180.
- Des Moines group, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Detroit River series, Devonian, Ontario: Stauffer, 1035.
- Dewey limestone, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Dingess limestone, Pennsylvanian, West Virginia: Hennen and Reger, 511; Krebs and Teets, 659.
- Dockum formation, Triassic, Texas: Baker, 38.
- Don beds, Pleistocene, Canada: Coleman, 255.
- Doré formation, pre-Cambrian, Canada: Coleman, 252.
- Double Mountain division, Permian, Texas: Richard, 928.
- Double Mountain formation, Permian, Texas: Baker, 38.
- Double Mountain formation, Permo-Carboniferous, Texas: Case, 206.
- Douglas formation, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Douglas shale, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Doyle shale, Permian, Oklahoma: Shannon and Trout, 983.
- Dripping Spring quartzite, Cambrian, Arizona: Ransome, 908, 909.
- Drum limestone member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Dunkard series, Permian, Pennsylvania: Pa. Top. G. S., 797.
- Dunvegan sandstones, Cretaceous, Alberta: Dowling, 370.
- Duplin formation, Tertiary, North Carolina: Gardner, 432.
- Duplin marl, Miocene, Georgia: Stephenson and Veatch, 1041.
- Durango till, Pleistocene, Colorado: Atwood, 33.
- Eagle limestone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Krebs and Teets, 659.
- Eagle limestone and shale, Pennsylvanian, West Virginia: Hennen and Reger, 511.
- Eaglesandstone, Cretaceous, Montana: Bowen, 119; Sternberg, 1042.
- Eagle sandstone, Cretaceous, Wyoming: Hintze, 530.
- Eagle sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Hennen and Reger, 511; Krebs and Teets, 659.
- Eastern or Jacobsville sandstone, pre-Cambrian, Michigan: Allen and Barrett, 13.
- East Lynn sandstone, Pennsylvanian, West Virginia: Hennen and Reger, 511; Krebs and Teets, 659.
- Easton schist, pre-Tertiary, Washington: Saunders, 954.
- Easton schist, Washington: Smith, 1018.
- Eckman sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Eden member, Ordovician, Kentucky: Miller, 802.
- Eden shale, Ordovician, Ohio: Bownocker, 126.

- Edgewood formation, Silurian, Missouri: Keyes, 631.
- Edmonton formation, Cretaceous, Alberta: Dowling, 370.
- Edmonton-St. Mary series, Cretaceous, Alberta: Dowling, 371.
- El Abra limestone, Cretaceous, Mexico: Garfias, 434.
- Elgin sandstone, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Elko formation, Cambrian, British Columbia: Schofield, 962.
- Ellensburg formation, Miocene, Washington: Saunders, 954.
- Ellis formation, Jurassic, Montana: Calkins and Emmons, 190.
- Elm Point limestones, Devonian, Manitoba: Wallace, 1129.
- Emperador limestone, Oligocene, Panama Canal Zone: MacDonald, 729.
- Englishtown sand, Cretaceous, New Jersey: Lewis and Kummel, 687.
- Enid formation, Permian, Oklahoma: Shannon and Trout, 983.
- Enochkin formation, Jurassic, Alaska: Martin *et al.*, 692.
- Eramosa beds, Silurian, Ontario: Williams, 1191.
- Escondido beds, Cretaceous, Mexico: Dumble, 378.
- Eska conglomerate, Tertiary, Alaska: Martin *et al.*, 757.
- Escliffe shales, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Escliffe shales, Permian, Kansas: Shannon and Trout, 983.
- Esopus grit, Devonian, New Jersey: Lewis and Kummel, 687.
- Etchegoin formation, Miocene and Pliocene, California: Anderson and Pack, 21.
- Etheline volcanics, Tertiary, British Columbia: Mackenzie, 736.
- Euclid sandstone, Mississippian, Ohio: Bownocker, 126.
- Euclid sandstone lentil, Ohio: Cushing, 294.
- Eutaw formation, Cretaceous, Georgia: Stephenson and Veatch, 1041.
- Eutaw formation, Cretaceous, Mississippi: Lowe, 709.
- Fairfield member, Mississippian, Ohio: Hyde, 573.
- Falls City limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Fargo limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Farley limestone bed, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Farnham slates, Ordovician, Quebec: Harvie, 493.
- Faulconer bed, Ordovician, Kentucky: Miller, 802.
- Fayette, Eocene, Texas and Mexico: Dumble, 380.
- Fayette, Tertiary, Mexico: Dumble, 378.
- Fayette sand, Eocene, Texas: Dumble, 377.
- Fayetteville formation, Mississippian, Oklahoma: Snider, 1019.
- Fayetteville shale, Mississippian, Oklahoma: Shannon and Trout, 983.
- Ferguson gypsum, Permian, Oklahoma: Shannon and Trout, 983.
- Fernie shales, Cretaceous, Alberta: Dowling, 371.
- Five Island volcanics, Triassic, New Brunswick and Nova Scotia: Powers, 894.
- Flaming Gorge formation, Jurassic, Colorado: Butler, 180.
- Flanagan member, Ordovician, Kentucky: Miller, 802.
- Flathead quartzite, Cambrian, Montana: Calkins and Emmons, 190.
- Flattop Mountain sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Fleming beds, Tertiary, Texas: Dumble, 377.
- Florena shales, Permian, Kansas: Shannon and Trout, 983.
- Florence shale, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Forbes (Deer Creek) limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Fort Hall formation, Triassic, Idaho: Mansfield, 753.
- Fort Riley limestone, Permian, Oklahoma: Shannon and Trout, 983.
- Fort Scott formation, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Fort Scott limestone member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Fort Union formation, Eocene, North and South Dakota: Lloyd and Hares, 696.
- Fort Union formation, Eocene, Saskatchewan: Rose, 950.
- Fountain formation, Pennsylvanian, Colorado: Butler, 180; Richardson, 931.
- Fox Hills formation, Cretaceous, Colorado: Butler, 180.
- Fox Hills sandstone, Cretaceous, Colorado: Richardson, 931.
- Fox Hills sandstone, Cretaceous, North and South Dakota: Lloyd and Hares, 696.
- Fox Hills sandstone, Cretaceous, Saskatchewan: Rose, 871.
- Franciscan formation, Jurassic (?), California: Anderson and Pack, 21.
- Franciscan group, Jurassic (?), California: Clark, 223.
- Franciscan series, California: Stalder, 1030.
- Franklin granodiorite, Jurassic, British Columbia: Drysdale, 374.
- Franklin group, Carboniferous, British Columbia: Drysdale, 374.
- Franklin limestone, pre-Cambrian, New Jersey: Lewis and Kummel, 687.
- Franklin monzonite, Oligocene, British Columbia: Drysdale, 374.
- Franks conglomerate, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Freeport (Lower) sandstone, Pennsylvanian, West Virginia: Hennen and Reger, 511.
- Freeport (Upper) sandstone, Pennsylvanian, West Virginia: Hennen and Reger, 511; Krebs and Teets, 659.
- Fremont cycle, Pliocene, Wyoming: Blackwelder, 108.
- Frio, Tertiary, Mexico: Dumble, 378.
- Frio clays, Eocene, Texas and Mexico: Dumble, 380.
- Frio clays, Tertiary, Texas: Dumble, 377.
- Galena-Trenton limestones, Ordovician, Saskatchewan and Manitoba: McInnes, 734.
- Galesburg shale member, Pennsylvanian, Missouri: Hinds and Greene, 529.

- Galton series, pre-Cambrian, British Columbia: Schofield, 962.
- Garrard bed, Ordovician, Kentucky: Miller, 802.
- Garrison formation, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Garrison formation, Permian, Kansas: Shannon and Trout, 983.
- Garrison limestone, Pennsylvanian or Permian, Nebraska and Kansas: Condra and Bengtson, 258.
- Gateway formation, pre-Cambrian, British Columbia: Schofield, 962.
- Gatun formation, Oligocene, Panama Canal Zone: MacDonald, 729.
