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ROAD LOG OF THE GEOLOGY FROM MADISON TO CUMBERLAND COUNTIES IN THE PIEDMONT, CENTRAL VIRGINIA

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This road log and discussion of the geology has been prepared for a field trip starting at Zeus on Robinson River, Madison County and ending near Carysbrook, on Rivanna River in Fluvanna County. It is a guide to important geologic features in central Virginia along or near the public roads in parts of Albemarle, Culpeper, Cumberland, Fluvanna, Goochland, Louisa, Madison, and Orange counties (Figure 1). The geology of approximately 960 square miles (2,486 sq km) in the Piedmont physiographic province was mapped in reconnaissance using aeromagnetic, aeroradioactivity, regional gravity, and topographic maps, high-altitude photographs, and LANDSAT (formerly ERTS) imagery as aids in interpreting the geology.

Thanks are extended to V. M. Seiders, U.S. Geological Survey, for making available radiometric dates on igneous rocks that intrude the Quantico Slate and to R. S. Good, Virginia Division of Mineral Resources, for data from current research on the gold-pyrite belt of Virginia.

Suggested road stops are located on both public and private property. *Permission should always be obtained before entering private property, as failure to do so violates trespass laws and is punishable under law.* The user of this road log should keep in mind that automobile odometers vary in accuracy.

GEOLOGIC SETTING

The extreme northwestern part of the area covered by the road log (Figure 2) contains Precambrian rocks in the core of the Blue Ridge anticlinorium. A porphyroblastic gneiss similar to the Marshall Formation is present in the extreme northwestern part of the quadrangle. Most of the feldspars in the gneiss are partially altered to sericite. The major rock type in the anticlinorium, however, is a biotite augen gneiss (Lovingston Formation?). In the north-central part of the quadrangle this unit contains a banded biotite gneiss probably of igneous origin. The biotite augen gneiss has been intruded by the relatively undeformed Robertson River Formation which consists of coarse-grained biotite granite and medium- to coarse-grained, generally porphyritic hornblende-quartz monzonite-syenite. Greenschist facies conglomeratic clastic rocks and chlorite phyllites of the Mechum River Formation occur in the northwestern part of the quadrangle and probably unconformably overlie the sericitized porphyroblastic gneiss to the northwest and are in fault contact with the Robertson River Formation to the southeast.

To the southeast the biotite augen gneiss is unconformably overlain by the Lynchburg Formation. The

Lynchburg is predominantly mica paragneiss (metamorphosed graywacke), which locally is graphitic. Conglomerate and granule metagraywacke are interlayered with the gneiss. The Lynchburg has been intruded by metapyroxenites.

Discontinuous arkosic and felsic metavolcanic beds of the Swift Run Formation (?) unconformably (?) overlie the Lynchburg Formation. Overlying these beds is the Catoctin Formation which consists of subaerially deposited metabasalt flows (Reed, 1955) and a minor amount of interlayered metasedimentary rocks. Basal units of the Catoctin have been dated by Rankin and others (1969) at 820 million years old.

The Catoctin Formation contains minor metasedimentary interlayers near the top of the unit, which contain much volcanic material derived from the Catoctin and are of fluvial (?) origin. The formation is overlain by water-laid, hematite-rich chlorite phyllite containing quartzite and metavolcanic beds that are correlated with the Candler Formation by Brown (1953). An unconformable relationship is suggested between the subaerially deposited Catoctin and the water-laid Candler Formation. Near its base, the Candler contains two discontinuous bands of pink and white marble and rather continuous bands of fissile, gray marble named the Everona Limestone by Jonas (1927). A synclinal infold of Candler has been mapped in the strike belt of the Catoctin Formation to the northwest of the main band of Candler. This structure has been traced to the southwest into the main band of Candler. Metamorphic grade gradually increases to the southeast, across the broad Candler outcrop belt; the garnet isograd approximately corresponds with its southeastern contact.

The Candler grades upward into a sequence of metavolcanic and metasedimentary rocks correlated by Pavildes and others (1974) with the Chopawamsic Formation of northern Virginia that is probably equivalent to the Charlotte belt rocks of Tobisch and Glover (1969) in the south-central Piedmont of Virginia. The Chopawamsic, as mapped in this area, is composed of a lower, clastic metasedimentary sequence that grades upward into a metavolcanic sequence. Interlayered with the lower unit along Ballinger Creek in the extreme northwest part of the Columbia 7.5-minute quadrangle are two bands of rocks that resemble the underlying Candler Formation, suggesting anticlinal structures.

