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The vascular flora of the Kersey-Crump creek watershed, Hanover County, Virginia

Eddie Reeves Smith

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THE VASCULAR FLORA OF THE KERSEY-CRUMP CREEK WATERSHED,
HANOVER COUNTY, VIRGINIA

BY

EDDIE REEVES SMITH

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SUBMITTED TO THE GRADUATE FACULTY
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EDDIE REEVES SMITH

Approved:

William S. Wolcott
Committee Chairman

W. R. West Jr.
Committee Member

Thomas R. Platt
Committee Member

Examining Committee:

F. B. Leftwich

W. John Hayden

William R. Tenny

John W. Davis

Richard J. Schneider

W. J. Gannon

Wm. H. Hale

R. Decker

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ABSTRACT

A floristic survey was conducted in the Kersey-Crump Creek watershed, Hanover County, Virginia from spring 1978 through summer 1980. This upper Coastal Plain area (42 km²) near the fall line yielded 514 species of vascular plants, representing 334 genera and 113 families. Four hundred and seventy-nine county records were established. Panax trifolium, colonizing a rich wooded creek bottom, was the only plant rare to Virginia. Voucher specimens are deposited in the herbaria of the University of Richmond, Virginia, and the College of William and Mary, Williamsburg, Virginia.

INTRODUCTION

The rapid urbanization of the fall line corridor in north-central Virginia dictates the urgency for floristic surveys if records of the present flora are to be established for future reference. Studies by Massey (1961) of Virginia flora include plants from fall line counties but include few records for Hanover County. Harvill et al. (1977) listed pteridophytes, gymnosperms, and monocotyledons from Hanover County, but their records also were limited, suggesting the need for further studies.

The present investigation was undertaken to identify and record the extant flora of Kersey-Crump Creek watershed, an upper Coastal Plain part of Hanover County. The only previous study to concentrate on this area was that of Merriman (1930), which did not include grasses, sedges, rushes, and trees. Information from the present study will become a part of a permanent record being prepared by the Flora Committee of the Virginia Academy of Science.

DESCRIPTION OF STUDY AREA

Kersey-Crump Creek watershed (Pamunkey River drainage) is in the upper Coastal Plain Province in Hanover County, Virginia near Hanover Courthouse (Figure 1). Most of the area (approximately 42 km²) lies in the Studley and Yellow Tavern 7.5 minute quadrangles (U.S. Geol. Survey, 1964). Daniels and Onuschak (1974) described the topography as level to gently rolling with an eastward gradient of approximately 1.5 m/km. Elevations range

from 6 to 61 m above sea level on this moderately dissected upland. Deposits, which are unconsolidated, include sand, gravel, and smaller amounts of clay and calcareous marl. Marine sediments were laid down during the Cretaceous and Tertiary Periods. Igneous and metamorphic rocks of Paleozoic origin and consolidated sedimentary rocks of the Triassic Period underlie the marine deposits (Daniels and Onuschak, 1974).

The upland soil is a moderately well-drained, loam to clay type, that gradually changes to a moderately well-drained loam and sandy soil near the northeast boundary on the Pamunkey River terraces. The flood plain is moderately to poorly drained, loam soil characteristic of Piedmont and upper Coastal Plain river flood plains and swamps. Part of the Pamunkey River meanders and has formed an oxbow lake. The flood plain is inundated frequently, and during the flood of 1969 water rose 8.5 m above the stream banks (Extension Div. of Va. Poly. Institute and St. Univ., 1974).

Hanover County has a mild continental climate with warm, humid summers and mild winters (Table 1). The growing season is 178 days; April 21 is the average date of the last freezing temperature in spring; and October 16 is the average date of the first freezing temperature in fall (Crockett, 1972). Average annual precipitation is 102 cm (74 to 130 cm), and is fairly evenly distributed throughout the year with July and August the wettest months (Crockett, 1972).

Intensive lumbering and heavy agricultural pressure have

reduced the number and size of extant mature hardwood stands so that the woodland is best described as a mixed pine-deciduous community. The climax vegetation of this region is considered to be an oak-hickory forest (Braun, 1950).

METHODS AND MATERIALS

Plants were collected approximately weekly from March 1978 to May 1979. Subsequent collecting, directed toward concentration on areas neglected earlier was continued on an irregular schedule through August 1980. Whenever possible specimens were collected either in flower or fruit; however, these were not restrictive conditions if other diagnostic features were present. Field data included location, habitat, date, and collection number. Specimens were collected in duplicate and returned to the laboratory in humid plastic bags. They were identified, dried, and labeled according to standard herbarium methods. Following drying, one set of specimens was cataloged and deposited in the herbarium cabinets at the University of Richmond; the other was given to the Herbarium of the College of William and Mary in Williamsburg, Virginia.

Identifications were based on plant keys by Radford et al. (1968), Gleason and Cronquist (1963) and Merriman (1930). Specimens of Cyperaceae, Juncaceae, and Poaceae were identified by Dr. Donna M. E. Ware, Curator, Herbarium of the College of William and Mary. Nomenclature and family arrangement follow Radford et al. (1968) in the annotated checklist. Common names, if available, are from Radford et al. (1968) or Merriman (1930). The following in-

formation is listed with each taxon in the annotated checklist; author, common name, abundance, habitat, and field collection number. Abundance is defined as rare (one to three colonies seen), occasional (4 to 9 colonies), common (ten or more colonies), or abundant (throughout one or more habitats).

RESULTS

A total of 514 species of plants representing 334 genera and 113 families were collected over a three year period. Many plants were common to a specific habitat, i.e., wooded bottomland (Table 2), wooded upland (Table 3), freshwater marsh (Table 4), and open, disturbed land (Table 5).

In the following annotated list of plants, species reported by Massey (1961) for Hanover County are preceded by 1; those not described by Merriman (1930) for the Richmond area by 2; and those not reported by Harvill et al. (1977) for Hanover County by 3.

Annotated List

Lycopodiaceae

2 Lycopodium appressum (Chapman) Lloyd & Underwood.

Southern Bog Clubmoss. Occasional; wet meadows and shores. 54.

L. flabelliforme (Fern.) Blanchard. Running-Pine.

Occasional; moist woods. 7.

2 L. lucidulum Michaux. Clubmoss. Rare; wet, wooded bottomland. 5.

L. obscurum L. Groundpine. Occasional; moist, wooded bottomland and low woods. 6.

Selaginellaceae

Selaginella apoda (L.) Spring. Meadow Spikemoss.

Rare; stream bank in woods. 401.

Ophioglossaceae

Botrychium dissectum Sprengel. Common Grapefern.

Common; rich, wooded bottomland. 536.

B. virginianum (L.) Swartz. Rattlesnake Fern.

Common; rich, wooded bottomland. 100.

3 Ophioglossum vulgatum L. var. pycnostichum Fernald.

Southern Adder's-Tongue. Rare; mixed woods. 399.

Osmundaceae

1 Osmunda cinnamomea L. Cinnamon Fern. Common; wet

woods. 121.

O. regalis L. var. spectabilis (Willd.) Gray. Royal

Fern. Occasional; wet woods. 131.

Schizaeaceae

2,3 Lygodium palmatum (Bernh.) Swartz. American Climbing

Fern. Rare; moist, wooded bottom. 11.

Pteridaceae

Adiantum pedatum L. Maidenhair Fern. Occasional;

open, wooded slopes. 103.

1 Pteridium aquilinum (L.) Kuhn. Bracken Fern. Common;

open, disturbed areas. 116.

Aspidiaceae

Athyrium asplenoides (Michaux) A. A. Eaton. Southern

Lady Fern. Common; moist, open woods. 398.

2 A. pycnocarpon (Sprengel) Tidestrom. Glade Fern.

Occasional; wooded bottomland. 213.

2,3 A. thelypteroides (Michaux) Desvaux. Silvery Spleen-

wort. Occasional; moist, wooded slopes. 102.

Onoclea sensibilis L. Sensitive Fern. Occasional;

wooded bottomland. 400.

1 Polystichum acrostichoides (Michaux) Schott. Christ-

mas Fern. Abundant; moist, wooded slopes. 98.

Thelypteris hexagonoptera (Michaux) Weatherby. Broad

Beech Fern. Common; wooded bottomland. 99, 208.

T. noveboracensis (L.) Nieuwland. New York Fern.

Common; wooded bottomland. 209.

Blechnaceae

2,3 Woodwardia areolata (L.) Moore. Netted Chain-Fern.

Common; wooded bottomland. 290.

Aspleniaceae

1 Asplenium platyneuron (L.) Oakes. Ebony Spleenwort.

Common; woods and fencerows. 111.

Pinaceae

1 Pinus echinata Miller. Short-leaf Pine. Common;

mixed woods and woodland borders. 3.

1 P. taeda L. Loblolly Pine. Abundant; mixed woods

and woodland borders. 1.

1 P. virginiana Miller. Virginia Pine. Common;

mixed woods and woodland borders. 2.

Cupressaceae

- 1 Juniperus virginiana L. Red Cedar. Abundant; mixed woods, hedgerows and abandoned fields. 4.

Typhaceae

- 1 Typha latifolia L. Common Cat-tail. Common; marshes and ponds. 311.

Sparganiaceae

- 1 Sparganium americanum Nuttall. Bur-reed. Occasional; marshes and ponds. 322.

Alismataceae

- 3 Sagittaria latifolia Willd. var. latifolia. Duck-Potato. Occasional; marshes and ponds. 328.

