

INDEX

A

Acanthoclema confluens, 153
Actinocrinus lowei, 152, 159, 166; *multiradiatus*, 133, 137; *pernodosus*, 152, 194; *scitulus*, 133, 140
Agaricocrinus americanus, 152; *americanus* var. *tuberosus*, 152, 193; *gracilis*, 135; *nodulosus*, 194; *nodulosus* var. *macadamsi*, 194; *ornotrema*, 124; *wortheni*, 152, 188, 194, 208
Agates, development of, 306
Agelacrinus legrandensis, 83
Agoniatites opimus, 62
Alden limestone of Kinderhook group, 52, 92; in Hardin county, 99
Allorhynchus heteropsis, 60, 66, 73
Allorisma marionensis, 294 ff; *sinuata*, 272
Alton, Illinois, Verdi beds at, 231
Amana, Kinderhook beds at, 78
Ambocoelia parva, 64
Ames, St. Louis beds near, 279
Amplexus fragilis, 123
Anderson quarry, Louisa Co., Burlington beds in, 139; Kinderhook beds at, 63
Anisotrypa fistulosa, 294 ff; *ramulosa*, 294 ff
Ankerite in geodes, 312, 336
Aorocrinus immaturus, 83; *parvibasis*, 83; *parvus*, 124, 138
Archaeocidaris, 170, 267; *keokuk*, 188, 200; *legrandensis*, 83
Archimedes limestone near Warsaw, 205
Archimedes negligens, 160, 209; cf. *A. negligens*, 153, 199-201, 209; *owenanus*, 153, 161, 189 ff, 209, 211; *wortheni*, 189, 209, 211, 216
Arey, M. F., work of, 87, 107, 293
Astartella, 296
Athyris crassicaudalis, 60, 66, 98, 105; *corpulenta*, 68, 70; *incrassatus*,

68; *lamellosa*, 125, 133 ff, 154, 156, 167, 180, 344; *subquadrata*, 267
Augusta, Burlington beds at, 127; fauna of Burlington beds at, 132; Keokuk limestone near, 163, 167
Augusta limestone, classification, 46; in Keokuk county, 180; in Washington county, 141
Avicula strigosa, 61
Aviculopecten caroli, 61, 68; *iowensis*, 61; *tenuicostus*, 61; cf. *A. oblongus*, 171

B

Bactropora simplex, 160, 176, 199, 201, 209, 217
Bain, H. F., work of, 48, 71, 74, 75, 141, 180, 230, 233, 273, 274, 276, 278, 298, 299
Ballinger Siding, Lower Warsaw beds near, 212
Baryocrinus bullatus, 194; *magister*, 152, 194; *spurius*, 152, 193, 194; *stellatus*, 152, 194; *tumidus*, 152, 194
Bassler, R. S., work of, 305, 314, 343
Batocrinus clypeatus, 137; *grandis*, 132; *laura*, 132, 134, 137, var. *sinuosus*, 141; *macbridei*, 83; *poculum*, 83; *subaequalis*, 124
Batostomella, 189; *interstincta*, 303
Bear creek, Van Buren Co., geodes on, 326, 334; Lower Warsaw beds on, 201; Spergen formation on, 228
Belfast, St. Louis limestone near, 240; Spergen beds near, 216
Bellerophon bilabiatum, 61, 69, 73; *panneus*, 62; *sublaevis*, 109; *vinculatus*, 61, 73
Bentonsport, geodes at, 326, 334; Keokuk limestone at, 169; Lower Warsaw beds near, 199; St. Louis limestone near, 259; Upper Burlington beds near, 135

- Beyer, S. W., work of, 79, 83, 84, 87, 88, 93, 95, 279, 280
- Big creek, Henry Co., St. Louis beds on, 264
- Bitumen in geodes, 312, 321, 339
- Bonaparte, Pella beds near, 293; St. Louis limestone near, 252; Spergen beds near, 228
- Brachythyris altonensis*, 243, 266; *burlingtonensis*, 64; *peculiaris*, 60; *subcardiformis*, 153, 189, 194, 199, 210, 215, 217, 226; *suborbicularis*, 125, 133, 135, 138, 153, 156, 167, 170 ff, 189, 194, 210
- Brecciation of St. Louis limestone, 233; origin, 235; relation to dolomitization, 235
- Brighton, Pella beds near, 299; St. Louis beds near, 272
- Brooklyn wells, Kinderhook strata in, 77
- Brush, Geo. H., work of, 304
- Brush creek, Henry Co., Pella beds along, 294
- Bucanopsis deflectus*, 62; *perelegans*, 62, 66
- Bulimorpha ? keokuk*, 180
- Burlington, Burlington limestone at, 121; fauna of Kinderhook at, 55; Keokuk beds at, 168; Kinderhook beds at, 51, 53
- Burlington limestone, character, 119; classification, 45; crinoid remains in, 120; distribution, 118; fish bed in, 120; relations, 347; thickness, 121; at Burlington, 121; in Des Moines county, 121, fauna, 123; in Lee county, 121; in Louisa county, 136, fauna, 137; in Van Buren county, 135; in Washington county, 141
- Butler county, Kinderhook beds in, 106
- C**
- Cactocrinus arnoldi*, 83; *glans*, 133; *longus*, 133; *multibrachiatus*, 124; *nodobrachiatus*, 83; *ornatissimus*, 83; *proboscidualis*, 83, 122, 124
- Calcite in geodes, 311, 335
- Calvin, Samuel, work of, 88, 114
- Camarophorella lenticularis*, 60
- Camarophoria bisinuata*, 133, 170, 180
- Camarotoechia chouteauensis*, 74, 94, 101, 104, 107; *mutata*, 160, 170 ff, 189 ff, 205, 209; *subglobosa*, 97; cf. *C. tuta*, 98; *grosvenori*, 295
- Capulus paralius*, 62; *vomerium*, 62
- Carboniferous, relation of Mississippian system to, 41
- Cardiopsis megambonata*, 61
- Cascade, Des Moines Co., Burlington beds at, 121
- Cedar Bluff, Jefferson Co., Spergen formation in, 230
- Cedar creek, Jefferson Co., St. Louis limestone on, 269
- Cedar Glen, Illinois, Keokuk beds at, 155
- Cedar Valley beds, relation to Mississippian system, 43; and Kinderhook, relations, 52
- Cement production, 18; in United States, 19; uses, 20
- Centronelloidea rowleyi*, 98
- Cerro Gordo county, Kinderhook beds in, 114
- Chalcedony in geodes, 311, 335
- Chalcopyrite in geodes, 337
- Chamberlin and Salisbury, cited, 304
- Chapin, Chapin beds near, 104
- Chapin beds, 52, 91; in Butler county, 108; in Franklin county, 104
- Chemung stage, 46
- Chequest creek, Van Buren Co., St. Louis beds on, 262
- Cherokee beds, thickness of, 349
- Chert in geodes, 335
- Cherty limestone, classification, 45
- Chester series of Mississippian system, 41
- Chonetes burlingtonensis*, 59, 66; *geniculata*, 59, 64; *gregarius*, 59; *illinoisensis*, 59, 68, 125, 135, 160, 170, 174; *logani*, 59, 66, 74, 81, 105; *multicosta*, 59, 66, 74, 81, 105, 106, 133; *shumardanus*, 170
- Chonopectus* sandstone, 65; at Burlington, 72
- Chonopectus fischeri*, 59 ff.
- Chouteau affinities of Kinderhook fossils, 63
- Chouteau beds, 416; fauna, age, 116