- Gemini limestone, Paleozoic, Utah: Crane, 272, 273.
- Gila conglomerate, Quaternary (?), Arizona: Ransome, 908.
- Gilbert (Lower) sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Hennen and Reger, 511.
- Gilbert (Upper) sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Hennen and Reger, 511.
- Gilbert shale, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Glacier division, pre-Cambrian, British Columbia: Daly, 302.
- Glenn formation, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Gloucester formation, Carboniferous, British Columbia: Drysdale, 374.
- Golden Ray limestone, Paleozoic, Utah: Crane, 272, 273.
- Goodland limestone, Cretaceous, Oklahoma: Shannon and Trout, 983.
- Gosport sand, Tertiary, Alabama: Berry, 98.
- Grand Falls chert member, Mississippian, Arkansas: Girty, 451.
- Grand Grève limestone, Devonian, Quebec: Clarke, 232.
- Grand Gulf group, Tertiary, Mississippi: Lowe, 709.
- Grand Gulf sandstones, Oligocene, Texas: Dumble, 380.
- Graneros formation, Cretaceous, Colorado: Butler, 180.
- Granville shale, Mississippian, Ohio: Hyde, 573.
- Grapevine sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Hennen and Reger, 511.
- Greendale bed, Ordovician, Kentucky: Miller, 802.
- Greene formation, Permian, Pennsylvania: Pa. Top. G. S., 870.
- Greenhorn formation, Cretaceous, Colorado: Butler, 180.
- Green Pond conglomerate, Silurian, New Jersey: Lewis and Kummel, 687.
- Greer formation, Permian, Oklahoma: Shannon and Trout, 983.
- Greer formation, Permian, Texas: Baker, 38.
- Grenada beds, Tertiary, Mississippi: Lowe, 709.
- Grenada formation, Tertiary, Mississippi: Berry, 98.
- Grenville (?) series, Laurentian, Saskatchewan and Manitoba: McInnes, 734.
- Grenville series, pre-Cambrian, Canada: Coleman, 252.
- Grenville series, pre-Cambrian, New York: Cushing, 293.
- Greyson (?) shale, pre-Cambrian, Montana: Calkins and Emmons, 190.
- Grimsby sandstone member, Silurian, Ontario: Malcolm, 750.
- Guanica coral reefs, Tertiary, Porto Rico: Berkey, 96.
- Guelph formation, Silurian, Ontario: Malcolm, 750.
- Guelph formation, Silurian, Ontario: Williams, 1189.
- Guyandot sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Gwinn series, Algonkian, Michigan: Allen and Barrett, 12.
- Haida formation, Cretaceous, British Columbia: Mackenzie, 736.
- Hale formation, Carboniferous, Arkansas: Mather, 763.
- Hale sandstone member, Pennsylvanian, Oklahoma: Snider, 1019.
- Hamilton formation, Devonian, Ontario: Malcolm, 750; Stauffer, 1035.
- Hampshire formation, Devonian, West Virginia: Prosser, 903.
- Haragan shale, Silurian, Oklahoma: Shannon and Trout, 983.
- Hardyston quartzite, Cambrian, New Jersey: Lewis and Kummel, 687.
- Harrodsburg limestone, Indiana: Beede *et al.*, 91.
- Harrodsburg limestone, Mississippian, Indiana: Malott, 751.
- Hartselle sandstone, Mississippian, Mississippi: Lowe, 709.
- Hartshorne sandstone, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Hartwell sandstone, Mississippian, West Virginia: Hennen and Gawthrop, 510.
- Harvey conglomerate, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Hasmark formation, Cambrian, Montana: Calkins and Emmons, 190.
- Hatchetigbee formation, Tertiary: Berry, 98.
- Hawkins formation, pre-Tertiary, Washington: Saunders, 954.
- Haystack gypsum member, Permian, Oklahoma: Shannon and Trout, 983.
- Helderberg formation, Devonian, Maryland: Prosser, 903.
- Henley shale member, Mississippian, Ohio: Hyde, 573.
- Henrietta formation, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Henryhouse shale, Silurian, Oklahoma: Shannon and Trout, 983.
- Herendeen limestone, Cretaceous, Alaska: Martin *et al.*, 757.
- Hermitage member, Ordovician, Kentucky: Miller, 802.
- Hernshaw sandstone, Pennsylvanian, West Virginia: Hennen and Reger, 511; Krebs and Teets, 659.
- Herrington limestone, Permian, Oklahoma: Shannon and Trout, 983.
- Hertha limestone member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Heuvelton sandstone, New York: Chadwick, 211.
- Higham grit, Triassic, Idaho: Mansfield, 753.
- High Falls formation, Silurian, New Jersey: Lewis and Kummel, 687.

- Hitz limestone member, Ordovician, Kentucky: Butts, 182.
- Hocking Valley conglomerate, Mississippian, Ohio: Hyde, 573.
- Hogshooter limestone, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Hoh formation, pre-Tertiary, Washington: Weaver, 1149.
- Holdenville shale, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Holly Springs sand, Tertiary, Mississippi: Berry, 98.
- Holly Springs sand, Tertiary, Mississippi: Lowe, 709.
- Holtzclaw sandstone, Mississippian, Kentucky: Butts, 182.
- Homewood (Roaring Creek) sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Hennen and Reger, 511; Krebs and Teets, 659.
- Honna conglomerate and sandstone, Cretaceous, British Columbia: Mackenzie, 736.
- Hornertown marl, Cretaceous, New Jersey: Lewis and Kummel, 687.
- Howard limestone member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Humbug limestone, Paleozoic, Utah: Crane, 273.
- Humbug sandstone, Paleozoic, Utah: Crane, 272, 273.
- Hunton formation, Silurian, Oklahoma: Shannon and Trout, 983.
- Huron shale, Devonian, Ohio: Bonine, 117; Stauffer, 951.
- Huron shale, Devonian, Ontario: Malcolm, 750; Stauffer, 1035.
- Huronian, pre-Cambrian, Canada: Coleman, 252.
- Huronian, pre-Cambrian, Saskatchewan and Manitoba: McInnes, 734.
- Hygiene sandstone, Cretaceous, Colorado: Butler, 180.
- Jaeger (Lower) sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Jaeger (Middle) sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Jaeger (Upper) sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Iatan limestone member, Pennsylvanian, Missouri: Hinds and Greep, 529.
- Idaho Springs formation, pre-Cambrian, Colorado: Bastin, 81.
- Illecillewaet quartzite, pre-Cambrian, British Columbia: Daly, 302.
- Illinoian drift, Pleistocene, Ohio: Hubbard *et al.*, 562.
- Illinoian drift, Pleistocene: Leverett and Taylor, 686.
- Illinoian till, Pleistocene, Illinois: Udden and Shaw, 1097.
- Index granodiorite, Washington: Smith, 1018.
- Ingleside formation, Mississippian?—Pennsylvanian, Colorado: Butler, 180.
- Ipperwash limestone, Devonian, Ontario: Stauffer, 1035.
- Ipperwash limestone member, Devonian, Ontario: Malcolm, 750.
- Iola limestone member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Ione formation, Tertiary, California: Dickerson, 349.
- Iowan drift, Pleistocene: Leverett and Taylor, 686.
- Iron formation, Algonkian, Michigan: Allen and Barrett, 12.
- Irondequoit limestone member, Silurian, Ontario: Malcolm, 750.
- Ironwood formation, Algonkian, Michigan: Allen and Barrett, 12.
- Ironwood formation, pre-Cambrian, Michigan: Allen and Barrett, 13.
- Jacalitos formation, Miocene, California: Anderson and Pack, 21.
- Jackford sandstone, Oklahoma: Shannon and Trout, 983.
- Jackson, Eocene, Texas: Dumble, 380.
- Jackson clays, Tertiary, Texas: Dumble, 377.
- Jackson formation, Eocene, Georgia: Stephenson and Veatch, 1041.
- Jackson formation, Tertiary, Texas: Dumble, 377.
