

## Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.



1  
Ag 84M  
Exp. 4

#1205

**A**  
**SELECTED BIBLIOGRAPHY OF  
NATURAL PLANT COMMUNITIES  
IN 11 MIDWESTERN STATES**

U.S. DEPT. OF AGRICULTURE  
NATL. AGRIC. LIBRARY  
RECEIVED

MAY 14 '76

PROCUREMENT SECTION  
CURRENT SERIAL RECORDS

SOIL CONSERVATION SERVICE  
U.S. DEPARTMENT OF AGRICULTURE  
MISCELLANEOUS PUBLICATION No. 1205

---

For sale by the Superintendent of Documents, U.S. Government Printing Office  
Washington, D.C. 20402 - Price 30 cents  
Stock Number 0100-1436

**Issued June 1971**

## A SELECTED BIBLIOGRAPHY OF NATURAL PLANT COMMUNITIES IN 11 MIDWESTERN STATES

Prepared by Arnold J. Heerwagen, *range conservationist (retired)*,  
Soil Conservation Service

Publications listed in this bibliography describe natural plant communities in the following states:

Illinois	Michigan	North Dakota
Indiana	Minnesota	South Dakota
Iowa	Missouri	Wisconsin
Kansas	Nebraska	

Only those studies actually conducted in the states listed and those studies made for larger areas but specifically referring to plant communities in the states listed are included.

With only a few exceptions, the studies are restricted to those describing the nature of past and present plant communities and the response of these communities to variations in such factors as soil, climate, drought, grazing, and fire. A few studies describing underground plant parts and the phenology of species are included. Taxonomic keys and lists of flora are not included.

Although the list is reasonably comprehensive, some worthy publications have undoubtedly been omitted. Students of natural plant communities will also want to refer to a number of excellent studies of similar vegetation in adjacent states and Canada.



1. Adams, Charles C. 1909. An ecological survey of Isle Royale, Lake Superior. Rpt. Bd. Geol. Survey 1908. Lansing, Mich. 1 to 14, 1-468.
2. Adams, R. P. 1930. Weed succession of an abandoned roadway. Proc. Iowa Acad. Sci. 36: 213-219.
3. Ahlgren, Clifford E. 1957. Phenological observations of nineteen native tree species in north-eastern Minnesota. Ecology 38: 622-628.
4. \_\_\_\_\_ 1960. Some effects of fire on reproduction and growth of vegetation in north-eastern Minnesota. Ecology 41: 431-445.
5. \_\_\_\_\_ 1963. Some basic ecological factors in prescribed burning in northeastern Minnesota. Proc. Annu. Tall Timbers Fire Ecol. Conf. 2: 143-149.
6. Aikman, J. M. 1928. Competition studies in the ecotone between prairie and woodland. Proc. Iowa Acad. Sci. 35: 99-103.
7. \_\_\_\_\_ 1929. Distribution and structure of the forests of eastern Nebraska. Univ. Nebr. Studies 26: 1-75.
8. \_\_\_\_\_ 1930. Secondary plant succession on Muscatine Island, Iowa. Ecology 11: 577-588.
9. \_\_\_\_\_ 1935. The relation of the stages of plant succession to soil erosion. Iowa State Col. J. Sci. 9: 379-389.
10. \_\_\_\_\_ 1955. Burning in the management of prairie in Iowa. Proc. Iowa Acad. Sci. 62: 53-62.
11. \_\_\_\_\_ and C. L. Gilly. 1948. A comparison of the forest floras along the Des Moines and Missouri Rivers. Proc. Iowa Acad. Sci. 55: 53-73.
12. \_\_\_\_\_ and A. W. Smelser. 1938. The structure and environment of forest communities in central Iowa. Ecology 19: 141-150.
13. Albee, L. R., E. W. Klosterman, W. H. Burkitt, and H. R. Olson. 1948. South Dakota grasslands—their condition and management. S. Dak. Agr. Expt. Sta. C. 70. 39 p.
14. Albertson, F. W. 1937. Ecology of the mixed prairie in west-central Kansas. Ecol. Monographs 7: 481-547.
15. \_\_\_\_\_ 1938. Prairie studies in west-central Kansas. Trans. Kans. Acad. Sci. 41: 77-83.
16. \_\_\_\_\_ 1939. Prairie studies in west-central Kansas. Trans. Kans. Acad. Sci. 42: 97-107.
17. \_\_\_\_\_ 1941. Prairie studies in west-central Kansas. Trans. Kans. Acad. Sci. 44: 49-57.
18. \_\_\_\_\_ 1942. Prairie studies in west-central Kansas. Trans. Kans. Acad. Sci. 45: 47-54.
19. \_\_\_\_\_ 1943. Prairie studies in west-central Kansas. Trans. Kans. Acad. Sci. 46: 81-84.
20. \_\_\_\_\_ 1945. Prairie studies in west-central Kansas. Trans. Kans. Acad. Sci. 47: 405-414.
21. \_\_\_\_\_ 1949. Man's disorder of nature's design in the Great Plains. Trans. Kans. Acad. Sci. 52: 117-131.
22. \_\_\_\_\_ and G. W. Tomanek. 1965. Vegetation changes during a 30-year period in grassland communities near Hays, Kansas. Ecology 46: 714-720.
23. \_\_\_\_\_ G. W. Tomanek, and Andrew Riegel. 1957. Ecology of drought cycles and grazing intensity on grasslands of central Great Plains. Ecol. Monographs 27: 27-44.
24. \_\_\_\_\_ and J. E. Weaver. 1942. History of the native vegetation of western Kansas during seven years of continuous drought. Ecol. Monographs 12: 23-51.
25. \_\_\_\_\_ and J. E. Weaver. 1944. Effects of drought, dust, and intensity of grazing on cover and yield of shortgrass pastures. Ecol. Monographs 14: 1-29.
26. \_\_\_\_\_ and J. E. Weaver. 1945. Injury

- and death of trees in a prairie climate. *Ecol. Monographs* 15: 393-433.
27. \_\_\_\_\_ and J. E. Weaver. 1946. Reduction of ungrazed mixed prairie to short grass as a result of drought and dust. *Ecol. Monographs* 16: 449-463.
  28. Aldous, A. E. 1934. Effects of burning on Kansas bluestem pastures. *Kans. Agr. Expt. Sta. Bull.* 38: 65 p.
  29. Allred, B. W. 1945. Some conditions and influences pertaining to the native forage crop of the northern mixed prairie. *J. Amer. Soc. Agron.* 37: 876-887.
  30. Alway, F. J., and P. R. McMiller. 1933. Interrelationships of soil and forest cover on Star Island, Minnesota. *Soil Sci.* 36: 281-294.
  31. Anderson, Kling L. 1940. Deferred grazing of bluestem pastures. *Kans. Agr. Expt. Sta. Bull.* 291 27 p.
  32. \_\_\_\_\_ 1943. The grasslands of Kansas. *Bien. Rpt. Kans. State Bd. Agr.* 38: 144-160.
  33. \_\_\_\_\_ 1951. The effects of grazing management and site conditions on Flint Hills bluestem pastures in Kansas. Ph.D. Thesis. Univ. of Nebr., Lincoln.
  34. \_\_\_\_\_ 1953. Utilization of grasslands in the Flint Hills of Kansas. *J. Range Mangt.* 6: 86-93.
  35. \_\_\_\_\_ and Claude L. Fly. 1955. Vegetation-soil relationships in Flint Hills bluestem pastures. *J. Range Mangt.* 8: 163-169.
  36. Anderson, O. 1948. An ecological study of the climax vegetation of Taylor County, Wisconsin. M.S. Thesis. Univ. of Wis., Madison.
  37. \_\_\_\_\_ 1954. The phytosociology of dry lime prairies of Wisconsin. Ph.D. Thesis. Univ. of Wis., Madison.
  38. Anderson, R. C. 1970. Prairies in the prairie state. *Trans. Ill. State Acad. Sci.* 63: 214-221.
  39. \_\_\_\_\_ O. L. Loucks, and A. M. Swain. 1969. Herbaceous response to canopy cover, light intensity, and through fall precipitation in coniferous forests. *Ecology* 50: 255-263.
  40. Anderson, S. T. 1954. A late-glacial pollen diagram from southern Michigan. *Danmarks Geol. Undersoqelse. Ser. 2, 4(1).* 24 p.
  41. Anderson, W. A. 1946. Development of prairie at Iowa Lakeside Laboratory. *Amer. Midl. Nat.* 36: 431-455.
  42. Anthoney, R. B. 1937. Prairie plant distribution in Rock County, Wisconsin. M.S. Thesis. Univ. of Wis., Madison.
  43. Archibald, D. 1954. The effect of native legumes on the establishment of prairie grasses. Ph.D. Thesis. Univ. of Wis., Madison.
  44. Artist, R. C. 1936. Stratigraphy and preliminary pollen analysis of a Lake County, Illinois, bog. *Butler Univ. Bot. Studies* 3: 191-198.
  45. Ashby, William C., and George T. Weaver. 1970. Forest regeneration on two old fields in south-eastern Illinois. *Amer. Midl. Nat.* 84: 90-104.
  46. Baker, R. G. 1965. Late-glacial pollen and plant macrofossils from Spider Creek, southern St. Louis Co., Minnesota. *Geol. Soc. Amer. Bull.* 76: 601-610.
  47. Barclay, H. G. 1924. The plant succession on the flood plain of the Mississippi River with special reference to the pioneer stage. M.A. Thesis. Univ. of Minn., Minneapolis.
  48. Bard, Lucia D. 1957. Relations between legumes and other prairie species on some relic prairie sites of Wisconsin. M.S. Thesis. Univ. of Wis., Madison.
  49. Barker, William T. 1969. The flora of the Kansas Flint Hills. *Univ. Kans. Sci. Bull.* 48(14): 525-584.
  50. Barnett, Jean. 1937. Pollen study of Cranberry Pond, near Emporia, Madison County, Indiana. *Butler Univ. Bot. Studies* 4: 55-64.
  51. Bay, Roger, R. 1967. Ground water and vegetation in two peat bogs in northern Minnesota. *Ecol. Monographs* 48: 308-310.



52. Bazzaz, F. A. 1963. Secondary succession on abandoned fields in southern Illinois. Ph.D. Thesis. Univ. of Ill., Urbana. 190 p.
53. \_\_\_\_\_ 1968. Succession on abandoned fields in the Shawnee Hills of southern Illinois. *Ecology* 49: 924-936.
54. Beals, Edward W., and James B. Cope. 1964. Vegetation and soils in an eastern Indiana woods. *Ecol. Monographs* 45: 777-792.
55. \_\_\_\_\_ and G. Cottam. 1960. The forest vegetation of the Apostle Islands, Wisconsin. *Ecology* 41: 743-751.
56. Beebe, J. D., and G. R. Hoffman. 1968. Effects of grazing on vegetation and soils in southeastern South Dakota. *Amer. Midl. Nat.* 80: 96-110.
57. Beilman, A. P., and L. C. Brenner. 1951a. The recent intrusion of forests in the Ozarks. *Ann. Mo. Bot. Gard.* 38: 261-282.
58. \_\_\_\_\_ and L. C. Brenner. 1951b. The changing forest flora of the Ozarks. *Ann. Mo. Bot. Gard.* 38: 283-291.
59. Benninghoff, W. S. 1960. Pollen spectra from bryophytic moss polsters, Inverness Mud Lake Bog, Cheboygan County, Mich. *Mich. Acad. Sci.* 45: 41-60.
60. \_\_\_\_\_ and K. J. Cramer. 1963. Phytosociological analysis of aspen communities on three site classes for *Populus grandidentata* in western Cheboygan County, Michigan. *Vegetatio* 11: 253-263.
61. Bergman, H. F. 1919. The vegetation of Minnesota swamps. *Minn. Geol. Survey Bull.* 16: 61-73.
62. \_\_\_\_\_ 1923. The composition of climax plant formations in Minnesota. *Papers Mich. Acad. Sci.* 3: 51-60.
63. \_\_\_\_\_ and H. Stallard. 1916. The development of climax formations in northern Minnesota. *Minn. Bot. Studies* 4: 333-378.
64. Bidwell, O. W. 1966. The Flint Hills range sites. *Trans. Kans. Acad. Sci.* 69: 205-213.
65. Bjugstad, A. J. 1965. Vegetation measurements in relation to range condition classification on the principal range sites of southwestern North Dakota. Ph.D. Thesis. N. Dak. State Univ., Fargo.
66. Black, W. H., A. L. Baker, V. I. Clark, and O. R. Matthews. 1937. Effect of different methods of grazing on native vegetation and gains of steers in northern Great Plains. *U.S. Dept. Agr. Tech. Bull.* 547. 18 p.
67. Blair, Byron O. 1949. The ecology of a pasture in the Dakota Sandstone formation in Ellsworth County, Kansas. *Trans. Kans. Acad. Sci.* 52: 38-57.
68. Blake, A. K. 1935. Viability and germination of seed and early life histories of prairie plants. *Ecol. Monographs* 5: 405-460.
69. Bland, M. K., and P. D. Kilburn. 1966. Bluff prairie vegetation and soil texture. *Trans. Ill. State Acad. Sci.* 59: 25-28.
70. Blewett, Marilyn Bowman, and John E. Potzger. 1951. The forest primeval of Marion and Johnson Counties, Indiana, in 1819. *Butler Univ. Bot. Studies* 10: 40-52.
71. Bliss, L. C., and George W. Cox. 1964. Plant community and soil variation within a northern Indiana Prairie. *Amer. Midl. Nat.* 72: 115-128.
72. Booth, W. E. 1941. Revegetation of abandoned fields in Kansas and Oklahoma. *Amer. J. Bot.* 28: 415-422.
73. Branson, F. A. 1952. Native pastures of the dissected loess plains of central Nebraska. Ph.D. Thesis. Univ. of Nebr., Lincoln.
74. \_\_\_\_\_ and J. E. Weaver. 1953. Quantitative study of degeneration of mixed prairie. *Bot. Gaz.* 114: 376-416.
75. Braun, E. Lucy. 1950. Deciduous forests of eastern North America. The Blakiston Co., Philadelphia. 596 p. (selected sections).
76. Bray, J. R. 1955. The savanna vegetation of Wisconsin and an application of the concepts order and complexity to the field of ecology. Ph.D. Thesis. Univ. of Wis., Madison.