- Cladodus**, 140
 Clark county, Missouri, geodes in, 320;
 Lower Warsaw beds in, 195
 Clay wares, classes, 16; output, 15;
 production in United States, 18
Cleiothyris roissyi, 295
 Clifton creek, Louisa Co., Kinderhook
 beds on, 69
Clinolites lizardensis, 303
Cliothyridina glenparkensis, 60; *hirsuta*,
 60, 296, 301; *incrassata*, 125, 133,
 135, 157, 167 ff., *obmaxima*, 113, 125,
 133, 154, 156, 167, 180; *parvirostris*,
 134, 154, 160, 167, 170 ff, 189 ff, 210,
 211, 217; *prouti*, 101, 102-104, 107;
 tenuilineata, 81, 109, 125
 Coal, production, 10, 14, 15; 1913 to
 1922, 14; in United States, 15
 Coal Measures, relation to Mississippian
 system, 44
 Coal tonnage mined per man, 15
Cochliodus nobilis, 154
Coelanthus welleri, 62
 Colchester, Illinois, St. Louis beds at,
 232
Composita corpulenta, 60, 64, 73; *glo-*
 bosa, 146, 154, 189, 190, 200, 210;
 opposita, 81; *pentagona*, 154; *trinu-*
 clea, 113, 134, 154, 157-160, 167, 170
 ff, 189, 190, 210, 217, 244, 246, 269,
 272, 275, 284, 290 ff
 Concretions, origin of, 306
 Connor quarry, Keokuk Co., Keokuk
 beds in, 181; St. Louis beds in, 277
Conocardium, 247; *pulchellum*, 61
 Conrad, Kinderhook beds at, 87
Conularia byblis, 62; *micronema* ?, 69;
 missouriensis, 154
 Copperas creek, Van Buren Co., geodes
 on, 326
 Coppock, St. Louis beds near, 273
 Correlation, see various formations
Cosinium latum, 124, 135, 142
Cranaena ? *allei*, 60; *globosa*, 180;
 sulcata, 158, 172, 173, 189, 194, 209
 Cretaceous, relation to Mississippian
 system, 44; and Kinderhook, rela-
 tions, 52
 Crinoid remains in Burlington lime-
 stone, 120; of LeGrand beds, 83
 Croton, Pella beds at, 289; St. Louis
 beds at, 244
 Croton limestone, 238, 264, 266; brec-
 ciation in, 234; character and rela-
 tions, 231; see also St. Louis, Lower
 St. Louis
Cryptoblastus melo, 124
 Crystal Glen, Illinois, geodes in, 319
Cyathaxonia, 132
Cyathocrinus marshallensis, 83
Cyathophyllum glabrum, 110
Cyclopora fungia, 195
Cypricardinia indianensis, 203, 210;
 sulcifera, 61, 66
Cyrtina acutirostris, 60
Cyrtoceras unicorne, 62
Cystodictya americana, 199; *lineata*,
 176, 189 ff, 208 ff; *nitida*, 199; *pus-*
 tulosa, 166, 176, 189 ff, 208, 211
Cytherellina glandella, 296
- D**
- Dakota City, St. Louis beds at, 286
 Dana, J. D., cited, 342
 Davis county, Pella beds in, 293
 Deamude quarries, Lee Co., St. Louis
 limestone in, 240; Spergen forma-
 tion in, 215; Upper Warsaw beds in,
 213
Delthyris clarksvillensis, 82; *similis*,
 157
Deltodopsis bialveatus, 141; *convexus*,
 141; *stludovici*, 296
Deltodus, 140; *spatulatus*, 141
 Denmark, geodes near, 306, 325, 327;
 Keokuk limestone near, 162
Dentalium grandaevum, 61, 64, 66, 73,
 75, 82
 Deposition of minerals in geodes, 340
Derbya keokuk, 295
 Des Moines, Kinderhook strata at, 51
 Des Moines county, Burlington beds
 in, 121; geodes in, 307; Keokuk
 limestone in, 163; Kinderhook beds
 in, 53; Lower Warsaw beds in, 196;
 St. Louis beds in, 263; Spergen
 beds in, 226
 Des Moines river, Pella beds on, 289,
 302; St. Louis beds on, 247, 283,
 285; Verdi beds on, 277