- Jackson group, Tertiary, Mississippi: Lowe, 709.
- Jacksonburg limestone, Ordovician, New Jersey: Lewis and Kummel, 687.
- Jacksonville formation, Miocene, Florida: Matson, 764.
- Jacobsville, Paleozoic, Michigan: Case and Robinson, 210.
- Jacobsville sandstone, pre-Cambrian, Michigan: Allen and Barrett, 13.
- Jefferson limestone, Devonian, British Columbia: Schofield 962.
- Jefferson limestone, Devonian, Montana: Calkins and Emmons, 190; Haynes, 502.
- Jeffersonville limestone, Devonian, Kentucky: Butts, 182.
- Jerseyan drift, Pleistocene, New Jersey: Lewis and Kummel, 687.
- Juana Diaz marls Tertiary, Porto Rico: Berkey, 96.
- Judith River beds, Cretaceous, Montana: Sternberg, 1042.
- Judith River formation, Cretaceous, Montana: Bowen, 119, 120.
- Kamishak chert, Triassic, Alaska: Martin *et al.*, 692.
- Kamloops group, Oligocene, British Columbia: Daly, 302.
- Kanawha black flint, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Hennen and Reger, 511.
- Kanawha group, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Kanawha series, Pennsylvanian, West Virginia: Hennen and Reger, 511; Krebs and Teets, 659.
- Kanouse sandstone, Devonian, New Jersey: Lewis and Kummel, 687.
- Kansas drift, Pleistocene: Leverett and Taylor, 686.
- Kansas City formation, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Kanwaka shale, Pennsylvanian, Nebraska and Kansas: Condra and Bengtson, 258.
- Kanwaka shale member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Keechelus andesitic series, Miocene, Washington: Smith, 1018.
- Keeseville(?) (Potsdam) sandstone, New York: Chadwick, 211.
- Keewatin, pre-Cambrian, Saskatchewan and Manitoba: McInnes, 734.

- Keewatin group, pre-Cambrian, Canada: Coleman, 252.
- Kenai formation, Tertiary, Alaska: Martin *et al.*, 757.
- Kennicott formation, Jurassic, Alaska: Martin *et al.*, 757.
- Kenwood sandstone, Mississippian, Kentucky: Butts, 182.
- Keokuk limestone, Mississippian, Illinois: Morse and Kay, 828.
- Kessler limestone lentil, Carboniferous, Arkansas: Mather, 763.
- Kettle River formation, Eocene or Oligocene, British Columbia: Drysdale, 374.
- Keweenawan, pre-Cambrian, Canada: Coleman, 252.
- Keweenawan series, Algonkian, Michigan: Allen and Barrett, 12.
- Key Largo limestone, Pleistocene, Florida: Matson, 764.
- Keystone sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Key West oolite, Pleistocene, Florida: Matson, 764.
- Kiamichi formation, Cretaceous, Oklahoma: Shannon and Trout, 983.
- Kinderhook beds, Mississippian, Oklahoma: Snider, 1019.
- Kinderhook group, Mississippian, Illinois: Blatchley, 112.
- Kirkfield limestone group, Ordovician, Ontario, Malcolm, 750.
- Kirkwood formation, Tertiary, New Jersey: Lewis and Kimmel, 687.
- Kiser gypsum member, Permian, Oklahoma: Shannon and Trout, 983.
- Kitchener formation, pre-Cambrian, British Columbia: Schofield, 962.
- Kittatinny limestone, Cambrian and Ordovician, New Jersey: Lewis and Kimmel, 687.
- Knobstone group, Mississippian, Indiana: Malott, 751.
- Knoxville formation, Cretaceous, California: Clark, 223.
- Kootenai(?) formation, Cretaceous, Montana: Bowen, 120.
- Kootenai formation, Cretaceous, Montana: Calkins and Emmons, 190.
- Kootenay granite, Jurassic(?), British Columbia: Schofield, 962.
- Kootenay series, Cretaceous, Alberta: Dowling, 371.
- Kreyenhagen shale, Oligocene(?), California: Anderson and Pack, 21.
- Labette shale, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Labette shale, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- La Biche shales, Cretaceous, Alberta: Huntley, 568.
- Lac LaRonge series, Laurentian, Saskatchewan: McLines, 734.
- Ladore shale member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Lagarto sand, Pliocene, Texas: Dumble, 377.
- La Muda limestone, Cretaceous, Porto Rico: Berkeley, 96.
- Lance beds, Cretaceous or Tertiary, Wyoming: Hares, 490.
- Lance formation, Cretaceous or Tertiary, Saskatchewan: Rose, 950.
- Lance formation, Cretaceous or Tertiary, Wyoming: Lull, 715.
- Lance formation, Tertiary(?), Montana: Bowen, 119, 120.
- Lance formation, Tertiary(?), North and South Dakota: Lloyd and Hares, 696.
- Landgraaf sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Lane shale member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Lansing formation, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Lapara sand, Pliocene, Texas: Dumble, 377.
- Laramie formation, Cretaceous, Colorado: Butler, 180; Richardson, 931.
- Las Cascadas agglomerate, Eocene(?), Panama Canal Zone: MacDonald, 729.
- Lauderdale chert, Mississippian, Mississippi: Lowe, 709.
- Laurel dolomite, Silurian, Kentucky: Butts, 182.
- Laurie formation, pre-Cambrian, British Columbia: Daly, 302.
- Lawrence shale member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Le Compton limestone, Pennsylvanian, Nebraska and Kansas: Condra and Bengtson, 258.
- Lecompton limestone member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Leda clay, Pleistocene, Canada: Stansfield, 1031.
- Lee formation, Pennsylvanian, Tennessee: Glenn 455.
- Lenapah limestone, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Lenore cycle, Pleistocene, Wyoming: Blackwelder, 108.
- Leray limestone, Ordovician, Canada: Malcolm, 750.
- Lewis formation, Cretaceous, Colorado: Butler, 180.
- Lewis formation, Cretaceous, Wyoming: Hares, 490.
- Liberty formation, Ordovician, Kentucky: Butts, 182.
- Lisbon formation, Tertiary, Alabama and Mississippi: Berry, 98.
- Lithopolis member, Mississippian, Ohio: Hyde, 573.
- Lockatong formation, Triassic, New Jersey: Lewis and Kimmel, 687.
- Lockport, Silurian, Michigan: Case and Robinson, 210.
- Lockport dolomite member, Silurian, Ontario: Malcolm, 750.
- Logan formation, Mississippian, Ohio: Hyde, 573.
- Logan sandstone, Pennsylvanian, West Virginia: Hennen and Reger, 511; Krebs and Teets, 659.
- Loganian, pre-Cambrian, Ontario: Miller and Knight, 806.
- Longwood shale, Silurian, New Jersey: Lewis and Kimmel, 687.
- Lorraine formation, Ordovician, Canada: Malcolm, 750.

- Lorraine formation, Ordovician, Ohio: Bownocker, 126.
- Loosee gneiss, pre-Cambrian, New Jersey: Lewis and Kümmel, 687.
- Lostmans River limestone, Pleistocene, Florida: Matson, 764.
- Louisville limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Louisville limestone, Silurian, Kentucky: Butts, 182.
- Lowville formation, Ordovician, Canada: Malcolm, 750.
- Ludlow lignitic member, Tertiary(?), North and South Dakota; Lloyd and Hares, 696.
- Lykins formation, Permian(?), Colorado: Richardson, 931.
- Lykins formation, Permian-Triassic(?), Colorado: Butler, 180.
- Lyons formation, Permian-Triassic(?), Colorado: Butler, 180.
- Lyons sandstone, Pennsylvanian, Colorado: Richardson, 931.
- McAlester shale, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- McBean formation, Eocene, Georgia: Stephenson and Veatch, 1041.
- McCarthy shale, Triassic, Alaska: Martin *et al.*, 757.
- McElmo formation, Jurassic, Colorado: Butler, 180.
- McKim graywacke, pre-Cambrian, Canada: Coleman, 252.
