

INDEX

A

Afton Junction, pebbles from, 187, 188, 189
Aftonian, at Oelwein, 203
Agency, pebbles from, 188
Aggraded areas in Kansan, 326
Albany, terraces near, 134
Alden, W. C., 3, 95, 117, 118, 128, 155, 161, 170, 182, 184, 189, 223, 227
and Leighton, Morris M., report by, 49
Allen, C. E., 133
Allison, pebbles from, 186
Alta Vista, pebbles from, 185, 186
Altamont moraine, 307, 443
Amber, Iowan near, 212
Anamosa, Iowan near, 177
Anderson, Nettie C., 133
Arcadia, divide near, 218
drift near, 218
Arey, M. F., work of, 3, 100
Aspinwall, gumbotil near, 221, 227
Atkins, pebbles from, 183
section near, 98

B

Bagley, pebbles from, 182
Bailey, B. H., work of, 3
Bain, H. F., 128, 149, 221, 240, 244, 245, 253, 326, 393, 434
Bassett, gravels near, 137
terraces near, 136
Bayard, pebbles from, 182
Bedrock of northwestern Iowa, 430
Benton beds, 433
Benton county, gumbo in, 98
Iowan in, 210
Beyer, S. W., 3, 127, 161, 206, 333, 399
Big Sioux river, outcrops on, 430, 433
valley gravels on, 381
Wisconsin margin on, 301
Bison occidentalis, 410

Black Hawk county, gumbo in, 99
Iowan in, 210
Boiler troubles, remedies for, 39
Boilers, corrosion in, 39
scale in, 38
use of water in, 38
Boone, water from Des Moines river
at, 48.
Bouton, pebbles from, 182
Boulders, character and size of, 121
character of till around, 126
distribution of, 122
topographic distribution of, 125
as evidence of Iowan glaciation, 127
in Iowan area, 121
Boyer river basin, drainage changes in, 318
valley gravel in, 409
Brandon, section near, 99
Bremer county, Iowan in, 201
Brighton, striae near, 28
Brooke creek, pre-Wisconsin, 317
Wisconsin boundary on, 259
Buchanan county, gumbo in, 96
Iowan till in, 112, 208
kames in, 138
terraces in, 136
Buchanan gravels in Buchanan county, 208
Buena Vista county, gravels in, 359
loess in, 351
Wisconsin boundary in, 257, 261
work in, 248, 253
Burlington, loess near, 155

C

Calcium and magnesium in water, effect of, 41
Calcium in river waters, 35
Calmar, pebbles from, 187
Calvin, Samuel, 55, 114, 117, 125, 126, 128, 132, 135, 149, 201, 208, 240