- Devils Anvil, Tama Co., Kinderhook beds at, 86
- Devonian, relation to Mississippian system, 43; and Kinderhook, relations, 52; fossils of Kinderhook, 56
- Dexiobia halli*, 61; *ovata*, 61
- Dichocrinus cinctus*, 83; *delicatus*, 83; *inornatus*, 83
- Dichotrypa elegans*, 246
- Dictophyton, 58
- Dielasma burlingtonensis*, 60; *formosa*, 267, 295; *osceolensis*, 125, 133; *rowlei*, 140; *sinuata*, 153, 172; *turgida*, 295
- Dizygocrinus andrewsianus*, 124, 133; *biturbinatus*, 152, 194; *dodecadactylus*, 132, 134; *rotundus*, 124, 132, 134, 137, 140
- Dolomite in geodes, 312, 336
- Dolomitization, relation to brecciation, 235
- Dorycrinus cornigerus*, 135; *mississippiensis*, 152, 171, 193; *missouriensis*, 133; *quinquelobus*, 124, 140; *unicornis*, 124
- Drain tile, sales, 17
- Drainage of Mississippian system, 40
- Dudley, Pella beds at, 297
- E**
- Eagle City, Eagle City formation at, 94
- Eagle City beds of Kinderhook group, 52, 92; in Hardin county, 93
- Echinoderms from LeGrand beds, 83
- Eckles quarry, Washington Co., Burlington beds in, 142
- Edmondia aequimarginalis*, 60, 66; *burlingtonensis*, 60, 68, 70; *illinoisensis*, 190, 210; *jejunus*, 60, 73; *nitida*, 60, 64; *nuptialis*, 60, 64; *quadrata*, 60; *strigillata*, 60; *varsoviensis*, 190, 210
- Elevations of Mississippian system, 40
- Ellsworth quarry, Hardin Co., Kinderhook beds in, 96
- Elrick Junction, Kinderhook beds near, 68
- Elrick quarry, Louisa Co., Burlington beds in, 139
- Endothyra baileyi*, 295
- England, geodes in, 306
- English river, Kinderhook beds on, 71
- English River gritstone, 51, 72
- Eretmocrinus calyculoides*, 124
- Eucladocrinus*, 180; *pleurovimenus*, 133; *praenuntius*, 124
- Eumetria altirostris*, 60, 70, 73; *marcyi*, 267, 295; *verneuiliana*, 94, 154 ff, 171 ff, 190, 194, 210, 215, 217, 246, 258
- Euomphalus luxus*, 110
- Eutaxocrinus fletcheri*, 83
- Eutrochocrinus christyi*, 124, 133, 137, 141; *lovei*, 124, 140; *planodiscus*, 152, 171, 194
- Evactinopora grandis*, 133
- F**
- Farmington, geodes at, 326, 331; Lower Warsaw beds near, 201; Pella beds near, 292, 293; St. Louis beds near, 249; Spergen beds near, 227
- Fauna of Burlington beds, at Augusta, 132; at Burlington, 122; in Des Moines county, 123; in Louisa county, 137; of Keokuk beds, in Des Moines county, 164; in Henry county, 175; in Keokuk county, 178; in Lee county, 146; in Louisa county, 177; in Van Buren county, 170; of Kinderhook beds, at Burlington, 55; in Hardin county, 94; in Louisa county, 63; in Marshall county, 81; in Pocahontas county, 113; in Washington county, 73; of Lower Warsaw beds, in Illinois, 188; in Lee county, 193; of Upper Warsaw at Warsaw, 208; of Pella beds, in Henry county, 294; in Jefferson county, 295; in Marion county, 301; in Wapello county, 296; in Webster county, 303
- Fenestella*, 81; *burlingtonensis*, 124, 138; *cingulata*, 160, 172; *compressa*, 152, 189, 193, 195, 209; *compressa* var. *nododorsalis*, 152; *exigua*, 189, 193, 199, 202, 209, 211; *funicula*, 188, 209; *limitaris*, 152, 176, 188, 209; *multispinosa*, 152, 157-160, 166, 176, 180 ff. 209, 217, 281, 301; *rudis*, 152, 160, 176, 189, 199, 201, 209; *serratula*,

- 124, 138, 152, 157-160, 166, 170 ff, 188 ff, 209 ff, 246, 295; **tenax**, 152, 176, 188 ff, 209, 215; **triserialis**, 152, 188 ff, 209, 211
- Fenestralia sancti-ludovici**, 209
- Fish remains, 64, 103, 126, 131, 138, 158, 170 ff, 194, 294, 301
- Fistulipora spergenensis**, 152
- Forbesiocrinus wortheni**, 194
- Fort Dodge, Pella beds at, 302; St. Louis beds at, 282
- Fort Madison-Appanoose Stone Co. quarry, Illinois, geodes in, 317; Spergen beds in, 225
- Fox City, Missouri, geodes at, 320; Lower Warsaw beds near, 195
- Fox quarry, Lee Co., Spergen formation in, 216
- Franklin county, Kinderhook beds in, 100
- G**
- Geode shales, age, 143; classification, 45; relations, 185; of Keokuk and Lower Warsaw, 304
- Geodes, bitumen in, 321; character, 311, 315; definition, 304; descriptions, 327; minerals in, 335; occurrences, 306; origin, 341; relation to containing rock, 312; time of formation, 345; of the Keokuk beds, 306; of the Lower Warsaw beds, 308
- Geodization, process of, 346
- Geosyncline, Western Interior, 45, 349
- Gifford, Kinderhook beds near, 95
- Gilmore City, Kinderhook beds at, 113
- Gilmore City limestone, relations, 114
- Gilmore Portland Cement Co. quarry, Pocahontas Co., Kinderhook beds in, 113
- Girtyella indianensis**, 174, 178, 205, 209, 215, 217, 243, 244, 258, 265, 272, 290 ff; **turgida**, 161, 209, 217
- Glaciation over Mississippian system, 40
- Glossites**, 291; **burlingtonensis**, 60; **elliptica**, 60, 69
- Glyptopora elegans**, 195, 199, 208; **keyserlingi**, 153, 160, 166, 180, 190, 195, 199, 208, 211; **melinina**, 201, 202, 208; **plumosa**, 209; **sagenella**, 199, 208, 217; **sagenella** var. **caliculosa**, 209
- Gomphoceras**, 62
- Goniocrinus sculptilis**, 83
- Goniophora jennae**, 61, 73
- Gordon, C. H., work of, 46, 142, 147, 213, 233, 259, 292
- Grammysia amygdalinus**, 60, 73; **plena**, 60, 64, 70, 73
- Granite quarry, Keokuk Co., Keokuk limestone in, 178; Verdi limestone near, 276
- Graphiocrinus longicirifer**, 83
- Griffithides**, 62, 134, 154, 170; **portlocki**, 176
- Grinnell wells, Kinderhook strata in, 77
- Grundy county, Kinderhook beds of, 86
- Gurley, see Miller and Gurley
- Gypsum in geodes, 312, 339; production, 20; production in United States, 22
- Gyroceras burlingtonensis**, 62
- H**
- Hadrophyllum glans**, 123, 132, 137
- Hale Roberts quarry, Hardin Co., Alden limestone in, 99
- Hall, James, work of, 45, 118, 142, 184, 203
- Halysiocrinus tunicatus**, 194
- Hamilton, Illinois, geodes at, 320, 333; Lower Warsaw beds near, 190
- Hamilton Clay Co. pit, geodes in, 320; Lower Warsaw beds in, 190
- Hancock county, Illinois, Lower Warsaw beds in, 187; Spergen formation in, 223; Upper Warsaw beds in, 203
- Hancock county, Iowa, Kinderhook beds in, 115
- Hannibal beds, 116
- Hannom's mill, Story Co., St. Louis beds at, 280
- Hardin county, Kinderhook beds in, 92
- Harrows branch, Wapello Co., Pella beds on, 296
- Helodus**, 67

Hematite in geodes, 312, 336

Hemitrypa aspera, 195, 199; cf. **H. beedei**, 199; **nodosa**, 199, 209; **pateriformis**, 160, 189, 209; **perstriata**, 152, 195, 199; **plumosa**, 195, 211; **proutana**, 152, 194, 195, 199, 209; **proutana** var. **nododorsalis**, 209