- McKissock Grove shales, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- McLeansboro formation, Pennsylvanian, Illinois: Blatchley, 112; Kay and White, 616; Lee, 672; Udden and Shaw, 1097.
- Madison limestone, Mississippian, Montana: Calkins and Emmons, 190.
- Madison sands, Tertiary, Mississippi: Lowe, 709.
- Magnesian (Lower) limestone, Ordovician, Illinois: Blatchley, 112.
- Magothy formation, Cretaceous, New Jersey: Lewis and Kümmel, 687.
- Mahoning sandstone, Pennsylvanian, Ohio: Bownocker, 126.
- Mahoning sandstone, Pennsylvanian, West Virginia: Krebs and Teets, 659.
- Malden sandstone, Pennsylvanian, West Virginia: Krebs and Teets, 659.
- Manasquan marl, Cretaceous, New Jersey: Lewis and Kümmel, 687.
- Manastash formation, Eocene, Washington: Saunders, 954.
- Mancos formation, Cretaceous, Colorado: Butler, 180.
- Mangum dolomite member, Permian, Oklahoma: Shannon and Trout, 983.
- Manitoban limestones, Devonian, Manitoba: Wallace, 1129.
- Manitou limestone, Ordovician, Colorado: Richardson, 931.
- Manitoulin member, Silurian, Ontario: Malcolm, 750.
- Manix beds, Pleistocene, California: Merriam, 787.
- Manlius limestone, Silurian, New Jersey: Lewis and Kümmel, 687.
- Manning clays, Tertiary, Texas: Dumble, 377.
- Marcellus shale, Devonian, New Jersey: Lewis and Kümmel, 687.
- Marianna limestone, Oligocene, Florida: Cooke, 268; Matson, 764.
- Marine beds, Eocene, Texas and Mexico: Dumble, 380.
- Marine beds, Tertiary, Mexico: Dumble, 378.
- Marks Head marl, Miocene, Georgia: Stephenson and Veatch, 1041.
- Marshalltown formation, Cretaceous, New Jersey: Lewis and Kümmel, 687.
- Martin limestone, Devonian, Arizona: Ransome, 908.
- Martinez (?) formation, Eocene, California: Anderson and Pack, 21.
- Martinsburg shale, Ordovician, New Jersey: Lewis and Kümmel, 687.
- Marysville sands, Pleistocene, British Columbia: Schofield, 962.
- Masset volcanics, Tertiary, British Columbia; Mackenzie, 736.
- Matagami series, pre-Cambrian, Canada: Coleman, 252.
- Matewan sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Hennen and Reger, 511; Krebs and Teets, 659.
- Matfield shale, Permian, Oklahoma: Shannon and Trout, 983.
- Mauch Chunk series, Mississippian, West Virginia: Hennen and Gawthrop, 510.
- Maude formation, Jurassic-Triassic, British Columbia: Mackenzie, 736.
- Mayes formation, Mississippian, Oklahoma: Shannon and Trout, 983; Snider, 1019.
- Maysville member, Ordovician, Kentucky: Miller, 802.
- Mayville limestone, Wisconsin: Savage, 955.
- Maywood formation, Silurian (?), Montana: Calkins and Emmons, 190.
- Meadow limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Medicine Lodge gypsum, Permian, Oklahoma: Shannon and Trout, 983.
- Medina formation, Silurian, Ontario: Malcolm, 750.
- Medina red rock, Silurian, Ohio: Bonine, 117.
- Medina shale, Silurian, Ohio: Bownocker, 126.
- Mendez shale, Eocene, Mexico: DeGolyer, 341.
- Mendez shales, Cretaceous and Eocene, Mexico: Garfias, 434.
- Mendez shales, Eocene, Mexico: DeGolyer, 342.
- Merchantville clay, Cretaceous, New Jersey: Lewis and Kümmel, 687.
- Mesa Verde formation, Cretaceous, Colorado: Butler, 180.
- Mesaverde formation, Cretaceous, Wyoming: Hares, 490.
- Mescal limestone, Cambrian, Arizona: Ransome, 908, 909.
- Miami oolite, Pleistocene, Florida: Matson, 764.
- Midway, Eocene, Texas and Mexico: Dumble, 380.
- Midway, Tertiary, Mexico: Dumble, 378.
- Midway formation, Eocene, Georgia: Stephenson and Veatch, 1041.
- Midway group, Tertiary: Berry, 98.
- Midway group, Tertiary, Mississippi: Lowe, 709.
- Midway volcanic group, Miocene, British Columbia: Drysdale, 374.
- Million bed, Ordovician, Kentucky: Miller, 802.
- Millsap limestone, Mississippian, Colorado: Richardson, 931.

- Missouri group, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Mitchell limestone, Indiana: Beede *et al.*, 91.
- Mitchell limestone, Mississippian: Malott, 751.
- Moberly sandstone, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Mohawkian series, Ordovician, Kentucky: Miller, 802.
- Monitor sandstone, Pennsylvanian, West Virginia: Krebs and Teets, 659.
- Monongahela formation, Carboniferous, Pennsylvania: Pa. Top. G. S., 870.
- Monroe limestone, Silurian, Ohio: Bownocker, 126.
- Monroe formation, Silurian, Ohio: Hubbard *et al.*, 562.
- Monroe formation, Silurian, Ontario: Malcolm, 750; Williams, 1189.
- Monitor sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Montana group, Cretaceous, Alberta: Dowling, 367.
- Montana group, Cretaceous, Colorado: Beekly, 92; Richardson, 931.
- Montana group, Cretaceous, Montana: Bowen, 119.
- Montana group, Cretaceous, Wyoming: Hintze, 530.
- Monterey group, Miocene, California: Anderson and Pack, 21; Clark, 223.
- Moody's Branch green marls, Tertiary, Mississippi: Lowe, 709.
- Moorefield shale, Mississippian, Arkansas: Girty, 450.
- Moose metargillite, pre-Cambrian, British Columbia: Daly, 302.
- Moreno formation, Cretaceous, California: Anderson and Pack, 21.
- Morrison formation, Cretaceous or Jurassic, Colorado: Richardson, 931.
- Morrison formation, Jurassic, Colorado: Butler, 180.
- Morrison formation, Jurassic or Cretaceous, Colorado: Beekly, 92.
- Morrison formation, Jurassic (?) or Cretaceous, Wyoming: Hintze, 530.
- Morrison formation, New Mexico: Darton, 309.
- Morrow formation, Pennsylvanian, Oklahoma: Snider, 1019.
- Morrow group, Carboniferous, Arkansas and Oklahoma: Mather, 763.
- Mount Hope bed, Ordovician, Kentucky: Miller, 802.
- Mount Laurel sands, Cretaceous, New Jersey: Lewis and Kümmel, 687.
- Mount Roberts formation, Carboniferous, British Columbia: Drysdale, 375.
- Mount Selman formation, Eocene, Texas: Burchard, 158.
- Mowry shale, Cretaceous, Wyoming: Hares, 490.
- Moyie sills, pre-Cambrian, British Columbia: Schofield, 962.
- Nakimu formation, pre-Cambrian, British Columbia: Daly, 302.
- Naknek formation, Jurassic, Alaska: Martin *et al.*, 757.
- Nanafalia formation, Tertiary: Berry, 98.
- Nashua marl, Pliocene, Florida: Matson, 764.
- Naugatuck sandstone, Pennsylvanian, West Virginia: Hennen and Reger, 511; Krebs and Teets, 659.
- Navasota sands, Tertiary, Texas: Dumble, 377.
- Navesink marl, Cretaceous, New Jersey: Lewis and Kümmel, 687.
- Nehawka limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Neihart quartzite, pre-Cambrian, Montana: Calkins and Emmons, 190.
- Nelson granodiorite, Jurassic, British Columbia: Drysdale, 374.
- Nemaha formation, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Neosho member, Permian, Kansas: Shannon and Trout, 983.
- New Albany shale, Devonian, Kentucky: Butts, 182.