Poaceae

- 3 Agrostis stolonifera L. Redtop. Common; barnyards and fields. 423.
- 3 Alopecurus carolinianus Walter. Foxtail Grass. Common; low fields. 434, 498.
- 3 Andropogon virginicus L. Broom Sedge. Abundant; fields and roadsides. 476.
- 3 Anthoxanthum odoratum L. Sweet Vernal Grass. Common; low fields. 431, 433.
- 3 Cinna arundinacea L. Wood Reed. Common; low woods. 410.
- 1,3 Cynodon dactylon (L.) Persoon. Bermuda Grass. Abundant; fields, roadsides and disturbed areas. 466.
- 1 Dactylis glomerata L. Orchard Grass. Abundant; fields and pastures. 440.

- Digitaria sanguinalis (L.) Scopoli. Crab Grass. Abundant;
fields and pastures. 415.
- Echinochloa crusgalli (L.) Beauvois. Barnyard Grass.
Common; fields. 405, 406.
- Eleusine indica (L.) Gaertner. Goose Grass. Common;
fields and pastures. 412.
- 1 Erianthus giganteus (Walter) Muhl. Beard Grass. Common;
wet, disturbed areas. 402.
- 1 Glyceria striata (Lam.) Hitchcock. Manna Grass. Common;
low fields and ditches. 424.
- 3 Hordeum pusillum Nuttall. Barley. Common; fields and
barnyards. 436.
- Lolium perenne L. Rye Grass. Common; fields and barn-
yards. 416, 428.
- 3 Panicum anceps Michaux. var. anceps. Common; fields and
roadsides. 558.
- P. dichotomiflorum Michaux. Common; cultivated fields.
411.
- P. dichotomum L. Common; low fields. 417.
- P. lanuginosum Ell. Common; fields and roadsides. 425.
- P. rigidulum Nees. Occasional; marshes. 547.
- 3 Paspalum floridanum Michaux. Common; low fields. 407.
- 3 P. laeve Michaux. Common; fields and roadsides. 469.
- 3 Phleum pratense L. Timothy. Occasional; fields and road-
sides. 427.
- 3 Poa annua L. Blue Grass. Common; fields and roadsides.
438.

- P. cuspidata Nuttall. Blue Grass. Common; wooded slopes.
441.
- 3 P. pratensis L. Blue Grass. Common; barnyards and fields.
437, 439, 491.
- 3 Setaria faberi W. Herrmann. Foxtail Grass. Common;
fields and roadsides. 408.
- S. glauca (L.) Beauvois. Foxtail Grass. Common; fields
and roadsides. 408.
- 3 Sorghum halepense (L.) Persoon. Johnson Grass. Common;
fields and roadsides. 418.
- Tridens flavus (L.) Hitchcock var. flavus. Purple Top.
Common; fields and roadsides. 404, 467.
- Uniola latifolia Michaux. Common; low woods. 403.
- U. laxa (L.) BSP. Common; low woods. 470.

Cyperaceae

- Carex crinita Lam. Sedge. Common; marshes. 419, 492.
- C. intumescens Rudge. Sedge. Common; low woods. 435.
- C. lurida Wahlenberg. Sedge. Common; low fields. 430.
- C. stricta Lam. Sedge. Common; marshes. 493.
- C. tribuloides Wahlenberg. Sedge. Common; marshes. 421.
- Cyperus lancastriensis Porter. Sedge. Common; fields.
561.
- C. ovularis (Michaux) Torr. Sedge. Common; marshes.
420.
- C. strigosus L. Sedge. Common; low fields. 414.
- Dulichium arundinaceum (L.) Britton. Sedge. Common;
marshes. 409.

Eleocharis obtusa (Willd.) Schultes. Spikerush. Common;
low woods and fields. 413, 543.

3 Rhynchospora capitellata (Michx.) Vahl. Beak Rush. Com-
mon; low fields and stream banks. 539, 563.

3 Scirpus polyphyllus Vahl. Bulrush. Common; marshes. 422.

Araceae

Arisaema triphyllum (L.) Schott. Jack-in-the-Pulpit.
Common; wet woods. 70.

Symplocarpus foetidus (L.) Nuttall. Skunk Cabbage. Rare;
wet, wooded bottom. 477.

Lemnaceae

2 Lemna perpusilla Torrey. Duckweed. Occasional; ponds
and marshes. 544.

2,3 Spirodela polyrrhiza (L.) Schleid. Duckweed. Common;
ponds, ditches and marshes. 302.

Xyridaceae

2,3 Xyris jupicai Richard. Yellow-eyed Grass. Occasional;
wet pastures and marshes. 545.

Commelinaceae

3 Commelina communis L. Dayflower. Occasional; moist, open
woods. 143.

2 C. virginica L. Dayflower. Occasional; low, open woods.
304.

Pontederiaceae

3 Heteranthera reniformis R. & P. Mud Plantain. Occasional;
marshes. 361.

- 3 Pontederia cordata L. Pickerelweed. Common; ponds and marshes. 233.

Juncaceae

- Juncus acuminatus Michaux. Rush. Abundant; low fields and ditches. 426.
- 3 J. coriaceus MacKenzie. Rush. Common; marshes and stream banks. 564.
- J. effusus L. Rush. Abundant; low fields and ditches. 129.
- J. scirpoides Lam. Rush. Common; low fields and ditches. 540, 548.
- 3 J. tenuis Willd. Path Rush. Common; fields and pastures. 429.
- 3 Luzula acuminata Raf. Woodrush. Abundant; moist woods and slopes. 513.
- L. echinata (Small) Hermann. Woodrush. Abundant; moist woods and slopes. 513.

Liliaceae

- 3 Allium canadense L. var. canadense. Wild Onion. Occasional; open woods. 523.
- A. vineale L. Field Garlic. Abundant; fields and roadsides. 197.
- 1 Asparagus officinalis L. Asparagus. Occasional; field borders and hedgerows. 471.
- Erythronium americanum Ker. Trout Lily. Occasional; wooded slopes and bottoms. 72, 483.

- 1,3 Hemerocallis fulva L. Daylily. Common; roadsides and field borders. 176.
- Medeola virginiana L. Indian Cucumber-root. Common; low woods. 228.
- 3 Muscari racemosum (L.) Miller. Blue-bottles. Occasional; cultivated fields and yards. 15.
- 3 Ornithogalum umbellatum L. Star of Bethlehem. Common; cultivated fields. 75.
- Polygonatum biflorum (Walter) Ell. Solomon's Seal. Common; moist, wooded slopes. 108.
- Smilacina racemosa (L.) Desf. False Solomon's Seal. Occasional; moist, wooded slopes. 109.
- 1 Smilax rotundifolia L. Greenbrier. Common; woods and hedgerows. 97.
- Uvularia perfoliata L. Bellwort. Common; wooded slopes. 101.

Dioscoreaceae

- Dioscorea villosa L. var. hirticaulis (Bartlett) Ahles. Wild Yam. Occasional; wooded slopes. 475.

Amaryllidaceae

- 2,3 Lycoris radiata (L'Her.) Herbert. Magic Lily. Rare; yard of old house site. 472.
- 1,2,3 Narcissus poeticus L. Poet's Narcissus. Common; old house sites and roadsides. 487.

Iridaceae

- 3 Iris virginica L. Blue Flag. Occasional; low, open

woods. 524.

Sisyrinchium angustifolium Miller. Blue-eyed Grass.

Common; open woods and roadsides. 128, 507.

Orchidaceae

1 Cypripedium acaule Ait. Pink Lady's Slipper. Occasional; mixed woods. 87.

1 Goodyera pubescens (Willd.) R. Brown. Downy Rattlesnake Plantain. Occasional; wooded slopes. 278.

Habenaria clavellata (Mich.) Sprengel. Small Green Wood-orchid. Rare; low woods. 256.

2,3 H. cristata (Michaux) R. Brown. Crested Fringed-orchid. Rare; low, mixed woods. 551.

3 Orchis spectabilis L. Showy Orchis. Occasional; moist, wooded slopes. 104.

3 Spiranthes vernalis Engelm. & Gray. Spring Ladies' Tresses. Rare; low field. 201.

Tipularia discolor (Pursh) Nuttall. Crane-fly Orchid. Occasional; low woods. 308.

Saururaceae

1 Saururus cernuus L. Lizard's Tail. Common; marshes and wet woods. 190.

Salicaceae

Populus grandidentata Michaux. Large-toothed Aspen. Occasional; woodland borders and fencerows. 375.

1 Salix babylonica L. Weeping Willow. Occasional; shores and stream banks. 464.

- S. humilis Marshall. Prairie Willow. Occasional; woodland borders. 508.
- 1 S. nigra Marshall. Black Willow. Common; wet woods and stream banks. 448.
- S. sericea Marshall. Silky Willow. Common; low, disturbed areas. 449.

Juglandaceae

- Carya glabra (Miller) Sweet. Pignut Hickory. Common; wooded slopes. 344. 460.
- 1 C. pallida (Ashe) Engler & Graebner. Pale Hickory. Common; wooded slopes. 461, 462.
- C. tomentosa (Poiret) Nuttall. Mockernut. Common; wooded slopes. 506.
- 1 Juglans nigra L. Black Walnut. Occasional; usually associated with old house sites. 279.