77. \_\_\_\_\_ 1957. Climax forest herbs in prairie. *Amer. Midl. Nat.* 58: 434-440.
78. \_\_\_\_\_ 1960. The composition of savanna vegetation in Wisconsin. *Ecology* 41: 721-732.
79. \_\_\_\_\_ 1962. The primary productivity of vegetation in central Minnesota, U.S.A., and its relationship to chlorophyll content and albedo. In *Die Stoffproduktion der Pflanzendecke*, p. 102-116. Gustav Fisher Verlag., Stuttgart.
80. \_\_\_\_\_ and J. T. Curtis. 1957. An ordination of the upland forest communities of southern Wisconsin. *Ecol. Monographs* 27: 325-349.
81. \_\_\_\_\_ D. B. Lawrence, and L. C. Pearson. 1959. Primary production in some Minnesota terrestrial communities for 1957. *Oikos* 10: 38-49.
82. Brédemeier, L. F. 1958. Measurement of time and rate of growth of range plants with application in range management. *J. Range Mangt.* 11: 119-122.
83. Brewer, Richard. 1965. Vegetational features of a wet prairie in southwestern Michigan. *C. C. Adams Cent. Ecol. Studies Occas. Paper* 13. p. 1-16. West. Mich. Univ., Kalamazoo.
84. \_\_\_\_\_ 1966a. Notes on vegetation and birds of a maple forest in southwestern Michigan. *Jack Pine Warbler* 44: 48-49.
85. \_\_\_\_\_ 1966b. Vegetation of two bogs in southwestern Michigan. *Mich. Bot.* 5: 36-46.
86. \_\_\_\_\_ Arlo Raim, and Jerome D. Robins. 1969. Vegetation of a Michigan grassland and thicket. *C. C. Adams Cent. Ecol. Studies. Occas. Paper* 18. West. Mich. Univ., Kalamazoo.
87. Brinegar, T. E., and F. D. Keim. 1942. The relations of vegetative composition and cattle grazing on Nebraska rangeland. *Nebr. Agr. Expt. Sta. Res. Bull.* 123.
88. Brown, F.B.H. 1905. A botanical survey of the Huron River Valley. III. The plant societies of the Bayou at Ypsilanti, Michigan. *Bot. Gaz.* 40: 264-284.
89. Brown, H. Leo. 1947. Coaction of jack rabbit, cottontail, and vegetation in a mixed prairie. *Trans. Kans. Acad. Sci.* 50: 28-44.
90. Brown, H. Ray. 1943. Growth and seed yields of native prairie plants in various habitats of the mixed prairie. *Trans. Kans. Acad. Sci.* 46: 87-99.
91. Brown, R. T. 1950. Forests of central Wisconsin sand plains. *Bull. Ecol. Soc. Amer.* 31: 56.
92. \_\_\_\_\_ 1951. The phytosociology of the conifer-hardwood forest of northern Wisconsin. Ph.D. Thesis. Univ. of Wis., Madison.
93. \_\_\_\_\_ and J. T. Curtis. 1952. The upland conifer-hardwood forests of Wisconsin. *Ecol. Monographs* 22: 217-234.
94. Bruncken, E. 1902a. Studies in plant distribution. I. On the succession of forest types in the vicinity of Milwaukee. *Bull. Wis. Nat. Hist. Soc.* 2: 17-28.
95. \_\_\_\_\_ 1902b. A tamarack swamp in Waukesha County. *Bull. Wis. Nat. Hist. Soc.* 2: 164-167.
96. \_\_\_\_\_ 1910. Studies in plant distribution. 9. The shore of Lake Michigan. *Bull. Wis. Nat. Hist. Soc.* 8: 145-157.
97. Buell, M. F. 1956. Spruce-fir, maple-basswood competition in Itasca Park, Minnesota. *Ecology* 37: 606.
98. \_\_\_\_\_ and F. H. Borman. 1955. Deciduous forests of Ponemah Point, Red Lake Indian Reservation, Minnesota. *Ecology* 36: 646-658.
99. \_\_\_\_\_ and H. F. Buell. 1941. Surface level fluctuation in Cedar Creek Bog, Minnesota. *Ecology* 22: 317-321.
100. \_\_\_\_\_ and H. F. Buell. 1959. Aspen invasion of the prairie. *Bull. Torrey Bot. Club* 86: 264-265.
101. \_\_\_\_\_ H. F. Buell, and W. A. Reiners. 1968. Radial mat growth in Cedar Creek Bog, Minnesota. *Ecology* 49: 1198-1199.

102. \_\_\_\_\_ and John E. Cantlon. 1951. A study of two forest stands in Minnesota with an interpretation of the prairie-forest margin. *Ecology* 32: 294-316.
103. \_\_\_\_\_ and V. Facey. 1960. Forest-prairie transition west of Itasca Park, Minnesota. *Bull. Torrey Bot. Club* 87: 46-58.
104. \_\_\_\_\_ and W. E. Gordon. 1945. Hard-wood-conifer forest contact zone in Itasca Park, Minnesota. *Amer. Midl. Nat.* 34: 433-439.
105. \_\_\_\_\_ and W. E. Martin. 1961. Competition between maple-basswood and fir-spruce communities in Itasca Park, Minnesota. *Ecology* 42: 428-429.
106. \_\_\_\_\_ and William A. Niering. 1957. Fir-spruce-birch forest in northern Minnesota. *Ecology* 38: 602-610.
107. \_\_\_\_\_ and R. L. Wilbur. 1948. Life-form spectra of the hardwood forests of the Itasca Park region, Minnesota. *Ecology* 29: 352-359.
108. Burgess, Robert L. 1964. Ninety years of vegetational change in a township in southeastern North Dakota. *Proc. N. Dak. Acad. Sci.* 18: 84-94.
109. \_\_\_\_\_ and Dennis T. Disrud. 1969. Wetland vegetation of the Turtle Mountains, North Dakota. *Prairie Nat.* 1(2): 19-30.
110. \_\_\_\_\_ 1965. A study of plant succession in the sandhills of southeastern North Dakota. *Proc. N. Dak. Acad. Sci.* 19: 62-80.
111. Burzlaff, D. F. 1960. Soil as a factor influencing distribution of vegetation in the Sandhills of Nebraska. Ph.D. Thesis. Utah State Univ., Logan.
112. \_\_\_\_\_ 1962. A soil and vegetation inventory and analysis of three Nebraska Sandhills range sites. *Nebr. Agr. Expt. Sta. Bull.* 206. 33 p.
113. \_\_\_\_\_ and Lionel Harris. 1969. Yearling steer gains and vegetation changes of western Nebraska rangeland under three rates of stocking. *Univ. Nebr. Agr. Expt. Sta. Bull.* 505. 18 p.
114. Buss, I. O. 1956. Plant succession on a sand plain, northwest Wisconsin, *Trans. Wis. Acad. Sci.* 45: 11-20.
115. Butler, J. E. 1954. Interrelations of autoecological characteristics of prairie herbs. Ph.D. Thesis. Univ. of Wis., Madison.
116. Butters, F. K., and E. C. Abbe. 1953. A floristic study of Cook County, northeastern Minnesota. *Rhodora* 55: 21-55, 63-101, 116-154, 161-201.
117. Buttrick, P. L. 1914. The probable origin of the forests of the Black Hills of South Dakota. *Forest. Q.* 12: 223-227.
118. Cain, Stanley A. 1928. Plant succession and ecological history of a central Indiana swamp. *Bot. Gaz.* 86: 384-401.
119. \_\_\_\_\_ 1932. Studies on virgin hardwood forest. I. Density and frequency of the woody plants of Donaldson's Woods, Lawrence County, Indiana. *Proc. Ind. Acad. Sci.* 41: 105-122.
120. \_\_\_\_\_ 1934. Studies on virgin hardwood forest. II. A comparison of quadrat sizes in a quantitative phytosociological study of Nash Woods, Posey County, Indiana. *Amer. Midl. Nat.* 15: 529-566.
121. \_\_\_\_\_ 1935. Studies on virgin hardwood forest. III. Warren's Woods, a beech-maple climax forest in Berrien County, Michigan. *Ecology* 16: 500-513.
122. \_\_\_\_\_ and R. C. Friesner. 1929. Soil reaction and plant distribution in the Sycamore Creek region. *Butler Univ. Bot. Studies* 1: 17-28.
123. \_\_\_\_\_ and J. V. Slater. 1948. The vegetation of Sodon Lake. *Amer. Midl. Nat.* 40: 741-762.
124. Carpenter, J. R. 1935. Fluctuations in biotic communities. I. Prairie-forest ecotone of central Illinois. *Ecology* 16: 203-216.
125. \_\_\_\_\_ 1940. The grassland biome. *Ecol. Monographs* 10: 617-683 (selected portions).

126. Catenhusen, J. 1950. Secondary successions on the peat lands of Glacial Lake, Wisconsin. *Trans. Wis. Acad. Sci.* 40: 29-48.
127. Cawley, Edward T. 1960. A phytosociological study of the effects of grazing on southern Wisconsin woodlots. Ph.D. Thesis. Univ. of Wis., Madison.
128. Chamberlain, T. C. 1877. Native vegetation of eastern Wisconsin. *In* *Geol. of Wis.* 2: 176-187.
129. Chapman, A. G. 1937. An ecological basis for reforestation of submarginal lands in the central hardwood region. *Ecology* 18: 93-105.
130. \_\_\_\_\_ 1942. Forests of the Illinoian till plain of southeastern Indiana. *Ecology* 23: 189-198.
131. Chavannes, Elizabeth. 1940. The steep prairies of southwestern Wisconsin and their invasion by forest. Ph.D. Thesis. Univ. of Wis., Madison.
132. Christensen, E. M. 1954. A phytosociological study of the winter range of deer of northern Wisconsin. Ph.D. Thesis. Univ. of Wis., Madison.
133. \_\_\_\_\_ J. J. Clausen, and J. T. Curtis. 1959. Phytosociology of the lowland forests of northern Wisconsin. *Amer. Midl. Nat.* 62: 232-247.
134. Clausen, J. Johanna. 1955. A phytosociological ordination of the conifer swamps of Wisconsin. Ph.D. Thesis. Univ. of Wis., Madison.
135. \_\_\_\_\_ 1957. A phytosociological ordination of the conifer swamps of Wisconsin. *Ecology* 38: 638-645.
136. Clements, F. E., J. E. Weaver, and H. C. Hanson. 1929. Competition in the ecotone between woodland and prairie. *In* *Plant Competition*. Carnegie Inst. Wash. P. 398.
137. Conard, E. C., and V. H. Arthaud. 1957. Effect of time of cutting on yield and botanical composition of prairie hay in southeastern Nebraska. *Nebr. Agr. Expt. Sta. Res. Bull.* 184. 36 p.
138. Conard, H. S. 1932. A boreal moss community. *Proc. Iowa Acad. Sci.* 39: 57-61.
139. \_\_\_\_\_ 1938. The fir forests of Iowa. *Proc. Iowa Acad. Sci.* 45: 69-72.
140. \_\_\_\_\_ 1952. The vegetation of Iowa. *State Univ. Iowa Studies in Nat. Hist.* 19: 1-66.
141. Conway, Verona M. 1949. The bogs of central Minnesota. *Ecol. Monographs* 19: 173-206.
142. Coons, G. H. 1911. Ecological relations of the flora. Sand dune region on the south shore of Saginaw Bay, Michigan. *Mich. Geol. and Biol. Survey P. Ser.* 2, 4: 35-64.
143. Cooper, A. W. 1961. Relationships between plant life-forms and microclimate in southeastern Michigan. *Ecol. Monographs* 31: 31-59.
144. Cooper, W. S. 1913. The climax forest of Isle Royale, Lake Superior, and its development. *Bot. Gaz.* 55: 1-44; 115-140; 189-235.
145. \_\_\_\_\_ 1928. Seventeen years of successional change upon Isle Royale, Lake Superior. *Ecology* 9: 1-5.
146. \_\_\_\_\_ and H. Foot. 1932. Reconstruction of a late Pleistocene biotic community in Minneapolis, Minnesota. *Ecology* 13: 63-72.
147. Cornelius, D. R. 1944. Revegetation in the tall grass prairie region. *J. Amer. Soc. Agron.* 36: 393-400.
148. Corson, C. W., J. H. Allison, and E. G. Cheyney. 1929. Factors controlling forest types in the Cloquet Forest, Minnesota. *Ecology* 10: 112-125.
149. Cosby, Hugh E. 1960. Rings on the range. *J. Range Mangt.* 13: 283-288.
150. \_\_\_\_\_ 1964. Some yield characteristics of range as influenced by soil type and weather. *J. Range Mangt.* 17: 266-269.
151. \_\_\_\_\_ 1965. Fescue grassland in North Dakota. *J. Range Mangt.* 18: 284-285.
152. Costello, D. F. 1931. Comparative study of river bluff succession on Iowa and Nebraska sides of the Missouri River. *Bot. Gaz.* 91: 295-307.
153. \_\_\_\_\_ 1936. Tussock meadows in southeastern Wisconsin. *Bot. Gaz.* 97: 610-648.

154. Cottam, Grant. 1949. The phytosociology of an oak woods in southern Wisconsin. *Ecology* 30: 271-287.
155. \_\_\_\_\_ and H. Cameron Wilson. 1966. Community dynamics on an artificial prairie. *Ecology* 47: 88-96.
156. Coupland, Robert T. 1958. The effects of fluctuations in weather upon the grasslands of the Great Plains. *Bot. Rev.* 24(5): 274-317 (selected portions).
157. \_\_\_\_\_ 1961. A reconsideration of grassland classification in the northern Great Plains of North America. *J. Ecol.* 49: 135-167 (selected portions).
158. Cowles, H. C. 1899. The ecological relations of the vegetation on the sand dunes of Lake Michigan. *Bot. Gaz.* 27: 95-117, 167-202, 281-308, 361-391.
159. \_\_\_\_\_ 1901a. The physiographic ecology of Chicago and vicinity; a study of the origin, development and classification of plant societies. *Bot. Gaz.* 31: 145-182.
160. \_\_\_\_\_ 1901b. The plant societies of Chicago and vicinity. *Geog. Soc. Chicago Bull.* 2: 13-76.
161. Crankshaw, W. B. 1964. Edaphology of tree species in presettlement Indiana south of the Late Wisconsin glacial border. Ph.D. Thesis. Purdue Univ., Lafayette.
162. Cratty, R. I. 1929. The immigrant flora of Iowa. *Iowa State Col. J. Sci.* 3: 247-269.
163. Cressler, Lawrence. 1942. The effect of different intensities and times of grazing and the degree of dusting upon the vegetation of rangeland in west-central Kansas. *Trans. Kans. Acad. Sci.* 45: 75-91.
164. Culbertson, W. L. 1955. The corticolous communities of lichens and bryophytes in the upland forests of northern Wisconsin. *Ecol. Monographs* 25: 215-231.
165. Curtis, J. T. 1955. A prairie continuum in Wisconsin. *Ecology* 36: 558-566.
166. \_\_\_\_\_ 1956. The modification of mid-latitude grasslands and forests by man. In Thomas, W. L. (ed.). *Man's role in changing the face of the earth*, p. 721-736. Univ. Chicago Press, Chicago.
167. \_\_\_\_\_ 1959. The vegetation of Wisconsin. Univ. Wis. Press., Madison. 657 pp.
168. \_\_\_\_\_ and H. C. Green. 1949. A study of the relic Wisconsin prairies by the species-presence method. *Ecology* 30: 83-92.
169. \_\_\_\_\_ R. P. McIntosh. 1951. An upland forest continuum in the prairie-forest border region of Wisconsin. *Ecology* 32: 476-496.
170. \_\_\_\_\_ and M. L. Partch. 1948. Effects of fire on the competition between bluegrass and certain prairie plants. *Amer. Midl. Nat.* 39: 437-443.
171. Cushing, E. J. 1963. Late-Wisconsin pollen stratigraphy in east-central Minnesota. Ph.D. Thesis. Univ. of Minn., Minneapolis. 165 p.
172. \_\_\_\_\_ 1967. Late-Wisconsin pollen stratigraphy and the glacial sequence in Minnesota. In E. J. Cushing and H. E. Wright, Jr. (ed.). *Quaternary paleoecology*, p. 59-88. Yale Univ. Press., New Haven.
173. Dachnowski, A. P. 1925. Profiles of peatlands within limits of extinct Lakes Agassiz and Wisconsin. *Bot. Gaz.* 80: 345-366.
174. Dahlman, Roger C., and Clair L. Kucera. 1965. Root productivity and turnover in native prairie. *Ecology* 46: 84-89.
175. Darland, R. W., and J. E. Weaver. 1945. Yields and consumption of forage in three pasture types: An ecological analysis. *Univ. Nebr. Conserv. and Survey Div. Bull.* 27. 76 p.
176. Darlington, Henry T. 1931. Vegetation of the Porcupine Mountains, Northern Michigan. *Papers Mich. Acad. Sci.* 13: 9-65.
177. \_\_\_\_\_ 1940. Some vegetational aspects of Beaver Island, Lake Michigan. *Papers Mich. Acad. Sci.* 25: 31-37.