The Candler-Chopawamsic sequence has been intruded by plutons of the coarse porphyritic Ellisville Granodiorite of Hopkins (1960) and Dissertation Abstracts (1961), diorite-gabbro, and the gabbro at Green Springs that contains leucogranite along its eastern border.

The Chopawamsic is overlain by graphite-staurolite-garnet-mica schist in the Columbia syncline, which is overlain by a sequence of metasiltstones and metavolcanics (?) in the core of the syncline. These metasiltstones and metavolcanics (?) are correlated with rocks of the Arvonia syncline (Smith, Milici, and Greenberg, 1964).

With increasing metamorphic grade to the southeast, rocks along the southeastern limb of the Columbia syncline and those of the Chopawamsic Formation around the nose of the structure are here interpreted to have been transformed by high-rank metamorphism into a sequence of rocks named the Hatcher Complex (Brown, 1969). The major rock type in the complex is a banded biotite gneiss. The Columbia Granite, the second most common rock unit of the complex, is traceable into biotite gneiss through a gradational contact, suggesting that the Columbia might be highly metamorphosed felsic volcanic rock that has been partially melted rather than an intrusive pluton. It has been dated at 575 million years old (Fullagar, 1971). Other rock types in the complex are amphibolite, amphibole gneiss, garnet-mica schist, and varying amounts of granitic material including foliated alaskites.

The northeastern nose of the Arvonia syncline, containing dark-gray slate and metasiltstone, is located along the southwestern border of the Columbia 7.5-minute quadrangle. These rocks contain Ordovician fossils (Stose and Stose, 1948) and overlie the Chopawamsic Formation and Ellisville Granodiorite. An unconformity has been proposed by Stose and Stose (1948) and Brown (1969) at the base of the Arvonia slate. Watson and Powell (1911) suggested a correlation among the rocks of the Arvonia, Columbia, and Quantico synclines. Based on magnetics, Pavlides and others (1974) show a continuous band of metavolcanic rocks flanking both the Quantico Slate and the graphite-staurolite-garnet-mica schist. Because of these continuous magnetic trends from the Quantico syncline into the Columbia syncline and the facts that the Quantico Slate and the staurolite-garnet-mica schist are similar rock types, hold similar stratigraphic position over the metavolcanic rocks of the Chopawamsic Formation, and are on strike with each other suggest equivalence. A quartz monzonite cutting the Quantico Slate has been dated at 560 million years old by Seiders and others (1975), thus suggesting a minimum age for the Quantico Slate. The Arvonia slate is Ordovician (440 ± 10 to 500 ± 15 million years old).

Faults have divided the Culpeper Triassic basin into two segments. Each segment is contained in the Lynchburg and Catoctin formations and has a border fault on its northwestern side. Lesser northeastward-trending faults also occur. Triassic rocks contain mixed sediments, in part of volcanic origin; felsic and mafic volcanic rocks; conglomerates with mafic volcanic rocks, in part derived from the Catoctin; and red shale. Diabase dikes and sills occur in the Triassic basin and diabase dikes are common in most of the mapped area, but none are shown in Figure 2 due to the small map scale.

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ROAD LOG

Cumulative Mileage	*Distance*	*Explanation*
0.0	0.0	Begin road log at the junction of U.S. Highway 29 and State Road 603 at Zeus, Madison County. Proceed northward on State Road 603.
0.4	0.4	Junction of State Road 603 and quarry access road leading westward; park cars and walk to quarry.
0.5	0.1	**STOP 1.** Exposures of Robertson River Formation in abandoned quarry; highly sheared hornblende-quartz monzonite cut by a mafic dike (Catoctin feeder dike?).
0.6	0.1	Return to cars and proceed northward on State road 603.
4.4	3.8	Haywood Post Office; junction of State Roads 603 and 609. Turn eastward (right) on State Road 609.
4.6	0.2	Junction of State Roads 609 and 603. Turn northward (left) on State Road 603.
7.3	2.7	**STOP 2.** Exposure of sericitized porphyritic gneiss (Marshall Formation?) in roadcut.
10.0	2.7	Turn around and return to junction of State Roads 603 and 609. Turn eastward (left) on State Road 609.
11.5	1.5	**STOP 3.** Exposure of Robertson River Formation; hornblende syenite (?). Turn around and proceed westward to State Road 606.