Betulaceae

- 1 Alnus serrulata (Aiton) Willd. Tag Alder. Common; stream banks and shores. 463.
- Betula nigra L. River Birch. Common; low woods and stream banks. 135.
- Carpinus caroliniana Walter. Ironwood. Common; low woods and stream banks. 454.

Fagaceae

- Castanea pumila (L.) Miller. Chinquapin. Occasional; woods. 555.
- 1 Fagus grandifolia Ehrhart. Beech. Abundant; woods,

especially along stream courses. 280.

- 1 Quercus alba L. White Oak. Abundant; woods. 335.
- Q. coccinea Muenchh. Scarlet Oak. Common; woods.
509.
- Q. falcata Michaux var. falcata. Southern Red Oak.
Abundant; woods. 393, 397, 458.
- 1 Q. marilandica Muenchh. Black Jack Oak. Occasional;
woods. 458.
- 1 Q. Michauxii Nuttall. Swamp Chestnut Oak. Common;
wooded bottomland. 503.
- Q. nigra L. Water Oak. Occasional; woods. 504.
- Q. phellos L. Willow Oak. Common; low woods. 336.
- 1 Q. prinus L. Rock Chestnut Oak. Occasional; wooded
slopes. 396.
- 1 Q. rubra L. var. rubra. Northern Red Oak. Common;
wooded slopes and bottomland. 517.
- 1 Q. velutina Lam. Black Oak. Common; woods. 502.

Ulmaceae

- Celtis occidentalis L. var. georgiana (Small) Ahles.
Hackberry. Occasional; hedgerows and woodland
borders. 173.
- Ulmus alata Michaux. Winged Elm. Common; woods. 326.
- U. americana L. American Elm. Common; wooded bottom-
land. 453.

Moraceae

- Broussonetia papyrifera (L.) Vent. Paper Mulberry.

Occasional; usually associated with old house sites.

528.

Maclura pomifera (Raf.) Schneider. Osage Orange. Occasional; usually associated with old house sites.

394.

Morus rubra L. Red Mulberry. Occasional; woodland borders. 146.

Urticaceae

Boehmeria cylindrica (L.) Swartz. False Nettle. Common; low woods and bottomland. 257.

Pilea pumila (L.) Gray. Clearweed. Common; open, low woods and bottomland. 348.

Loranthaceae

Phoradendron serotinum (Raf.) M. C. Johnston. Mistletoe. Common; especially on Nyssa sylvatica. 479.

Aristolochiaceae

Hexastylis virginica (L.) Small. Heart Leaf. Common; wooded slopes. 35.

Polygonaceae

Polygonum arifolium L. Tearthumb. Common; low, open woods and marshes. 350.

P. aviculare L. Prostrate Knotweed. Common; yards and roadsides. 149.

P. convolvulus L. Climbing Buckwheat. Occasional; woodland borders and open woods. 163.

P. erectum L. Knotweed. Occasional; fields. 242.

- P. hydropiperoides Michx. Mild Water Pepper. Occasional; low, disturbed areas. 260.
- 1 P. pennsylvanicum L. Smartweed. Abundant; open, disturbed areas and fields. 134.
- P. sagittatum L. Tearthumb. Common; low, open woods and marshes. 271.
- 1 Rumex acetosella L. Sheep-sorrel. Abundant; yards, fields and roadsides. 76.
- R. crispus L. Curled Dock. Abundant; fields and barnyards. 186, 521.
- 1 Tovara virginiana (L.) Raf. Jumpseed. Common; moist, open woods. 296.

Chenopodiaceae

- Chenopodium album L. Lamb's-quarters. Common; fields and pastures. 232.
- 1 C. ambrosioides L. Mexican-tea. Common; fields and pastures. 370.

Amaranthaceae

- 2 Amaranthus hybridus L. Pigweed. Abundant; cultivated fields. 301, 557.
- A. spinosus L. Thorny Amaranth. Common; fields and pastures. 532.

Phytolaccaceae

- 1 Phytolacca americana L. Pokeweed. Abundant; woodland borders and fields. 158.

Aizoaceae

- 1 Mollugo verticillata L. Carpet-weed. Abundant; fields and roadsides. 196.

Portulacaceae

- Claytonia virginica L. Spring-beauty. Common; wooded slopes and bottomland. 41.

Caryophyllaceae

- Agrostemma githago L. Corn-cockle. Common; fields. 133
- Cerastium glomeratum Thuillier. Mouse-ear Chickweed. Common; fields and roadsides. 43.
- C. holosteoides var. vulgare (Hartman) Hylander. Larger Mouse Ear Chickweed. Occasional; yards and fields. 494.
- Dianthus armeria L. Deptford Pink. Common; open, disturbed areas and right of ways. 155.
- Lychnis alba Miller. White Campion. Common; fields and roadsides. 119.
- Scleranthus annuus L. German-moss. Abundant; fields. 46.
- Silene antirrhina L. Sleepy Catchfly. Occasional; open, disturbed areas. 117.
- S. caroliniana Walter. Wild Pink. Occasional; roadsides and open, disturbed areas. 501.
- S. stellata (L.) Aiton. Starry Campion. Occasional wooded roadsides. 313.
- 2 Spergula arvensis L. Spurrey. Occasional; sandy fields. 53.
- 1 Stellaria media (L.) Cyrill. Chickweed. Abundant, yards, fields and disturbed areas. 12.
- S. pubera Michaux. Giant Chickweed. Common; woods. 36.

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Nymphaeaceae

Nuphar luteum (L.) Sibthorp & Smith ssp. macrophyllum
 (Small) E. O. Beal. Yellow Pond-lily. Common;
 ponds and marshes. 456.

Ranunculaceae

Anemone virginiana L. Thimbleweed. Common; wooded
 bottomland. 183.

Clematis dioscoreifolia Levl. & Vaniot. Clematis. Rare;
 woodland borders. 343.

Hepatica americana (DC.) Ker. Liverleaf. Occasional;
 moist, wooded slopes. 443.

Ranunculus abortivus L. Buttercup. Common; wooded bottom-
 land. 67.

R. bulbosus L. Buttercup. Abundant; pastures and fields. 58.

R. recurvatus Poiret. Hooked Crowfoot. Common; wooded
 bottomland. 105.

2 R. septentrionalis Poiret. Swamp Buttercup. Rare; wooded,
 river flood plain. 488.

Thalictrum polygamum Muhl. Meadow Rue. Common; wooded
 bottomland and low woods. 185.

Berberidaceae

Podophyllum peltatum L. May-apple. Abundant; wooded
 slopes and bottomland. 64.

Magnoliaceae

1 Liriodendron tulipifera L. Tulip Tree. Abundant; woods. 95.

1 Magnolia virginiana L. Sweet Bay. Occasional; shores

and fencecrows. 145.

Annonaceae

Asimina triloba (L.) Dunal. Pawpaw. Occasional; wooded
bottomland. 314.

Lauraceae

Lindera benzoin (L.) Blume. Spicebush. Common; wooded
bottomland. 447.

1 Sassafras albidum (Nuttall) Nees. Sassafras. Abundant;
hedgerows and woodland borders. 277.

Papaveraceae

Sanguinaria canadensis L. Bloodroot. Occasional; moist,
wooded slopes. 38.

Capparaceae

1,2 Cleome houtteana Raf. Spider-flower. Occasional; wooded
river banks. 355.

Brassicaceae

2 Arabidopsis thaliana (L.) Heynhold. Mouse-Ear Cress.
Abundant; cultivated fields. 17.

Arabis laevigata (Muhl. ex Willd.) Poir. Rock-cress.
Occasional; moist woods. 446.

2 Barbarea verna (Miller) Ascherson. Winter Cress. Abun-
dant; fields. 28.

B. vulgaris R. Brown var. arcuata (Opiz.) Fries. Winter
Cress. Abundant; fields. 54.

1 Brassica napus L. Turnip. Common; cultivated fields. 27.

1 Capsella bursa-pastoris (L.) Medicus. Shepherd's purse.

Abundant; fields and roadsides. 18.

Cardamine bulbosa (Schreber) BSP. Bitter Cress. Occasional; wooded slopes. 445, 484.

C. concatenata (Michaux) Ahles. Toothwort. Occasional; wooded slopes. 444.

C. hirsuta L. Bitter Cress. Abundant; yards and fields. 9.

C. pennsylvanica Muhl. Bitter Cress. Occasional; wooded bottomland. 84.

Coronopus didymus (L.) Smith. Wart Cress. Common; cultivated fields. 485.

1 Draba verna L. Whitlow-grass. Common; cultivated fields. 10.

1 Lepidium campestre (L.) R. Brown. Cow Cress. Common; open, disturbed areas and cultivated fields. 59.

1 L. virginicum L. Poor-mans Pepper. Common; open, disturbed areas and cultivated fields. 73.

2 Lunaria annua L. Honesty. Rare; open, disturbed areas. 93. (Not described in Radford et al., 1968).

2 Raphanus raphanistrum L. Wild Radish. Common; cultivated fields. 174.

Sisymbrium officinale (L.) Scopoli. Hedge Mustard. Occasional; fields. 92.

Crassulaceae

Penthorum sedoides L. Ditch Stonecrop. Common; low woods and ditches. 346.

Saxifragaceae

Heuchera americana L. Alumroot. Common; wooded slopes.

110.

Saxifraga virginensis Michaux. Early Saxifrage.

Common; wooded slopes. 71.

Hamamelidaceae

1 Liquidambar styraciflua L. Sweet-Gum. Abundant; woods.

451.