Henry county, geodes in, 316, 323, 327 ff; Keokuk limestone in, 174; Lower Warsaw beds in, 196; Pella formation in, 293; St. Louis beds in, 263; Spergen formation in, 229

History, geologic, of Mississippian strata, 347

Holopea subconica, 62, 98; **proutana**, 210; cf. **H. proutana**, 189, 194

Holopella mira, 62

Honey creek, Louisa Co., Burlington limestone on, 136; Keokuk limestone on, 177

Humboldt, Kinderhook beds at, 109; St. Louis beds at, 286

Humboldt county, Kinderhook beds in, 109; St. Louis beds in, 284

Humboldt oölite, relations, 111

I

Igoceras, 134; **capulus**, 141; **undata**, 62

Illinois, geodes in, 318 ff; Keokuk beds in, 145; Lower Warsaw beds in, 187, 318 ff; Spergen formation in, 223; Upper Warsaw beds in, 203

Indian creek, Van Buren Co., geodes on, 326, 331; Pella beds on, 290; St. Louis limestone on, 249; Spergen beds on, 227

Indiana, building stone in, 31

Iowa, Mississippian system in, 39

Iowa county, Kinderhook beds of, 78

Iowa Falls, Eagle City beds at, 97; Iowa Falls beds at, 97; Kinderhook beds at, 51; well at, 93

Iowa Falls dolomite of Kinderhook, 92; in Hardin county, 97

Iowa river, Kinderhook beds on, 69, 95

Iowa series of Mississippian system, 41

Iowana Gypsum Company, 21

Ivanhoe quarries, Hardin Co., Alden beds in, 100

J

Jasper county, Kinderhook beds in, 78

Jefferson county, Pella beds in, 294; St. Louis beds in, 267; Spergen formation in, 230

Juniper Hill formation, name proposed, 116

K

Kalona, Kinderhook beds at, 72

Kaolin in geodes, 312, 338, 345

Kay, G. F., acknowledgments, 39

Kemper quarries, Des Moines Co., Burlington beds at, 126; Kinderhook beds at, 55

Keokuk, geodes at, 308, 318, 330; Keokuk beds at, 145; Lower Warsaw beds at, 193; Montrose cherts at, 155; St. Louis beds at, 237; Spergen beds at, 222; thickness of Kinderhook beds at, 51; Upper Warsaw beds near, 211

Keokuk county, Keokuk limestone in, 178; Pella beds in, 299; St. Louis limestone in, 274

Keokuk formation, beds in, 143; character, 142; classification, 45; distribution, 144; geodes of, 306; fauna of, 143; relations, 44, 143, 347; in Illinois, 145; in Des Moines county, 163, fauna, 164; in Henry county, 174, fauna, 175; in Keokuk county, 178, fauna, 178; in Lee county, 145, fauna, 146; in Louisa county, 176, fauna, 177; in Van Buren county, 168, fauna, 170

Keokuk and Lower Warsaw beds, geodes of, 304

Keosauqua, Pella beds at, 292; St. Louis limestone near, 259

Keosauqua sandstone, 292; relations, 259

Keyes, Charles, work of, 46, 53, 117, 120, 142, 144, 239, 263

Kilbourne, St. Louis limestone near, 262

Kinderhook group, Alden limestone of, 92; Chapin beds of, 91; character,

- 50; classification, 46; definition, 49; distribution, 49; Eagle City beds of, 92; English River gritstone of, 72; Iowa Falls dolomite of, 92; LeGrand beds of, '80, 89; Maple Mill beds of, 71; Marshalltown shales of, 84; Mayne Creek beds of, 92; relations, 44; Sheffield beds of, 91; Sweetland Creek beds of, 70; subdivisions, 51; thickness, 51; Wassonville beds of, 74; at Burlington, 55; in Butler county, 106; in Cerro Gordo county, 114; in Des Moines county, 53, fauna, 55; in Franklin county, 100; in Grundy county, 87; in Hancock county, 115; in Hardin county, 92, fauna, 94; in Humboldt county, 109; in Iowa county, 78; in Jasper county, 78; in Kossuth county, 115; in Lee county, 53; in Louisa county, 63, correlation, 70, fauna, 63; in Marshall county, 80, fauna, 81; in Muscatine county, 70; in Pocahontas county, 113, fauna, 113; in Poweshiek county, 77; in Tama county, 84; in Washington county, 71, fauna, 73; in Winnebago county, 115; in Wright county, 109
- Kinderhook of central Iowa, correlation, 88; relations, 78; of north-central Iowa, 90; correlation, 115
- Kinderhook transgression, 347
- Kinderhook and Cedar Valley, relations, 52; and Cretaceous, relations, 52; and Devonian, relations, 52; and Lime Creek, relations, 52; and Pennsylvanian, relations, 52
- Kirschner quarries, Des Moines Co., Kinderhook beds in, 54
- Knobstone shale, geodes of, 314
- Kossuth county, Kinderhook beds in, 115
- L
- Laevidentalium*, 189, 210, 272
- Leda curta*, 290, 291; *saccata*, 61, 64, 106
- Lee county, brecciation in, 234; Burlington beds in, 121; geodes in, 306, 325, 327; Keokuk beds in, 145; Kinderhook beds in, 53; Lower Warsaw beds in, 192; Pella formation in, 289; St. Louis limestone in, 237; Spergen formation in, 215; Upper Warsaw beds in, 210
- Lees and Thomas, work of, 284, 302, 303
- LeGrand, fossils from, 81; quarries near, 80
- LeGrand beds, 52, 84; age, 89; crinoids of, 83; echinoderms from, 83; sections in, 80
- Leioclema foliatum*, 199, 208; *gracillimum*, 160, 166, 180, 217; *punctatum*, 152, 158-160, 166, 173 ff, 189 ff, 208, 211; *wachsmuthi*, 87
- Leiopteria spinalata*, 61, 73
- Leonard, A. G., work of, 270, 296
- Leperditia carbonaria*, 246, 272, 275, 296
- Lepetopsis capulus*, 125, 133, 135, 138
- Leptaena analoga*, 81, 87, 94, 105, 106, 133; *convexa*, 59, 65
- Leptopora typa*, 58, 104, 105
- Leverett estate, geodes on, 325
- Lime, production in Iowa, 31
- Lime Creek shales, relation to Mississippian system, 43; and Kinderhook, relations, 52
- Limestone sold in Iowa, 28; in United States, 30
- Limonite in geodes, 339
- Lingula* cf. *L. melie*, 71; *membranacea*, 59; cf. *L. nuda*, 71; *subspatulata*, 71; *varsoviensis*, 209
- Lithophaga minuta*, 61; *pertenuis*, 296
- Lithophagus illinoisensis*, 154, 161, 173, 190, 210
- Lithostrotion canadensis*, 242, 244, 264 ff; *canadensis* var. *proliferum*, 267, 269; *proliferum*, 246, 256, 258, 265 ff
- Lizard creek, Webster Co., Pella beds on, 302; St. Louis beds on, 284
- Lobocrinus pyriformis*, 65, 140
- Long creek, Louisa Co., Kinderhook beds in, 68
- Lost creek, Lee Co., fossils from, 134
- Louisa county, Burlington beds in, 136; correlation of Kinderhook of, 70;