178. Daubenmire, R. F. 1930. The relation of certain ecological factors to the inhibition of forest floor herbs under hemlock. *Butler Univ. Bot. Studies* 1: 61-76.
179. \_\_\_\_\_ 1931. Factors favoring the persistence of a relic association of eastern hemlock in Indiana. *Butler Univ. Bot. Studies* 2: 29-32.
180. \_\_\_\_\_ 1936. The "Big Woods" of Minnesota, its structure and relation to climate, fire, and soils. *Ecol. Monographs* 6: 233-268.
181. Day, R. K., and D. Den Uyl. 1932. Studies in Indiana farmwoods. I. Natural regeneration of farmwoods following the exclusion of livestock. *Ind. Agr. Expt. Sta. Bull.* 368. 48 p.
182. Den Uyl, D., O. D. Diller, and R. K. Day. 1938. The development of natural reproduction in previously grazed farmwoods. *Ind. Agr. Expt. Sta. Bull.* 431. 28 p.
183. Dietz, H. 1953. Variation in yield, cover, and composition of vegetation on a mixed prairie in west-central Kansas. M.S. Thesis, Ft. Hays, Kans., State Col.
184. Diller, Oliver D. 1937. The forage cover in heavily grazed farmwoods in northern Indiana. *J. Amer. Soc. Agron.* 29: 924-933.
185. Dix, R. L. 1955. Phytosociological changes on the thin-soil prairies of Wisconsin under the influence of grazing. Ph.D. Thesis. Univ. of Wis., Madison.
186. \_\_\_\_\_ 1958. Some slope-plant relationships in the grasslands of the Little Missouri badlands of North Dakota. *J. Range Mangt.* 11: 88-92.
187. \_\_\_\_\_ 1959. The influence of grazing on the thin-soil prairies of Wisconsin. *Ecology* 40: 36-49.
188. \_\_\_\_\_ 1960. The effects of burning on mulch structure and species composition of grasslands in western North Dakota. *Ecology* 41: 49-56.
189. \_\_\_\_\_ and J. E. Butler. 1954. The effects of fire on a dry, thin-soil prairie in Wisconsin. *J. Range Mangt.* 7: 265-268.
190. \_\_\_\_\_ and J. E. Butler. 1960. A phytosociological study of a small prairie in Wisconsin. *Ecology* 41: 316-327.
191. \_\_\_\_\_ and F. E. Smeins. 1967. The prairie, meadow, and marsh vegetation of Nelson County, North Dakota. *Canad. J. Bot.* 45: 21-58.
192. Doell, J. H. 1938. The flora of the sandhills of Harvey County, Kansas. *Univ. Kans. Sci. Bull.* 25: 113-147.
193. Drew, W. B. 1942. The revegetation of abandoned cropland in the Cedar Creek area, Boone and Calloway Counties, Missouri. *Mo. Agr. Expt. Sta. Res. Bull.* 344. 52 p.
194. \_\_\_\_\_ 1947. Floristic composition of grazed and ungrazed prairie vegetation in north-central Missouri. *Ecology* 28: 26-41.
195. Duncan, D. P. 1954. A study of some of the factors affecting natural regeneration of tamarack in Minnesota. *Ecology* 35: 498-521.
196. Duncan, W. E. 1935. Root systems of woody plants of old fields in Indiana. *Ecology* 16: 554-567.
197. Eggler, W. A. 1938. The maple-basswood forest type in Washburn County, Wisconsin. *Ecology* 19: 243-263.
198. Ehrenreich, J. H. 1957. Management practices for maintenance of native prairie in Iowa. Ph.D. Thesis. Iowa State Univ., Ames. 159 p.
199. \_\_\_\_\_ 1959. Effect of burning and clipping on growth of native prairie in Iowa. *J. Range Mangt.* 12: 133-137.
200. \_\_\_\_\_ and John M. Aikman. 1963. An ecological study of the effects of certain management practices on native prairie in Iowa. *Ecol. Monographs* 33: 113-130.
201. Eilers, L. J. 1968. The remnant prairie flora in northeast Iowa. *Proc. Iowa Acad. Sci.* 73: 32-43.
202. Ellarson, R. S. 1949. The vegetation of Dane County, Wisconsin in 1835. *Trans. Wis. Acad. Sci.* 39: 21-45.

203. Elliot, J. C. 1953. Composition of upland second growth hardwood stands in the tension zone of Michigan as affected by soils and man. *Ecol. Monographs* 23: 271-288.
204. Engelhardt, D. W. 1965. A comparative pollen study of two early Wisconsin bogs in Indiana. *Proc. Ind. Acad. Sci.* 69: 110-118.
205. Esten, M. M. 1932. A statistical study of a beech-maple association at Turkey Run State Park, Parke County, Indiana. *Butler Univ. Bot. Studies* 2: 183-201.
206. Erickson, R. O., L. G. Brenner, and J. Wraight. 1942. Dolomitic glades of east-central Missouri. *Ann. Mo. Bot. Gard.* 29: 89-101.
207. Evans, F. C., and S. A. Cain. 1952. Preliminary studies on the vegetation of an old field community in southeastern Michigan. *Contrib. Lab. Vertebrate Biol., Univ. Mich.* 51: 1-17.
208. \_\_\_\_\_ and E. Dahl. 1955. The vegetational structure of an abandoned field in southeastern Michigan and its relation to environmental factors. *Ecology* 36: 685-706.
209. Evers, R. A. 1952. Hill prairies in Illinois. Ph.D. Thesis. Univ. of Ill., Urbana.
210. \_\_\_\_\_ 1955. The hill prairies of Illinois. *Bull. Ill. Nat. Hist. Survey* 26: 368-446.
211. Ewing, J. 1924. Plant successions of the brush-prairie in northwestern Minnesota. *J. Ecol.* 12: 238-267.
212. Fassett, N. C. 1929. Preliminary reports on the flora of Wisconsin. *Trans. Wis. Acad. Sci.* 24: 249-268.
213. \_\_\_\_\_ 1944. Vegetation of the Brule Basin, past and present. *Trans. Wis. Acad. Sci.* 36: 33-56.
214. Fichter, E. 1954. An ecological study of invertebrates of grassland deciduous scrub savanna in eastern Nebraska. *Amer. Midl. Nat.* 51: 321-439.
215. Finley, R. W. 1951. The original vegetation cover of Wisconsin. Ph.D. Thesis. Univ. of Wis., Madison.
216. \_\_\_\_\_ and J. E. Potzger. 1952. Characteristics of the original vegetation in some prairie counties of Indiana. *Butler Univ. Bot. Studies* 10: 114-118.
217. Fitch, Henry S., and Ronald L. McGregor. 1956. The forest habitat of the University of Kansas Natural History Reservation. *Univ. Kans. P.* 10(3): 79-127.
218. Flaccus, Edward, and Lewis F. Ohman. 1964. Old-growth northern hardwood forests of north-eastern Minnesota. *Ecology* 45: 448-459.
219. Flesland, James R., and Warren C. Whitman. 1964. A vegetational analysis of the salt-desert shrub type in western North Dakota. *Proc. N. Dak. Acad. Sci.* 18: 73-75.
220. Florell, V. H. 1937. Native grasslands in the Huron (South Dakota) area. *J. Amer. Soc. Agron.* 29: 403-411.
221. Flory, E. L. 1936. Comparison of the environment and some physiological responses of prairie vegetation and cultivated maize. *Ecology* 17: 67-103.
222. Fosberg, M. A. 1949. Soil and site condition typical of the maple-basswood association in southern Wisconsin. M. S. Thesis. Univ. of Wis., Madison.
223. Franks, James W., and Harold H. Hopkins. 1954. Upland depressions in a mixed prairie. *Trans. Kans. Acad. Sci.* 57: 48-54.
224. Freckman, R. W. 1968. The prairie remnants of the Ames area. *Proc. Iowa Acad. Sci.* 73: 126-136.
225. Fredricksen, M. T. 1938. Comparison of the environment and certain physiological activities of alfalfa and prairie vegetation. *Amer. Midl. Nat.* 20: 641-681.
226. Fries, Magnus. 1962. Pollen profiles of late Pleistocene and recent sediments at Weber Lake, north-eastern Minnesota. *Ecology* 43: 295-308.
227. Friesner, Ray C. 1937. Indiana as a critical botanical area. *Proc. Ind. Acad. Sci.* 46: 28-45.

228. \_\_\_\_\_ and Charles M. Ek. 1944. Correlation of microclimatic factors with species distribution in Shenk's Woods, Howard County, Indiana. *Butler Univ. Bot. Studies* 6: 87-101.
229. \_\_\_\_\_ and J. E. Potzger. 1932a. Studies in forest ecology. I. Factors concerned in hemlock reproduction in Indiana. *Butler Univ. Bot. Studies* 2: 133-144.
230. \_\_\_\_\_ and J. E. Potzger. 1932b. Studies in forest ecology. II. The ecological significance of *Tsuga canadensis* in Indiana. *Butler Univ. Bot. Studies* 2: 145-149.
231. \_\_\_\_\_ and J. E. Potzger. 1934. Climax conditions and ecological status of *Pinus strobus*, *Taxus canadensis* and *Tsuga canadensis* in the Pine Hills region of Indiana. *Butler Univ. Bot. Studies* 3: 65-83.
232. \_\_\_\_\_ and J. E. Potzger. 1936. Soil moisture and the nature of the *Tsuga* and *Tsuga-Pinus* forest associations in Indiana. *Butler Univ. Bot. Studies* 3: 206-209.
233. \_\_\_\_\_ and J. E. Potzger. 1937. Contrasts in certain physical factors in *Fagus-Acer* and *Quercus-Carya* communities in Brown and Bartholomew Counties, Indiana. *Butler Univ. Bot. Studies* 4: 1-12.
234. \_\_\_\_\_ and J. E. Potzger. 1944. Survival of hemlock seedlings in a relict colony under forest conditions. *Butler Univ. Bot. Studies* 6: 102-115.
235. Frolick, A. L. 1941. Vegetation of the peat lands of Dane County, Wisconsin. *Ecol. Monographs* 11: 117-140.
236. \_\_\_\_\_ and F. D. Keim. 1933. Native vegetation in the prairie hay district of north central Nebraska. *Ecology* 14: 298-305.
237. \_\_\_\_\_ and W. O. Shepherd. 1940. Vegetative composition and grazing capacity of a typical area of Nebraska sandhill range land. *Univ. Nebr. Agr. Expt. Sta. Res. Bull.* 117.
238. Fuller, George D. 1935. Postglacial vegetation of the Lake Michigan region. *Ecology* 16: 473-488.
239. \_\_\_\_\_ and P. D. Strausbaugh. 1919. On the forests of LaSalle County, Illinois. *Trans. Ill. Acad. Sci.* 12: 246-272.
240. Gates, F. C. 1912a. The vegetation of the beach area in northeastern Illinois and southeastern Wisconsin. *Bull. Ill. Lab. Nat. Hist.* 9: 255-272.
241. \_\_\_\_\_ 1912b. The vegetation of the region in the vicinity of Douglas Lake, Cheboygan County, Michigan. *Annu. Rpt. Mich. Acad. Sci.* 14: 46-106.
242. \_\_\_\_\_ 1926. Plant succession about Douglas Lake, Cheboygan County, Michigan. *Bot. Gaz.* 82: 170-182.
243. \_\_\_\_\_ 1930. Aspen association in northern Lower Michigan. *Bot. Gaz.* 90: 233-259.
244. \_\_\_\_\_ 1939. Trends of tree migration in Kansas. *Trans. Kans. Acad. Sci.* 42: 127-132.
245. \_\_\_\_\_ 1942. The bogs of northern Lower Michigan. *Ecol. Monographs* 12: 213-254.
246. Getz, Lowell L. 1960. Standing crops of herbaceous vegetation in southern Michigan. *Ecology* 41: 393-395.
247. Gilbert, M. L. 1953. The phytosociology of the understory vegetation of the upland forests of Wisconsin. Ph.D. Thesis. Univ. of Wis., Madison.
248. \_\_\_\_\_ and J. T. Curtis. 1953. Relation of the understory of the upland forest in the prairie-forest border region of Wisconsin. *Trans. Wis. Acad. Sci.* 42: 183-195.
249. Gleason, H. A. 1907. On the biology of the sand areas of Illinois. II. A botanical survey of the Illinois River Valley sand region. *Bull. Ill. Lab. Nat. Hist.* 7: 149-194.
250. \_\_\_\_\_ 1909. Some unsolved problems of the prairie. *Bull. Torrey Bot. Club* 36: 265-271.
251. \_\_\_\_\_ 1910. The vegetation of the inland sand deposits of Illinois. *Bull. Ill. Lab. Nat. Hist.* 9: 23-174.
252. \_\_\_\_\_ 1912. An isolated prairie grove



- and its phytogeographical significance. Bot. Gaz. 53: 38-49.
253. \_\_\_\_\_ 1913. The relation of forest distribution and prairie fires in the Middle West. Torrey 13: 173-181.
254. \_\_\_\_\_ 1917. A prairie near Ann Arbor, Michigan. Rhodora 19: 163-165.
255. \_\_\_\_\_ 1918. On the development of two plant associations of northern Michigan. Plant World 21: 151-158.
256. \_\_\_\_\_ 1923. The vegetational history of the Middle West. Ann. Assoc. Amer. Geographers 12: 39-85.
257. \_\_\_\_\_ 1925. The structure of the maple-beech association in northern Michigan. Papers Mich. Acad. Sci. 4: 285-296.
258. Glover, Robert K., G. W. Tomanek, and Gale. L. Wolters. 1967. Soil and vegetation relationships on four slopes of the Ogallala Formation in Trego County, Kansas. Trans. Kans. Acad. Sci. 71: 69-84.
259. Goder, H. A. 1955. A phytosociological study of *Tsuga canadensis* near the termination of its range in Wisconsin. Ph.D. Thesis. Univ. of Wis., Madison.
260. \_\_\_\_\_ 1956. Presettlement vegetation of Racine County, Wisconsin. Trans. Wis. Acad. Sci. 45: 169-176.
261. Goetz, Harold. 1968. Vegetation and soil responses to nitrogen fertilization on different range sites. M.S. Thesis. N. Dak. State Univ., Fargo.
262. \_\_\_\_\_ 1969. Composition and yields of native grassland sites fertilized at different rates of nitrogen. J. Range Mangt. 22: 384-390.
263. Goff, F. G. 1966. Dynamic relations in Wisconsin upland forests. Ph.D. Thesis. Univ. Wis., Madison.
264. \_\_\_\_\_ and Paul H. Zedler. 1968. Structural gradient analysis of upland forests in the western Great Lakes area. Ecol. Monographs 38: 65-86.
265. Gooding, A. M., and J. G. Ogden III. 1965. A radio-carbon dated pollen sequence from the Wells mastodon site near Rochester, Indiana. Ohio J. Sci. 65: 1-11.
266. Gordon, R. B. 1936. A preliminary vegetation map of Indiana. Amer. Midl. Nat. 17: 866-877.
267. Gould, F. W. 1937. The present status of Dane County prairie flora. M.S. Thesis. Univ. of Wis., Madison.
268. \_\_\_\_\_ 1941. Plant indicators of original Wisconsin prairies. Ecology 22: 427-429.
269. Graham, S. A. 1941. Climax forests of the upper peninsula of Michigan. Ecology 22: 355-362.
270. \_\_\_\_\_ 1954. Changes in Michigan forests from browsing by deer. Trans. North Amer. Wildlife Conf. 19: 526-533.
271. Grant, M. L. 1934. The climax forest community in Itasca County, Minnesota, and its bearing upon the successional status of the pine community. Ecology 15: 243-257.
272. Grayson, John F. 1954. Evidence of four pine species from fossil pollen in Michigan. Ecology 35: 327-331.
273. Green, H. C., and J. T. Curtis. 1953. The re-establishment of prairie in the University of Wisconsin Arboretum. Wild Flower 29: 77-88.
274. Green, Phoebe. 1950. Ecological composition of high prairie relics in Rock County, Wisconsin. Trans. Wis. Acad. Sci. 40: 159-172.
275. Griswold, Sherwin B. 1942. A study of the woody plants along the streams which cross Ellis County, Kansas. Trans. Kans. Acad. Sci. 45: 98-106.
276. Habeck, J. R. 1959. A vegetational study of the central Wisconsin winter deer range. J. Wildlife Mangt. 23: 273-278.
277. Hadley, E. B., and R. P. Buccos. 1967. Plant community composition and net primary production within a native eastern North Dakota prairie. Amer. Midl. Nat. 77(1): 116-127.
278. Hadley, Elmer B. 1970. Net productivity and burning response of native North Dakota prairie