- Newark group, Triassic, New Brunswick and Nova Scotia: Powers, 894.
- Newark group, Triassic, New Jersey: Lewis and Kümmel, 687.
- Newland formation, pre-Cambrian, Montana: Calkins and Emmons, 190.
- Newman limestone, Mississippian, Tennessee: Glenn, 455.
- New Providence shale, Mississippian, Kentucky: Butts, 182.
- New River group, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Krebs and Teets, 659.
- New Scotland beds, Devonian, New Jersey: Lewis and Kümmel, 687.
- Niagara formation, Silurian, Ontario: Malcolm, 750.
- Niagarylimestone, Silurian, Ohio: Bownocker, 126.
- Niagara limestones, Silurian, Saskatchewan and Manitoba: McInnes, 670.
- Nicola series, Triassic-Jurassic, British Columbia: Daly, 302.
- Nikolai greenstone, Alaska: Mertie, 799.
- Nikolai greenstone, Triassic (?) or Carboniferous (?), Alaska: Martin *et al.*, 757.
- Niobrara formation, Cretaceous, Colorado: Beekly, 92; Butler, 180; Richardson, 931.
- Niobrara formation, Cretaceous, Wyoming: Hares, 490.
- Niobrara shales, Cretaceous, Saskatchewan: McInnes, 734.
- Nipple Mountain series, Miocene, British Columbia: Reinecke, 920.
- Noix oolite, Silurian, Missouri: Keyes, 631.
- North Fork shale, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- North Mountain basalt, Triassic, New Brunswick and Nova Scotia: Powers, 894.
- North Park formation, Tertiary, Colorado: Beekly, 92.
- Nowata shales, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Nugget sandstone, Triassic, Idaho: Mansfield, 753.
- Nussbaum formation, Pliocene, Colorado: Butler, 180.
- Nuttall sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Oak Grove sand, Oligocene, Florida: Matson, 764.
- Oak Grove sands, Tertiary, Florida: Dall, 301.
- Oakville sand, Miocene, Texas: Dumble, 377, 380.
- Ocala formation, Eocene, Florida: Sellards, 978.
- Ocala limestone, Eocene, Florida: Cooke, 268; Sellards, 978.
- Ocala limestone, Oligocene, Florida: Matson, 764.

- Ocala limestone, Tertiary, Florida: Dall, 301.
- Oceana limestone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Ogalla formation, Pliocene, Colorado: Butler, 180.
- Ogdenburg (Beekmantown) dolomite, New York: Chadwick, 211.
- Ohio shale, Devonian, Ohio: Hubbard *et al.*, 562.
- Ohio shale group, Devonian, Ohio: Bonine, 117.
- Okefenokee formation, Pleistocene, Georgia: Stephenson and Veatch, 1041.
- Olentangy shale, Devonian, Ohio: Bonine, 117; Grabau, 464; Hubbard *et al.*, 562; Stauffer, 1036.
- Olentangy shale, Devonian, Ontario: Stauffer, 1035.
- Olentangy shale member, Devonian, Ontario: Malcolm, 750.
- Onalaska sands, Tertiary, Texas: Dumble, 377.
- Onaping tuff, pre-Cambrian, Canada: Coleman, 252.
- Onondaga formation, Devonian, Ontario: Malcolm, 750.
- Onondaga limestone, Devonian, New Jersey: Lewis and Kummel, 687.
- Onondaga limestone, Devonian, Ontario: Stauffer, 1035.
- Onwatin slate, pre-Cambrian, Ontario: Coleman, 252.
- Orca group, Jurassic or Cretaceous, Alaska: Martin *et al.*, 757.
- Orca group, Mesozoic, Alaska: Capps and Johnson, 203.
- Oread limestone, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Oread limestone member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Oreapolis limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Orinda formation, Pliocene, California: Clark, 223.
- Oriskany formation, Devonian, New Jersey: Lewis and Kummel, 687.
- Oriskany formation, Devonian, Ontario: Malcolm, 685; Stauffer, 950.
- Osgood beds, Silurian, Ohio: Bownocker, 126.
- Osgood formation, Silurian, Kentucky: Butts, 182.
- Packard rhyolite, Tertiary, Utah: Crane, 272, 273.
- Pageton sandstone, Mississippian, West Virginia: Hennen and Gawthrop, 510.
- Paint Lick bed, Ordovician, Kentucky: Miller, 802.
- Paint slate formation, Algonkian, Michigan: Allen and Barrett, 12.
- Palm Beach limestone, Pleistocene, Florida: Matson, 699.
- Palms formation, Algonkian, Michigan: Allen and Barrett, 12.
- Palms formation, pre-Cambrian, Michigan: Allen and Barrett, 13.
- Panama formation, Oligocene, Panama Canal Zone: MacDonald, 729.
- Panhandle beds, Miocene, Texas: Baker, 38.
- Panoche formation, Cretaceous, California: Anderson and Pack, 21.
- Panther conglomerate, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Papagalloes shale, Cretaceous, Mexico: Dumble, 378.
- Papagalloes shales, Cretaceous, Mexico: Garfias, 434.
- Papagalloes shales, Eocene, Mexico: DeGolyer, 342.
- Papagalloes shales, Mexico: Dumble, 379.
- Parkman sandstone, Cretaceous, Wyoming: Hares, 490.
- Parrsboro formation, Pennsylvanian, Nova Scotia: Hyde, 572.
- Paskapoo formation, Cretaceous-Tertiary, Alberta: Dowling, 370.
- Pawneelimestone, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Pawnee limestone, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Peace River sandstone, Cretaceous, Alberta: Dowling, 370.
- Peay sandstone, Cretaceous, Wyoming: Hintze, 530.
- Peerless sandstone, Pennsylvanian, West Virginia: Hennen and Reger, 511.
- Peninsular limestone, Tertiary, Florida: Dall, 301.
- Pennington shale, Mississippian, Tennessee: Glenn, 455.
- Pennsylvanian series, Carboniferous, Illinois: Lee, 672.
- Pensauken formation, Pleistocene, New Jersey: Lewis and Kummel, 687.
- Peorian or postloessial soil, Pleistocene: Leverett and Taylor, 686.
- Percé limestone, Devonian, Quebec: Clarke, 232.
- Perryville member, Ordovician, Kentucky: Miller, 802.
- Peshastin formation, pre-Tertiary, Washington: Saunders, 954.
- Peshastin series, Carboniferous, Washington: Smith, 1018.
- Petrolia shale, Devonian, Ontario: Stauffer, 1035.
- Petrolia shale member, Devonian, Ontario: Malcolm, 750.
- Phillips formation, pre-Cambrian, British Columbia: Schofield, 962.
- Pic d'Aurore series, Devonian, Quebec: Clarke, 232.
- Picton granite, pre-Cambrian, New York: Cushing, 293.
- Pierpoint sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Pierre formation, Cretaceous, Colorado: Butler, 180.
- Pierre shale, Cretaceous, Colorado: Beekly, 92; Richardson, 931.
- Pierre shale, Cretaceous, Saskatchewan: Rose, 950.
- Pierre shale, Cretaceous, Wyoming: Hintze, 530.
- Pikes Peak granite, pre-Cambrian, Colorado: Richardson, 931.
- Pinal schist, pre-Cambrian, Arizona: Ransome, 908, 909.
- Pinedale stage, Pleistocene, Wyoming: Blackwelder, 108.
- Pine Mountain formation, pre-Cambrian or Cambrian, Georgia: Galpin, 429.
- Pineville sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Pinyon conglomerate, Eocene, Wyoming: Blackwelder, 108.
- Pioneer shale, Cambrian, Arizona: Ransome, 908, 909.
- Pitkin limestone, Mississippian, Oklahoma: Shannon and Trout, 983; Snider, 1019.
- Pittsburgh red shale, Pennsylvanian, West Virginia: Krebs and Teets, 659.
- Platte shales, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Plattsburg limestone member, Pennsylvanian, Missouri: Hinds and Greene, 529.