- Canton, gravels near, 382
 Wisconsin plain near, 297
 Carbonate and bicarbonate in river waters, 37
 Carbonates in water, effect of, 41
 Carroll county, deposits of, 215
 erosion in, 218
 Carman, J. Ernest, 4, 58, 297
 report by, 233
 Cedar county, gumbo in, 195
 Iowan in, 179
 paha in, 151
 Cedar Falls, Iowan near, 210
 Cedar Rapids, striae near, 128
 water from Cedar river at, 44, 48
 Cedar river at Charles City, water from, 44, 48
 at Waterloo, water from, 43
 terraces on, 136, 137
 Center Point, pebbles from, 183
 section near, 97, 116
 Central City, section near, 98
 terraces near, 136
 Cerro Gordo county, gumbo in, 104
 Iowan in, 200
 Chamberlin, R. T., 111, 113, 181, 182, 184, 189, 203
 Chamberlin, T. C., 56, 57, 58, 101, 113, 149, 175, 243, 252, 294
 Chariton, pebbles from, 188
 Charles City, Iowan near, 201
 pebbles from, 186
 water from Cedar river at, 44, 48
 Cherokee, gravels at, 360
 Cherokee county, gravel hills in, 367
 gravel in, 398, 405
 interbedded gravels in, 372
 loess in, 351
 Nebraskan till in, 418
 work in, 248, 253
 Chickasaw county, gravels in, 137
 Iowan till in, 111, 201
 terraces in, 136
 Chlorides in water, effect of, 42
 Chlorine in river waters, 37
 Churchville, pebbles from, 187
 Clay and clay products in 1915, 18
 Clay county, dissected areas in, 328
 gravels in, 359
 level areas in, 323
 loess in, 354
 Wisconsin margin in, 261
 work in, 247, 253
 Clay-balls in gravels, 362
 Clayton county, loess in, 150
 moraine in, 174
 terraces in, 134
 Clear Lake, pebbles from, 182
 Clermont, terraces near, 133
 Clinton, pebbles from, 183, 188, 189
 Clinton county, gumbo in, 195
 Iowan in, 178
 loess in, 150
 Coal production in 1915, 15
 Color in water, effect of, 40
 Conover, moraine near, 173
 Coon Rapids, pebbles from, 182
 Correctionville, fossils from, 410
 gravel near, 401
 Corrosion in boilers, 39
 Coteau des Prairies, 251, 288, 441
 Coulter, pebbles from, 182
 Crawford county, deposits of, 215
 fossils from, 410
 gumbotil in, 218
 Cresco, pebbles from, 185
 section near, 101
 terraces near, 131
 Cretaceous system, 433
 in Northwestern Iowa, 337
- D**
- Dakota beds, 433
 lobe, 251, 306, 307
 plain, characters of, 305
 Davenport, gumbo near, 198
 loess near, 155, 168
 Dedham, gumbotil near, 222
 pebbles from, 223
 Deep creek, gravel in, 394
 Delaware county, Iowan in, 208
 kames in, 138
 paha in, 151
 Delmar, pebbles from, 188, 189
 striae near, 128

Des Moines, water from Des Moines
 river at, 45, 48
 water from Raccoon river at, 48
 Des Moines lobe, 307, 441
 Des Moines river at Boone, water
 from, 48
 at Des Moines, water from, 45, 48
 at Emmetsburg, water from, 48
 at Estherville, water from, 48
 at Fort Dodge, water from, 45, 48
 at Harvey, water from, 48
 at Keosauqua, water from, 48
 at Ottumwa, water from, 46, 48
 Dewitt, gumbo near, 197
 Dickens, gravel near, 397
 Dickens outlet, 267
 moraine near, 272
 Dickinson county, moraine in, 275
 work in, 246, 253
 Doon, gravel at, 382
 Doris, pebbles from, 184
 section near, 113
 Drainage, pattern of, 312
 pre-Wisconsin stream courses, 313
 changes in northwest Iowa, 310, 444
 Drift, lithological composition of, 181
 Driftless area, 60
 Drifts, changes of, 231
 Dubuque county, loess in, 149
 Dyersville, Iowan near, 174
 terraces near, 135

E

Eddyville, striae near, 128
 Edgewood, moraine near, 174
 Eldorado, terraces near, 133
Elephas columbi, 409
Elephas primigenius, 133, 410
 Elgin, terraces near, 133
 Elk creek, pre-Wisconsin, 315
 Ellsworth, Minn., gravel near, 385
 Elma, section near, 111
 Emmet county, work in, 250
 Emmetsburg, water from Des Moines
 river at, 48
 Erosion, post-Kansan, 440
 Estherville, water from Des Moines
 river at, 48
 Ewers, 277

F

Fairview, section near, 117
 Faulkner, section near, 105
 Fayette county, gumbo in, 100
 Iowan in, 202
 moraine in, 173
 terraces in, 133
 Ferretto band in Kansan till, 84, 154
 Festina, terraces near, 131
 Florenceville, terraces near, 130
 Floyd county, Iowan in, 201
 Floyd river, valley gravel on, 392
 Fort Atkinson, moraine near, 172
 terraces near, 131
 Fort Dodge, water from Des Moines
 river at, 45, 48
 Fossils from valley gravels, 409
 Franklin county, gumbo in, 104
 Free acids in water, effect of, 40
 Freeport, terraces near, 131
 Fulton, terraces near, 135