- communities. *Amer. Midl. Nat.* 84: 121-135.
279. \_\_\_\_\_ and Barbara J. Kieckhefer. 1963. Productivity of two prairie grasses in relation to fire frequency. *Ecology* 44: 389-395.
280. Hale, M. E., Jr. 1955. Phytosociology of corticolous cryptogams in the upland forests of southern Wisconsin. *Ecology* 36: 45-63.
281. \_\_\_\_\_ 1955. A survey of upland forests in the Chautauqa Hills, Kansas. *Trans. Kans. Acad. Sci.* 58: 165-168.
282. Hansen, H. P. 1933. Tamarack bogs of the driftless area of Wisconsin. *Bull. Milwaukee Pub. Mus.* 7: 231-304.
283. \_\_\_\_\_ 1937. Pollen analysis of two Wisconsin bogs of different ages. *Ecology* 18: 136-148.
284. \_\_\_\_\_ 1939. Postglacial vegetation of the driftless areas of Wisconsin. *Amer. Midl. Nat.* 21: 752-762.
285. Hanson, H. C. 1922. Prairie inclusions in the deciduous forest. *Amer. J. Bot.* 9: 330-337.
286. \_\_\_\_\_ and Warren Whitman. 1937. Plant succession on solonetz soils in western North Dakota. *Ecology* 18: 516-522.
287. \_\_\_\_\_ and Warren Whitman. 1938. Characteristics of major grassland types in western North Dakota. *Ecol. Monographs* 8: 57-114.
288. Harper, K. T. 1963. Structure and dynamics of sugar maple-basswood forests of southern Wisconsin. Ph.D. Thesis. Univ. of Wis., Madison.
289. Hart, C. A., and H. A. Gleason. 1907. On the biology of the sand areas of Illinois. *Bull. Ill. Lab. Nat. Hist.* 7: 137-267.
290. Harvey, L. H. 1908. Floral succession in the prairie-grass formation of southeastern South Dakota. *Bot. Gaz.* 46: 81-108, 277-298.
291. \_\_\_\_\_ 1922. Yellow-white pine formation at Little Manistee, Michigan. *Bot. Gaz.* 73: 26-43.
292. Hayden, A. 1919. The ecological subterranean anatomy of some plants of the prairie province of central Iowa. *Amer. J. Bot.* 6: 87-105.
293. \_\_\_\_\_ 1943. A botanical survey in the Iowa lake region of Clay and Palo Alto Counties. *Iowa State Col. J. Sci.* 17: 277-416.
294. \_\_\_\_\_ 1946. A progress report on the preservation of prairie. *Proc. Iowa Acad. Sci.* 53: 45-82.
295. Hayes, B. N. 1964. An ecological study of a wet prairie on Harsen's Island, Michigan. *Mich. Bot.* 3: 71-82.
296. Hayward, H. E. 1928. Studies of plants in the Black Hills of South Dakota. *Bot. Gaz.* 85: 353-412.
297. Heinselman, M. L. 1961. Black spruce on the peatlands of former glacial Lake Agassiz and adjacent areas in Minnesota: A study of forest sites, bog processes, and bog types. Ph.D. Thesis. Univ. of Minn., Minneapolis.
298. \_\_\_\_\_ 1963. Forest sites, bog processes, and peatland types in the glacial Lake Agassiz region, Minnesota. *Ecol. Monographs* 33: 327-374.
299. \_\_\_\_\_ 1965. String bogs and other patterned organic terrain near Seney, Upper Michigan. *Ecology* 46: 185-188.
300. \_\_\_\_\_ and E. I. Roe. 1963. A record of some pleistocene trees and shrubs from Itasca County, Minnesota. *Forest Sci.* 9: 336-337.
301. Hensel, R. L. 1923a. Effects of burning on vegetation in Kansas pastures. *J. Agr. Res.* 23: 631-643.
302. \_\_\_\_\_ 1923b. Recent studies on the effect of burning on grassland vegetation. *Ecology* 4: 183-188.
303. Herbel, Carlton H. 1954. The effects of date of burning on native Flint Hills rangeland. M.S. Thesis. Kans. State Univ., Manhattan.
304. \_\_\_\_\_ and Kling L. Anderson. 1959. Response of true prairie vegetation on major Flint

- Hills range sites to grazing treatment. Ecol. Monographs 29: 171-186.
305. Hetzer, W. A., and R. L. McGregor. 1951. An ecological study of prairie and pasture lands in Douglas and Franklin Counties, Kansas. Trans. Kans. Acad. Sci. 54: 356-369.
  306. Hewes, Leslie. 1951. The northern wet prairie of the United States: Nature, sources of information, and extent. Ann. Assoc. Amer. Geographers 41: 307-323.
  307. Hitchcock, A. S. 1898. Ecological plant geography of Kansas. Trans. Kans. Acad. Sci. 8: 55-69.
  308. Hopkins, H. H. 1951. Ecology of the native vegetation of the loess hills in central Nebraska. Ecol. Monographs 21: 125-147.
  309. \_\_\_\_\_ 1952. Native vegetation of the Loess Hills-Sandhills ecotone in central Nebraska. Trans. Kans. Acad. Sci. 55: 267-277.
  310. \_\_\_\_\_ 1956. Effects of mulch on yield and cover in mixed prairie. Trans. Kans. Acad. Sci. 59: 71-75.
  311. \_\_\_\_\_ F. W. Albertson, and A. Riegel. 1948. Some effects of burning upon a prairie in west-central Kansas. Trans. Kans. Acad. Sci. 51: 131-141.
  312. \_\_\_\_\_ F. W. Albertson, and A. Riegel. 1952. Ecology of grassland utilization in a mixed prairie. Trans. Kans. Acad. Sci. 55: 395-418.
  313. \_\_\_\_\_ and G. W. Tomanek. 1957. A study of woody vegetation at Cedar Bluff Reservoir. Trans. Kans. Acad. Sci. 60: 351-359.
  314. Horr, W. H. 1955. A pollen profile study of the Muscotah Marsh. Univ. Kans. Sci. Bull. 37: 143-150.
  315. Hosner, John F., and L. S. Minckler. 1963. Bottomland hardwood forests of southern Illinois—regeneration and succession. Ecology 44: 29-41.
  316. Houdek, P. K. 1932. Pollen statistics from two Indiana bogs. Proc. Ind. Acad. Sci. 42: 73-77.
  317. \_\_\_\_\_ 1935. Pollen statistics from two bogs in southwestern Michigan. Papers Mich. Acad. Sci. 20: 49-56.
  318. Howell, D. L., and C. L. Kucera. 1956. Composition of presettlement forest in three counties of Missouri. Bull. Torrey Bot. Club 83: 207-217.
  319. Howell, John W. 1938. A fossil pollen study of Kokomo Bog, Howard County, Indiana. Butler Univ. Bot. Studies 4: 117-127.
  320. Hulett, Gary K. 1959. Study of vegetation within and surrounding long-established exclosures. M.S. Thesis. Ft. Hays, Kans., State Col.
  321. \_\_\_\_\_ and G. W. Tomanek. 1969a. Remnant prairies on the shallow limy range site in north central Kansas. J. Range Mangt. 22: 19-23.
  322. \_\_\_\_\_ and G. W. Tomanek. 1969b. Forage production on a clay upland range site in western Kansas. J. Range Mangt. 22: 270-276.
  323. Hus, Henri. 1908. An ecological cross section of the Mississippi River in the region of St. Louis, Missouri. Ann. Mo. Bot. Gard. 19: 127-258.
  324. Janssen, C. R. 1966. Recent pollen spectra from the deciduous and coniferous-deciduous forests of northeastern Minnesota: A study in pollen dispersal. Ecology 47: 804-825.
  325. \_\_\_\_\_ 1967a. A floristic study of forests and bog vegetation, northwestern Minnesota. Ecol. Monographs 48: 751-765.
  326. \_\_\_\_\_ 1967b. Stevens pond: A post-glacial pollen diagram from a small *Typha* swamp in northwestern Minnesota, interpreted from pollen indicators and surface samples. Ecol. Monographs 37: 145-172.
  327. Jantzen, P. G. 1960. The ecology of a boggy marsh in Safford County, Kansas. (Kans. State Teachers Col., Emporia.) Emporia State Res. Studies 9: 1-46.
  328. Jelgersma, Saskia. 1962. A late glacial pollen diagram from Madelia, south-central Minnesota. Amer. J. Sci. 260: 522-529.
  329. Jensen, Peter N., and C. M. Schumacher. 1969. Changes in prairie composition. J. Range Mangt. 22: 57-60.

330. Johnson, Leslie E., L. R. Albee, R. O. Smith, and A. L. Moxon. 1951. Cows, calves, and grass. S. Dak. Agr. Expt. Sta. Bull. 412. 39 p.
331. Johnson, William F. 1968. Lowland brush in clear-cut spruce swamps develops from residual vegetation—not from invasion. *J. Forestry* 66: 566-567.
332. Jones, J. Johanna. 1952. A survey of fifteen forest stands in the early Wisconsin drift plain in Indiana. *Butler Univ. Bot. Studies* 10: 182-204.
333. \_\_\_\_\_ 1955. Conifer swamps in Wisconsin. Ph.D. Thesis. Univ. of Wis., Madison.
334. Juday, Chancey. 1942. The summerstanding crop of plants and animals in four Wisconsin lakes. *Trans. Wis. Acad. Sci.* 34: 103-135.
335. Judd, B. I. 1939. Plant succession on scoria buttes of western North Dakota. *Ecology* 20: 335-336.
336. \_\_\_\_\_ and M. L. Jackson. 1939. Natural succession of vegetation on abandoned farm lands in the Rosebud soil area of western Nebraska. *J. Amer. Soc. Agron.* 31: 541-557.
337. \_\_\_\_\_ and M. D. Weldon. 1930. Some changes in the soil during natural succession of vegetation after abandonment in western Nebraska. *J. Amer. Soc. Agron.* 31: 217-228.
338. Kapp, R. O. 1965. Illinoian and Sangamon vegetation in southwestern Kansas and adjacent Oklahoma. *Univ. Mich. Mus. Paleontol. Contrib.* 19(14): 167-255.
339. Kell, L. L. 1938. The effect of the moisture-retaining capacity of soils on forest succession in Itasca Park, Minnesota. *Amer. Midl. Nat.* 20: 682-694.
340. Keller, Carl O. 1946. An ecological study of the Klein Woods, Jennings County, Indiana. *Butler Univ. Bot. Studies* 8: 64-81.
341. Kenoyer, L. A. 1930. Ecological notes on Kalamazoo County, Michigan, based on the original land survey. *Papers Mich. Acad. Sci.* 11:211-218.
342. \_\_\_\_\_ 1934. Forest distribution in southwestern Michigan as interpreted from the original land survey (1826-1832). *Papers Mich. Acad. Sci.* 19: 107-111.
343. Kilburn, Paul D. 1957. Historical development and structure of the aspen, jack pine, and oak vegetation types on sandy soils in northern Lower Michigan. Ph.D. Thesis. Univ. of Mich., Ann Arbor.
344. Kittredge, Joseph. 1934. Evidence of the rate of forest succession on Star Island, Minnesota. *Ecology* 15: 24-35.
345. \_\_\_\_\_ 1938. The interrelations of habitat, growth rate, and associated vegetation in the aspen community of Minnesota and Wisconsin. *Ecol. Monographs* 8: 151-246.
346. \_\_\_\_\_ and A. K. Chittenden. 1929. Oak forests of Northern Michigan. *Mich. Agr. Expt. Sta. Spec. Bull.* 190. 47 p.
347. Knapp, J. G. 1871. The native vegetation of Wisconsin. *Trans. Wis. State Hort. Soc.* 1: 119-125.
348. Knight, D. H. 1965. A gradient analysis of Wisconsin prairie vegetation on the basis of plant structure and function. *Ecology* 46: 744-747.
349. \_\_\_\_\_ and Orie L. Loucks. 1969. A quantitative analysis of Wisconsin forest vegetation on the basis of plant function and gross morphology. *Ecology* 50: 219-234.
350. Koelling, M. R., and C. K. Kucera. 1965a. Dry matter losses and mineral leaching in bluestem standing crop and litter. *Ecology* 46: 529-532.
351. \_\_\_\_\_ and C. K. Kucera. 1965b. Productivity and turnover relationships in native tall-grass prairie. *Iowa State J. of Sci.* 39: 387-392.
352. Kucera, C. L. 1952. An ecological study of a hardwood forest area in central Iowa. *Ecol. Monographs* 22: 283-299.
353. \_\_\_\_\_ 1956. Grazing effects on composition of virgin prairie in north-central Missouri. *Ecology* 37: 389-391.