Platanaceae

1 Platanus occidentalis L. Sycamore. Common; low woods
and wooded bottomland. 169.

Rosaceae

2 Aggrimonia pubescens Wallroth. Agrimony. Occasional;
open woods. 225.

Amelanchier arborea (Michaux f.) Fernald var. arborea.

Serviceberry. Occasional; wooded slopes and wood-
land borders. 29.

A. canadensis (L.) Medicus. Serviceberry. Occasional;
low, woodland borders. 30.

Duchesnea indica (Andrz.) Focke. Indian Strawberry.

Common; roadsides and open, disturbed areas. 63.

Fragaria virginiana Duchesne. Strawberry. Common;

woodland borders and fields. 25.

Geum canadense Jacquin. Avens. Occasional; wet woods.

189.

Potentilla canadensis L. Five Fingers. Common; open,

disturbed areas and roadsides. 55.

2 P. recta L. Five Fingers. Occasional; fields and roadsides. 459.

Prunus persica (L.) Batsch. Peach. Occasional; escape, woodland borders. 486.

P. serotina Ehrhart. Wild Black Cherry. Common; woodland borders and hedgerows. 337.

Pyrus communis L. Pear. Occasional; escape, usually found near old home sites. 32.

Rosa carolina L. Wild Rose. Occasional; open, disturbed areas and right of ways. 148.

R. palustris Marshall. Swamp Rose. Common; shores and marshes. 529.

Rubus argutus Link. Blackberry. Abundant; pastures, fencerows and woodland borders. 520.

Sorbus arbutifolia (L.) Heynhold var. arbutifolia. Red Chokeberry. Common; low woods. 80.

Fabaceae

Albizia julibrissin Durazzini. Mimosa. Common; roadsides and woodland borders. 395.

Apios americana Medic. Ground Nut. Occasional; low woods. 305.

Cassia fasciculata Michaux. Partridge Pea. Abundant; disturbed areas and roadsides. 276.

C. nictitans L. Wild Sensitive Plant. Common; disturbed areas and roadsides. 315.

- Cercis canadensis L. Redbud. Common; woodland borders. 33.
- Clitoria mariana L. Butterfly Pea. Common; mixed woods and roadsides. 219.
- Cytisus scoparius (L.) Link. Scotch Broom. Occasional; open, disturbed areas. 450.
- Desmodium nudiflorum (L.) DC. Beggar's Lice. Abundant; woods and disturbed areas. 220.
- D. obtusum (Muhl. ex Willd.) DC. Beggar's Lice. Common; woods and disturbed areas. 334.
- Gleditsia triacanthos L. Honey Locust. Occasional; woodland borders. 298.
- 2 Lathyrus hirsutus L. Common; roadsides and fields. 177.
- 2 L. latifolius L. Everlasting Pea. Occasional; open roadsides. 270.
- 2 Lespedeza cuneata (Dumrnt) G. Don. Sericea. Common; roadsides and fields. 379.
- L. procumbens Michx. Trailing Bush Clover. Common; roadsides and fields. 373.
- L. repens (L.) Barton. Creeping Bush Clover. Common; roadsides and fields. 200.
- 2 L. stipulacea Maxim. Korean Clover. Abundant; roadsides and fields. 363.
- L. striata (Thunberg) H. & A. Japanese Clover. Abundant; roadsides and fields. 352.
- L. virginica (L.) Britton. Slender Bush Clover. Common;

fields and roadsides. 353.

Lupinus perennis L. Lupine. Occasional; open, disturbed areas and roadsides. 114.

Medicago sativa L. Alfalfa. Occasional; fields. 217.

Melilotus alba Desr. White Sweet Clover. Occasional; open, disturbed areas. 181.

M. officinalis (L.) Lam. Yellow Sweet Clover. Occasional; open, disturbed areas. 203.

2 Phaseolus polystachios (L.) BSP. Common; woodlands. 294.

Psoralea psoralioides (Walter) Cory var. psoralioides. Samson Snakeroot. Rare; woodland border. 245.

Robinia hispida L. Bristly Locust. Occasional; usually associated with old house sites. 452.

R. pseudo-acacia L. Black Locust. Occasional; usually associated with old house sites. 106.

Strophostyles helvola (L.) Ell. Trailing Wild Bean. Occasional; open, wooded slopes. 297.

Stylosanthes biflora (L.) BSP. Pencil Flower. Common; roadsides and open, disturbed areas. 307.

2 Tephrosia spicata (Walter) T. & G. Occasional; moist, sandy, disturbed areas. 275.

1 Trifolium arvense L. Rabbit Foot Clover. Common; fields and roadsides. 147.

T. dubium Sibthorp. Low Hop Clover. Common; fields and open, disturbed areas. 89.

- T. incarnatum L. Crimson Clover. Common; fields and roadsides. 96.
- 2 T. pratense L. Red Clover. Common; fields and roadsides. 127.
- T. repens L. White Clover. Abundant; fields and roadsides. 115.
- Vicia angustifolia Reichard. Common Vetch. Common; fields and roadsides. 56.
- 2 V. dasycarpa Tenore. Smooth Vetch. Occasional; fields and roadsides. 122.
- 2 Wisteria sinensis (Sims) Sweet. Wisteria. Occasional; woodland borders. 65.

Linaceae

- Linum virginianum L. var. medium Planchon. Yellow Flax. Common; open, disturbed areas and fields. 180.

Oxalidaceae

- Oxalis dillenii Jacquin. Wood Sorrel. Abundant; roadsides and fields. 79, 519.
- O. stricta L. Wood Sorrel. Common; open woods and disturbed areas. 211.

Geraniaceae

- Erodium cicutarium (L.) L'Her. Heronsbill. Occasional; roadsides and cultivated fields. 32.
- Geranium carolinianum L. Cranesbill. Common; roadsides and fields. 91.

G. molle L. Dovesfoot Cranesbill. Occasional; rich,
moist, cutover areas. 51.

Simaroubaceae

1 Ailanthus altissima (Miller) Swingle. Tree of Heaven.
Common; hedgerows and woodland borders. 455.

Polygalaceae

Polygala curtissii Gray. Curtiss' Milkwort. Common;
moist, open, disturbed areas and cutover areas. 207.

P. incarnata L. Milkwort. Occasional; open, disturbed
areas. 234.

Euphorbiaceae

2 Acalypha gracilens Gray. Three-Seeded Mercury. Oc-
casional; moist, shaded situations. 284.

Croton glandulosus var. septentrionalis Muell-Arg.

Croton. Abundant; roadsides and cutover fields. 318.

Euphorbia corollata L. Flowering Spurge. Common; rail-
road right of ways and old fields. 247.

2 E. cyparissias L. Cypress Spurge. Occasional;
roadsides. 62.

2 E. dentata Michaux. Spurge. Common; roadsides. 246.

E. maculata L. Milk Purslane. Abundant; cutover fields,
cultivated fields and roadsides. 325.

Callitrichaceae

Callitriche heterophylla Pursh. Water Starwort. Abun-
dant; ponds, generally any quiet body of water. 40.

Anacardiaceae

- 1 Rhus copallina L. Winged Sumac. Common; hedgerows and woodland borders. 288.
- 1 R. glabra L. Smooth or Common Sumac. Abundant; hedgerows and woodland borders. 254.
- 1 R. radicans L. Poison Ivy. Abundant; hedgerows and woods. 474.

Aquifoliaceae

- Ilex opaca Ait. American Holly. Abundant; woods. 8.
- I. verticillata (L.) Gray. Black Alder. Occasional; low woods. 510.

Celastraceae

- Euonymus americanus L. Heart's-a-Bustin-With-Love. Common; moist, open woods. 388.

Aceraceae

- Acer negundo L. Box Elder. Occasional; wooded flood plain. 482.
- 1 A. rubrum L. Red Maple. Common; woods. 327.
- A. saccharinum L. Silver Maple. Rare; wooded flood plain. 534.

Balsaminaceae

- Impatiens capensis Meerb. Spotted Touch-Me-Not. Common; wet to moist wooded bottomland. 160.

Rhamnaceae

- Ceanothus americanus L. New Jersey Tea. Occasional; open woods and woodland borders. 182.

Vitaceae

- 1 Parthenocissus quinquefolia (L.) Planchon. Virginia Creeper. Common; hedgerows and woods. 258.
- Vitis labrusca L. Fox Grape. Occasional; woodland borders and low woods. 339.
- V. rotundifolia Michaux. Muscadine Grape. Common; woodland borders and woods. 167.
- 2 V. vulpina L. Frost Grape. Occasional; woodland borders and low woods. 166.

Malvaceae

- 1 Abutilon theophrastii Medicus. Velvet-leaf. Occasional; fields and pastures. 533.
- Hibiscus moscheutos L. ssp. moscheutos. Rose Mallow. Common; marshes. 303.
- Malva moschata L. High Mallow. Occasional; fields. 556.
- 2 Sida rhombifolia L. Mallow. Common; fields and barnyards. 244.
- S. spinosa L. Prickly Mallow. Common; fields and barnyards. 372.

Hypericaceae

- Hypericum gentianoides (L.) BSP. Pineweed. Occasional; open, disturbed areas. 366.
- H. hypericoides (L.) Crantz. St. Andrew's Cross. Occasional; open, disturbed areas. 390.
- H. mutilum L. Small Flowered St. John's-wort. Occasional; open, disturbed areas. 324.
- H. prolificum L. Shrubby St. John's-wort. Occasional; low, open woods. 329.