Cumulative Mileage	*Distance*	*Explanation*
12.6	1.1	Turn northward (right) on State Road 606.
13.5	0.9	**STOP 4.** Exposure of Robertson River Formation; coarse biotite granite. Continue on State Road 606.
14.6	1.1	**STOP 5.** Park at junction of State Road 606 and private drive leading northward. Exposure of granule conglomerate in Mechum River Formation is found a short distance to the north in private drive; exposure of granule conglomerate in Mechum River Formation and of granite in the Robertson River Formation are located in roadcut 0.1 mile to the east on State Road 606. Continue eastward on State Road 606.
15.9	1.3	Junction of State Roads 606 and 604; turn northward (left) on State Road 604.
17.0	1.1	**STOP 6.** Junction of State Road 604 from the northwest. Exposure of phyllite in Mechum River Formation; turn around and return to State Road 606.
18.1	1.1	Turn eastward (left) on State Road 606.
19.8	2.7	Junction of State Roads 606 and 607. Turn southeastward (right) on State Road 607.
22.0	2.2	Intersection of State Roads 607 and 609. Turn eastward (left) on State Road 609.
22.4	2.4	Junction of State Road 609 and U.S. Highway 29. Turn northward (left) on U.S. Highway 29.
22.9	0.5	Junction of U.S. Highway 29 and State Road 633. Turn northward (left) on State Road 633.
23.2	0.3	Junction of State Roads 633 and 644. Proceed left on State Road 644.
23.9	0.7	**STOP 7.** Exposures of biotite orthogneiss. Turn around and proceed southward on State Road 644.
24.6	0.7	Junction of State Roads 644 and 633. Proceed right on State Road 633.
24.9	0.3	Intersection of State Road 633 and U.S. Highway 29. Turn right on U.S. Highway 29.
26.9	2.0	Intersection of U.S. Highway 29 and State Road 631 at Leon. Turn southeastward (left) on State Road 631.
27.9	1.0	**STOP 8. Exposures of Lynchburg Formation; basal graywacke and conglomerate containing** phyllite chips; continue southward on State Road 631.
29.3	1.4	Junction of State Roads 631 and 630; turn westward (right) on State Road 630.
30.0	0.7	**STOP 9.** Ultramafic rocks, probably metamorphosed pyroxenite intruding the Lynchburg Formation; continue westward on State Road 630.
31.1	1.1	Junction of State Roads 630 and 632. Turn southward (left) on State Road 632.
33.9	2.8	Junction of State Roads 632 and 634 at Oak Park. Turn eastward (left) on State Road 634.
36.8	2.9	Junction of State Road 634 and U.S. Highway 15. Turn northeastward (left) on U.S. Highway 15.
38.3	1.5	Intersection of U.S. Highway 15 and State Road 721. Turn southeastward (right) on State Road 721.
39.0	0.7	**STOP 10.** Triassic lithic conglomerate; continue southeastward on State Road 721.
39.4	0.4	**STOP 11.** Triassic volcanic agglomerate and conglomerate. Turn around and return to U.S. Highway 15.
40.5	1.1	Turn northward (right) on U.S. Highway 15.