354. \_\_\_\_\_ 1958. Some changes in the soil environment of a grazed prairie community in central Missouri. *Ecology* 39: 538-540.
355. \_\_\_\_\_ 1960. Forest encroachment in native prairie. *Iowa State Col. J. Sci.* 34: 635-640.
356. \_\_\_\_\_ Roger C. Dahlman, and Melvin R. Koelling. 1967. Total net productivity and turnover on an energy basis for tallgrass prairie. *Ecology* 48: 536-541.
357. \_\_\_\_\_ and John H. Ehrenreich. 1962. Some effects of annual burning on central Missouri prairie. *Ecology* 43: 334-336.
358. \_\_\_\_\_ John H. Ehrenreich, and Carl Brown. 1963. Some effects of fire on tree species in Missouri prairie. *Iowa State Col. J. Sci.* 38: 179-185.
359. \_\_\_\_\_ and Melvin Koelling. 1964. The influence of fire on composition of central Missouri prairie. *Amer. Midl. Nat.* 72: 142-147.
360. \_\_\_\_\_ and S. C. Martin. 1957. Vegetation and soil relationships in the glade region of the southwestern Missouri Ozarks. *Ecology* 38: 285-291.
361. \_\_\_\_\_ and R. E. McDermott. 1955. Sugar maple-basswood studies in the forest-prairie transition of central Missouri. *Amer. Midl. Nat.* 54: 495-503.
362. Kuehler, A. W. 1967. Some geographic features of the Kansas prairies. *Trans. Kans. Acad. Sci.* 70: 388-401.
363. Lacey, Marvin L. 1942. The effect of climate and different grazing and dusting intensities upon the yeild of short-grass prairies in western Kansas. *Trans. Kans. Acad. Sci.* 45: 111-123.
364. Lane, G. H. 1941. Pollen analysis of interglacial peats of Iowa. *Iowa Geol. Survey* 37: 233-262.
365. Larsen, J. A. 1953. A study of an invasion by red maple of an oak woods in southern Wisconsin. *Amer. Midl. Nat.* 49: 908-914.
366. Larson, Floyd. 1940. The role of the bison in maintaining the short grass plains. *Ecology* 21: 113-121.
367. \_\_\_\_\_ and W. Whitman. 1942. A comparison of used and unused grassland mesas in the Badlands of South Dakota. *Ecology* 23: 438-445.
368. Lathrop, Earl W. 1958. The flora and ecology of the Chautauqua Hills in Kansas. *Univ. Kans. Sci. Bull.* 39: 97-209.
369. Launchbaugh, J. L. 1957. The effect of stocking rate on cattle gains and on native shortgrass vegetation in west central Kansas. *Kans. Agr. Expt. Sta. Bull.* 394.
370. \_\_\_\_\_ 1964. Effect of early spring burning on yields of native vegetation. *J. Range Mangt.* 17: 5-6.
371. \_\_\_\_\_ 1967. Vegetation relationships associated with intensity of summer grazing on a clay upland range site in the Kansas 20-24 inch precipitation zone. *Kans. Agr. Expt. Sta. Tech. Bull.* 154. 24 p.
372. \_\_\_\_\_ 1969. Range condition classification based on regressions of herbage yields on summer stocking rates. *J. Range Mangt.* 22: 97-101.
373. Lee, M. B. 1945. An ecological study of the floodplain forest along the White River system in Indiana. *Butler Univ. Bot. Studies* 7: 155-165.
374. Lee, S. C. 1924. Factors controlling forest succession at Lake Itasca, Minnesota. *Bot. Gaz.* 78: 129-174.
375. Leisman, G. A. 1953. The rate of organic matter accumulation on the sedge mat zones of bogs in the Itasca State Park region of Minnesota. *Ecology* 34: 81-101.
376. \_\_\_\_\_ 1957a. A vegetation and soil chronosequence in the Mesabi Iron Range spoil banks, Minnesota. *Ecol. Monographs* 27: 221-245.
377. \_\_\_\_\_ 1957b. Further data on the rate of organic matter accumulation in bogs. *Ecology* 38: 361.
378. Leonard, A. Byron, and John C. Frye. 1954. Ecological conditions accompanying loess deposition

- in the Great Plains region of the United States. *J. Geol.* 62(4): 399-404.
379. Leopold, Aldo, and Sara Elizabeth Jones. 1947. A phenological record for Sauk and Dane Counties, Wisconsin, 1935-1945. *Ecol. Monographs* 17: 81-122.
380. Lewis, James K., G. M. VanDyne, L. R. Albee, and F. W. Wetzal. 1956. Intensity of grazing: Its effect on livestock and forage production. *S. Dak. Agr. Expt. Sta. Bull.* 459. 44 p.
381. Lindeman, R. L. 1941. The developmental history of Cedar Creek Bog, Minnesota. *Amer. Midl. Nat.* 25: 101-112.
382. Lindsey, Alton A. 1961. Vegetation of the drainage-aeration classes of the northern Indiana soils in 1930. *Ecology* 42: 432-436.
383. \_\_\_\_\_ William B. Crankshaw, and Syed A. Qadir. 1965. Soil relations and distribution of the vegetation of presettlement Indiana. *Bot. Gaz.* 126: 155-163.
384. \_\_\_\_\_ R. O. Petty, D. K. Sterling, and W. Van Arsdall. 1961. Vegetation and environment along the Wabash and Tippecanoe Rivers. *Ecol. Monographs* 31: 105-156.
385. Linnel, Lyle D. 1961. Soil-vegetation relationships on a chalk-flat range site in Gove County, Kansas. *Trans. Kans. Acad. Sci.* 64: 293-303.
386. Lippert, Robert D., and Harold H. Hopkins. 1940. Study of viable seeds in various habitats in mixed prairie. *Trans. Kans. Acad. Sci.* 53: 355-364.
387. Livingston, B. E. 1902. The distribution of plant societies of Kent County, Michigan. *Mich. Geol. Survey Rpt.* 1901: 81-103.
388. \_\_\_\_\_ 1903. The distribution of the upland societies of Kent County, Michigan. *Bot. Gaz.* 35: 36-55.
389. \_\_\_\_\_ 1905. The relation of soils to natural vegetation in Roscommon and Crawford Counties, Michigan. *Bot. Gaz.* 39: 22-41.
390. Loomis, W. E., and A. L. McComb. 1944. Recent advances of the forest in Iowa. *Proc. Iowa Acad. Sci.* 51: 217-224.
391. Lueders, H. F. 1895. Vegetation of the Town Prairie du Sac. *Trans. Wis. Acad. Sci.* 10: 510-524.
392. Lunsford, L. C. 1963. Comparison of soils and vegetation on five undisturbed limy upland range sites in Ellis County, Kansas. M.S. Thesis. Ft. Hays, Kans., State Col.
393. MacMillan, C. 1897. Observations on the distribution of plants along shore at Lake of the Woods. *Minn. Bot. Studies* 1: 949-1023.
394. Maissurow, D. K. 1941. The role of fire in the perpetuation of virgin forests of northern Wisconsin. *J. Forestry* 39: 201-207.
395. Manning, Winston M., and Richard E. Juday. 1941. The chlorophyll content and productivity of some lakes in northeastern Wisconsin. *Trans. Wis. Acad. Sci.* 33: 363-393.
396. Markle, M. S. 1915. The phytoecology of peat bogs near Richmond, Indiana. *Proc. Ind. Acad. Sci.* p. 359-375.
397. Marks, John B. 1942. Land use and plant succession in Coon Valley, Wisconsin. *Ecol. Monographs* 12: 113-133.
398. Marshall, Ruth. 1910. The vegetation of Twin Island. *Trans. Wis. Acad. Sci.* 16: 773-797.
399. Martin, S. C. 1955. Range problems in the Missouri Ozarks. *Central States Forest Expt. Sta. Misc. Paper* 9. 33 p.
400. \_\_\_\_\_ and J. S. Crosby. 1955. Burning and grazing on glade range in Missouri. *Central States Forest Expt. Sta. Tech. Paper* 147. 13 p.
401. Maycock, Paul F. 1961. The spruce-fir forests of Keweenaw Peninsula, Northern Michigan. *Ecology* 42: 357-365.
402. \_\_\_\_\_ and J. T. Curtis. 1960. The phytosociology of boreal-conifer hardwood forest of the Great Lakes region. *Ecol. Monographs* 30: 1-35.
403. McAndrews, J. H. 1966. Postglacial history of prairie, savanna, and forest in northwestern

- Minnesota. Torrey Bot. Club Mem. 22(2): 536-541.
404. \_\_\_\_\_ 1967. Pollen analysis and vegetational history of the Itasca region, Minnesota, p. 219-236. In E. J. Cushing and H. E. Wright, Jr. (ed.). Quaternary Paleoecology. Yale Univ. Press., New Haven.
405. McComb, A. L., and W. E. Loomis. 1944. Subclimax prairie. Bull. Torrey Bot. Club 71: 46-76.
406. McCoy, S. 1939. A phytosociological study of the woody plants constituting 25-type forests of the Illinoian till plain of Indiana. Proc. Ind. Acad. Sci. 48: 50-66.
407. McDermott, R. E. 1954. Seeding tolerance as a factor in bottomland timber succession. Mo. Agr. Expt. Sta. Bull. 557.
408. McDougall, W. B. 1919. The forests of Vermilion County. Trans. Ill. State Acad. Sci. 12: 282-289.
409. \_\_\_\_\_ 1925. Forests and soils of Vermilion County, Illinois, with special reference to the "striplands." Ecology 6: 372-379.
410. McIntire, G. S. 1931. Theory and practice of forest typing, with special relation to the hardwood and hemlock associations of northern Michigan. Papers Mich. Acad. Sci. 15: 239-251.
411. McIntosh, Arthur C. 1931. A botanical survey of the Black Hills of South Dakota. Black Hills Engin. 19(3): 159-276.
412. McIntosh, R. P. 1950a. Pine stands in southwestern Wisconsin. Trans. Wis. Acad. Sci. 40: 243-257.
413. \_\_\_\_\_ 1950b. The phytosociology of the upland hardwood forest in southern Wisconsin. Ph.D. Thesis. Univ. Wis., Madison.
414. \_\_\_\_\_ 1957. The York Woods, a case history of forest succession in southern Wisconsin. Ecology 38: 29-37.
415. \_\_\_\_\_ 1962. Pattern in a forest community. Ecology 43: 25-33.
416. McLaughlin, W. T. 1932. Atlantic coastal plain plants in the sand barrens of northwestern Wisconsin. Ecol. Monographs 2: 335-383.
417. McMillan, Calvin. 1956. Nature of the plant community. I. Uniform garden and light period studies of five grass taxa in Nebraska. Ecology 37: 330-340.
418. \_\_\_\_\_ 1959a. Nature of the plant community. V. Variations within the true prairie community-type. Amer. J. Bot. 46: 418-424.
419. \_\_\_\_\_ 1959b. The role of ecotypic variation in the distribution of the central grassland of North America. Ecol. Monographs 29: 285-308.
420. McMurphy, W. E., and Kling L. Anderson. 1963. Burning bluestem range—forage yields. Trans. Kans. Acad. Sci. 66: 49-51.
421. \_\_\_\_\_ and Kling L. Anderson. 1965. Burning Flint Hills range. J. Range Managt. 18: 265-269.
422. McQueeney, Carl R. 1950. An ecological study of the relationship between direction of slope, elevation, and forest cover in Brown County, Indiana. Butler Univ. Bot. Studies 9: 239-269.
423. Mehringer, Peter J. Jr., Charles E. Schweger, W. Raymond Wood, and R. Bruce McMillan. 1968. Late pleistocene boreal forest in the western Ozark Highlands. Ecology 49: 567-568.
424. Mentzer, L. W. 1951. Studies on plant succession in true prairie. Ecol. Monographs 21: 255-267.
425. Miller, R. B. 1923. First report on a forestry survey of Illinois. Ill. State Nat. Hist. Bull. 14: 291-377.
426. \_\_\_\_\_ and George D. Fuller. 1921. Forest conditions in Alexander County, Illinois. Trans. Ill. State Acad. Sci. 14: 1-17.
427. Modha, V. V. 1961. Vegetation cover, composition, and yield as influenced by soil, litter, and grazing intensity. M.S. Thesis. Ft. Hays, Kans., State Col.
428. Mohlenbrock, Robert H. 1959a. Plant communities in Jackson County, Illinois. Bull. Torrey Bot. Club 86: 109-119.

429. \_\_\_\_\_ 1959b. A floristic study of a southern Illinois swampy area. *Ohio J. Sci.* 59: 89-100.
430. Moir, D. R. 1957. An occurrence of buried coniferous wood in the Altamont Moraine in North Dakota. *Proc. N. Dak. Acad. Sci.* 11: 1-5.
431. Moyer, J. F. 1953. Ecology of native prairie in Iowa. Ph.D. Thesis. Iowa State Col., Ames. 110 p.
432. Moyer, L. R. 1910. The prairie flora of southwestern Minnesota. *Bull. Minn. Acad. Sci.* 4: 357-378.
433. Nelson, Jack R. 1961. Woody plant communities in the badlands of western North Dakota (Abstract). *Proc. N. Dak. Acad. Sci.* 15, 1961 meeting.
434. Nichols, J. T. 1961. Variations in vegetation and microclimate on north and south facing slopes in the mixed prairie near Hays, Kansas. M.S. Thesis. Ft. Hays, Kans., State Col.
435. \_\_\_\_\_ 1969. Range improvement practices on deteriorated dense clay wheatgrass range in western South Dakota. *S. Dak. Agr. Expt. Sta. Bull.* 552. 23 p.
436. Nielson, Etlar L., and John B. Moyle. 1941. Forest invasion and succession on the basins of two catastrophically drained lakes in northern Minnesota. *Amer. Midl. Nat.* 25: 564-579.
437. Noll, W. C. 1939. Environment and physiological activities of winter wheat and prairie during extreme drought. *Ecology* 20: 479-506.
438. Olsen, Jerry S. 1958. Rates of succession and soil changes on southern Lake Michigan sand dunes. *Bot. Gaz.* 119: 125-170.
439. Orput, P. A., and J. T. Curtis. 1957. Soil microfungi in relation to the prairie continuum in Wisconsin. *Ecology* 38: 628-637.
440. Otto, James H. 1938. Forest succession in the southern limits of Early Wisconsin glaciation as indicated by a pollen spectrum from Bacon Swamp, Marion County, Indiana. *Butler Univ. Bot. Studies* 4: 93-116.
441. Ovington, J. D., Dale Heitkamp, and Donald B. Lawrence. 1963. Comparative plant biomass and productivity of prairie, savanna, oakwood, and maize field ecosystems. *Ecology* 44: 52-63.
442. Owensby, Clenton E., and Kling L. Anderson. 1967. Yield responses to time of burning. *J. Range Mangt.* 20: 12-16.
443. \_\_\_\_\_ Robert M. Hyde, and Kling L. Anderson. 1970. Effects of clipping and supplemental nitrogen and water on loamy upland blue-stem range. *J. Range Mangt.* 23: 341-346.
444. Paintin, R. D. 1929. The morphology and nature of a prairie in Cook County, Illinois. *Trans. Ill. Acad. Sci.* 21: 152-175.
445. Pammel, L. H. 1902. Preliminary notes on the flora of western Iowa, especially from the physiographical ecological standpoint. *Proc. Iowa Acad. Sci.* 9: 152-180.
446. \_\_\_\_\_ 1905. A comparative study of the vegetation of swamp, clay, and sandstone areas in western Wisconsin, southeastern Minnesota, northeastern, central, and southeastern Iowa. *Proc. Davenport Acad. Sci.* 10: 32-126.
447. \_\_\_\_\_ 1909. Flora of Iowa peat bogs. *Iowa Geol. Survey Annu. Rpt.* (19). 1908. p. 735-778.
448. Parker, D. 1936. Affinities of the flora of Indiana. *Amer. Midl. Nat.* 17: 700-724.
449. Partch, M. L. 1949. Habitat studies of soil moisture in relation to plants and plant communities. Ph.D. Thesis. Univ. Wis., Madison.
450. \_\_\_\_\_ 1962. Species distribution in a prairie in relation to water-holding capacity. *Proc. Minn. Acad. Sci.* 30: 38-43.
451. Pase, Charles P. 1958. Herbage production and composition under immature ponderosa pine in the Black Hills. *J. Range Mangt.* 11: 238-243.
452. Patel, K. R., F. W. Albertson, and G. W. Tomanek. 1964. Micro-climate and vegetation responses on three big bluestem (*Andropogon gerardi Vitman*)