G

Gabriel, George A., report by, 29
 Geologic history of northwestern Iowa,
 430, 434
 George, gravel near, 385
 Gilleas pit, 399
 Gillett Grove, Wisconsin boundary at,
 260, 267
 Gladstone, pebbles from, 188
 section near, 105
 Goose Lake channel, 178
 Grainger, terraces near, 130
 Graneros beds, 434
 Grant City, outcrops near, 434
 Granite, gravel near, 381
 Gravel, see also under counties
 Gravel and sand production in 1915,
 24
 Gravel and till interbedded, 372, 444
 Gravel benches on Kansan, 330
 Gravel boulders in till, 357, 445
 origin of, 361
 Gravel hills on Kansan area, 330, 362
 distribution of, 363
 location of, 370
 material of, 371

- nature of, 362
 origin of, 370
 structure of, 370
 Gravel masses in till, 357
 Gravels, analyses of, 359
 composition of, 413
 interbedded, origin of, 379
 Iowan, 130
 valley, 380
 weathering of, 136
 Wisconsin, 139
 Greenhorn beds, 434
 Grimes, C. H., pit of, 394
 Gumbo, character of, 90
 color of, 91
 definition of, 217
 Illinoian, 217
 Kansan, 89, 190, 217
 Nebraskan, 217
 see also Gumbotil
 Gumbo beneath Iowan till, 199
 in Benton county, 98
 in Black Hawk county, 99
 in Buchanan county, 96
 in Cerro Gordo county, 104
 in Fayette county, 100
 in Franklin county, 104
 in Howard county, 101
 in Iowan drift area, 92
 in Jones county, 93
 in Kansan drift area, 89
 in Linn county, 97
 in Mitchell county, 102
 in Tama county, 105
 in Worth county, 104
 Gumbotil, 57
 definition of, 218
 in northwest Iowa, 333
 in southern Iowa, 332
 Kansan, 439
 near Kiron, 332
 Nebraskan, 226
 topographic position of, 228
 zone, 338
 Gypsum production in 1915, 26
- H**
- Hale, terraces near, 136
 Hall, James, 242
 Hampton, pebbles from, 182, 184
 section near, 105
 Hardin county, loess in, 161
 Harvey, water from Des Moines river
 at, 48
 Haverhill, gumbo near, 192
 Hawkeye, section near, 101
 Hay, Dr. O. P., 133, 410
 Henry county, Ill., gumbo in, 199
 Hopkinton, terraces near, 135
 Howard county, Iowan till in, 111
 kames in, 138
 terraces in, 130
 Hurstville, terraces near, 135
- I**
- Ice movement, direction of, 129
 Ice sheets in northwestern Iowa, 241
 Ida county, gravel hills in, 369
 loess in, 349
 work in, 249, 253
 Igneous intrusion, 436
 Illinoian drift, erosion in, 167
 relations of loess to, 154
 Illinois, Sangamon soil in, 170
 Independence, Iowan near, 209
 kames near, 138
 Intermediate drift-region, 321
 Iowa, Pleistocene epoch in, 56
 Iowa City, striae near, 128
 terraces near, 136
 water from Iowa river at, 47, 48
 Iowa county, gumbo in, 193
 Iowa Falls, water from Iowa river at,
 47, 48
 Iowa river, terraces on, 136
 at Iowa City, water from, 47, 48
 at Iowa Falls, water from, 47, 48
 at Marshalltown, water from, 46
 Iowan area, compared with Kansan, 67
 dissected tracts in, 74

gorge cutting in, 72
 loess in, 77
 rock under, 71
 uppermost till of, 77
 Iowan drift, 49
 age of, 164
 area of, 60
 characters of, 78
 drainage on, 62
 existence of, 3
 generalized section of, 79
 leaching of, 81
 lithology of, 79
 limits of, 171
 loess on, 83
 oxidation of, 80
 relations to loess, 156
 topography of, 60
 compared with Kansan, 83
 compared with Wisconsin, 88
 in Buchanan county, 112
 in Chickasaw county, 111
 in Howard county, 111
 in Johnson county, 117
 in Jones county, 116, 178
 in Linn county, 115
 in Winnesheik county, 110
 Iowan glaciation, limits of, 72
 Iowan gravels, 130
 Iowan kames, 138
 Iowan moraine, 172
 Iron in river waters, 35
 in water, effect of, 41
 Iron ore, study of, 28