- H. punctatum Lam. Spotted St. John's-wort. Occasional;
open, disturbed areas. 215.
- 1 H. stans (Michaux) P. Adams & Robson. St. Peter's-
wort. Occasional; open, disturbed areas. 384.
- 2 H. stragalum P. Adams and Robson. Occasional; open,
disturbed areas. 229.

Cistaceae

- Helianthemum canadense (L.) Michaux. Frostweed.
Occasional; sandy clearings. 527.

Violaceae

- Viola arvensis Murray. European Field Pansy. Common;
cultivated fields. 31.
- V. emarginata (Nuttall) LeConte var. emarginata.
Triangle-Leaved Violet. Common; roadsides and
field borders. 26.
- 2 V. eriocarpa Schweinitz var. eriocarpa. Smooth Yellow
Violet. Rare; wooded, river flood plain. 481.
- V. palmata L. var. sororia (Willd.) Pollard. Downy
Violet. Occasional; wooded slopes. 496.
- V. palmata L. var. triloba (Schweinitz) Ging. ex DC.
Three-lobed Violet. Occasional; open woods. 499.
- V. papilionacea Pursh. Common Blue Violet. Abundant;
roadsides, fields and woods. 24, 60.
- V. primulifolia L. Primrose-Leaved Violet. Common;
wet fields and low woods. 52.
- V. rafinesquii Greene. Field Pansy. Abundant; road-
sides, yards and fields. 22.

Passifloraceae

Passiflora incarnata L. Passion Flower. Rare; low,
woodland borders. 320.

Elaeagnaceae

1 Elaeagnus umbellata Thunberg. Silverberry. Occasional;
woodland borders. 118.

Melastomataceae

Rhexia mariana L. var. mariana. Meadow Beauty. Common;
fields and roadsides. 222.

Onagraceae

Circaea lutetiana ssp. canadensis (L.) Ascherson & Magnus.
Enchanter's Nightshade. Occasional; wooded bottomland.
191.

Ludwigia alternifolia L. Seed-box. Occasional; open,
disturbed areas. 250.

L. decurrens Walter. Ludwigia. Occasional; marshes and
wet, open areas. 345.

L. palustris (L.) Ell. Water-Purslane. Common; wet,
open, wooded bottomland. 289.

Oenothera laciniata Hill var. laciniata. Evening Primrose.
Common; open, disturbed areas and fields. 86.

Araliaceae

Aralia spinosa L. Hercules Club. Occasional; low,
woodland borders and hedgerows. 310.

2 Panax trifolium L. Dwarf Ginseng. Rare; wooded bottom.
37.

Apiaceae

- 2 Chaerophyllum tainturieri Hooker. Wild Chervil. Occasional; open, disturbed areas. 94.
- Cicuta maculata L. Water Hemlock. Occasional; stream banks and low woods. 251.
- Daucus carota L. Wild Carrot. Common; open, disturbed areas and roadsides. 154.
- 2 Hydrocotyle umbellata L. Marsh Pennywort. Occasional; ponds and marshes. 546.
- Oxypolis rigidior (L.) Raf. Cowbane. Occasional; wet, woodland borders. 364.
- 2 Thaspium barbinode (Michaux) Nuttall. Meadow Parsnip. Occasional; wooded river flood plain. 489.

Nyssaceae

- Nyssa sylvatica Marshall var. biflora (Walter) Sargent. Black Gum. Common; low woods and swamps. 522.
- Nyssa sylvatica Marshall var. sylvatica. Black Gum. Common; woods. 132, 505.

Cornaceae

- 1 Cornus florida L. Flowering Dogwood. Common; woods. 34.

Clethraceae

- Clethra alnifolia L. var. alnifolia. Sweet Pepperbush. Common; moist, woodland borders, and low hedgerows. 264.

Ericaceae

- Chimaphila maculata (L.) Pursh. Spotted Wintergreen.

- Common; woods. 159.
- Epigaea repens L. Trailing Arbutus. Rare; moist, wooded slope. 50.
- Gaylussacia baccata (Wang.) K. Koch. Black Huckleberry. Common; low woods. 515.
- G. frondosa (L.) T. & G. var. frondosa. Dangleberry. Common; low woods. 511.
- Kalmia latifolia L. Mountain Laurel. Abundant; moist, wooded slopes. 136.
- Leucothoe racemosa (L.) Gray. Fetter-bush. Common; low woods. 512.
- Lyonia mariana (L.) D. Don. Stagger-bush. Occasional; woodland borders and low woods. 516.
- Monotropa uniflora L. Indian Pipe. Occasional; mixed woods. 237.
- Oxydendrum arboreum (L.) DC. Sourwood. Rare; mixed woods. 535.
- Rhododendron nudiflorum (L.) Torrey. Wild Azalea. Common; moist, open woods. 66.
- R. viscosum (L.) Torrey var. viscosum. Swamp Azalea. Rare; bog in open woods. 157.
- 2 Vaccinium atrococcum (Gray) Porter. Black Highbush Blueberry. Common; woods. 514.
- 2 V. corymbosum L. Highbush Blueberry. Common; woodland borders and open woods. 39.

V. stramineum L. Squaw Huckleberry. Common; woodland borders and open woods. 81.

V. vacillans Torrey. Low Blueberry. Common; mixed woods. 85.

Primulaceae

Anagallis arvensis L. Scarlet Pimpernel. Common; fields and roadsides. 195.

2 Lysimachia ciliata L. Fringed Loosestrife. Occasional; moist, open woods. 227.

2 L. lanceolata Walter var. lanceolata. Fringed Loosestrife. Occasional; low, open areas. 262.

L. quadrifolia L. Whorled Loosestrife. Common; open woods and right of ways. 144.

Ebenaceae

1 Diospyros virginiana L. Persimmon. Common; woodland borders. 12.

Symplocaceae

Symplocos tinctoria (L.) L'Her. Sweet Leaf. Occasional; open, wooded, flood plain. 490.

Oleaceae

Chionanthus virginicus L. Fringe-tree. Occasional; woods. 113.

Fraxinus americana L. American Ash. Common; wooded slopes and bottomland. 465, 497, 530.

1 Ligustrum sinense Lour. Privet. Common; hedgerows and roadsides. 142.

Loganiaceae

Polypremum procumbens L. Polypremum. Common; fields and open, disturbed areas. 206.

Gentianaceae

2 Bartonia virginica (L.) BSP. Occasional; low, open, disturbed areas.

Obolaria virginica L. Pennywort. Rare; wooded slopes. 495.

Apocynaceae

Apocynum cannabinum L. Indian Hemp. Common; open, disturbed areas and right of ways. 168.

2 Vinca major L. Greater Periwinkle. Occasional; old house sites. 69.

V. minor L. Periwinkle. Common; roadsides and old house sites. 21.

Asclepiadaceae

Asclepias amplexicaulis Smith. Clasping-leaved Milkweed. Common; roadsides and open, disturbed areas. 141.

A. incarnata L. ssp. pulchra (Willd.) Woodson. Hairy Swamp Milkweed. Common; wet pastures and fields. 268.

A. syriaca L. Common Milkweed. Common; fields and roadsides. 199.

A. tuberosa L. ssp. tuberosa. Butterfly Weed. Common; fields and roadsides. 198.

Convolvulaceae

- Cuscuta campestris Yuncker. Field Dodder. Common;
fields and woodland borders. 218.
- Ipomoea coccinea L. Small Red Morning Glory. Common;
roadsides and cultivated fields. 354.
- I. hederacea (L.) Jacquin. Ivy Leaved Morning Glory.
Abundant; roadsides and cultivated fields. 274.
- I. lacunosa L. Morning Glory. Abundant; roadsides
and cultivated fields. 338.
- I. pandurata (L.) G. F. W. Meyer. Wild Potato Vine.
Common; roadsides and fields. 239.
- I. purpurea (L.) Roth. Common Morning Glory. Abun-
dant; roadsides and cultivated fields. 559.

Polemoniaceae

- Phlox paniculata L. Summer Phlox. Rare; clearing in
mixed woods. 300.
- 2 P. subulata L. Moss Pink. Rare; sandy, open slope.
49.

Boraginaceae

- Lithospermum arvense L. Corn Gromwell. Common; culti-
vated fields. 57.

Verbenaceae

- Verbena urticifolia L. White Vervain. Common; pastur-
es and open roadsides. 243.

Phrymaceae

- 2 Phryma leptostachya L. Lop-seed. Common; moist, open

woods. 359.

Lamiaceae

- 2 Glechoma hederacea L. Ground Ivy. Common; open, cutover areas and yards. 47.
- Hedeoma pulegioides (L.) Persoon. Pennyroyal. Common; pastures and open woods. 292.
- Lamium amplexicaule L. Henbit. Abundant; fields and yards: 13.
- 2 L. purpureum L. Henbit. Common; fields and yards. 14.
- Lycopus virginicus L. Bugle-weed. Occasional; wet, open, wooded bottomland. 249.
- Monarda punctata L. Horse Mint. Occasional; open, mixed woods. 299.
- 2 Perilla frutescens (L.) Britton. Perilla. Common; woodland borders and roadsides. 378.
- Prunella vulgaris L. Heal-All. Common; roadsides and woodland borders. 291.
- Salvia lyrata L. Lyre-leaved Sage. Common; roadsides and woodland borders. 107.
- Satureja calamintha (L.) Scheele var. nepeta (L.) Briquet. Basil Thyme. Occasional; pastures and fencerows. 283.
- 2 Scutellaria elliptica Muhl. Skullcap. Occasional; moist, open woods. 192.
- S. integrifolia L. Skullcap. Common; wet, open woods. 312.
- S. lateriflora L. Skullcap. Common; wooded bottomland. 312.