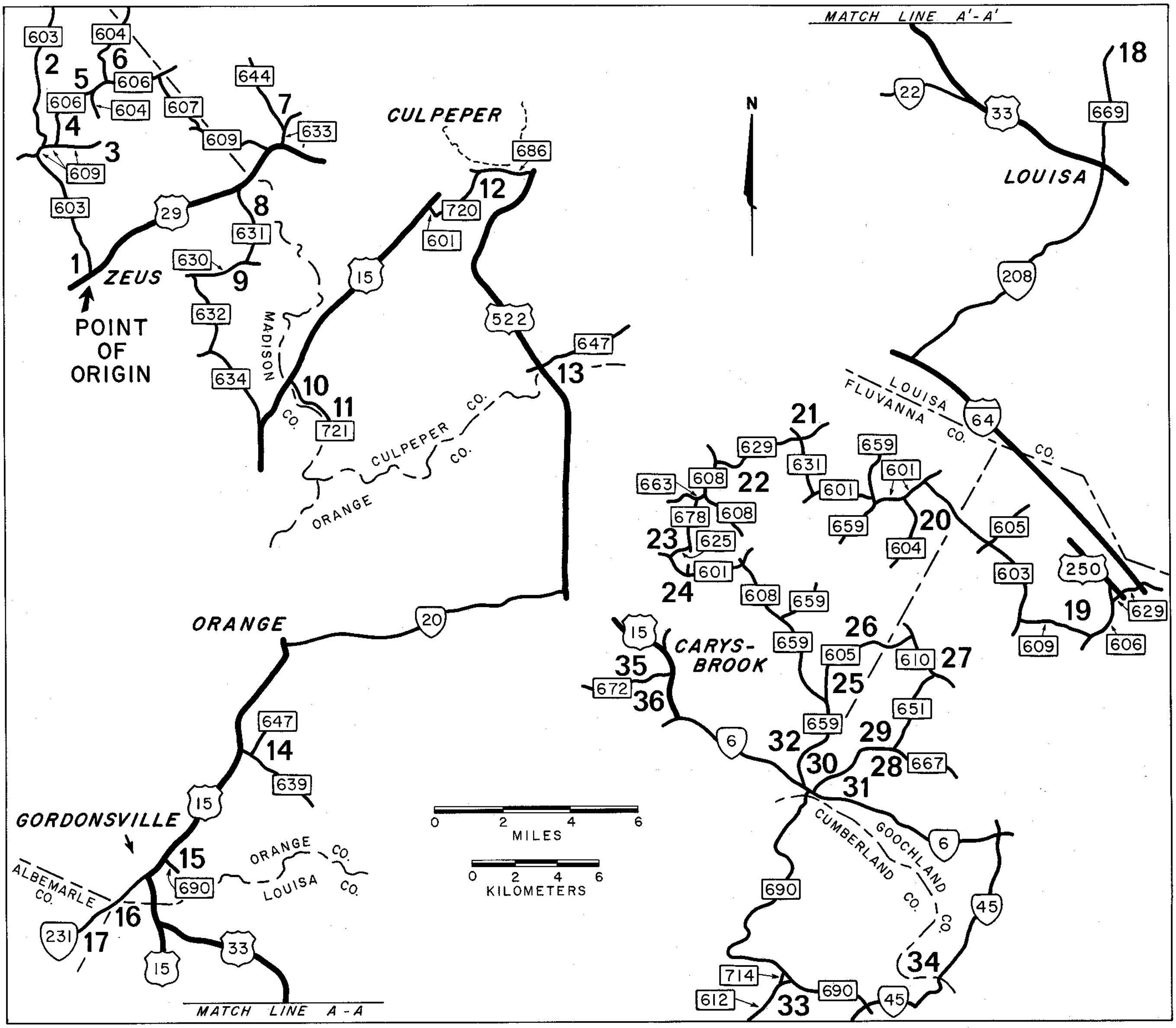


Figure 1. Road-log route from Madison to Cumberland counties, Virginia.

Cumulative Mileage	*Distance*	*Explanation*
47.6	7.1	Intersection U.S. Highway 15 and State Road 601. Turn southeastward (right) on State Road 601.
47.9	0.3	Junction of State Roads 601 and 720. Turn northeastward (left) on State Road 720.
49.9	2.0	Junction of State Roads 720 and 686.
		STOP 12. Triassic lithic fanglomerate (?) and conglomerate, some lithic pebbles could be derived from the Catoctin Formation. Turn eastward (right) on State Road 686.
51.5	1.6	Intersection of State Road 686 and U.S. Highway 522. Turn southward (right) on U.S. Highway 522.

EXPLA

Triassic rocks

M, mixed volcanic and sedimentary rocks; N, conglomerate with mafic volcanic rocks; O, red shale; P, diabase dikes and sills.

Arvonia Formation

Graphitic slate and metasiltstone.

Hatcher Complex

K, predominantly biotite gneiss; L, Columbia Granite.

Columbia syncline rocks

Graphite-staurolite-garnet-mica schist overlain by metasiltstone and metavolcanic (?) rocks.

Intrusive rocks

H, Ellisville Granodiorite; I, Green Springs intrusive, hornblende gabbro; J, leucogranite.

Chopawamsic Formation

Felsic and mafic metavolcanic rocks; interlayered quartzite and metasiltstone.

Candler Formation

Predominantly phyllite; lesser quartzite, marble, volcanic rocks, and Everona Limestone.

Catoctin and Swift Run formations

Catoctin: metabasalt with interlayered metasedimentary rocks. Swift Run: arkosic, felsic metavolcanic be

Figure 2. Major rock units, Madison to Cumberland counties, Virginia.