J

Jackson county, terraces in, 135
 Johnson county, gumbo in, 195
 Iowan till in, 117
 loess in, 146
 Jones county, gumbo in, 92, 197
 Iowan till in, 116, 178, 212

K

Kames, Iowan, 138
 Kansan, 138
 Kansan drift, character of, 302, 334

concretions in, 335
 erosion of, 443
 ferretto band in, 84, 154
 freshness of, 338
 gravel in, 330, 357
 leaching of, 85
 limestone in, 336
 oxidation of, 83
 relations to loess, 154
 source of material for, 337
 of northwestern Iowa, 4
 Kansan drift region, 320, 443
 absence of terraces from, 137
 aggraded areas in, 326
 area of, 320
 gorge cutting in, 71
 loess of, 342
 rock under, 71
 rolling areas of, 325
 rugged areas of, 325
 sharply dissected areas in, 327
 slightly rolling areas of, 323
 topography of, 61
 work in, 321
 Kansan gravel hills, 330
 Kansan gumbotil, 439
 distribution of, 231
 elevation of, 229
 thickness of, 231
 Kansan history, 438
 Kansan topography, compared with
 Iowan, 61
 compared with Wisconsin, 61, 254,
 282
 history of, 332
 Kay, George F., 57, 58, 95, 118, 126,
 169, 240, 321, 332
 mineral production in Iowa for
 1915, 9
 report by, 213
 Keewatin glacier, 170
 Keosauqua, Des Moines river at, 48
 Keyes, C. R., 59, 128
 Keystone, pebbles from, 183, 184, 185
 Kiene, pebbles from, 186
 section near, 97
 Kiron, gumbotil near, 218
 Klondike terrace, 382

L

- Labrador ice sheet, 170
 Lakes, Wisconsin, 254
 Lakes in moraine, 271
 Langworthy, section near, 93
 Lees, James H., 3, 240, 274, 321, 324
 Leighton, M. M., 3, 112, 117, 136, 184, 189
 and Alden, W. C., report by, 49
 Le Mars, gravel near, 393
 outcrops near, 434
 Leonard, A. G., 126, 134, 149, 150
 Leverett, Frank, 56, 58, 95, 118, 155, 161, 170, 175, 217, 240, 253, 288, 307, 321
 Lime Springs, pebbles from, 186
 Limestone, solution of, 137
 Lincoln county, S. Dak., Wisconsin plain in, 297
 Linn county, gumbo in, 97
 Iowan till in, 115, 211
 kames in, 138
 terraces in, 136
 Lisbon, Iowan near, 180
 Little Cedar river, terraces on, 136
 Little Rock, gravel near, 385
 Little Rock river, valley gravel on, 385
 Little Sioux river, course of, 312
 drainage changes of, 310
 Nebraskan till on, 414
 profiles of, 396
 valley gravels on, 395
 Wisconsin boundary on, 259
 Loess, absence of, near Sioux Falls, 304
 character of, 140, 339
 distribution of, 144, 339
 elevation of, 345
 eolian theory of, 142
 formation of, 157
 fossils of, 141
 generalized section of, 143
 grayish, 143
 leaching of, 341
 modification of, 142
 origin and age of, 356
 pebbles in, 343
 post-Wisconsin, 161
 relations to Illinoian drift, 154
 relations to Iowan drift, 156
 relations to Kansan drift, 154
 relations to Wisconsin drift, 157
 significance of, 140
 soil under, 168
 sources of, 153
 stratigraphic relations of, 154
 thickness of, 231
 thinning of, 340
 topographic influence of, 342
 two phases of, 231
 Loess along rivers, 144
 on Iowan border, 145
 on Iowan drift, 83
 on Kansan drift, 342
 on North Liberty plain, 146
 on paha, 150
 west of Wisconsin drift, 443
 Loesslike clay, 322
 Lost Nation, pebbles from, 188
 Louisa county, gumbo in, 199
 Sangamon soil in, 169
 Lyon county, gravel hills in, 363
 loess in, 355
 outcrops in, 430
 Wisconsin in, 294
 work in, 245, 253