2 Teucrium canadense L. Germander. Common; low, open woods. 223.

Trichostema dichostomum L. Blue Curls. Common; open, mixed woods and disturbed areas. 368.

Solanaceae

Datura stramonium L. Jimson Weed. Abundant; cultivated fields and pastures. 295.

2 Lycium halimifolium Miller. Matrimony Vine. Rare; old house site. 273.

Physalis pubescens L. var. grisea Waterfall. Ground Cherry. Occasional; cultivated fields. 342.

Solanum americanum Miller. Nightshade. Common; fields and open, disturbed areas. 164.

S. carolinense L. Horse Nettle. Abundant; fields and pastures. 156.

Scrophulariaceae

Agalinis purpurea (L.) Pennell. Gerardia. Common; open, disturbed areas and roadsides. 380.

Aureolaria virginica (L.) Pennell. Smooth False Foxglove. Common; open woods. 230.

1 Chelone glabra L. Turtleheads. Common; wet, open, wooded bottomland. 252, 285.

2 Gratiola pilosa Michaux. Hedge Hyssop. Occasional; low, open, disturbed areas. 236.

1 G. neglecta Torrey. Hedge Hyssop. Common; wet, open, wooded bottomland. 252, 285.

- 1 G. virginiana L. Hedge Hyssop. Common; wet, open, wooded bottomland. 286.
- Linaria canadensis (L.) Dumont. Toad Flax. Common; open, disturbed areas and roadsides. 74.
- 1,2 Lindernia dubia (L.) Pennell. False Pimpernel. Occasional; wet, open, wooded bottomland. 226.
- 2 Mimulus alatus Aiton. Monkey-flower. Occasional; wet, open, wooded bottomland. 287.
- Paulownia tomentosa (Thunberg) Steudel. Princess Tree. Occasional; woodland borders. 120.
- Penstemon laevigatus Solander ex Aiton. Smooth Beard-tongue. Occasional; open woods. 525.
- Verbascum blattaria L. Moth Mullein. Common; fields and pastures. 140.
- V. thapsus L. Mullein. Abundant; fields and pastures. 151.
- Veronica hederifolia L. Speedwell. Common; fields and yards. 16.
- V. officinalis L. Speedwell. Abundant, fields and yards. 138.
- V. peregrina L. Speedwell. Common; fields and yards. 44.
- 2 V. persica Polrot. Speedwell. Common; fields and yards. 19.

Bignoniaceae

- Campsis radicans (L.) Seeman. Trumpet Creeper. Abundant; fencerows and woodland borders. 165.

Catalpa speciosa Warder ex Engelm. Catawba Tree. Occasional; woodland borders. 457.

Orobanchaceae

Epifagus virginiana (L.) Barton. Beech-drops. Common; woods beneath Fagus grandifolia. 321.

Orobanche uniflora L. One-Flowered Cancer Root. Occasional; rich woods. 112.

Lentibulariaceae

2 Utricularia biflora Lam. Bladderwort. Occasional; shallow pools and marshes. 541.

Acanthaceae

Ruellia caroliniensis (Walter) Steudel. Hairy Ruellia. Occasional; roadsides and woodland borders. 194.

Plantaginaceae

Plantago aristata Michaux. Large Bracted Plantain. Common; fields and roadsides. 170.

P. lanceolata L. Narrow-leaved Plantain. Abundant; fields, yards and roadsides. 90.

P. rugelii Dcne. Broad-leaved Plantain. Common; fields and roadsides. 171.

P. virginica L. Dwarf Plantain. Common; cultivated fields and roadsides. 42.

Rubiaceae

Cephalanthus occidentalis L. Buttonbush. Common; wet hedgerows and woodland borders. 205.

1 Diodia teres Walter. Rough Buttonweed. Common; fields

and roadsides. 235.

D. virginiana L. Larger Buttonweed. Common; low fields and ditches. 221.

Galium aparine L. Bedstraw. Abundant; woods. 68.

G. circaezans Michx. Wild Liquorice. Occasional; woods. 162, 231.

2 G. obtusum Bigelow var. filifolium (Wiegand) Fernald. Bedstraw. Occasional; low woods. 224.

G. tinctorium L. Bedstraw. Occasional; wet woods. 266.

Houstonia caerulea L. Bluets. Abundant; fields, roadsides and woods. 23.

H. longifolia Gaertner. Narrow-leaved Houstonia. Occasional; wooded roadsides and right of ways. 306.

H. purpurea L. Large Houstonia. Occasional; open, wooded slopes. 193.

Mitchella repens L. Partridge Berry. Common; wooded slopes and bottomland. 389.

Caprifoliaceae

1 Lonicera japonica Thunb. Japanese Honeysuckle. Abundant; woods, open, disturbed areas and roadsides. 123.

Sambucus canadensis L. Elderberry. Common; low woods and hedgerows. 153.

Viburnum dentatum L. var. lucidum Aiton. Arrow-wood. Occasional; wet, open woods. 526.

V. nudum L. Larger Withe-rod. Occasional; low hedgerows and low, open woods. 333.

V. prunifolium L. Black Haw. Common; woodland borders and woods. 61.

Valerianaceae

Valerianella locusta (L.) Latterade. Corn Salad. Common; cultivated fields. 83.

Campanulaceae

2 Campanula americana L. Bluebell. Occasional; moist wooded slopes. 356.

Lobelia cardinalis L. Cardinal Flower. Occasional; stream banks and low woods. 255.

L. inflata L. Indian-tobacco. Common; fields and pastures. 293.

2 L. nuttallii R. & S. Lobelia. Common; low fields. 202.

L. puberula Michaux. Lobelia. Occasional; low fields and field borders. 340.

Specularia perfoliata (L.) A. DC. Venus' Looking-glass. Abundant; fields and roadsides. 126.

Asteraceae

Achillea millefolium L. Yarrow. Abundant; fields and roadsides. 124.

1 Ambrosia artemisiifolia L. Ragweed. Abundant; fields and roadsides. 362.

A. trifida L. Great Ragweed. Occasional; fields and roadsides. 386.

Antennaria plantaginifolia (L.) Richardson. Pussy-toes. Abundant; fields and open areas. 45.

- Anthemis arvensis L. Dog Fennel. Common; fields and roadsides. 88.
- Arctium minus (Hill) Bernh. Burdock. Common; pastures and barnyards. 238.
- Aster gracilis Nuttall. Slender Aster. Occasional; open, disturbed areas and right of ways. 265.
- A. paternus Cronquist. White-topped Aster. Common; open, disturbed areas and right of ways. 212, 263.
- A. undulatus L. Aster. Common; open, disturbed areas and roadsides. 391.
- Bidens bipinnata L. Spanish Needles. Common; fields and roadsides. 367.
- 2 B. polylepis Blake. Beggar Ticks. Common; low, open, disturbed areas. 259.
- B. tripartita L. Beggar Ticks. Common; low, open, disturbed areas. 347.
- Carduus lanceolatus L. Bull Thistle. Common; pastures and roadsides. 272.
- Centaurea cyanus L. Bachelor's Button. Common; fields and roadsides. 77.
- Chrysanthemum leucanthemum L. Ox-eye Daisy. Abundant; fields and roadsides. 125.
- Chrysogonum virginianum L. var. virginianum. Green-and-gold. Occasional; open roadsides and right of ways. 500.
- Cichorium intybus L. Chicory. Occasional; roadsides. 267.

- Coreopsis verticillata L. Whorled Tickseed. Common;
low, wooded roadsides and open, disturbed areas.
204.
- Eclipta alba (L.) Hasskarl. River-herb. Common; low
woods and fields. 374.
- Elephantopus carolinianus Willd. Elephant's-foot. Oc-
casional; open woods. 357.
- E. tomentosus L. Elephant's-foot. Occasional; wooded
right of ways. 309.
- Erechtites hieracifolia (L.) Raf. Fireweed. Abundant;
disturbed woods and open areas. 351.
- Erigeron canadensis L. var. canadensis. Horseweed.
Abundant; fields and roadsides. 261.
- E. strigosus Muhl. ex Willd. Daisy Fleabane. Common;
fields and open, disturbed areas. 178, 531.
- Eupatorium capillifolium (Lam.) Small. Dog Fennel.
Abundant; fields and pastures. 385.
- E. coelestinum L. Mistflower. Occasional; wooded road-
sides. 323.
- 2 E. fistulosum Barratt. Joe-pye-weed. Occasional; low
fields and marshes. 317.
- E. perfoliatum L. Boneset. Common; low fields and low,
open, disturbed areas. 365.
- E. pilosum Walter. Vervain Thoroughwort. Common; wet,
open, disturbed areas and woodland borders. 341.
- E. rotundifolium L. var. rotundifolium. Thoroughwort.
Common; roadsides and old fields. 331.