ATION

PRECAMBRIAN

Lynchburg Formation

F, graywacke and graywacke conglomerate; G, mica paragneiss, locally graphitic.

Mechum River Formation

Phyllite and conglomeratic clastic rocks.

Robertson River Formation

D, biotite granite; E, hornblende quartz monzonite - syenite.

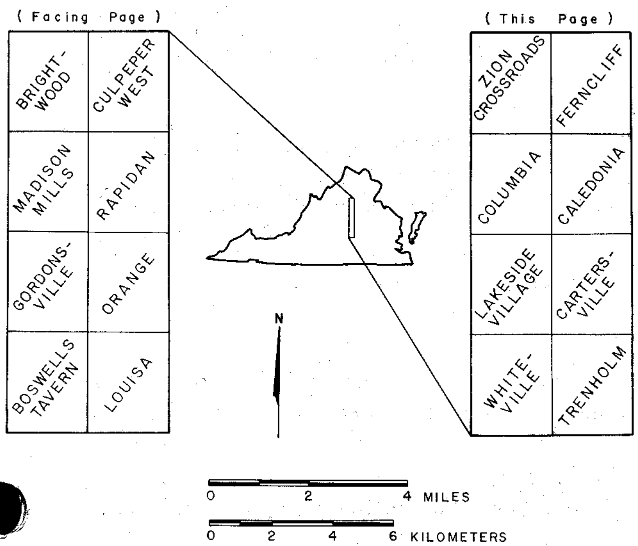
Blue Ridge anticlinorium rocks

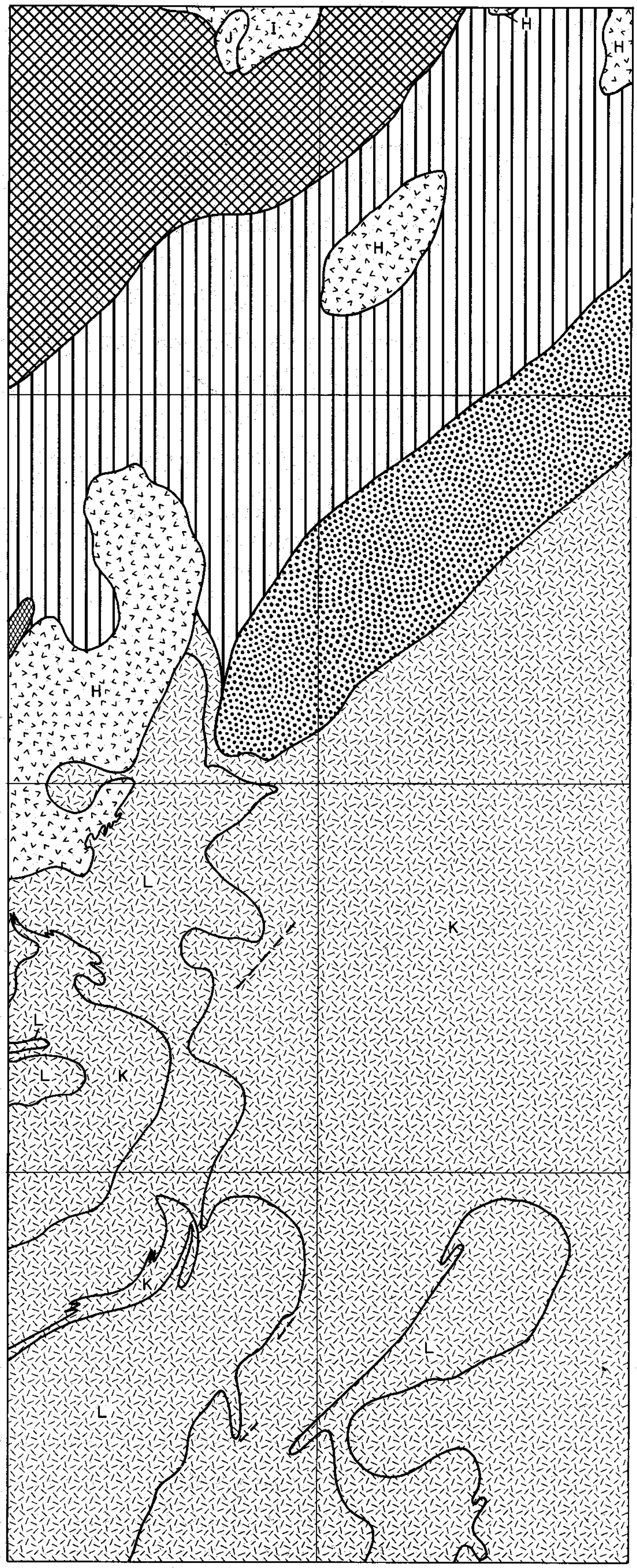
A, porphyroblastic gneiss; B, biotite augen gneiss; C, banded biotite gneiss.