- Plattsmouth limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Pleasanton formation, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Pocahontas group, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Krebs and Teets, 659.
- Pocahontas (Lower) sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Pocahontas (Upper) sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Pochuck gneiss, pre-Cambrian, New Jersey: Lewis and Kümmel, 687.
- Point Edward formation, Pennsylvanian, Nova Scotia: Hyde, 572.
- Point Pleasant beds, Ordovician, Ohio: Bownocker, 126.
- Poison Canyon formation, Eocene, Colorado: Butler, 180.
- Pomeroy sandstone, Pennsylvanian, Ohio: Bownocker, 126.
- Ponce chalky limestones, Tertiary, Porto Rico: Berkeley, 96.
- Popo Agie beds, Triassic, Wyoming: Branson, 132.
- Porter's Creek formation, Tertiary, Mississippi: Lowe, 709.
- Port Ewen beds, Devonian, New Jersey: Lewis and Kümmel, 687.
- Port Hudson formation, Pleistocene, Mississippi: Lowe, 709.
- Port Lambton beds, Devonian, Ontario: Malcolm, 750; Stauffer, 1035.
- Portneuf limestone, Triassic, Idaho: Mansfield, 753.
- Portsmouth shale member, Mississippian, Ohio: Hyde, 573.
- Potsdam formation, Cambrian, Canada: Malcolm, 750.
- Potsdam sandstone, New York: Chadwick, 211.
- Pottsville formation, Carboniferous, Pennsylvania: Pa. Top. G. S., 870.
- Pottsville formation, Pennsylvanian, Illinois: Blatchley, 112; Kay and White, 616; Lee, 672; Morse and Kay, 828; Udden and Shaw, 1097.
- Pottsville series, Pennsylvanian, West Virginia: Krebs and Teets, 659.
- Poxino Island shale, Silurian, New Jersey: Lewis and Kümmel, 687.
- Presque Isle granite, Algonkian, Michigan: Allen and Barrett, 12.
- Presque Isle granite, pre-Cambrian, Michigan: Allen and Barrett, 13.
- Preston limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Prichard formation, pre-Cambrian, Montana: Calkins and Emmons, 190.
- Princeton series, Algonkian, Michigan: Allen and Barrett, 12.
- Prout series, Devonian, Ohio: Grabau, 464.
- Providence sand member, Cretaceous, Georgia: Stephenson and Veatch, 1041.
- Purcell lava, pre-Cambrian, British Columbia: Schofield, 962.
- Purcell series, pre-Cambrian, British Columbia: Schofield, 962.
- Purcell sills, pre-Cambrian, British Columbia: Schofield, 962.
- Purgatoire formation, Cretaceous, Colorado: Richardson, 931.
- Purgatory (or Purgatoire) formation, Comanchean, Colorado: Butler, 180.
- Puyallup, Pleistocene, Washington: Bretz, 135.
- Puyer formation, Eocene, Washington: Daniels, 305.
- Quadrant formation, Pennsylvanian, Montana: Calkins and Emmons, 190.
- Quartermaster formation, Permian, Oklahoma: Shannon and Trout, 983.
- Quartermaster formation, Permian, Texas: Baker, 38.
- Quebradillas reef limestones, Tertiary, Porto Rico: Berkey, 96.
- Queen Charlotte series, Cretaceous, British Columbia: Mackenzie, 736.
- Quinnimont sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Raccoon member, Mississippian, Ohio: Hyde, 573.
- Rainbow series, post-Franciscan, California: Stalder, 1030.
- Raleigh (Lower) sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Raleigh (Upper) sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Raritan formation, Cretaceous, New Jersey: Lewis and Kümmel, 687.
- Raton formation, Eocene, Colorado: Butler, 180.
- Ravalli formation, pre-Cambrian, Montana: Calkins and Emmons, 190.
- Raytown limestone, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Reagan sandstone, Cambrian (?), Oklahoma: Shannon and Trout, 983.
- Red Bank sand, Cretaceous, New Jersey: Lewis and Kümmel, 687.
- Red Beds (Chugwater formation), Permian and Triassic, Wyoming: Branson, 132.
- Red Bluff clay member, Oligocene, Florida: Cooke, 268.
- Reynosa limestone, Tertiary, Mexico: Dumble, 378.
- Ricardo formation, Pliocene, California: Merriam, 787.
- Richmond, Paleozoic, Michigan: Case and Robin, son, 210.
- Richmond formation, Ordovician, Ohio: Bownocker, 126.
- Richmond group, Ordovician, Kentucky: Butts, 182.
- Richmond shale, Ordovician, Ontario: Malcolm, 750.
- Ridgway till, Eocene, Colorado: Atwood, 33.
- Rift shale, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Ripley formation, Cretaceous, Georgia: Stephenson and Veatch, 1041.
- Ripley formation, Cretaceous, Mississippi: Lowe, 709.
- Riverside sandstone, Indiana: Beede, *et al.*, 91.
- Roan gneiss, pre-Cambrian, Georgia: Galpin, 429.
- Rochester shale, Silurian, Ontario: Malcolm, 750.
- Rock Creek or Tule beds, Pleistocene, Texas: Baker, 38.
- Rocky Mountain limestone, Cretaceous, Alberta: Dowling, 371.
- Romney shales, Devonian, West Virginia: Prosser, 903.

- Rondout limestone, Silurian, New Jersey: Lewis and Kümmel, 687.
- Rossville formation, pre-Cambrian, British Columbia: Schofield, 962.
- Rosewood shale, Mississippian, Kentucky: Butts, 182.
- Roslyn formation, Eocene, Washington: Saunders, 954.
- Ross formation, pre-Cambrian and Cambrian, British Columbia: Daly, 302.
- Ross limestone, Triassic, Idaho: Mansfield, 753.
- Rulo limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Rustler formation, Permian, Texas: Baker, 38.
- Rustler Spring formation, Cretaceous or Jurassic, Texas: Udden, 1095.
- St. Clair marble, Silurian, Oklahoma: Shannon and Trout, 983; Snider, 1019.
- St. Eugene interglacial epoch, Pleistocene, British Columbia: Schofield, 962.
- St. Eugene silts, Pleistocene, British Columbia: Schofield, 962.
- Ste. Genevieve limestone, Mississippian, Illinois: Blatchley, 112.
- St. Joe limestone member, Mississippian, Arkansas: Girty, 451.
- St. Joe limestone member, Mississippian, Oklahoma: Snider, 1019.
- St. Louis limestone, Mississippian, Illinois: Blatchley, 112; Morse and Kay, 828.
- St. Mary sills, pre-Cambrian, British Columbia: Schofield, 962.
- St. Peter sandstone, Ordovician, Illinois: Blatchley, 112.
- St. Piran formation, Cambrian, British Columbia: Daly, 302.
- Salem formation, Mississippian, Illinois: Morse and Kay, 828.
- Salem limestone, Mississippian, Indiana: Malott, 751.
- Salem oolitic limestone, Indiana: Beede, *et al.*, 91.
- Salem (Spergen) limestone, Mississippian, Illinois: Blatchley, 112.
- Salina formation, Silurian, Ontario: Malcolm, 750; Williams, 1189.
- Salmon Arm formation, pre-Cambrian, British Columbia: Daly, 302.
- Saltsburg sandstone, Pennsylvanian, West Virginia: Krebs and Teets, 659.
- Saluda limestone, Ordovician, Kentucky: Butts, 182.
- Salvisa bed, Ordovician, Kentucky: Miller, 802.
- Sandy Huff shale, Pennsylvania, West Virginia: Hennen and Gawthrop, 510.
- San Felipe beds, Eocene, Mexico: DeGolyer, 341.
- San Felipe limestone, Cretaceous, Mexico: Garfias, 434.
- San Felipe series, Eocene, Mexico: DeGolyer, 342.
- San Fernando, Oligocene, Mexico: Dumble, 380.
- San Fernando beds, Oligocene, Mexico: Garfias, 434.
- Sangamon interglacial stage, Pleistocene: Leverett and Taylor, 686.