- E. rugosum Houttuyn. White Snakeroot. Occasional;
rich, open woods. 358.
- 2 E. sessilifolium L. var. vaseyi (Porter) Fernald &
Griscom. Thoroughwort. Occasional; wooded road-
sides. 316.
- Gnaphalium obtusifolium L. Rabbit Tobacco. Common;
fields and roadsides. 349.
- G. purpureum L. Purplish Cudweed. Common; fields and
roadsides. 187.
- Helianthus tuberosus L. Jerusalem Artichoke. Occasion-
al; field borders and roadsides. 377.
- Heterotheca graminifolia (Michaux) Shinnars. Grass-
leaved Golden Aster. Common; road banks and open
fields. 269.
- H. mariana (L.) Shinnars. Maryland Golden Aster. Common;
fields and roadsides. 381.
- Hieracium gronovii L. Hawkweed. Occasional; woods and
roadsides. 330.
- H. venosum L. Rattlesnake-weed. Occasional; woods. 139.
- Hypochoeris radicata L. Cat's Ear. Common; open, dis-
turbed areas and roadsides. 78.
- Krigia virginica (L.) Willd. Dwarf Dandelion. Common;
open, disturbed areas and cultivated fields. 48.
- Lactuca canadensis L. Wild Lettuce. Common; fields and
roadsides. 216.
- L. scariola L. Prickly Lettuce. Common; open, disturbed

areas and roadsides. 214.

Liatris squarrosa (L.) Michaux. Scaly Blazing Star. Occasional; open, disturbed areas and open woods. 240.

Mikania scandens (L.) Willd. Climbing Hempweed. Occasional; low, open, disturbed areas and low, open woods. 319.

Prenanthes altissima L. Rattlesnake-root. Common; low, open woods and wooded bottomland. 387.

P. serpentaria Pursh. Lion's foot. Occasional; field borders. 473.

Pyrrhopappus carolinianus (Walter) DC. False Dandelion. Common; fields and roadsides. 175.

Rudbeckia hirta L. Black-eyed Susan. Abundant; open, disturbed areas, fields and roadsides. 161.

Senecio smallii Britton. Small's Squaw-weed. Common; open, disturbed areas and roadsides. 130.

Silphium trifoliatum L. Rosin-weed. Occasional; open, wooded slopes. 184.

Solidago caesia L. Blue-stem Goldenrod. Common; open, wooded slopes. 371.

S. graminifolia (L.) Salisbury. Goldenrod. Occasional; open, disturbed areas. 392.

S. odora Aiton. Sweet-scented Goldenrod. Common; open, disturbed areas and pastures. 382.

S. rugosa Miller var. rugosa. Goldenrod. Common; open, disturbed areas and pastures. 383.

Taraxacum officinale Wiggers. Common Dandelion. Abundant;

yards, fields and roadsides. 20.

2 Verbesina alternifolia (L.) Britton ex Kearney. Wing-stem. Occasional; moist, open woods. 360.

Vernonia noveboracensis (L.) Michaux. Ironweed. Occasional; wet meadows and pastures. 549.

Xanthium strumarium L. var. glabratum (DC.) Cronquist. Cocklebur. Abundant; cultivated fields. 369.

DISCUSSION

A comparison of the results of this study with previous floristic surveys that included Hanover County indicates that a substantial number of new county records have been established. Approximately 85% (438) of the plants collected were not reported by Massey (1961). Thirty-three of these were not recorded as occurring in the fall line counties in Virginia (Table 6). Forty-one species (37%) of the 109 pteridophytes and monocotyledons that are reported in my study are not listed from Hanover County by Harvill et al. (1977) in their survey of Virginia pteridophytes and monocotyledons. Sixty-seven species of herbs and shrubs were not reported by Merriman (1930) in his keys to the flora (exclusive of grasses, sedges, rushes, and trees) of Richmond and eight surrounding counties. Comparing the results of this study with studies from New Kent County (Gillespie, 1970; Soltis, 1975), which adjoins southeastern Hanover County, more similarities than divergences occur. The extent of agreement among the studies seems to reflect the thoroughness of the coverage. Fifty-nine percent of the flora from Hanover County was reported for New Kent County by Gillespie (1970).

There is an even greater overlap of species (66%) between the current study and the study of Davis Pond-Goddins Pond Drainage System in New Kent County (Soltis, 1975).

A large colony of the rare herb, Panax trifolium (Dwarf Ginseng), previously reported from five Piedmont counties and two cities, was found in the rich, wooded bottom bordering a small tributary of Crump Creek. Porter (1979) considers this species to be especially vulnerable to logging operations and development, both of which are imminent to the study area.

The number of species in this study compares favorably with that reported in other floristic surveys by Gillespie (1970), Appler (1974), and Soltis (1975) on the Virginia Coastal Plain. However, the conspicuous absence of certain plants, e.g. Rubus occidentalis, Viola sagittata, and Crotalaria spectabilis and the recording of species not reported by Merriman (1930), Massey (1961), and Harvill et al. (1977) underscores the need for further study if the record is to be completed before the region is urbanized.

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Figure 1. Kersey-Crump Creek Watershed, Hanover County, Virginia.

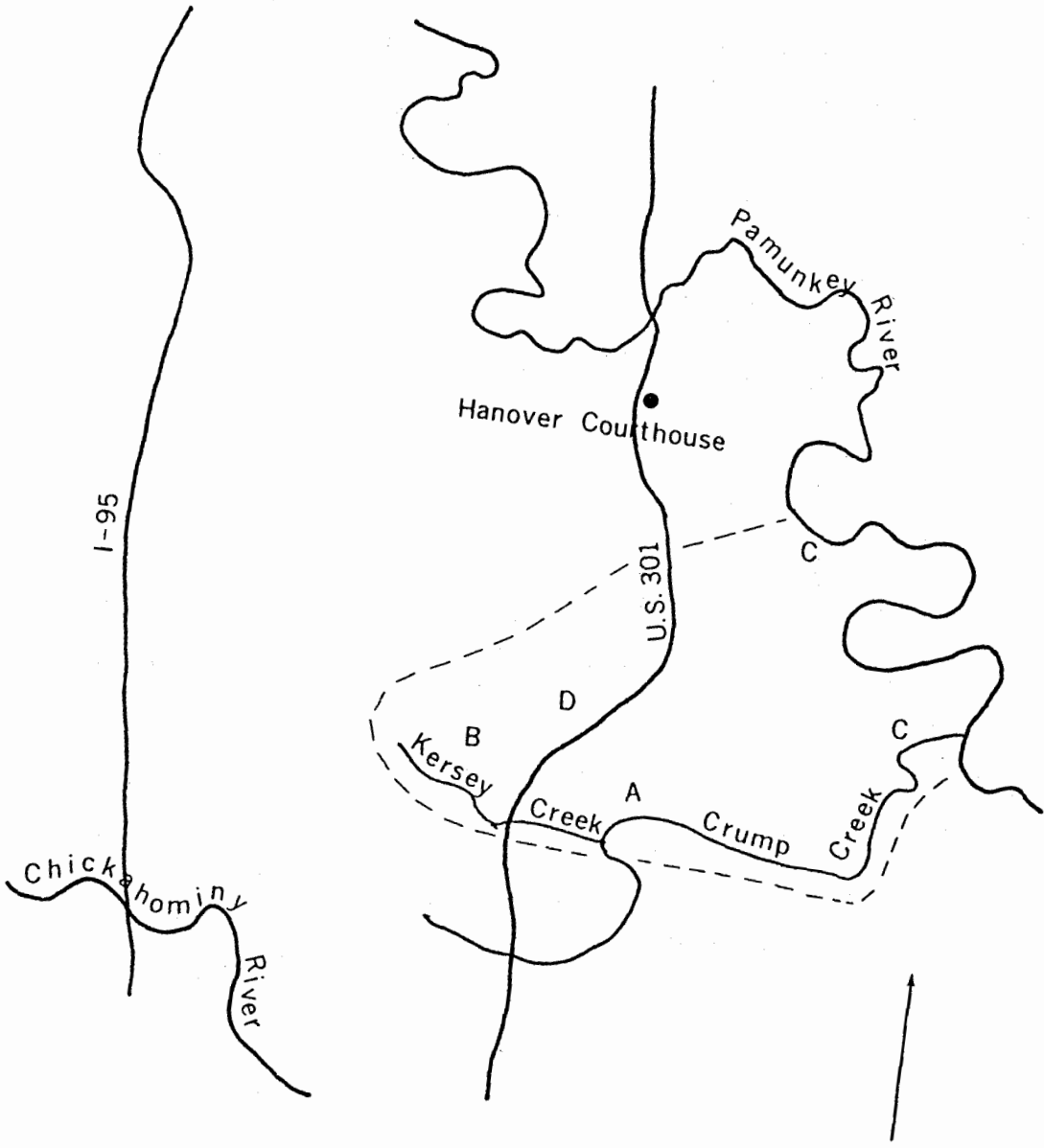
Study area outlined by dashes (- - -) approximates watershed boundary. I-95 designates the fall line.

A = wooded bottomland

B = wooded upland

C = freshwater marsh

D = open, disturbed land



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kilometer



Table 1. Climatological data, 1947-1969, for Hanover Co.,
Virginia, averaged from Crockett (1972).

Season	Temperature (C)		Precipitation (cm)
	Av. min.	Av. max.	Av.
Winter	-3.4	3.6	22.7
Spring	6.1	20.2	24.3
Summer	17.0	30.0	31.1
Fall	7.2	21.3	24.6

Table 2. Plants common to wooded bottomland in Kersey-Crump Creek watershed, Hanover Co., Virginia. Species in Dicotyledoneae are designated tree (T), shrub (S) or herb (H).