Contacts: exposed, approximate, covered, and inferred categories

Faults: exposed, approximate, covered, and inferred categories; U, upthrown side; D, downthrown side

Silicified mylonite





Cumulative Mileage	*Distance*	*Explanation*
58.9	7.4	Intersection of U.S. Highway 522 and State Road 647. Turn eastward (left) on State Road 647.
59.1	0.2	**STOP 13.** Triassic mafic lava flows. Park and walk to abandoned quarry to the southeast. Turn around and return to U.S. Highway 522.
59.3	0.2	Turn southward (left) on U.S. Highway 522 and continue to intersection with State Highway 20 at Unionville.
66.4	7.1	Turn westward (right) on State Highway 20.
76.4	10.0	Junction of State Highway 20 (By-pass) and U.S. Highway 15 in Orange. Turn southward (left) on U.S. Highway 15.
80.2	3.8	Intersection of U.S. Highway 15 and State Road 639. Turn eastward (left) on State Road 639.
80.4	0.2	Junction of State Roads 639 and 647. Turn northward (left) on State Road 647.
80.5	0.1	**STOP 14.** Catoctin Formation; metabasalt and thin interlayered clastic beds exposed in abandoned quarry to the west and Candler Formation crops out along State Road 647. Bed of pink marble in Candler Formation exposed in abandoned quarry to the east of State Road 647. Turn around and return to U.S. Highway 15.
80.8	0.3	Turn southward (left) on U.S. Highway 15.
84.9	4.1	Junction of U.S. Highway 15 and State Road 690. Turn southeastward (left) on State Road 690.
85.3	0.4	**STOP 15.** Everona Limestone, in stream on west side of railroad. Turn around and return to U.S. Highway 15.
85.7	0.4	Turn southwestward (left) on U.S. Highway 15.
86.4	0.7	Traffic circle at Gordonsville; intersection of U.S. Highways 15 and 33 with State Highway 231; proceed through circle on State Highway 231 to the southwest.
87.8	1.4	**STOP 16.** Catoctin Formation; lithic tuff interbedded in metabasalt near the top of the unit; continue westward on State Highway 231.
88.8	1.0	**STOP 17.** Marble at base of Candler Formation in bed of Howards Creek; Candler phyllite can be seen in exposure along the creek to the east. Turn around and return to traffic circle at Gordonsville.
91.2	2.4	Turn southward (right) on U.S. Highways 15 and 33 and proceed through Gordonsville.
92.7	1.5	Turn southeastward (left) on U.S. Highway 33 to Louisa.
101.0	8.3	Junction of U.S. Highway 33 and State Highway 22; turn southeastward (left) to Louisa.
105.5	4.5	Junction of U.S. Highway 33 and State Highway 22 with State Road 669. Turn northward (left) on State Road 669.
108.7	3.2	**STOP 18.** Ellisville Granodiorite. Turn around and return to Louisa.
111.9	3.2	Turn eastward (left) on U.S. Highways 33 and 22.
112.1	0.2	Junction of U.S. Highway 33 and State Highway 22 with State Highway 208. Turn southward (right) on State Highway 208 and proceed to its intersection with Interstate Highway 64.
121.2	9.1	Turn southeastward (left) on Interstate Highway 64.
131.2	10.0	Intersection of Interstate Highway 64 and State Road 629 at Hadensville. Turn southwestward (right) on State Road 629.