- habits near Hays, Kansas. Trans. Kans. Acad. Sci. 67: 41-49.
453. Pepon, H. S. 1910. The forest associations of northwestern Illinois. Trans. Ill. Acad. Sci. 3: 143-156.
454. Phillips, Alice. 1929. Life forms and biological spectra of the flora of Bacon Swamp, Indiana. Butler Univ. Bot. Studies 1: 41-54.
455. Poggi, E. M. 1934. The prairie province of Illinois. Univ. Ill. Studies in Social Sci. 19: 1-124.
456. Pokara, Dan. 1968. Seasonal changes in a sand prairie in Van Buren County, Michigan. Mich. Bot. 7: 62-66.
457. Pool, R. J. 1914. A study of the vegetation of the sandhills of Nebraska. Minn. Bot. Studies 4: 189-312.
458. \_\_\_\_\_ J. E. Weaver, and F. C. Jean. 1918. Further studies in the ecotone between prairie and woodland. Univ. Nebr. Studies 18: 1-47.
459. Potter, Loren D., and Duane L. Green. 1964a. Ecology of ponderosa pine in western North Dakota. Ecology 45: 10-23.
460. \_\_\_\_\_ and Duane L. Green. 1964b. Ecology of a northeastern outlying stand of *Pinus flexillis*. Ecol. Monographs 45: 866-868.
461. \_\_\_\_\_ and D. Ross Moir. 1961. Phytosociological study of burned deciduous woods, Turtle Mountains, North Dakota. Ecology 42: 468-480.
462. Potzger, J. E. 1934. A notable case of bog formation. Amer. Midl. Nat. 15: 567-580.
463. \_\_\_\_\_ 1936a. Post-Pleistocene fossil records in peat of the Upper Blue River Valley, Henry County, Indiana. Proc. Ind. Acad. Sci. 45: 64-68.
464. \_\_\_\_\_ 1936b. Topography and forest types in a central Indiana region. Amer. Midl. Nat. 16: 212-229.
465. \_\_\_\_\_ 1939. Microclimate and a notable case of its influence on a ridge in central Indiana. Ecology 20: 29-37.
466. \_\_\_\_\_ 1941. The vegetation of the Mackinac Island, Michigan: An ecological survey. Amer. Midl. Nat. 25: 298-323.
467. \_\_\_\_\_ 1942. Pollen spectra from four bogs on the Gillen Nature Reserve along the Michigan-Wisconsin state line. Amer. Midl. Nat. 28: 501-511.
468. \_\_\_\_\_ 1943. Pollen study of five bogs in Price and Sawyer Counties, Wisconsin. Butler Univ. Bot. Studies 61: 54-64.
469. \_\_\_\_\_ 1946. Phytosociology of the primeval forest in central-northern Wisconsin and Upper Michigan, and a brief post-glacial history of the lake forest formation. Ecol. Monographs 16: 211-250.
470. \_\_\_\_\_ 1948. A pollen study in the tension zone of Lower Michigan. Butler Univ. Bot. Studies 8: 161-177.
471. \_\_\_\_\_ 1950. Forest types in the Versailles State Park area, Indiana. Amer. Midl. Nat. 43: 729-742.
472. \_\_\_\_\_ 1953. History of forests in the Quetico-Superior country from fossil pollen studies. J. Forestry 51: 560-565.
473. \_\_\_\_\_ 1956. Pollen profiles as indicators in the history of lake filling and bog formation. Ecology 37: 476-483.
474. \_\_\_\_\_ and L. Chandler. 1950. Beech in the forests about Laughery Creek Valley. Proc. Ind. Acad. Sci. 59: 82-94.
475. \_\_\_\_\_ and L. Chandler. 1953. Oak forests in the Laughery Creek Valley, Indiana. Proc. Ind. Acad. Sci. 62: 129-135.
476. \_\_\_\_\_ and A. Courtemanche. 1955. Pollen profiles as indicators in the history of lake filling and bog formation. Ecology 37: 476-483.
477. \_\_\_\_\_ and R. C. Friesner. 1934. Some comparisons between virgin forest and adjacent areas of secondary succession. Butler Univ. Bot. Studies 3: 85-98.

478. \_\_\_\_\_ and R. C. Friesner. 1940a. A phytosociological study of the herbaceous plants in two types of forests in central Indiana. *Butler Univ. Bot. Studies* 4: 163-180.
479. \_\_\_\_\_ and R. C. Friesner. 1940b. What is climax in central Indiana? *Butler Univ. Bot. Studies* 4: 181-195.
480. \_\_\_\_\_ and R. C. Friesner. 1943. An ecological survey of Berkey Woods, a remnant of forest primeval in Kosciusko County, Indiana. *Butler Univ. Bot. Studies* 6: 10-16.
481. \_\_\_\_\_ R. C. Friesner, and C. O. Keller. 1942. Phytosociology of the Cox Woods: A remnant of forest primeval in Orange County, Indiana. *Butler Univ. Bot. Studies* 5: 190-221.
482. \_\_\_\_\_ and C. O. Keller. 1952. The beech line in northwestern Indiana. *Butler Univ. Bot. Studies* 10: 108-113.
483. \_\_\_\_\_ and A. N. Liming. 1953. Secondary succession in stands of red maple-sweet gum-beech forest in Ripley County, Indiana. *Butler Univ. Bot. Studies* 11: 50-59.
484. \_\_\_\_\_ and Esther Potzger. 1950. Secondary succession in an Illinoian till plain habitat. *Proc. Ind. Acad. Sci.* 59: 95-101.
485. \_\_\_\_\_ and M. E. Potzger. 1950. Composition of the forest primeval from Hendricks County southward to Lawrence County, Indiana. *Proc. Ind. Acad. Sci.* 60: 109-113.
486. \_\_\_\_\_ M. E. Potzger, and Jack McCormick. 1956. The forest primeval of Indiana as recorded in the original U.S. land surveys and an evaluation of previous interpretations of Indiana vegetation. *Butler Univ. Bot. Studies* 13: 95-111.
487. \_\_\_\_\_ and W. A. Van Engel. 1943. Study of rooted aquatic vegetation of Weber Lake, Vilas County, Wisconsin. *Trans. Wis. Acad. Sci.* 34: 149-166.
488. Pound, R., and F. E. Clements. 1900. The phytogeography of Nebraska. 2nd ed. Jacob North and Co., Lincoln, Nebr.
489. Prettyman, R. L. 1937. Fossil pollen analysis of Fox Prairie bog, Hamilton County, Indiana. *Butler Univ. Bot. Studies* 4: 33-42.
490. Qadir, S. A. 1964. A study of edaphic controls of tree species in presettlement forests of Northern Indiana. Ph.D Thesis. Purdue Univ., Lafayette.
491. Quick, B. E. 1924. A comparative study of the distribution of the climax association in southern Michigan. *Papers Mich. Acad. Sci.* 3: 211-244.
492. Quinnild, Clayton L., and Hugh E. Cosby. 1958. Relicts of climax vegetation on two mesas in western North Dakota. *Ecology* 39: 29-32.
493. Ralston, R. D., and R. L. Dix. 1966. Green herbage production of native grasslands in the Red River Valley—1965. *Proc. N. Dak. Acad. Sci.* 20: 57-66.
494. Randall, W. E. 1952. Interrelations of autecological characteristics of forest herbs. Ph.D. Thesis. Univ. Wis., Madison.
495. \_\_\_\_\_ 1953. Water relations and chlorophyll content of forests herbs in southern Wisconsin. *Ecology* 34: 544-553.
496. Read, Ralph A. 1952. Tree species occurrence as influenced by geology and soil on an Ozark north slope. *Ecology* 33: 239-246.
497. Rhodes, J. W. 1933. An ecological comparison of two Wisconsin peat bogs. *Milwaukee Pub. Mus. Bull.* 7: 305-362.
498. Richards, R. R. 1938. A pollen profile of Otterbein Bog, Warren County, Indiana. *Butler Univ. Bot. Studies* 4: 128-139.
499. Rickett, H. W. 1921. A quantitative study of the larger aquatic plants of Lake Mendota. *Trans. Wis. Acad. Sci.* 20: 501-531.
500. \_\_\_\_\_ 1924. A quantitative study of the larger aquatic plants of Green Lake, Wisconsin. *Trans. Wis. Acad. Sci.* 21: 381-414.
501. Ridgway, R. 1872a. Notes on the vegetation of the lower Wabash Valley. *Amer. Nat.* 6: 758-765.
502. \_\_\_\_\_ 1872b. Notes on the vegetation

- of the lower Wabash Valley. II. Peculiar features of the bottomlands. *Amer. Nat.* 6: 724-732.
503. Riegel, D. A. 1944. A comparative study of natural and artificial revegetation of land retired from cultivation at Hays, Kansas. *Trans. Kans. Acad. Sci.* 47: 195-214.
504. \_\_\_\_\_ F. W. Albertson, and H. H. Hopkins. 1950. Yields and utilization of forage on a mixed prairie in west-central Kansas. *Trans. Kans. Acad. Sci.* 53: 455-472.
505. Robertson, J. H. 1939. A quantitative study of true-prairie vegetation after three years of extreme drought. *Ecol. Monographs* 9: 433-492.
506. Robinson, T. S. 1966. Effects of canopy density and slope exposure on the subcanopy microenvironment of a northern hardwood forest. *Amer. Midl. Nat.* 75: 339-346.
507. Robocker, W. C. 1951. Certain factors affecting establishment and survival of several native grass species in Wisconsin. Ph.D. Thesis. Univ. Wis., Madison.
508. \_\_\_\_\_ J. T. Curtis, and H. L. Ahlgren. 1953. Some factors affecting emergence and establishment of native grass seedlings in Wisconsin. *Ecology* 34: 194-199.
509. \_\_\_\_\_ and B. J. Miller. 1955. Effects of clipping, burning, and competition on establishment and survival of some native grasses in Wisconsin. *J. Range Mangt.* 8: 117-129.
510. Rogler, George A. 1951. A twenty-five year comparison of continuous and rotation grazing in the Northern Plains. *J. Range Mangt.* 4: 35-41.
511. \_\_\_\_\_ and H. J. Haas. 1947. Range production as related to soil moisture and precipitation on the Northern Great Plains. *J. Amer. Soc. Agron.* 5: 378-389.
512. Rohr, F. W., and J. E. Potzger. 1951. Forest and prairie in three northwestern Indiana counties. *Butler Univ. Bot. Studies* 10: 61-70.
513. Rosendahl, C. O. 1948. A contribution to the knowledge of Pleistocene flora of Minnesota. *Ecology* 29: 284-315.
514. Ross, B. A., J. R. Tester, and W. J. Breckenridge. 1968. Ecology of mima-type mounds in northwestern Minnesota. *Ecology* 49: 172-177.
515. Ruby, E. S. 1952. Forage production of North Platte River islands. *J. Range Mangt.* 5: 84-89.
516. Rudd, Velva E. 1951. Geographical affinities of the flora of North Dakota. *Amer. Midl. Nat.* 45: 722-739.
517. Rudman, S., and R. W. Pohl. 1951. Vegetational changes in ungrazed grassland at the Iowa Lakeside Laboratory. *Proc. Iowa Acad. Sci.* 58: 189-200.
518. Russell, N. H. 1953. Plant communities of the Apple River Canyon, Wisconsin. *Proc. Iowa Acad. Sci.* 60: 228-242.
519. Ruthven, A. G. 1906. An ecological survey in the Porcupine Mountains and Isle Royale, Michigan. *State Bd. Geol. Survey Rpt. for 1905*: p. 17-55.
520. Sampson, H. S. 1921. An ecological survey of the prairie vegetation in Illinois. *Bull. Ill. Nat. Hist. Survey* 13: 523-577.
521. Sarvis, J. T. 1920. Composition and density of the native vegetation in the vicinity of the Northern Great Plains Field Station. *J. Agr. Res.* 19: 63-72.
522. \_\_\_\_\_ 1923. Effects of different systems and intensities of grazing upon the native vegetation of the Northern Great Plains Field Station. *U.S. Dept. Agr. Bull.* 1170. 45 p.
523. \_\_\_\_\_ 1941. Grazing investigations on the Northern Great Plains. *N. Dak. Agr. Expt. Sta. Bull.* 308. 110 p.
524. Savage, D. A. 1937. Drought survival of native grass species in the central and southern Great Plains, 1935. *U.S. Dept. Agr. Tech. Bull.* 549.
525. \_\_\_\_\_ and H. E. Runyon. 1937. Natural revegetation of abandoned farm land in the central and southern Great Plains. Report Fourth Intern. Grassland Congress. Great Britain. *Grassland Ecol.* 178-182.
526. Schaffner, J. H. 1898. Notes on the salt marsh plants of northern Kansas. *Bot. Gaz.* 25: 255-260.

527. \_\_\_\_\_ 1907. Development of the forest belts in the northwestern part of Clay County, Kansas. *Trans. Kans. Acad. Sci.* 20: 74-79.
528. \_\_\_\_\_ 1913. The characteristic plants of a typical prairie. *Ohio Nat.* 13: 65-69
529. \_\_\_\_\_ 1926. Observations on the grasslands of the central United States. *Ohio State Univ. Studies, Contrib. Bot. Lab.* 178: 1-56.
530. Schram, Peter (ed.). 1970. Proceedings of a symposium on prairie and prairie restoration (20 papers). Knox College, Galesburg, Ill.
531. Sears, P. B. 1942. Forest sequences in the North Central States. *Bot. Gaz.* 103: 751-761.
532. Segades-Vianna, F. 1951. A phytosociological and ecological study of cattail stands in Oakland County, Michigan. *J. Ecol.* 39: 316-329.
533. Shantz, H. L. 1923. The natural vegetation of the Great Plains region. *Ann. Assoc. Amer. Geographers* 13: 81-107 (selected portions).
534. Sharp, Ward M. 1953. A re-evaluation of plant communities within the Pheasant Range in the Nebraska Sandhills. *Ecology* 34: 771-777.
535. Shay, C. T. 1967. Vegetation history of the southern Lake Agassiz basin during the past 12,000 years, p. 231-252. *In* W. J. Mayer Oakes (ed.). Life, land, and water. Proc. 1966 conference on environmental studies of the glacial Lake Agassiz region. Univ. Manitoba Press, Winnipeg.
536. Shelford, V. E., and G. S. Winterringer. 1959. The disappearance of an area of prairie in the Cook County, Illinois Forest Preserve District. *Amer. Midl. Nat.* 61: 89-95.
537. Sheppard, J. H. 1919. Carrying capacity of native grasses in North Dakota. *J. Amer. Soc. Agron.* 11: 129-142.
538. Sherff, E. E. 1912. The vegetation of Skokie Marsh, with special reference to subterranean organs and their interrelationships. *Bot. Gaz.* 53: 415-435.
539. Shimek, B. 1910. Prairie openings in the forest. *Proc. Iowa Acad. Sci.* 10: 16-19.
540. \_\_\_\_\_ 1911. The prairies. *Univ. Iowa Nat. Hist. Lab. Bull.* 6: 169-240.
541. \_\_\_\_\_ 1915. The plant geography of the Lake Okoboji region. *Univ. Iowa Nat. Hist., Lab. Bull.* 7(2): 3-69.
542. \_\_\_\_\_ 1917. The sand flora of Iowa. *Univ. Iowa Lab. Nat. Hist. Lab. Bull.* 7: 4-24.
543. \_\_\_\_\_ 1924. The prairie of the Mississippi River bluffs. *Proc. Iowa Acad. Sci.* 31: 205-215.
544. \_\_\_\_\_ 1925a. Papers on the prairie. *Univ. Iowa Studies Nat. Hist.* 11: 36 p.
545. \_\_\_\_\_ 1925b. The persistence of the prairie. *Univ. Iowa Studies Nat. Hist.* 11(5): 3-24.
546. \_\_\_\_\_ 1931. The relation between the migrant and native flora of the prairie region. *Univ. Iowa Studies Nat. Hist.* 14: 10-16.
547. \_\_\_\_\_ 1948. The plant geography of Iowa (edited by H. S. Conard). *Univ. Iowa Studies Nat. Hist.* 18(4): 1-178.
548. Shirley, Hardy L. 1934. Observations on drought injury in Minnesota forests. *Ecology* 15: 42-48.
549. \_\_\_\_\_ 1945. Reproduction of upland conifers in the Lake States as affected by root competition and light. *Amer. Midl. Nat.* 33: 537-612.
550. Shively, S. B., and J. E. Weaver. 1939. Amount of underground plant material in different grassland climates. *Univ. Nebr. Cons. and Survey Div. Bull.* 21: 68 p.
551. Short, C. W. 1845. Observations on the botany of Illinois, more especially in reference to the autumnal flora of the prairies. *West. J. Med. and Surg., N. S.* 3: 185-198.
552. Smith, B. E., and G. Cottam. 1967. Spatial relationships of mesic forest herbs in southern Wisconsin. *Ecology* 48: 546-558.
553. Smith, C. Ray. 1963. Variations in vegetation and soil on three breaks—sites overlying three different limestone formations. M.S. Thesis. Ft. Hays, Kans., State Col.