- Keokuk limestone in, 176; Kinderhook beds in, 63; St. Louis beds in, 271
- Louisiana beds of Mississippian system, 116
- Lowell, geodes at, 316, 323, 327; Lower Warsaw beds near, 196; St. Louis beds near, 266; Spergen beds near, 229
- Lower *Archimedes* limestone, 142
- Lower Burlington beds at Burlington, 121; in Louisa county, 139; see Burlington limestone
- Lower St. Louis beds, character, 231; see Croton, St. Louis
- Lower Warsaw beds, analysis, 186; character, 186, 312; geodes of, 308; at Montrose, 195; in Clark county, Missouri, 195, 320; in Des Moines county, 196; in Hancock county, Illinois, 187; in Henry county, 196; in Illinois, fauna of, 188; in Lee county, 192, fauna, 193; in Van Buren county, 198, fauna, 199
- Lower Warsaw and Keokuk beds, geodes of, 304, 318
- Loxonema difficile*, 110; *oligospira*, 62; *shumardana*, 62; *yandellana*, 109
- M
- McBride mill, Pella beds at, 300
- Maebride, T. H., work of, 109, 112, 286
- Macrocrinus konincki*, 124, 132, 137; *lagunculus*, 152; *verneuilianus* 124, 132, 134, 137, 179
- Macrodon cochlearis*, 69; cf. *M. cochlearis*, 110
- Madlener quarry, Lower Warsaw in, 196; Spergen in, 226
- Magnetite in geodes, 312, 336
- Mahaska county, Pella beds in, 299; St. Louis beds in, 277
- Malachite in geodes, 338
- Maple Mill, fossils from, 73; Kinderhook beds at, 71
- Maple Mill shale, 51, 72
- Marion county, Pella formation in, 300; St. Louis beds in, 278
- Marshall county, Kinderhook beds in, 80; St. Louis beds in, 279
- Marshalltown, deep well at, 79; thickness of Kinderhook at, 51
- Marshalltown shales, 52; age, 90; at Marshalltown, 84
- Mayne Creek beds of Kinderhook group, 52, 92; in Butler county, 108; in Franklin county, 105
- Meck and Worthen, work of, 46, 49
- Meekopora*, 189, 208
- Megistocrinus* cf. *M. evansi*, 124; *nobilis*, 83
- Meramec group, character, 183; definition, 182; distribution, 183; relations, 184; thickness, 184
- Meramec time, oscillations during, 438
- Metablastus lineatus*, 138; *wortheni*, 199
- Miller quarry, Des Moines Co., Burlington beds in, 121
- Miller quarry, Webster Co., St. Louis beds in, 282
- Millerite in geodes, 337
- Mineral production in Iowa, value, 9
- Mineral water, production, 31; in United States, 32
- Minerals, paragenesis of, in geodes, 340
- Minerals of the geodes, 335
- Miners employed in Iowa, 11
- Minnesota, building stone in, 31
- Mississippian system, Chester series, 41; classification, 41; distribution, 39; divisions, 41; drainage, 40; elevations, 40; geologic history, 347; glaciation over, 40; in Iowa, 39; Iowa series, 41; relations, 43; relation to Cedar Valley, 43; relation to Coal Measures, 44; relation to Cretaceous, 44; relation to Devonian, 43; relation to Lime Creek shales, 43; relation to Pennsylvanian, 44; section, 41; structure, 45; topography, 40
- Missouri, Clark county, geodes in, 320; Lower Warsaw in, 195
- Modiola*, 290
- Modiomorpha*, 69, 246, 281
- Monilopora beecheri*, 152, 159, 160, 166, 174, 175, 188 ff, 208, 217
- Monk creek, Lee Co., Spergen limestone on, 221
- Monotrypa*, 113

- Montrose, Spergen limestone at, 223; St. Louis limestone near, 238
- Montrose cherts, age, 120, 143; classification, 46; geodes in, 308; at Keokuk, 155; in Louisa county, 176
- Moore quarry, Louisa Co., Upper Burlington beds in, 141
- Morning Sun, Burlington beds near, 67; Kinderhook beds near, 67; Upper Burlington beds near, 140
- Mount Pleasant, thickness of Kinderhook at, 51
- Mud creek, Henry Co., geodes on, 323, 327 ff; Lower Warsaw beds on, 197
- Mumm creek, Lee Co., St. Louis beds on, 242; Spergen beds on, 220
- Murchisonia quadricincta*, 61, 66
- Muscatine county, Kinderhook beds in, 70; Sweetland Creek beds in, 70
- Myalina ? abstemia*, 110; *keokuk*, 154, 157, 170, 173, 174
- Mytilarca fibristriata*, 61; *occidentalis*, 61, 73
- N**
- Naticopsis depressa*, 62, 73
- Natural gas, production, 32
- Nauvoo, Illinois, Keokuk limestone near, 158
- Niles and Wachsmuth, work of, 120
- Niota, Illinois, geodes from, 317, 321, 329; Keokuk limestone near, 161; Lower Warsaw beds near, 191; Spergen beds near, 225
- Nodules, origin of, 306
- Norton, W. H., work of, 45, 79, 279
- Nucleospira barrisi*, 60, 64, 66, 74, 105
- Nucula illinoisensis*, 290; *iowensis*, 61, 64, 66
- O**
- O'Hara, Cleopas, work of, 505
- Ollie, Keokuk beds near, 178; St. Louis limestone near, 274
- Onion creek, Story Co., St. Louis beds on, 281
- Orbiculoidea*, 190, 242; *capax*, 59
- Orbitremites norwoodi*, 124, 133, 135, 138
- Orodus*, 140
- Orophocrinus conicus*, 83, 87; *fusiformis*, 83
- Orthoceras heterocinctum*, 62, 73; *inaequalis*, 70; *indianense*, 62, 66; *whitei*, 62, 69, 73
- Orthonychia* cf. *O. acutirostre*, 200, 211, 217, 226; *pabulocrinus*, 125, 133, 154; *quincyense*, 134
- Orthotetes crenistria*, 85; *inaequalis*, 68; *kaskaskiensis*, 275, 294 ff; *keokuk*, 153, 157-161, 166, 170 ff, 189 ff, 209
- Osage group, character, 118; classification, 46; definition, 117; distribution, 117; relations, 118; thickness, 118
- Osage time, conditions during, 347
- Ottumwa, Pella beds in, 296
- Owen, D. D., work of, 45, 79, 142
- P**
- Pachylocrinus*, 194
- Palaeacis obtusus*, 152, 157 ff, 170 ff
- Palaeoneilo barrisi*, 61, 66; *microdonta*, 61, 73
- Palaeopalaemon newberryi*, 62
- Paragenesis of minerals in geodes, 340
- Parallelodon cochlearis*, 61, 73; *leptogaster*, 61; *modesta*, 61; *parvus*, 61, 64, 74
- Parichthyocrinus meeki*, 160
- Paryphorhynchus striatocostatum*, 60, 68; *transversum*, 59, 64, 73
- Patellostium scriptiferus*, 62
- Pella, Kinderhook beds at, 51; Pella beds near, 300
- Pella beds, brecciation in, 236; character and relations, 44, 231, 288; classification, 48; type section of, 300; in Davis county, 293; in Henry county, 293, fauna, 294; in Jefferson county, 294, fauna, 295; in Keokuk county, 299; in Lee county, 289; in Mahaska county, 299; in Marion county, 300, fauna, 301; in Poweshiek county, 300; in Van Buren county, 290; in Wapello county, 296, fauna, 296; in Washington county, 298; in Webster county, 301, fauna, 303