M

- Macbride, T. H., 240, 246, 248, 249, 250, 253, 256, 258, 271, 278, 292, 315, 328, 331, 434, 442
 Madrid, pebbles from, 182
 Magnesium in river waters, 36
 Manchester, terraces near, 135
 Manganese in drift, 103
 Manilla, gumbotil near, 227
 Manly, section near, 104
 Manning, gumbotil near, 225, 228
 pebbles from, 227
 Maple river, valley gravel in, 408
 Maps, use of, 4
 Maquoketa river, terraces on, 135
 Marion, pebbles from, 185
 section near, 115
 Marshall county, gumbo in, 190
 Marshalltown, pebbles from, 187, 188

- water from Iowa river at, 46
 Marshes, Wisconsin, 254
 Martelle, section near, 116
 Mason City, Iowan near, 200
 pebbles from, 185
 Masonville, section near, 96
 McGee, W J, 55, 110, 127, 128, 149,
 150, 152, 174, 208, 210, 217
 Melbourne, cuts near, 86
 Mesozoic history, 436
 Milford bench, gravel in, 276, 396
 Mill creek, gravel on, 403
 interbedded gravels on, 373
 Nebraskan till on, 42
 profiles along, 404
 Mineral production in Iowa for 1915, 9
 Mineral waters, production in 1915, 27
 Minnesota, ice in, 441
 Minnesota-Des Moines, lobe, 251
 Mississippi-Missouri divide, altitude
 of, 216, 310
 course of, 310
 Missouri river, outcrops on, 430
 Mitchell, section near, 103
 Mitchell county, gumbo in, 102
 kames in, 138
 terraces in, 136
 Monticello, Iowan near, 176
 striae near, 129
 terraces near, 135
 Moraine, terminal, of Wisconsin drift,
 251
 Moraine near Sand Springs, 175
 Mount Vernon, pebbles from, 183
 Mud creek, valley gravel on, 392
 Mullin, J., 204
 Murry creek, gravel on, 402
 profiles along, 403
 Muscatine, loess near, 155
 pebbles from, 188, 189
 Musk-ox, 134
- N.**
- Natural gas, production in 1915, 28
 Nebraskan drift, 414, 444
 character of, 415
 in Cherokee county, 418
 in Little Sioux valley, 414
 in northwest Iowa, 337
 near Cherokee, 352
 Nebraskan gumbotil, 438
 distribution of, 231
 elevation of, 229
 thickness of, 231
 Nebraskan history, 437
 Nebraskan-Kansan contact plane, 424
 New Hampton, pebbles from, 185, 186
 section near, 111
 Newhall, section near, 99
 Newport, terraces near, 136
 Nitrates in river waters, 37
 Nobles county, Minn., gravel hills in,
 364
 loess in, 356
 Wisconsin margin in, 287
 North Liberty plain, Iowan on, 180
 loess on, 146
 Northwestern Iowa, bedrock of, 430
 earlier work in, 241
 geologic history of, 430, 434
 geology of, 239
 work in, 240
 Norton, W. H., J., 58, 128, 151, 179.
- O**
- O'Brien county, aggraded area in, 327
 gravel hills in, 364
 gravels in, 359, 392
 level area in, 323
 work in, 247, 253
 Ochevedan mound, 286
 Ochevedan river, course of, 312
 gravel on, 397
 moraine on, 278
 Oelwein, Aftonian at, 203
 drift near, 202
 pebbles from, 184, 185, 186
 sub-Aftonian till at, 205
 Okoboji ice lobe, 276
 lakes, moraine around, 275
 outlet, moraine near, 272
 Olin, terraces near, 136
 Osage, section near, 102
 Osceola county, aggraded area in, 327
 gravel hills in, 364
 loess in, 354

Wisconsin margin in, 279
 work in, 246, 253
 Osterdock, terraces near, 134
 Ottumwa, water from Des Moines river
 at, 46, 48
 Outwash, lack of, along Wisconsin
 boundary, 284
 Outwash plain on Wisconsin margin,
 269
Ovidos moschatus, 134
 Owen, D. D., 242
 Oxford Junction, gumbo near, 197
 pebbles from, 188