- San Juan formation, Pleistocene, Porto Rico: Berkey, 96.
- San Juan limestone, Cretaceous, Mexico: Dumble, 378.
- San Juan series, Mexico: Dumble, 379.
- San Pablo formation, Miocene, California: Anderson and Pack, 21.
- San Pablo group, Tertiary (Miocene), California: Clark, 220.
- San Sebastian shales, Tertiary, Porto Rico: Berkey, 96.
- Santa Clara formation, Tertiary or Quaternary, California: Clark, 223.
- Santa Margarita (?) formation, Miocene, California: Anderson and Pack, 21.
- Satilla formation, Pleistocene, Georgia: Stephenson and Veatch, 1041.
- Satsop formation, Pleistocene, Washington: Bretz, 135.
- Savanna sandstone, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Sawatch sandstone, Cambrian, Colorado: Richardson, 931.
- Scanlan conglomerate, Cambrian, Arizona: Ransome, 908, 909.
- Scarboro beds, Pleistocene, Canada: Coleman, 255.
- Scioto Valley shale, Mississippian, Ohio: Hyde, 573.
- Scots Bay formation, Triassic, New Brunswick and Nova Scotia: Powers, 894.
- Scranton shale member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Seine River series, pre-Cambrian, Canada: Coleman, 252.
- Selkirk series, pre-Cambrian, British Columbia: Daly, 302.
- Sellersburg limestone, Devonian, Kentucky: Butts, 182.
- Selma chalk formation, Cretaceous, Mississippi: Lowe, 709.
- Seminole conglomerate, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Senora formation, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Severy shale member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Shannon sand, Cretaceous, Wyoming: Huntley, 568.
- Shark River marl, Tertiary, New Jersey: Lewis and Kümmel, 687.
- Shawangunk conglomerate, Silurian, New Jersey: Lewis and Kümmel, 687.
- Shawnee formation, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Sheppard formation, Jurassic?, British Columbia: Schofield, 962.
- Sheppard granite porphyry, Miocene, British Columbia: Drysdale, 375.
- Shimer gypsum, Permian, Oklahoma: Shannon and Trout, 983.
- Shoal Creek limestone member, Pennsylvanian, Illinois: Lee, 672.; Udden and Shaw, 1097.
- Shoal River marl, Oligocene, Florida: Matson, 764.
- Short Creek oolite member, Mississippian, Arkansas: Girty, 451.
- Shoshone series, Eocene, Colorado: Butler, 180.
- Shuswap terrane, pre-Cambrian, British Columbia: Daly, 302.
- Sicamous formation, pre-Cambrian, British Columbia: Daly, 302.
- Silo sandstone, Cretaceous, Oklahoma: Shannon and Trout, 983.
- Silver Hill formation, Cambrian, Montana: Calkins and Emmons, 190.

- Silver Plume granite, pre-Cambrian, Colorado: Bastin, 81.
- Simpson formation, Ordovician, Oklahoma: Shannon and Trout, 983.
- Sir Donald formation, Cambrian, British Columbia: Daly, 302.
- Siyeh formation, pre-Cambrian, British Columbia: Schofield, 962.
- Skidgate sandstones and shales, Cretaceous, British Columbia: Mackenzie, 736.
- Skonun sediments, Tertiary, British Columbia: Mackenzie, 736.
- Skunnumunk conglomerate, Devonian, New Jersey: Lewis and Kummel, 687.
- Skwentna group, Triassic? or Carboniferous?, Alaska: Martin *et al.*, 757.
- Smoky River shales, Cretaceous, Alberta: Dowling, 370.
- Snake Creek beds, Pliocene, Nebraska: Sinclair, 919.
- Snake River stage, Pliocene, Nebraska: Barbour, 63.
- Snoqualmie granodiorite, Washington: Smith, 1018.
- Sodus shale, Silurian, Ontario: Malcolm, 750.
- South Bend limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Spergen limestone, Mississippian, Kentucky: Butts, 182.
- Spokane formation, pre-Cambrian, Montana: Calkins and Emmons, 190.
- Spring Creek limestone, Mississippian, Arkansas: Girty, 450.
- Springfield limestone, Silurian, Ohio: Bownocker, 126.
- Springvale sandstone, Devonian, Ontario: Stauffer, 1035.
- Standley shale, Oklahoma: Shannon and Trout, 983.
- Stanlukovich shale, Cretaceous, Alaska: Martin *et al.*, 757.
- Stanton limestone member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Steele shale, Cretaceous, Wyoming: Hares, 490.
- Steeprock series, pre-Cambrian, Canada: Coleman, 252.
- Stewartville, Paleozoic, Michigan: Case and Robinson, 210.
- Stockton formation, Triassic, New Jersey: Lewis and Kummel, 687.
- Stockton limestone, Pennsylvanian, West Virginia: Krebs and Teets, 659.
- Stonewall series, Silurian, Manitoba: Wallace, 1119.
- Stormville sandstone, Devonian, New Jersey: Lewis and Kummel, 687.
- Stringtown shale, Ordovician, Oklahoma: Shannon and Trout, 983.
- Stuart shale, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Sturm limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Sudbury series, pre-Cambrian, Canada: Coleman, 252.
- Sunbeam monzonite, Tertiary, Utah: Crane, 272, 273.
- Sunbury shale, Mississippian, Ohio: Bonine, 117; Hubbard *et al.*, 562; Hyde, 573.
- Sunbury shales, Mississippian, Ohio: Bownocker, 126.
- Sundance formation, Jurassic, Colorado: Butler, 180.
- Sunday quartzite, Algonkian, Michigan: Allen and Barrett, 12.
- Sunday quartzite, pre-Cambrian, Michigan: Allen and Barrett, 13.
- Sunrise group, Paleozoic, Alaska: Martin *et al.*, 757.
- Swansea rhyolite, Tertiary, Utah: Crane, 272.
- Swauk formation, Eocene, Washington: Saunders, 954.
- Swauk sandstone, Eocene, Washington: Smith, 1018.
- Sycamore limestone, Devonian, Oklahoma: Shannon and Trout, 983.
- Sylamore sandstone member, Devonian, Oklahoma: Shannon and Trout, 983.
- Sylamore sandstone member, Devonian(?), Oklahoma: Snider, 1019.
- Sylvan shale, Ordovician, Oklahoma: Shannon and Trout, 983.
- Sylvania sandstone member, Silurian, Ontario: Malcolm, 750.
- Talihina chert, Oklahoma: Shannon and Trout, 983.
- Tallahatta buhrstone, Tertiary, Alabama and Mississippi: Berry, 98.
- Tallahatta formation, Tertiary, Mississippi: Lowe, 709.
- Tallulah Falls quartzite, Georgia: Galpin, 429.
- Tamasopo limestone, Cretaceous, Mexico: Garfias, 434; DeGolyer, 341; Dumble, 379.
- Tampa formation, Oligocene, Florida: Matson, 764; Sellards, 978.
- Tampa limestone, Oligocene, Florida: Sellards, 978.
- Tampa limestone, Tertiary, Florida: Dall, 301.
- Tampa silex beds, Oligocene, Florida: Sellards, 978.
- Taneum andesite, Miocene, Washington: Saunders, 954.
- Tarkio limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Tarkio limestone member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Tatina group, Ordovician, Alaska: Martin *et al.*, 757.
- Tazin series, pre-Cambrian, Alberta and Northwest Territory: Camsell, 194.
- Tazin series, pre-Cambrian, Alberta and Saskatchewan: Alcock, 5.
- Teanaway basalt, Eocene, Washington: Saunders, 954.
- Teapot sandstone, Cretaceous, Wyoming: Hares, 490.
- Tecovas formation, Triassic, Texas: Baker, 38.
- Tecumseh shale member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Tecumseh shales, Pennsylvanian, Nebraska and Kansas: Condra and Bengtson, 258.
- Tejon formation, Eocene, California: Anderson and Pack, 21; Clark, 223.