554. Smith, William M. 1937. Pollen spectrum of Lake Cicott Bog, Cass County, Indiana. *Butler Univ. Bot. Studies* 4: 43-54.
555. Sonnenberg, Duane. 1961. Some ecological studies of the vegetation at the Cheyenne Bottoms Waterfowl Refuge. M.S. Thesis. Ft. Hays, Kans., State Col.
556. Sperry, Theodore M. 1935. Root systems in Illinois prairie. *Ecology* 16: 178-201.
557. Spurr, S. H. 1954. The forests of Itasca in the nineteenth century as related to fire. *Ecology* 35: 21-25.
558. Stallard, Harvey. 1929. Secondary succession in the climax forest formation of northern Minnesota. *Ecology* 10: 476-547.
559. Stearns, F. W. 1949. Ninety years change in a northern hardwood forest in Wisconsin. *Ecology* 30: 350-358.
560. \_\_\_\_\_ 1950. The composition of a remnant white pine forest in the Lake States. *Ecology* 31: 209-292.
561. \_\_\_\_\_ 1951. The composition of the sugar maple-hemlock-yellow birch association of northern Wisconsin. *Ecology* 32: 245-265.
562. Steiger, T. L. 1930. Structure of prairie vegetation. *Ecology* 11: 170-217.
563. Steinbrenner, E. C. 1951. Effect of grazing on floristic composition and soil properties of farm woodlots in southern Wisconsin. *J. Forestry* 49: 906-910.
564. Steyermark, Julian A. 1940. Studies of the vegetation of Missouri. I. Natural plant associations and succession in the Ozarks of Missouri. *Field Mus. of Nat. Hist. P.* 485, 9(5): 349-475.
565. \_\_\_\_\_ 1959. Vegetational history of the Ozark forest. *Univ. Mo. Studies* 31. 138 p.
566. Stinemetze, LeRay O. 1954. Vegetation on a mixed prairie of west-central Kansas. M.S. Thesis. Ft. Hays, Kans., State Col.
567. Stoeckeler, Joseph H. 1960. Soil factors affecting the growth of quaking aspen forests in the Lake States. *Minn. Agr. Expt. Sta. Tech. Bull.* 233.
568. \_\_\_\_\_ and Gustaf A. Limstrom. 1942. Ecological factors influencing reforestation in northern Wisconsin. *Ecol. Monographs* 12: 191-212.
569. \_\_\_\_\_ and John W. Macon. 1956. Regeneration of aspen cutover areas in northern Wisconsin. *J. Forestry* 54: 13-16.
570. Stout, A. B. 1914. A biological and statistical analysis of the vegetation of a typical wild hay meadow. *Trans. Wis. Acad. Sci.* 17: 405-469.
571. \_\_\_\_\_ 1944. The bur oak openings in southern Wisconsin. *Trans. Wis. Acad. Sci.* 36: 141-161. (Issued January 1946.)
572. Struik, Gwendolyn J. 1957. The distribution of some herbaceous plants in the maple forest. M.S. Thesis. Univ. Wis., Madison.
573. \_\_\_\_\_ and J. T. Curtis. 1962. Herb distribution in an *Acer saccharum* forest. *Amer. Midl. Nat.* 68: 285-296.
574. Swanson, C. H. 1929. The ecology of Turkey Run State Park. I. The flood plain. *Proc. Ind. Acad. Sci.* 1928. 38: 165-170.
575. Swindale, D. N., and J. T. Curtis. 1957. Phytosociology of the larger submerged plants in Wisconsin lakes. *Ecology* 38: 397-407.
576. Sylvester, Donell D. 1957. Response of sandhill vegetation to deferring grazing. *J. Range Managt.* 10: 267-268.
577. Telford, C. J. 1926. Third report on the forest survey of Illinois. *Ill. Nat. Hist. Survey Bull.* 16: 1-102.
578. Tester, J. R., and W. H. Marshall. 1961. A study of certain plant and animal interrelations on a native prairie in northwestern Minnesota. *Univ. Minn. Mus. Nat. Hist. Occas. Paper* 8. 51 p.
579. \_\_\_\_\_ and W. H. Marshall. 1962. Minnesota prairie management techniques and their wildlife implications. *Trans. North Amer. Wildlife Conf.* 27: 267-287.

580. Thomson, J. W. 1940. Relic prairie areas in central Wisconsin. *Ecol. Monographs* 10: 685-717.
581. \_\_\_\_\_ 1943. Plant succession on abandoned fields in the central Wisconsin sand plain area. *Bull. Torrey Bot. Club* 70: 34-41.
582. \_\_\_\_\_ 1944. A survey of the larger aquatic plants and bank flora of the Brule River. *Trans. Wis. Acad. Sci.*, 36: 57-76.
583. Thompson, Paul W. 1970. A wet prairie community in Ann Arbor, Michigan. *Mich. Academician* II (4): 87-94.
584. Thornber, J. J. 1901. The prairie-grass formation in region 1. *Rpt. Bot. Survey Univ. Nebr.* 5: 29-143.
585. Tolstead, W. L. 1941. Plant communities and secondary succession in south-central South Dakota. *Ecology* 22: 322-328.
586. \_\_\_\_\_ 1942. Vegetation of the northern part of Cherry County, Nebraska. *Ecol. Monographs* 12: 255-292.
587. \_\_\_\_\_ 1947. Woodlands in northwest Nebraska. *Ecology* 28: 180-188.
588. Tomanek, G. W. 1948. Pasture types of western Kansas in relation to the intensity of utilization in past years. *Trans. Kans. Acad. Sci.* 51: 171-196.
589. \_\_\_\_\_ 1959. Effects of climate and grazing on mixed prairie. *Amer. Assoc. Advn. Sci. P. 53. Grasslands.* 371-377. Wash. D.C.
590. \_\_\_\_\_ 1964. Some soil-vegetation relationships in western Kansas. *Amer. Soc. Agron. Spec. P. 5. Forage Plant Physiology and soil-range relationships.* 158-164.
591. \_\_\_\_\_ and F. W. Albertson. 1953. Some effects of different intensities of grazing on mixed prairies near Hays, Kansas. *J. Range Mangt.* 6: 299-306.
592. \_\_\_\_\_ and F. W. Albertson. 1957. Variations in cover, composition, production, and roots of vegetation in two prairies in western Kansas. *Ecol. Monographs* 27: 267-281.
593. \_\_\_\_\_ F. W. Albertson, and A. Riegel. 1955. Natural revegetation of a field abandoned thirty-three years in central Kansas. *Ecology* 36: 407-412.
594. Transeau, E. N. 1905. The bogs and bog flora of the Huron River Valley. *Bot. Gaz.* 40: 418-448.
595. \_\_\_\_\_ 1935. The prairie peninsula. *Ecology* 16: 423-437.
596. Truman, H. V. 1937. Fossil evidence of two prairie invasions of Wisconsin. *Trans. Wis. Acad. Sci.* 30: 35-42.
597. Turner, L. M. 1934. Grassland in the flood-plain of Illinois rivers. *Amer. Midl. Nat.* 15: 770-780.
598. \_\_\_\_\_ 1936. Ecological studies in the lower Illinois River Valley. *Bot. Gaz.* 97: 689-727.
599. Ungar, I. A. 1964. A phytosociological analysis of the Big Salt Marsh, Stafford County, Kansas. *Trans. Kans. Acad. Sci.* 67: 50-64.
600. \_\_\_\_\_ 1965. An ecological study of the vegetation of the Big Salt Marsh, Stafford County, Kansas. *Univ. Kans. Sci. Bull.* 46: 1-98.
601. \_\_\_\_\_ 1966. Salt tolerance of inland halophytes of Kansas and Oklahoma. *Ecology* 47: 154-155.
602. \_\_\_\_\_ 1967. Vegetation-soil relationships on saline soils in northern Kansas. *Amer. Midl. Nat.* 78: 98-120.
603. Van Amburg, Gil. 1965. The effect of soil depth upon basal cover and production of mixed prairie vegetation. *M. S. Thesis. Ft. Hays, Kans., State Col.* 53 p.
604. Van Denack, Sister Julia Maria. 1961. An ecological analysis of the sand dune complex in Point Beach State Forest, Two Rivers, Wisconsin. *Bot. Gaz.* 122: 155-174.
605. Veatch, J. O. 1927. The dry prairies of Michigan. *Papers Mich. Acad.* 8: 269-278.
606. \_\_\_\_\_ 1928. Reconstruction of forest cover based on soil maps. *Mich. Agr. Expt. Sta. Q. Bull.* 10: 116-126.

607. \_\_\_\_\_ 1932. Soil maps as a basis for mapping original forest cover. *Papers Mich. Acad. Sci.* 15: 267-273.
608. Vestal, A. G. 1913. An associational study of Illinois sand prairie. *Bull. Ill. State Lab. Nat. Hist.* 10: 1-96.
609. \_\_\_\_\_ 1914. A black-soil prairie station in northeastern Illinois. *Torrey Bot. Club Bull.* 41: 351-363.
610. \_\_\_\_\_ 1918a. Local inclusions of prairie within forest. *Trans. Ill. State Acad. Sci.* 11: 122-126.
611. \_\_\_\_\_ 1918b. Invasion of forest land by prairie along railroads. *Trans. Ill. State Acad. Sci.* 11: 126-128.
612. \_\_\_\_\_ 1931. A preliminary vegetation map of Illinois. *Trans. Ill. State Acad. Sci.* 23: 204-217.
613. Vogl, Richard J. 1964a. Vegetational history of the Crex Meadows, a prairie savanna in northwestern Wisconsin. *Amer. Midl. Nat.* 72: 157-175.
614. \_\_\_\_\_ 1964b. The effects of fire on a muskeg in northern Wisconsin. *J. Wildlife Mangt.* 28: 317-329.
615. \_\_\_\_\_ 1965. Effects of spring burning on yields of bush prairie savanna. *J. Range Mangt.* 18: 202-205.
616. \_\_\_\_\_ 1969. One hundred and thirty years of plant succession in a southeastern Wisconsin lowland. *Ecology* 50: 248-255.
617. Voight, J. W. 1951. Vegetational changes on a 25-year subsere in the Loess Hill region of central Nebraska. *J. Range Mangt.* 4: 254-263.
618. \_\_\_\_\_ 1953. Yield and consumption in a southern Illinois bluegrass-broomsedge pasture. *J. Range Mangt.* 6: 260-266.
619. \_\_\_\_\_ and R. H. Mohlenbrock. 1964. *Plant communities of southern Illinois.* South. Ill. Univ. Press., Carbondale. 202 p.
620. \_\_\_\_\_ and J. E. Weaver. 1951. Range condition classes of native midwestern pasture: An ecological analysis. *Ecol. Monographs* 21: 39-60.
621. Voss, John. 1933. Pleistocene forests of central Illinois. *Bot. Gaz.* 94: 808-814.
622. \_\_\_\_\_ 1934. Postglacial migration of forests of central Illinois, Wisconsin, and Minnesota. *Bot. Gaz.* 96: 3-43.
623. \_\_\_\_\_ 1937. Comparative study of bogs on Cary and Tazewell drift of Illinois. *Ecology* 18: 119-135.
624. \_\_\_\_\_ 1939. Forests of the Yarmouth and Sangamon interglacial period in Illinois. *Ecology* 20: 517-528.
625. Wagner, B. G. 1951. A study of prairie soils and vegetation in southern Wisconsin. M.S. Thesis. Univ. Wis., Madison.
626. Wanek, Wallace J., and Robert L. Burgess. 1965. Floristic composition of the sand prairies of southeastern North Dakota. *Proc. N. Dak. Acad. Sci.* 19: 26-40.
627. Ward, R. T. 1954. A phytosociological study of the beech forests of Wisconsin. Ph.D. Thesis. Univ. of Wis., Madison.
628. \_\_\_\_\_ 1956. The beech forests of Wisconsin—changes in forest composition and the nature of the beech border. *Ecology* 37: 407-419.
629. Ware, George H. 1955. A phytosociological study of the lowland forests of southern Wisconsin. Ph.D. Thesis. Univ. Wis., Madison.
630. Waterman, W. G. 1917. Ecology of Northern Michigan dunes: Crystal Lake Bar region. *Mich. Acad. Sci. Rpt.* 19: 197-208.
631. \_\_\_\_\_ 1922. Development of plant communities of a sand ridge in Michigan. *Bot. Gaz.* 74: 1-31.
632. \_\_\_\_\_ 1923. Bogs of northern Illinois. *Trans. Ill. State Acad. Sci.* 16: 214-225.
633. \_\_\_\_\_ 1926. Ecological problems from the Sphagnum bogs of Illinois. *Ecology* 7: 255-272.

634. Watts, W. A. 1967. Late-glacial plant macrofossils from Minnesota, p. 89-97. *In* E. J. Cushing and H. E. Wright, Jr. (ed.), *Quaternary Paleocology*. Yale Univ. Press, New Haven.
635. \_\_\_\_\_ and R. C. Bright. 1968. Pollen, seed, and mollusk analysis of a sediment core from Pickerel Lake, Day County, South Dakota. *Geol. Soc. Amer. Bull.* 79: 855-876.
636. \_\_\_\_\_ and T. C. Winter. 1966. Plant macrofossils from Kircher Marsh, Minnesota—a paleoecological study. *Geol. Soc. Amer. Bull.* 77: 1339-1360.
637. \_\_\_\_\_ and H. E. Wright, Jr. 1966. Late-Wisconsin pollen and seed analysis from the Nebraska sandhills. *Ecology* 47: 202-210.
638. Weaver, J. E. 1920. Root development in the grassland formation. *Carnegie Inst. Wash. P.* 292.
639. \_\_\_\_\_ 1942. Competition of western wheatgrass with relict vegetation of prairie. *Amer. J. Bot.* 29: 366-372.
640. \_\_\_\_\_ 1943. Replacement of true prairie by mixed prairie in eastern Nebraska and Kansas. *Ecology* 24: 421-434.
641. \_\_\_\_\_ 1944a. Recovery of midwestern prairies from drought. *Amer. Philos. Soc. P.* 88. No. 2.
642. \_\_\_\_\_ 1944b. North American prairie. *The Amer. Scholar* 13(3): 329-339.
643. \_\_\_\_\_ 1947. Rate of decomposition of roots and rhizomes of certain range grasses in undisturbed prairie soil. *Ecology* 28: 221-240.
644. \_\_\_\_\_ 1950a. Effects of different intensities of grazing on depth and quantity of roots of grasses. *J. Range Mangt.* 3: 100-113.
645. \_\_\_\_\_ 1950b. Stabilization of midwestern grasslands. *Ecol. Monographs* 20: 251-270.
646. \_\_\_\_\_ 1954a. North American prairie. *Johnsen Co., Lincoln, Nebr.* 348 p.
647. \_\_\_\_\_ 1954b. A seventeen-year study of plant succession in prairie. *Amer. J. Bot.* 41: 31-38.
648. \_\_\_\_\_ 1958a. Classification of root systems of forbs of grassland and a consideration of their significance. *Ecology* 39: 393-401.
649. \_\_\_\_\_ 1958b. Native grassland of southwestern Iowa. *Ecology* 39: 733-750.
650. \_\_\_\_\_ 1958c. Summary and interpretation of underground development in natural grassland communities. *Ecol. Monographs* 28: 55-78.
651. \_\_\_\_\_ 1960a. Comparison of vegetation of the Kansas-Nebraska drift-loess hills and loess plains. *Ecology* 41: 73-88.
652. \_\_\_\_\_ 1960b. Extent of communities and abundance of the most common grasses in the prairie. *Bot. Gaz.* 122: 25-33.
653. \_\_\_\_\_ 1960c. Flood plain vegetation of the central Missouri Valley and contacts of woodland with prairie. *Ecol. Monographs* 30: 37-64.
654. \_\_\_\_\_ 1961a. The living network in prairie soils. *Bot. Gaz.* 123: 16-28.
655. \_\_\_\_\_ 1961b. Return of midwestern grassland to its former composition and stabilization. *C. C. Adams Cent. Ecol. Studies Occas. Paper* 3: 1-15.
656. \_\_\_\_\_ 1963. The wonderful prairie sod. *J. Range Mangt.* 16: 165-171.
657. \_\_\_\_\_ 1965. Native vegetation of Nebraska. *Univ. Nebr. Press, Lincoln.* 185 p.
658. \_\_\_\_\_ 1968. Prairie plants and their environment—a fifty-year study in the Midwest. *Univ. Nebr. Press, Lincoln.* 276 p.
659. \_\_\_\_\_ and F. W. Albertson. 1936. Effects of the great drought on the prairies of Iowa, Nebraska, and Kansas. *Ecology* 17: 567-639.
660. \_\_\_\_\_ and F. W. Albertson. 1939. Major changes in grassland as a result of continued drought. *Bot. Gaz.* 100: 576-591.