- Pella time, changes at close of, 289
 Pennsylvanian, relation to Mississippian system, 44; and Kinderhook, relations, 52
 Pentremites conoideus, 208, 301; elongatus, 124, 133, 138, 140; koninckiana, 295
 Pernopecten circulus, 61; cooperensis, 61, 64, 73, 74
 Petroleum in Iowa, 32
 Phanerotinus paradoxus, 62
 Phillipsia, 66, 73, 179, 210, 290 ff
 Pholidocidaris irregularis, 200
 Phractopora trifolia, 159, 160, 166, 176, 199, 202
 Phragmoceras expansum, 62, 73
 Phytocrinus ventricosus, 124, 133, 137
 Picnic Point, Des Moines Co., Kinderhook beds at, 54
 Pinna, 291; subspatulata, 194, 211
 Pinnatopora conferta, 189, 193, 209
 Platyceras equilateralis, 154, 170, 189, 194, 210; fissurella, 154, 170; latum, 125, 133; obliquum, 125, 133; paraliium, 125
 Platychisma barrisi, 62, 73; depressa, 62
 Platycrinus agassizi, 83; burlingtonensis, 133; discoideus, 133; glyptus, 137; halli, 124; ornigranulus, 124; planus, 124; saffordi, 152, 194; sculptus, 124; symmetricus, 83
 Pleuracanthus, 154
 Pleurotomaria mississippiensis, 61; quinquesulcata, 61
 Pocahontas county, Kinderhook beds in, 113
 Polypora biseriata, 160, 189, 195, 209, 217; burlingtonensis, 153; gracilis, 189, 193, 209; halliana, 153, 160, 199; maccoyana, 153, 160; radialis, 176; retrorsa, 153, 158-160, 189 ff, 209, 211; simulatrix, 153, 160, 176; spininodata, 195, 199, 209; striata, 153; varsoviensis, 153, 189 ff, 209, 211
 Porcellia crassinoda, 61; obliquinoda, 61, 70, 73; rectinoda, 61
 Portland cement production, 18
 Posidonomya ? ambigua, 61
 Poteriocrinus genista, 83; hammondi, 83; legrandensis, 83; maccabei, 83; maccabei var. decrepitus, 83; scopae, 83
 Potters branch, Van Buren Co., Lower Warsaw beds on, 202; St. Louis beds on, 257; Spergen beds on, 228
 Poweshiek county, Kinderhook beds in, 77; Pella beds in, 300; St. Louis limestone in, 278
 Prairie Plains province, 40
 Price creek, Van Buren Co., St. Louis beds on, 261
 Price quarry, Van Buren Co., St. Louis beds in, 261
 Productella concentrica, 59, 67, 73; nummularis, 59, 70, 73
 Productus altonensis, 174, 209, 215, 217, 226; arcuatus, 59, 64, 66, 73, 74, 81, 103, 105; blairi, 59, 64, 102-104, 107; burlingtonensis, 65, 125, 133, 135, 138, 141; cooperensis, 59, 68; curtirostris, 59, 64, 70, 73; cf. P. gallatinensis, 153; indianensis, 190, 209, 217; laevicostatus, 68; levicostus, 68; marginicinctus, 295; mesialis, 160, 171, 175; mesicostalis, 59, 73; ovatus, 59, 64, 73, 81, 94, 105, 153, 167, 172, 174, 189, 194, 209, 211, 246, 258, 275, 281, 290 ff; parvulus, 59, 66; parvus, 294 ff; sampsoni, 59; semireticulatus, 140; setigerus, 153, 170 ff, 189 ff, 209; tenuicostatus, 244; viminalis, 133, 135, 153; wortheni, 167, 171 ff
 Promacrus cuneatus, 60
 Prospect Hill, Burlington, Kinderhook beds at, 53
 Proutella discoidea, 153
 Psammodus glyptus, 141
 Pseudosyrinx keokuk, 153, 171, 194
 Pterinopecten laetus, 61; nodocostus, 61
 Pteronites whitei, 61, 73
 Ptilopora prouti, 195, 209; valida, 153, 189, 209
 Ptyctodus calceolus, 71
 Pugnoides ottumwa, 284, 290 ff
 Pustula alternata, 125, 133, 135, 153, 156-160, 167, 170 ff, 189 ff, 205, 209, 272; biseriata, 153, 170 ff, 190 ff, 209 ff, 226; morbilliana, 59
 Pyrite in godes, 312, 336

Q

Quartz in geodes, 311, 335

R

Rand Park, Keokuk, St. Louis beds near, 238; Spergen beds near, 222

Reed creek, Van Buren Co., Pella beds on, 291; St. Louis limestone on, 254; Spergen beds on, 228

Reticularia cooperensis, 60, 64, 74, 81, 87, 94, 106; *pseudolineata*, 125, 133, 138, 154 ff, 161, 167, 170 ff, 194, 199, 210; *setigera*, 154, 189 ff, 210 ff, 226

Rhipidomella burlingtonensis, 59, 68, 125, 133, 135, 138, 140; *dubia*, 82, 125, 133, 135, 153, 157-160, 167, 170 ff, 194 ff, 209, 211, 217; *tenuicostata*, 105; *thiemei*, 59, 64, 66