- Tejon group, Eocene, California and Washington: Dickerson, 348.
- Temiscaming series, pre-Cambrian, Canada: Coleman, 252.
- Tetro limestone, Paleozoic, Utah: Crane, 272, 273.

- Thaynes group, Triassic, Idaho: Mansfield, 753.
 Theresa formation, New York: Chadwick, 211.
 Thorold sandstone member, Silurian, Ontario: Malcolm, 750.
 Three Forks formation, Devonian, Montana: Haynes, 502.
 Thurman sandstone, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
 Timiskamian, pre-Cambrian, Ontario: Miller and Knight, 806.
 Timpas formation, Cretaceous, Colorado: Butler, 180.
 Tintic quartzite, Paleozoic, Utah: Crane, 272, 273.
 Tintic slate, Paleozoic, Utah: Crane, 273.
 Tinton bed, Cretaceous, New Jersey: Lewis and Kummel, 687.
 Tippah sandstone, Tertiary, Mississippi: Lowe, 709.
 Toboso conglomerate, Mississippian, Ohio: Hyde, 573.
 Toccoa quartzite, Georgia: Galpin, 429.
 Tonkawatia form, pre-Cambrian, British Columbia: Daly, 302.
 Tonto group, Cambrian, Arizona: Ransome, 908.
 Tonzona group, Silurian or Devonian, Alaska: Martin *et al.*, 757.
 Topeka limestone member, Pennsylvanian, Missouri: Hinds and Greene, 529.
 Torchlight sandstone, Cretaceous, Wyoming: Hintze, 530.
 Tordrillo formation, Jurassic, Alaska: Martin *et al.*, 692.
 Tornado limestone, Carboniferous, Arizona: Ransome, 908.
 Toro limestone, Pliocene or Pleistocene, Panama Canal Zone: MacDonald, 729.
 Toronto formation, Pleistocene, Canada: Coleman, 255.
 Traverse formation, Devonian, Ohio: Bownocker, 126.
 Trenton formation, Ordovician, Canada: Malcolm, 750.
 Trinidad formation, Cretaceous, Colorado: Butler, 180.
 Trinity sand, Cretaceous, Oklahoma: Shannon and Trout, 983.
 Trout Lake conglomerate, pre-Cambrian, Canada: Coleman, 252.
 Troy quartzite, Cambrian(?), Arizona: Ransome, 908, 909.
 Trujillo formation, Triassic, Texas: Baker, 38.
 Trujillo Alto limestone, Cretaceous, Porto Rico: Berkey, 96.
 Tshimakin formation, pre-Cambrian, British Columbia: Daly, 302.
 Tulare(?) formation, Pliocene and Pleistocene, California: Anderson and Pack, 21.
 Tule or Rock Creek beds, Pleistocene, Texas: Baker, 38.
 Tuscahoma formation, Tertiary: Berry, 98.
 Tuscaloosa formation, Cretaceous, Mississippi: Lowe, 709.
 Tuscan tuff, Tertiary, California: Bryan, 156.
 Tuscumbia chert, Mississippian, Mississippi: Lowe, 709.
 Tuxedni sandstone, Jurassic, Alaska: Martin *et al.*, 757.
 Tuxpan beds, Miocene, Mexico: Garfias, 434.
 Tye soda granite, Washington: Smith, 1018.
 Tyler slate, Algonkian, Michigan: Allen and Barrett, 12.
 Tyler slate, pre-Cambrian, Michigan: Allen and Barrett, 13.
 Tyner formation, Ordovician, Oklahoma: Shannon and Trout, 983; Snider, 1019.
 Tyrone limestone, Ordovician, Kentucky: Miller, 802.
 Uncas shale, Permian, Oklahoma: Shannon and Trout, 983.
 Unga formation, Tertiary, Alaska: Martin *et al.*, 757.
 Union limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
 Union Pass cycle, Pleistocene, Wyoming: Blackwelder, 108.
 Utica group, Ordovician, Canada: Malcolm, 750.
 Valdez group, Paleozoic, Alaska: Capps and Johnson, 203; Martin *et al.*, 757.
 Vanceburg member, Mississippian, Ohio: Hyde, 573.
 Vancouver group, Jurassic-Triassic, British Columbia: Mackenzie, 736.
 Vaqueros formation, Miocene, California: Anderson and Pack, 21.
 Vashon, Pleistocene, Washington: Bretz, 135.
 Vermejo formation, Cretaceous, Colorado: Butler, 180.
 Vicksburg formation, Oligocene, Georgia: Stephenson and Veatch, 1041.
 Vicksburg group, Oligocene, Florida: Cooke, 268; Matson, 764.
 Vicksburg group, Tertiary, Mississippi: Lowe, 709.
 Vilas shale member, Pennsylvanian, Missouri: Hinds and Greene, 529.
 Vincentown sand, Cretaceous, New Jersey: Lewis and Kummel, 687.
 Vinton member, Mississippian, Ohio: Hyde, 573.
 Viola limestone, Ordovician, Oklahoma: Shannon and Trout, 983.
 Virgelle sandstone member, Cretaceous, Montana: Bowen, 119.
 Vivian sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
 Wabausee formation, Pennsylvanian, Missouri: Hinds and Greene, 529.
 Waccamaw formation, Tertiary, North Carolina and South Carolina: Gardner, 432.
 Wahnapiatae quartzite, pre-Cambrian, Canada: Coleman, 252.
 Walker Ridge shales, post-Franciscan, California: Stalder, 1030.
 Wallace group, Mesozoic, British Columbia: Reinecke, 920.
 Wall Creek sand, Cretaceous, Wyoming: Huntley, 568.
 Waldron shale, Silurian, Kentucky: Butts, 182.
 Wapanucka limestone, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
 Wapiti River sandstone, Cretaceous, Alberta: Dowling, 370.
 Wardner formation, Mississippian, British Columbia: Schofield, 962.

- War Eagle (Lower) sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510; Hennen and Reger, 511.
- Warrensburg sandstone, Pennsylvanian, Missouri: Hinds and Greene, 529.
- Warsaw formation, Mississippian, Illinois: Morse and Kay, 828.
- Warsaw limestone, Mississippian, Kentucky: Butts, 182.
- Washington formation, Permian, Pennsylvania: Pa. Top. G. S., 870.
- Waverly formations, Mississippian, Ohio: Hyde, 573.
- Waynesville limestone, Ordovician, Kentucky: Butts, 182.
- Wedington sandstone member, Mississippian, Oklahoma: Snider, 1019.
- Weeping Water limestone, Pennsylvanian, Nebraska: Condra and Bengtson, 258.
- Welch sandstone, Pennsylvanian, West Virginia: Hennen and Gawthrop, 510.
- Wellborn sand, Eocene, Tex.: Dumble, 377.
- Wenonah sands, Cretaceous, New Jersey: Lewis and Kummel, 687.
- Westkettle quartz diorite, Jurassic(?), British Columbia: Reinecke, 920.
- Weston shale member, Pennsylvanian, Missouri: Hinds and Greene, 529.
- West Union limestone, Silurian, Ohio: Bownocker 126.
- Wetumka shale, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Wewoka formation, Carboniferous, Oklahoma: Girty, 448.
- Wewoka formation, Pennsylvanian, Oklahoma: Shannon and Trout, 983.
- Wharncliffe (Dotson) sandstone, Pennsylvanian, West Virginia: Hennen and Reger, 511.
- Whirlpool sandstone member, Silurian, Ontario: Malcolm, 750.
- White Beach limestone, Tertiary, Florida: Dall, 301.
- Whitehorse sandstone, Permian, Oklahoma: Shannon and Trout, 983.
- White River formation, Oligocene, North and South Dakota: Lloyd and Hares, 696.
- Whitetail conglomerate, Tertiary (?), Arizona: Ransome, 908.
- Whitewater series, pre-Cambrian, Canada: Coleman, 252.
- Wichita division, Permian, Texas: Richard, 928.
- Wichita formation, Permian, Oklahoma: Wegmann, 1156.
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