Cumulative Mileage	*Distance*	*Explanation*
131.9	0.7	Intersection of U.S. Highway 250 and State Road 629. Turn northwestward (right) on U.S. Highway 250 and then turn to the southwest (left) on State Road 629 (less than 0.05 mile).
132.1	0.2	Junction of State Roads 629 and 606. Turn southward (left) on State Road 606.
133.7	1.6	Junction of State Roads 606 and 609. Turn westward (right) on State Road 609.
134.9	1.2	**STOP 19.** Alaskite in Hatcher Complex located at edge of field north of road. Continue on State Road 609.
136.2	1.3	Junction of State Roads 609 and 603. Turn northward (right) on State Road 603.
139.0	2.8	Intersection of State Roads 603 and 605 at Tabscott; continue westward on State Road 603.
142.0	3.0	Junction of State Roads 603 and 601. Turn to the south (left) on State Road 601.
142.8	0.8	Junction of State Roads 601 and 604. Turn southeastward (left) on State Road 604.
143.2	0.4	**STOP 20.** Chopawamsic Formation, hornblende dacite ("chicken track texture"). Turn around and return to State Road 601.
143.6	0.4	Turn westward (left) on State Road 601.
144.5	0.9	Junction of State Roads 601 and 659 at Kents Store. Turn northward (right) on State Road 659.
144.6	0.1	Junction of State Roads 659 and 601. Turn westward (left) on State Road 601.
146.6	2.0	Junction of State Roads 601 and 631. Turn northward (right) on State Road 631.
148.6	2.0	Intersection of State Roads 631 and 629. Turn eastward (right) on State Road 629.
148.8	0.2	**STOP 21.** Chopawamsic Formation; amygdaloidal greenstone in bed of Middle Fork Creek. Turn around and proceed westward on State Road 629.
151.2	2.4	**STOP 22.** Quartzite. Continue westward on State Road 629.
152.2	1.0	Junction of State Roads 629 and 608. Turn southward (left) on State Road 608.
153.3	1.1	Junction of State Roads 608 and 663 at Yanceys Store. Turn southwestward (right) on State Road 663.
153.6	0.3	Junction of State Roads 663 and 678. Turn southward (left) on State Road 678.
155.2	1.6	Junction of State Roads 678 and 625. Turn westward (right) on State Road 625.
155.3	0.1	**STOP 23.** Candler phyllite. Continue on State Road 625.
155.9	0.6	Junction of State Roads 625 and 601. Turn southeastward (left) on State Road 601.
157.0	1.1	**STOP 24.** Chopawamsic Formation (?); metasiltstone and mudstone in clastic member. Continue on State Road 601.
158.6	1.6	Intersection of State Roads 601 and 608 in Wilmington. Turn southeastward (right) on State Road 608.
160.7	2.1	Junction of State Roads 608 and 659 at Shepherds Store; continue southward on State Road 659.
163.9	3.2	Junction of State Roads 659 and 605 at Stage Junction. Turn northward (left) on State Road 605.
164.8	0.9	**STOP 25.** Amphibolite, probably metatuff in Chopawamsic Formation.
166.2	1.4	**STOP 26.** Graphitic staurolite-garnet schist.

Cumulative Mileage	Distance	Explanation
168.3	2.1	Intersection of State Roads 605 and 610 at Caledonia. Turn southward (right) on State Road 610.
169.8	1.5	**STOP 27.** Kyanitic garnetiferous quartzite on southwest limb of the Columbia syncline at junction of State Roads 610 and 651. Turn southwestward (right) on State Road 651.
172.7	2.9	Junction of State Roads 651 and 667; turn westward (right) on State Road 667.
173.0	0.3	**STOP 28.** Biotite paragneiss in the Hatcher Complex.
173.8	0.8	**STOP 29.** Finely layered garnetiferous amphibole gneiss derived from mafic tuff(?).
174.9	1.1	**STOP 30.** Amphibolite in Hatcher Complex; probably a mafic metavolcanic rock.
176.0	1.1	Intersection of State Roads 667, 690, and 1108 in Columbia. Turn southward (left) on State Road 690.
176.1	0.1	Intersection of State Road 690 and State Highway 6 in Columbia. Turn eastward (left) on State Highway 6.
176.2	0.1	**STOP 31.** Columbia granite (type locality at Columbia). Turn around and proceed westward on State Highway 6.
176.6	0.4	Junction of State Highway 6 and State Road 659. Turn northward (right) on State Road 659.
178.4	1.8	**STOP 32.** Garnetiferous quartzite at the base(?) of the staurolite-garnet schist on the northwestern limb of the Columbia syncline. Turn around and return to State Highway 6.
180.2	1.8	Turn eastward (left) on State Highway 6.
180.4	0.2	Intersection of State Highway 6 and State Road 690. Turn southward (right) on State Road 690.
189.4	9.0	Junction of State Roads 690 and 714 at Lakeside Village Post Office. Turn southward (right) on State Road 714.
189.6	0.2	Junction of State Roads 714 and 612; proceed on State Road 612 to dam at Trice Lake.
		STOP 33. Amphibolite gneiss interlayered with amphibolite and biotite gneiss in the Hatcher Complex. Turn around and return to State Road 690. Turn eastward (right) on State Road 690.
192.7	3.1	Junction of State Road 690 and State Highway 45 at Hamilton. Turn northeastward (left) on State Highway 45.
195.9	3.2	**STOP 34.** Garnetiferous biotite gneiss in the Hatcher Complex at Pemberton. Park on right south of railroad; view gneiss riprap on left from excavation to west. Walk north across railroad to exposure in cut on the east side of the road (right). Continue northward on State Highway 45.
201.0	5.1	Junction of State Highways 45 and 6. Turn westward (left) on State Highway 6.
212.4	11.4	Junction of State Highway 6 and U.S. Highway 15 at Dixie. Turn northward (right) on U.S. Highway 15.
214.0	1.6	Junction of U.S. Highway 15 and State Road 672 just north of Carys Creek Wayside. Turn westward (left) on State Road 672.
214.1	0.1	**STOP 35.** Felsic metavolcanic rock at contact(?) between slate of the Arvonia Formation and the Chopawamsic Formation.
214.3	0.2	**STOP 36.** Arvonia Formation; slate.