Rhizopods, 295

Rhodocrinus coxanus, 195; *kirbyi*, 83; *nanus*, 83; *watersianus*, 83

Rhombopora asperula, 160, 200, 203; *attenuata*, 153, 160, 166, 176, 180, 189 ff, 209, 211, 215; *bedfordensis*, 217; *dichotoma*, 153, 193; *gracilis*, 124, 138; *transversalis*, 166, 176, 200; *varians*, 153, 157, 160, 166, 172, 176, 178, 180, 189 ff, 209, 217

Rhynchodus excavatus, 71

Rhynchonella unica, 60

Rhynchopora beecheri, 153, 173, 174; *persinuata*, 60; *pustulosa*, 60, 66

Rynchotetra caput-testudinis, 60, 66

Rivers in Mississippian area, 40

Rock creek, Van Buren Co., Pella beds on, 295; St. Louis limestone on, 258

Rockton, LeGrand beds at, 83

Rutland, Kinderhook beds at, 110; St. Louis beds at, 285

S

St. Francisville, Missouri, geodes at, 321

St. Louis limestone, brecciation, 233; character, 230; classification, 45; distribution, 236; fauna of, 232; relations, 44; in Des Moines county, 263; in Henry county, 263; in Humboldt

county, 284; in Keokuk county, 274; in Jefferson county, 267; in Lee county, 237; in Louisa county, 271; in Mahaska county, 277; in Marion county, 278; in Marshall county, 279; in Poweshiek county, 278; in Story county, 280; in Van Buren county, 247; in Wapello county, 270; in Washington county, 271; in Webster county, 282

St. Louis time, conditions during, 348
Ste. Genevieve beds, 287; relations, 44; see also Pella

Ste. Genevieve time, changes at close of, 289

Salisbury and Chamberlin, cited, 304

Sand and gravel production, 23; in United States, 27

Sandalodus, 146

Sardeson, F. W., work of, 110

Savage, T. E., work of, 79, 84, 88, 142, 174, 234, 266

Scalarituba missouriensis, 73

Scaphiocrinus briaerius, 195; *elegantulus*, 83; *extensus*, 195; *globosus*, 83; *iowensis*, 195; *notatus*, 83; *obscurus*, 195; *orestes*, 195

Schellwienella crenulicostata, 59, 74; *inaequalis*, 59; *inflata*, 59, 65, 81, 94; *planumbona*, 59, 65, 81

Schizoblastus granulatus, 188, 208; *roemeri*, 104, 109

Schizodus, 290; *burlingtonensis*, 61; cf. *S. circulus*, 190, 210; *iowensis*, 61; *trigonalis*, 61, 64

Schizophoria chouteauensis, 74, 105, 106; *subelliptica*, 59; *swallovi*, 125, 133, 135, 138, 141

Schuchertella, 171

Scylatocrinus, 194

Second *Archimedes* limestone at Warsaw, 203

Seminula trinuclea, 295

Shaler, N. S., cited, 342

Sheffield, Sheffield beds near, 101

Sheffield beds of Kinderhook group, 52, 91; age, 91; in Butler county, 107; in Franklin county, 101

Shumard, B. F., work of, 182

Skunk river, Burlington beds on, 127; St. Louis limestone on, 268, 280

- Slaughters branch, Van Buren Co., Pella beds on, 293; St. Louis limestone on, 256
- Smith creek, Louisa Co., Burlington beds on, 65; Kinderhook beds on, 65
- Smithsonite in geodes, 312, 338
- Soap creek, Lee Co., geodes in, 308, 318, 330, 333; Keokuk beds on, 145; Lower Warsaw beds on, 192
- Soap Factory Hollow, Illinois, geodes in, 319; Lower Warsaw beds in, 188; Warsaw beds in, 207
- Soldier creek, Webster Co., St. Louis beds on, 282
- Solenocaris strigata*, 71
- Solenomya iowensis*, 291
- Solenospira*, 290
- Soper's mill, Story Co., St. Louis beds at, 281
- South Augusta, Burlington beds at, 127; Keokuk limestone near, 162
- South Avery creek, Wapello Co., Pella beds on, 297
- Spathella phaselina*, 60
- Spathiocaris emersoni*, 71
- Spergen beds, character and relations, 44, 214, 348; distribution, 214; nomenclature, 213; in Des Moines county, 226; in Hancock county, Illinois, 223; in Henry county, 229; in Jefferson county, 230; in Lee county, 215; in Van Buren county, 226
- Sphaerodoma pinguis*, 62
- Sphalerite in geodes, 312, 338
- Sphenotus*, 290; *bicarınatus*, 60; *bicos-tatus*, 60; *cylindricus*, 60, 74; *iowensis*, 60, 64, 73; *rigidus*, 60; *ventri-cosa*, 60
- Spirifer bifurcatus*, 189, 190, 210, 217, 226; *biplicatus*, 60, 64, 67, 73, 85; *biplicoides*, 60, 64, 66, 85; *calvini*, 81, 87; *carınatus*, 133; *extenuatus*, 85; *forbesi*, 60, 105, 125; *grimesi*, 60, 125, 133, 135, 138, 141, 162, 167, 170, 179; cf. *S. grimesi*, 157; *imbrex*, 125; *incertus*, 125, 133, 135, 138, 167; *indianensis*, 210; *insculptus*, 133; *keokuk*, 153, 157-161, 167, 170 ff, 189 ff, 209, 211, 267, 295; *legrandensis*, 81, 87, 94, 105, 106, 109; *logani*, 153, 156, 161, 167, 170, 175; *louisianensis*, 125; *maplensis*, 73; *marionensis*, 67; cf. *S. mundulus*, 60; *pellaensis*, 210, 246, 275, 284, 291 ff; cf. *S. pellaensis*, 153, 199, 205, 244, 246, 272, 275; *platynotus*, 60, 64, 66, 74, 81, 82, 105, 109; *plenus*, 140; *rostellatus*, 136, 153, 158, 167, 170 ff, 189, 209; *subaequalis*, 153; *sub-rotundus*, 60, 64, 69; *tenuicostatus*, 153, 156-160, 167, 170 ff, 189 ff, 209 ff, 226; *whitneyi*, 102, 103, 107
- Spiriferella neglecta*, 154, 157-160, 167, 170 ff, 189 ff, 210, 211, 215; *plena*, 125, 134, 135, 138
- Spiriferina norwoodana*, 194; *salemen-sis*, 226; *solidirostris*, 60, 66, 74, 81, 82, 105, 106; *subtexta*, 94, 105; cf. *S. subtexta*, 133
- Spirorbis*, 189, 208, 295; *fortdodgensis*, 303
- Springer, see Wachsmuth
- Springvale beds, 274; age, 181; classification, 48; relations, 231
- Starr cave, Des Moines Co., Burlington beds at, 127; Kinderhook beds at, 55
- Stenopora*, 189
- Stookey, S. W., work of, 77, 78, 278
- Stone and lime, production, 28
- Story county, St. Louis beds in, 280
- Straparollus ammon*, 62, 73; *angularis*, 62; *latus*, 85; *macromphalus*, 62, 69, 109; *obtusus*, 62, 66, 81, 96, 97, 105, 109, 134; *planispira*, 109; *springva-lensis*, 109
- Streblotrypa major*, 160, 176, 199; *radialis*, 166, 176, 199
- Streptorhynchus*, 113; *ruginosum*, 207, 209, 244
- Strophostylus bivalve*, 62, 73; ? *car-leyana*, 189, 210
- Strotocrinus glyptus*, 124, 133, 137; *regalis*, 124, 137
- Subcarboniferous period, 45
- Sugar creek, Lee Co., St. Louis lime-stone on, 240
- Sweetland Creek beds, Muscatine Co. age, 70
- Synbathocrinus swallowi*, 194
- Synthetodus*, 71
- Syringopora*, 65