P

Paha, 178
 characters of, 150
 location of, 151
 loess on, 150
 origin of, 151
 Paleozoic history, 436
 Palo Alto county, moraine in, 270
 work in, 250
 Parnell, gumbo near, 193
 Paullina, gravel near, 404
 Pearce, J. N., work of, 3, 217
 Pebbles in loess, 343
 Perlee, striae near, 128
 Perry, pebbles from, 182
 Pleistocene epoch in Iowa, 56
 geology of northwestern Iowa, 233
 history, 437
 Plymouth county, outcrops in, 430, 434
 thick loess in, 339
 topography of, 326
 work in, 245
 Pocahontas county, work in, 250
 Post-Kansan erosion, 440
 Poweshiek county, gumbo in, 192
 Prairiesburg, Iowan near, 211
 Pre-Kansan topography, 438
 Pre-Pleistocene history, 434
 topography, 437
 Pre-Wisconsin drift plains, 443
 Primghar, gravel near, 404
 Proterozoic history, 434
 in northwestern Iowa, 431

Q

Quarry Station, striae near, 128
 Quartzite in northwest Iowa, 337
 Quasqueton, terrace near, 136

R

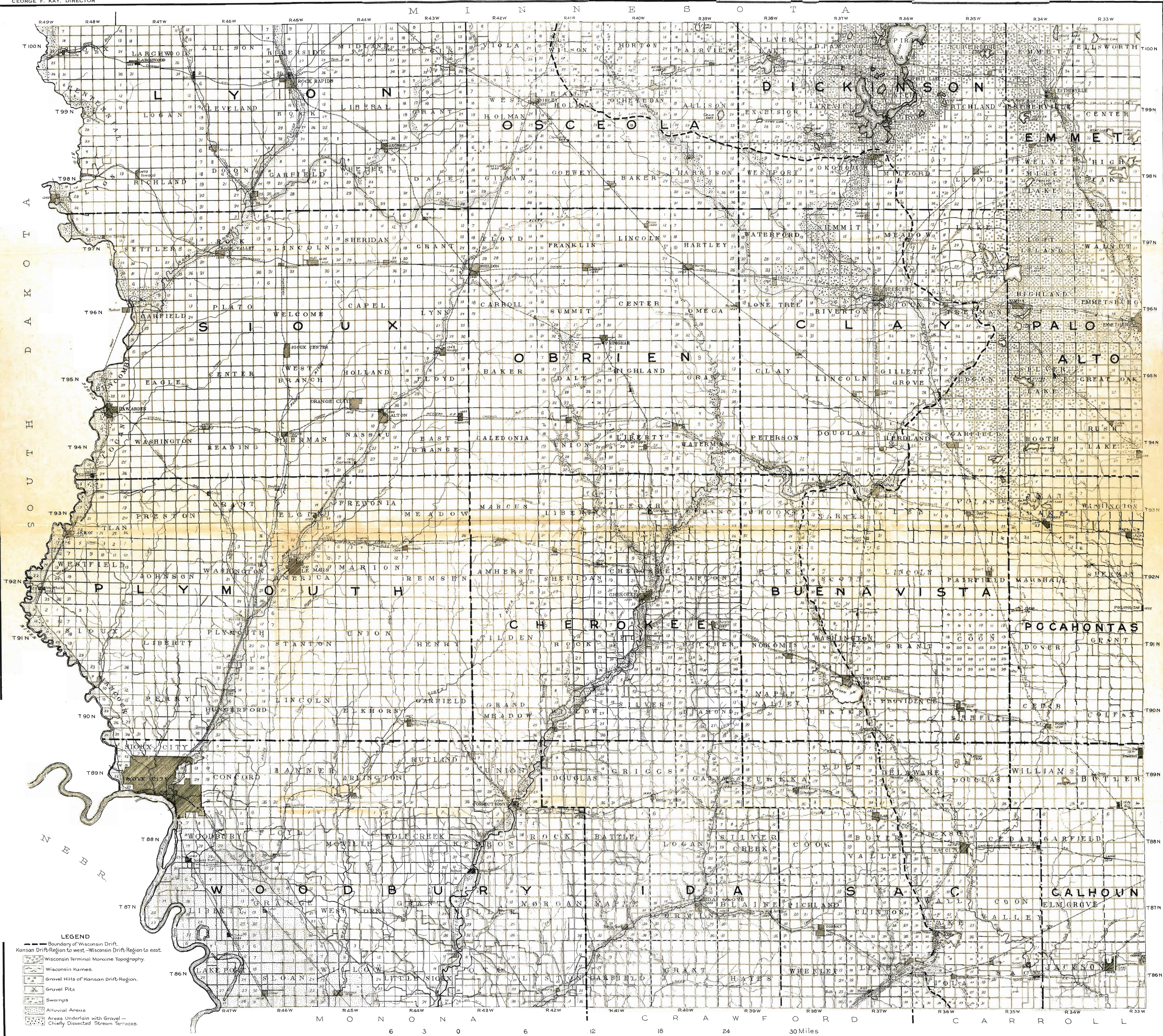
Raccoon river at Des Moines, water
 from, 48
 Railroads, altitude of, on divides, 311
 Rhodes, cut near, 87, 162
 gumbo near, 191
 Ridgeway, Iowan near, 200
 moraine near, 172
 section near, 111
 terraces near, 131
 River waters, calcium in, 35
 carbonate and bicarbonate in, 37
 chlorine in, 37
 collection of samples of, 34
 examination of, 33
 iron in, 35
 magnesium in, 36
 nitrates in, 37
 silica in, 35
 sodium and potassium in, 36
 sulphate in, 36
 River waters in Iowa, 29
 Riverview, pebbles from, 187
 Rochester, terraces near, 136
 Rock Island county, Ill., gumbo in, 198
 Rock Rapids, fossils from, 410
 gravel near, 382
 Rock river, gravel on, 382
 Rock Valley, gravel at, 385
 Rolling areas of Kansan, 325
 Russell, pebble counts at, 90
 Rugged areas of Kansan, 325
 Ruthven moraine, 270
 Ryan, section near, 95