661. \_\_\_\_\_ and F. W. Albertson. 1940a. Deterioration of grassland from stability to denudation with decrease in soil moisture. *Bot. Gaz.* 101: 598-624.
662. \_\_\_\_\_ and F. W. Albertson. 1940b. Deterioration of midwestern ranges. *Ecology* 21: 216-236.
663. \_\_\_\_\_ and F. W. Albertson. 1943. Resurvey of grasses, forbs, and underground plant parts at the end of the great drought. *Ecol. Monographs* 13: 63-117.
664. \_\_\_\_\_ and F. W. Albertson. 1944. Nature and degree of recovery of grassland from the great drought of 1933 to 1940. *Ecol. Monographs* 14: 393-479.
665. \_\_\_\_\_ and F. W. Albertson. 1956. Grasslands of the Great Plains. Johnsen Co., Lincoln, Nebr. 395 p.
666. \_\_\_\_\_ and W. E. Bruner. 1945. A seven-year quantitative study of succession in grassland. *Ecol. Monographs* 15: 297-319.
667. \_\_\_\_\_ and W. E. Bruner. 1948. Prairies and pastures of the dissected loess plains of central Nebraska. *Ecol. Monographs* 18: 508-549.
668. \_\_\_\_\_ and W. E. Bruner. 1954. Nature and place of transition from true prairie to mixed prairie. *Ecology* 35: 117-126.
669. \_\_\_\_\_ and R. W. Darland. 1944. Grassland patterns in 1940. *Ecology* 25: 202-215.
670. \_\_\_\_\_ and R. W. Darland. 1945. Yields and consumption of forage in three prairie types; an ecological analysis. *Univ. Nebr. Conserv. Survey Div. Bull.* 27. 76 p.
671. \_\_\_\_\_ and R. W. Darland. 1948. Changes in vegetation and production of forage resulting from grazing lowland prairie. *Ecology* 29: 1-29.
672. \_\_\_\_\_ and R. W. Darland. 1949. Soil-root relationships of certain native grasses in various soil types. *Ecol. Monographs* 19: 303-338.
673. \_\_\_\_\_ and T. J. Fitzpatrick. 1932. Ecology and relative importance of the dominants of tall-grass prairie. *Bot. Gaz.* 93: 113-150.
674. \_\_\_\_\_ and T. J. Fitzpatrick. 1934. The prairie. *Ecol. Monographs* 4: 109-295.
675. \_\_\_\_\_ and E. L. Flory. 1934. Stability of climax prairie and some environmental changes resulting from breaking. *Ecology* 15: 333-347.
676. \_\_\_\_\_ and W. W. Hansen. 1941a. Native midwestern pastures: Their origin, composition, and degeneration. *Univ. Nebr. Conserv. Survey Div. Bull.* 22. 93 p.
677. \_\_\_\_\_ and W. W. Hansen. 1941b. Regeneration of native midwestern pastures under protection. *Univ. Nebr. Conserv. Survey Div. Bull.* 23. 91 p.
678. \_\_\_\_\_ and G. W. Harmon. 1935. Quantity of living plant materials in prairie soils in relation to runoff and soil erosion. *Univ. Nebr. Conserv. Survey Div. Bull.* 8. 53 p.
679. \_\_\_\_\_ and W. J. Himmel. 1931. The environment of the prairie. *Univ. Nebr. Conserv. Survey Div. Bull.* 5. 150 p.
680. \_\_\_\_\_ and V. H. Hougen. 1939. Effect of clipping on plant production in prairie and pasture. *Amer. Midl. Nat.* 21: 396-414.
681. \_\_\_\_\_ and J. Kramer. 1932. Root system of *Quercus macrocarpa* in relation to the invasion of prairie. *Bot. Gaz.* 94: 51-85.
682. \_\_\_\_\_ and I. M. Mueller. 1942a. Role of seedlings in recovery of midwestern prairie from drought. *Ecology* 23: 275-294.
683. \_\_\_\_\_ and I. M. Mueller. 1942b. Relative drought resistance of seedlings of dominant prairie grasses. *Ecology* 23: 387-398.
684. \_\_\_\_\_ J. H. Robertson, and R. L. Fowler. 1940. Changes in true prairie during drought as determined by list quadrats. *Ecology* 21: 357-362.
685. \_\_\_\_\_ and N. W. Rowland. 1952. Effects of excessive natural mulch on development, yield, and structure of native grassland. *Bot. Gaz.* 114: 1-19.

686. \_\_\_\_\_ L. A. Stoddart, and W. Noll. 1935. Response of the prairie to the great drought of 1934. *Ecology* 16: 612-629.
687. \_\_\_\_\_ and A. F. Thiel. 1916. Ecological studies in the tension zone between prairie and woodland. *Bot. Survey Nebr. N. S.* 1: 1-60.
688. \_\_\_\_\_ and G. W. Tomanek. 1951. Ecological studies in a midwestern range: The vegetation and effects of cattle on its composition and distribution. *Univ. Nebr. Conserv. Survey Div. Bull.* 31. 82 p.
689. \_\_\_\_\_ and E. Zink. 1946a. Annual increase in underground materials in three range grasses. *Ecology* 27: 115-127.
690. \_\_\_\_\_ and E. Zink. 1946b. Length of life of roots of ten species of perennial range and pasture grasses. *Plant Physiol.* 21: 201-217.
691. Wedel, Waldo R. 1957. The central North American grassland: Man-made or natural. *Social Sci. Monog. III. Studies in human ecology.* Dept. Cultural Affairs, Pan Amer. Union. Wash., D. C. p. 39-69.
692. Welch, W. H. 1929. Forest and prairie, Benton County, Indiana. *Proc. Ind. Acad. Sci.* 39: 67-72.
693. \_\_\_\_\_ 1936. Boreal plant relics in Indiana. *Proc. Ind. Acad. Sci.* 45: 75-88.
694. Werner, R. M., and J. M. Aikman. 1943. Relation of secondary plant succession to soil water conservation. *Iowa State Col. J. Sci.* 17: 175-189.
695. West, R. G. 1961. Late-glacial and post-glacial vegetation history in Wisconsin, particularly changes associated with the Valdres readvance. *Amer. J. Sci.* 259: 766-783.
696. Westveld, R. H. 1933. The relation of certain soil characteristics to forest growth and composition in the northern hardwood forest of northern Michigan. *Mich. Agr. Expt. Sta. Tech. Bull.* 135.
697. White, Keith L. 1965. Shrub-carrs of southeastern Wisconsin. *Ecology* 46: 267-304.
698. Whitford, H. M. 1901. The genetic development of the forests of northern Michigan. *Bot. Gaz.* 31: 289-325.
699. Whitford, P. B. 1948. Species distribution and age of hardwood stands in the prairie-forest region of Wisconsin. Ph.D. Thesis. Univ. Wis., Madison.
700. \_\_\_\_\_ 1949. Distribution of woodland plants in relation to succession and clonal growth. *Ecology* 30: 199-208.
701. \_\_\_\_\_ 1951. Estimation of the age of forest stands in the prairie-forest border region. *Ecology* 32: 143-147.
702. \_\_\_\_\_ 1958. A study of prairie remnants in southeastern Wisconsin. *Ecology* 39: 727-733.
703. \_\_\_\_\_ and P. J. Salamun. 1954. An upland forest survey of the Milwaukee area. *Ecology* 35: 533-540.
704. Whitman, W. C. 1954. Yield characteristics of native grass ranges. *Proc. N. Dak. Acad. Sci.* 8: 14-19.
705. \_\_\_\_\_ 1963. Vegetation of North Dakota, p. 37-61. *In Conservation of Natural Resources in North Dakota.* N. Dak. State Univ., Fargo.
706. \_\_\_\_\_ and O. A. Stevens. 1951. Native legumes of North Dakota grassland. *Proc. N. Dak. Acad. Sci.* 4: 73-78.
707. \_\_\_\_\_ and H. C. Hanson. 1939. Vegetation on scoria and clay buttes in western North Dakota. *Ecology* 20: 455-457.
708. \_\_\_\_\_ H. T. Hanson, and G. Loder. 1943. Natural revegetation of abandoned fields in western North Dakota. *N. Dak. Agr. Expt. Sta. Bull.* 321.
709. \_\_\_\_\_ H. T. Hanson, and R. Peterson. 1943. Relation of drought and grazing to North Dakota rangeland. *N. Dak. Agr. Expt. Sta. Bull.* 320. 27 p.
710. \_\_\_\_\_ and E. A. Helgeson. 1946. Range vegetation studies. *N. Dak. Agr. Expt. Sta. Bull.* 340. 43 p.

711. \_\_\_\_\_ and O. A. Stevens. 1941. Grass. N. Dak. Agr. Expt. Sta. Bull. 300. 112 p.
712. Whitney, J. D. 1876. Plain, prairie, and forest. Amer. Nat. 10: 577-588, 656-667.
713. Wiegert, Richard G., and Francis C. Evans. 1964. Primary production and the disappearance of dead vegetation on an old field in southeastern Michigan. Ecology 45: 49-63.
714. Wilde, S. A. 1933. The relation of soils and forest vegetation of the Lake States region. Ecology 14: 94-105.
715. \_\_\_\_\_ 1958. Forest soils, their properties and relation to silviculture. The Ronald Press. New York. 537 p. (selected sections).
716. \_\_\_\_\_ and A. L. Leaf. 1955. The relationship between the degree of soil podzolization and the composition of ground cover vegetation. Ecology 36: 19-22.
717. \_\_\_\_\_ P. B. Whitford, and C. T. Youngberg. 1948. Relation of soils and forest growth in the driftless area of southwestern Wisconsin. Ecology 29: 173-180.
718. Wilson, I. T., and J. E. Potzger. 1943a. Pollen records from lakes in Anoka County, Minnesota: A study of methods of sampling. Ecology 24: 382-392.
719. \_\_\_\_\_ and J. E. Potzger. 1943b. Pollen study of sediments from Douglas Lake, Cheboygan County and Middle Fish Lake, Montgomery County, Michigan. Proc. Ind. Acad. Sci. 52: 87-92.
720. Wilson, L. R. 1935. Lake development and plant succession in Vilas County, Wisconsin. Ecol. Monographs 5: 207-247.
721. \_\_\_\_\_ 1936. Further fossil studies of the Two Creek bed, Manitowoc County, Wisconsin. Bull. Torrey Bot. Club 63: 317-325.
722. \_\_\_\_\_ 1937. A quantitative and ecological study of the larger aquatic plants of Sweeney Lake, Onieda County, Wisconsin. Bull. Torrey Bot. Club 64: 199-208.
723. \_\_\_\_\_ 1938. The postglacial history of vegetation in northwestern Wisconsin. Rhodora 40: 137-175.
724. \_\_\_\_\_ 1941. The larger aquatic vegetation of Trout Lake, Vilas County, Wisconsin. Trans. Wis. Acad. Sci. 33: 135-146.
725. Winchell, N. H. 1875. Notes on the Big Woods. Annu. Rpt. Minn. State Hort. Soc. 3: 47-50.
726. Wing, Leonard W. 1937. Evidences of ancient oak openings in southern Michigan. Ecology 18: 170-171.
727. Winterringer, G. S., and A. G. Vestal. 1956. Rock-ledge vegetation in southern Illinois. Ecol. Monographs 26: 105-130.
728. Woodward, J. 1924. Origin of prairies in Illinois. Bot. Gaz. 77: 241-261.
729. \_\_\_\_\_ 1925. Factors influencing the distribution of tree vegetation in Champaign County, Illinois. Ecology 6: 150-156.
730. Woollett, Marjorie L., and Dorothy Sigler. 1928. Revegetation of beech-maple areas in the Douglas Lake Region. Torreya 28: 21-28.
731. Wright, H. E., Jr. 1964. Aspects of the early post-glacial forest succession in the Great Lakes Region. Ecology 45: 439-448.
732. \_\_\_\_\_ T. C. Winter, and H. L. Patten. 1963. Two pollen diagrams from southeastern Minnesota: Problems in the regional late-glacial and postglacial vegetational history. Geol. Soc. Amer. Bull. 1371-1396.
733. Yeager, A. F. 1935. Root systems of certain trees and shrubs grown on prairie soils. J. Agr. Res. 51: 1085-1092.
734. Yeager, Lee E. 1949. Effect of permanent flooding in a river bottom timber tract. Ill. Nat. Hist. Survey Bull. 25: 33-65.
735. Youngberg, C. T. 1951. Evolution of prairie-forest soils under cover of invading northern hardwoods in the driftless area of southwestern Wisconsin. Trans. Wis. Acad. Sci. 40: 285-289.

736. Zavesky, Larry D. 1966. Soil-vegetation relationships of a blue shale-limy upland range site in Ellis County, Kansas. M.S. Thesis. Ft. Hays, Kans., State Col.
737. \_\_\_\_\_ 1967. Soil-vegetation relationships of a blue shale-limy upland range site in Ellis County, Kansas. Ft. Hays Studies. Sci. Ser. No. 7. Ft. Hays, Kans., State Col. 42 p.
738. Zedler, Joy B., and O. L. Loucks. 1969. Differential burning response of *Poa pratensis* fields and *Andropogon scoparius* prairies in central Wisconsin. Amer. Midl. Nat. 81: 341-352.
739. \_\_\_\_\_ and Paul H. Zedler. 1969. Association of species and their relationship to microtopography within old fields. Ecology 50: 432-442.
740. Zeller, Deane Harlan. 1963. Certain mulch and soil characteristics of major range sites in western North Dakota as related to range condition. M.S. Thesis. N. Dak. State Univ., Fargo.
741. Zicker, Wilma A. 1955. An analysis of Jefferson County vegetation using surveyor's records and present day data. M.S. Thesis. Univ. Wis., Madison.
742. Zumberge, J. H., and J. E. Potzger. 1956. Late Wisconsin chronology of the Lake Michigan basin correlated with pollen studies. Geol. Soc. Amer. Bull. 67: 271-288.