PTERIDOPHYTA	
<u>Botrychium virginianum</u>	<u>Thelypteris</u> spp.
<u>Onoclea sensibilis</u>	<u>Woodwardia areolata</u>
<u>Athyrium asplenoides</u>	
SPERMATOPHYTA	
ANGIOSPERMAE	
MONOCOTYLEDONEAE	
<u>Cinna arundinacea</u>	<u>Luzula</u> spp.
<u>Carex</u> spp.	<u>Polygonatum biflorum</u>
<u>Juncus</u> spp.	<u>Smilacina racemosum</u>
DICOTYLEDONEAE	
<u>Salix nigra</u> (T)	<u>Claytonia virginica</u> (H)
<u>Alnus serrulata</u> (S)	<u>Podophyllum peltatum</u> (H)
<u>Betula nigra</u> (T)	<u>Lindera benzoin</u> (S)
<u>Carpinus caroliniana</u> (T)	<u>Platanus occidentalis</u> (T)
<u>Fagus grandifolia</u> (T)	<u>Acer negundo</u> (T)
<u>Quercus falcata</u> (T)	<u>A. rubrum</u> (T)
<u>Q. michauxii</u> (T)	<u>Impatiens capensis</u> (H)
<u>Q. phellos</u> (T)	<u>Viola papilionacea</u> (H)
<u>Q. rubra</u> (T)	<u>Nyssa sylvatica</u> (T)
<u>Liriodendron tulipifera</u> (T)	<u>Galium</u> spp. (H)
<u>Liquidambar styraciflua</u> (T)	

Table 3. Plants common to wooded upland in Kersey-Crump Creek watershed, Hanover Co., Virginia. Species in Dicotyledoneae are designated tree (T), shrub (S), or herb (H).

PTERIDOPHYTA	
<u>Polystichum acrostichoides</u>	<u>Asplenium platyneuron</u>
SPERMATOPHYTA	
GYMNOSPERMAE	
<u>Pinus echinata</u>	<u>P. virginiana</u>
<u>P. taeda</u>	
ANGIOSPERMAE	
MONOCOTYLEDONEAE	
<u>Smilax rotundifolia</u>	<u>Poa</u> spp.
DICOTYLEDONEAE	
<u>Carya</u> spp. (T)	<u>Acer rubrum</u> (T)
<u>Fagus grandifolia</u> (T)	<u>Nyssa sylvatica</u> (T)
<u>Quercus alba</u> (T)	<u>Cornus florida</u> (T)
<u>Q. falcata</u> (T)	<u>Chimaphila maculata</u> (S)
<u>Hexastylis virginica</u> (H)	<u>Vaccinium</u> spp. (S)
<u>Stellaria media</u> (H)	<u>Gaylussacia</u> spp. (S)
<u>Liriodendron tulipifera</u> (T)	<u>Diospyros virginiana</u> (T)
<u>Liquidambar styraciflua</u> (T)	<u>Epifagus virginiana</u> (H)
<u>Amelanchier arborea</u> (S)	<u>Galium</u> spp. (H)
<u>Cercis canadensis</u> (S)	<u>Houstonia caerulea</u> (H)
<u>Oxalis</u> spp. (H)	<u>Mitchella repens</u> (H)
<u>Rhus radicans</u> (S)	<u>Lonicera japonica</u>
<u>Ilex opaca</u> (T)	<u>Viburnum prunifolium</u> (S)
<u>Euonymus americanus</u> (S)	

Table 4. Plants common to freshwater marshes in Kersey-Crump Creek watershed, Hanover Co., Virginia. All Dicotyledoneae are herbs.

SPERMATOPHYTA

ANGIOSPERMAE

MONOCOTYLEDONEAE

Typha latifolia

Cyperus ovularis

Sparganium americanum

Spirodela polyrrhiza

Sagittaria latifolia

Pontederia cordata

Dulichium arundinaceum

Heteranthera reniformis

Eleocharis obtusa

Juncus spp.

Carex spp.

DICOTYLEDONEAE

Saururus cernuus

Impatiens capensis

Nuphar luteum

Hibiscus moscheutos

Callitriche heterophylla

Table 5. Plants common to open, disturbed land in Kersey-Crump Creek watershed, Hanover Co., Virginia. Species in Dicotyledoneae are designated shrub (S), or herb (H).

PTERIDOPHYTA	
<u>Pteridium aquilinum</u>	<u>Asplenium platyneuron</u>
SPERMATOPHYTA	
GYMNOSPERMAE	
<u>Pinus taeda</u>	<u>Juniperus virginiana</u>
ANGIOSPERMAE	
MONOCOTYLEDONEAE	
<u>Andropogon virginicus</u>	<u>Poa pratensis</u>
<u>Cynodon dactylon</u>	<u>Setaria glauca</u>
<u>Dactylis glomerata</u>	<u>Tridens flavus</u>
<u>Digitaria sanguinalis</u>	<u>Juncus effusus</u>
<u>Eleusine indica</u>	<u>Allium vineale</u>
<u>Paspalum floridanum</u>	<u>Sisyrinchium angustifolium</u>
DICOTYLEDONEAE	
<u>Polygonum</u> spp. (H)	<u>Viola rafinesquii</u> (H)
<u>Rumex</u> spp. (H)	<u>Rhexia mariana</u> (H)
<u>Chenopodium album</u> (H)	<u>Ipomoea</u> spp. (H)
<u>Amaranthus hybridus</u> (H)	<u>Lamium amplexicaule</u> (H)
<u>Phytolacca americana</u> (H)	<u>Datura stramonium</u> (H)
<u>Mollugo verticillata</u> (H)	<u>Solanum carolinense</u> (H)
<u>Cerastium</u> spp. (H)	<u>Veronica</u> spp. (H)
<u>Scleranthus annuus</u> (H)	<u>Campsis radicans</u>
<u>Stellaria media</u> (H)	<u>Plantago</u> spp. (H)
<u>Ranunculus bulbosus</u> (H)	<u>Lonicera japonica</u>
<u>Sassafras albidum</u> (S)	<u>Achillea millefolium</u> (H)
<u>Barbarea</u> spp. (H)	<u>Ambrosia artemisiifolia</u> (H)
<u>Cardamine hirsuta</u> (H)	<u>Antennaria plantaginifolia</u> (H)
<u>Potentilla</u> spp. (H)	<u>Centaurea cyanus</u> (H)
<u>Cassia fasciculata</u> (H)	<u>Erigeron</u> spp. (H)
<u>Desmodium</u> spp. (H)	<u>Eupatorium capillifolium</u> (H)
<u>Lespedeza</u> spp. (H)	<u>Lactuca</u> spp. (H)
<u>Trifolium</u> spp. (H)	<u>Rudbeckia hirta</u> (H)
<u>Oxalis</u> spp. (H)	<u>Solidago</u> spp. (H)
<u>Geranium</u> spp. (H)	<u>Taraxacum officinale</u> (H)
<u>Rhus</u> spp. (S)	<u>Xanthium strumarium</u> (H)

Table 6. Plants identified from Kersey-Grump Creek watershed, Hanover Co., Virginia, 1978-80, not reported in fall line counties by Massey (1961). Species in Dicotyledoneae are designated tree (T), shrub (S), or herb (H).

PTERIDOPHYTA	
<u>Athyrium asplenoides</u>	
SPERMATOPHYTA	
ANGIOSPERMAE	
MONOCOTYLEDONEAE	
<u>Carex crinita</u>	<u>L. echinata</u>
<u>C. tribuloides</u>	<u>Dioscorea villosa</u>
<u>Juncus coriaceus</u>	<u>Habenaria cristata</u>
<u>Luzula acuminata</u>	
DICOTYLEDONEAE	
<u>Carpinus caroliniana</u> (T)	<u>Hydrocotyle umbellata</u> (H)
<u>Quercus nigra</u> (T)	<u>Nyssa sylvatica</u> (T)
<u>Broussonetia papyrifera</u> (T)	<u>Oxydendrum arboreum</u> (T)
<u>Celtis occidentalis</u> (T)	<u>Symplocos tinctoria</u> (S)
<u>Maclura pomifera</u> (T)	<u>Phlox paniculata</u> (H)
<u>Morus rubra</u> (T)	<u>Monarda punctata</u> (H)
<u>Desmodium obtusum</u> (H)	<u>Solanum americanum</u> (H)
<u>Gleditsia triacanthos</u> (T)	<u>Veronica peregrina</u> (H)
<u>Malva moschata</u> (H)	<u>Viburnum dentatum</u> (S)
<u>Sida rhombifolia</u> (H)	<u>Campanula americana</u> (H)
<u>Hypericum stragalum</u> (H)	<u>Achillea millefolium</u> (H)
<u>Aralia spinosa</u> (S)	<u>Bidens polylepis</u> (H)
<u>Panax trifolium</u> (H)	

VITA

Eddie Reeves Smith was born in Hanover, Virginia on March 9, 1954. He attended public school in Hanover County, and graduated from Lee-Davis High School in 1972. After attending Randolph-Macon College for four years, he received a B.S. in biology in 1976. In the fall of that year he was admitted to the Graduate School of the University of Richmond as a candidate for a M.S. degree in biology, which he received in May 1981. He was granted two Graduate Service Fellowships while attending the University. He assisted in classes for general biology and plant systematics. He has been employed as a science teacher by the Hanover Public Schools since 1978.