S

Sac county, gravel hills in, 369
 loess in, 349
 outcrops in, 434
 Wisconsin boundary in, 256
 work in, 249, 253
 St. Ansgar, section near, 103
 Salisbury, R. D., 58, 95, 118, 149

- Sand and gravel production in 1915, 24
- Sand hills north of Spencer flat, 331
- Sand Springs, moraine near, 175
- Sangamon soil in Illinois, 170
in Louisa county, 169
- Sardeson, F. W., 58
- Sargent Bluff, outcrops near, 433
- Savage, T. E., 126, 127, 133, 149, 152, 180, 211
- Scale in boiler waters, 38
- Scott county, gumbo in, 198
- Sheets, A. M., gravel pit of, 131
- Sheffield, pebbles from, 182
- Sheldon, gravel near, 393
- Shimek, B., 3, 141, 157, 161, 240, 296, 305, 327, 356, 382, 414
- Snindler, Wisconsin plain at, 300
- Sibley, gravel near, 386
loess at, 355
- Silica in river waters, 35
- Sioux county, loess in, 354
outcrops in, 430
work in, 245
- Sioux Falls, gravels at, 360, 398
Wisconsin drift near, 294
- Sioux Island, 436, 437
- Sioux quartzite in northwestern Iowa, 431
- Sioux Rapids, Wisconsin boundary at, 260
- Slightly rolling areas of Kansan, 323
- Sodium and potassium in river waters, 36
- Solon, gumbo near, 195
Iowan near, 180
- South Dakota, Altamont moraine in, 295
- Spencer, gravel near, 396
level area near, 324
- Spencer flat, 397
sand hills north of, 331
- Stacyville, terraces near, 136
- Stone and lime production in 1915, 22
- Stoner, Dayton, work of, 3
- Storm Lake, 259
Wisconsin boundary at, 257
- Story county, gumbo in, 190
- Stream courses, pre-Wisconsin drainage, 313
- Stream diversion by Wisconsin ice, 441
- Streams, cross profiles of, 329
- Striae in eastern Iowa, 127
- Sub-Aftonian till at Oelwein, 205
- Sulphates in river waters, 36
- Sulphates in water, effect of, 42
- Sumner, pebbles from, 183
- Suspended matter in water, effect of, 40
- T
- Tama county, gumbo in, 105
- Templeton, gumbotil near, 220
- Terraces, valley train, 130
see under counties
- Thayer, pebbles from, 188, 189
- Thomas, A. O., 3, 58, 201
- Till, gravel masses in, 357
- Tilton, J. L., work of, 3
- Tipton, gumbo near, 195
- Todd, J. E., 288, 294, 302, 305, 307
- Toledo, section near, 105
- Tom creek, valley gravel on, 391
- Topography of Iowan drift, 60, 67
of Kansan drift, 61, 254, 282, 322
of Wisconsin drift, 61, 251
- Traer, section near, 107
- Tripoli, pebbles from, 185
- Trowbridge, A. C., 58
- Turkey river, terraces on, 131
- U
- Udden, J. A., 126, 128, 149, 150, 169
- Upham, Warren, 288, 385
- Upland gravel, 137
- Uplift of northwest Iowa, 334, 413
- Upper Iowa river, terraces on, 130
- Urbana, pebbles from, 183, 184
- V
- Valley gravels, 380, 445
distribution of, 381
fossils from, 409
origin and age of, 411
- Valley Junction, water from Raccoon river at, 48