- Syringothyris extenuatus*, 60, 67, 73;
halli, 60, 105; *subcuspidatus*, 153,
 171, 199; *textus*, 153, 180; *typus*, 125
- T**
- Taeniodictya lineata*, 153; *ramulosa*,
 147, 160, 166, 174; cf. *T. ramulosa*
 var. *burlingtonensis*, 87
- Tama county, Kinderhook of, 84
- Taxocrinus intermedius*, 83
- Teleocrinus umbrosus*, 124, 133, 137
- Tetracamera arctirostrata*, 215, 217;
subcuneata, 153, 157, 167, 170, 209,
 211, 217; *subtrigona*, 153, 157, 161,
 167, 170 ff
- Thatcher creek, Van Buren Co., St.
 Louis beds on, 260
- Thomas, A. O., work of, 71, 102; and
 Lees, 284, 302, 303
- Thunder creek, Marion Co., Verdi beds
 on, 278
- Topography of Mississippian system,
 40
- Tracy, Pella beds near, 301
- Triplophyllum dalei*, 123, 132, 134, 137,
 152, 156-160, 166, 170 ff, 188 ff, 208;
PELLAENSIS, 200
- Turkey creek, Jefferson Co., St. Louis
 limestone on, 268
- U**
- Udden, J. A., work of, 63, 65, 67, 70,
 136, 139, 176, 177, 267, 270, 271, 294
- Ulrich, E. O., work of, 182, 213
- Universal Gypsum Company, 21
- Uperocrinus aequibrachiatus* var. *aster-*
iscus, 133; *hageri*, 133; *nashvillae*,
 152, 188, 193, 208; *pyriformis*, 124,
 133, 137
- Upper Burlington beds, 121; at West
 Burlington, 127; in Louisa county,
 139; see also Burlington
- Upper St. Louis limestones, character,
 231; see also Verdi, St. Louis
- Upper Warsaw beds, fauna of, at War-
 saw, 208; type section, 203; in Lee
 county, 210
- V**
- Van Aucken quarry, Van Buren Co.,
 Upper St. Louis limestone in, 248
- Van Buren county, brecciation in, 234;
 Burlington beds in, 135; geodes in,
 326; Keokuk limestone in, 168; Low-
 er Warsaw beds in, 198; Pella beds
 in, 290; St. Louis limestone in, 247;
 Spergen beds in, 227
- Van Tuyl, F. M., work of, 45, 288.
 302; on geodes, 341
- Verdi, St. Louis beds near, 272
- Verdi member, 238, 259, 274 ff, 299,
 300; brecciation in, 234; character
 and relations, 231; classification, 48;
 type section, 271; see also St. Louis,
 Upper St. Louis
- Vernon, geodes at, 326, 334
- W**
- Wachsmuth and Springer, work of, 79,
 83, 88, 120, 126, 143; see also Niles
- Wallace, S. J., cited, 342
- Wapello county, Pella formation in,
 296; St. Louis beds in, 270
- Warsaw, Illinois, geodes from, 315,
 318; Lower Warsaw beds near, 190;
 Spergen beds at, 223; Upper Warsaw
 beds at, 203
- Warsaw formation, classification, 45;
 description, 184; relations, 44, 348
- Washington, Burlington beds near, 142
- Washington county, Burlington beds
 in, 141; Kinderhook beds in, 71;
 Pella beds in, 298; St. Louis beds
 in, 271
- Wasson quarry, Louisa Co., Burlington
 beds in, 140
- Wassonville limestone, 51, 74; correla-
 tion, 76
- Wassonville mill, Kinderhook beds at,
 74
- Water in geodes, 312, 339
- Wayland, St. Louis limestone near, 267
- Wayland, Missouri, geodes near, 321;
 Lower Warsaw beds near, 195
- Webster City, St. Louis beds near, 279
- Webster county, Pella formation in,
 301; St. Louis beds in, 282
- Webster mill, Keokuk limestone near,
 174
- Weller, Stuart, work of, 39, 41, 46,
 49, 53, 55, 56, 70, 71, 116, 117, 182,
 288, 302

- Wellman, Wassonville limestone at, 75
 West Burlington, Burlington beds at, 127
 Western Interior geosyncline, 45, 289, 349
 Wever fossils from Upper Burlington beds near, 135
 What Cheer, Pella beds near, 299
 White, C. A., work of, 46, 79, 88, 302
 Whitney, J. D., work of, 79
 Wild Cat Glen, Hardin Co., Iowa Falls beds at, 98
 Wilder, F. A., work of, 282, 302
 Williams, H. S., work of, 46, 117
 Williams, Ira A., work of, 78, 101, 107
 Winfield, St. Louis limestone near, 266
 Winnebago county, Kinderhook beds in, 115
 Winter quarry, Henry Co., St. Louis limestone in, 265
- Woodocrinus asperatus**, 195; **tentaculatus**, 195
 Worthen, A. H., work of, 49, 83, 142, 195, 304, 318; see also Meek
Worthenia mississippiensis, 66
Worthenopora spatulata, 209; **spinosa**, 153, 160, 166, 172 ff, 189 ff, 209, 211, 215
 Wright county, Kinderhook beds in, 109
- Z**
- Zaphrentis**, 65, 81; **calceola**, 104, 123; **cassedyi**, 208; **illinoisensis**, 172; **pellaensis**, 294 ff; **spergenensis**, 189, 194, 208; **spinulifera**, 208; **spinulosa**, 267; cf. **Z. spinulosa**, 152; **varsoviensis**, 152, 159, 160, 166, 170 ff
Zeacrinus keokuk, 195