- Valley train terraces, 130
 Van Horn, pebbles from, 183, 184
 Van Tuyl, F. M., work of, 3
 Victor, cuts near, 85
 gumbo near, 193
 pebbles from, 188
 Vining, pebbles from, 187, 188
 sections near, 85, 106
 Vinton, Iowan near, 211
 pebbles from, 193
 section near, 99
 Volga, terraces near, 134
 Volga river, terraces on, 134
 Voorhies, section near, 100
- W
- Wadena, terraces near, 134
 Wall Lake outlet, 256
 Walsh Brothers' pit, 408
 Wapello, loess near, 155, 168
 Wapsipinicon river, terraces on, 136
 Washington county, gumbo in, 194
 Water, purification of, 42
 uses of, 38
 Water for boiler purposes, 38
 in industries, 40
 Waterloo, pebbles from, 183
 water from Cedar river at, 43
 Waterman creek, gravel on, 402
 pre-Wisconsin, 317
 profiles along, 403
 Waucoma, terraces near, 133
 Waverly, Iowan near, 202
 Weidman, Samuel, 58
 West Union, moraine near, 173
 section near, 100
 White, C. A., 242
 Whitney, J. D., 242
- Wilder, Frank A., 7, 240, 245, 253,
 294, 295, 385, 443
 Williams, I. A., 126
 Williams, J. A., 58
 Willow creek, gravel on, 402
 pre-Wisconsin, 316
 Winchell, N. H., 288
 Winneshiek county, Iowan till in, 110,
 200
 loess in, 149
 moraine in, 172
 terraces in, 131
 Winthrop, Iowan near, 209
 Wisconsin boundary, 442
 characters of, 254
 earlier tracing of, 248, 252, 292
 general course, 290
 near Sioux Falls, 301
 south of Sac county, 255
 Wisconsin drift, 258
 character of, 252, 255, 302
 relations to loess, 158
 topography of, 61, 283, 442
 Wisconsin drift near Sioux Falls, 294
 Wisconsin drift region, 251
 character of, 251, 297
 topography of, 251
 in Osceola county, 285
 Wisconsin gravels, 139
 Wisconsin history, 441
 Wisconsin ice, stream diversion by,
 441
 Woodbury county, gravel in, 408
 outcrops in, 430
 thick loess in, 339
 topography of, 326
 work in, 244
 Worth county, gumbo in, 104
 Worthington, Iowan near, 175
 terraces near, 135



MAP OF THE PLEISTOCENE DEPOSITS OF NORTHWESTERN IOWA

BY J. ERNEST CARMAN, 1917