END OF ROAD LOG

NEW TOPOGRAPHIC MAPS AND PRODUCTS*

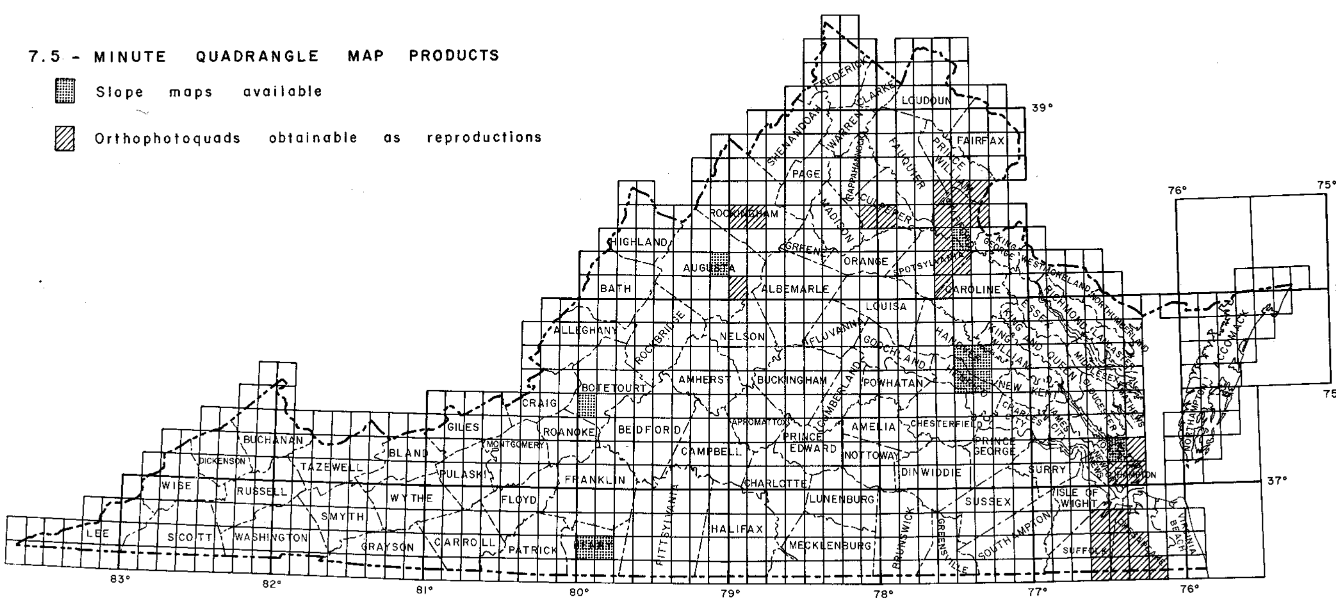
New editions of four different maps showing the entire Commonwealth are now available. These are particularly useful to those interested in political subdivisions, public recreation areas, drainage basins, transportation routes, and terrain of Virginia.

(1) A base map at the scale of 1:500,000 (1 map inch represents 8 miles) shows in black and blue the county and city names and boundaries, railroads, rivers, and lakes. The map is 30 x 64 inches and sells for $1.56. (2) A reduced 16 x 32 inch black and white version of this map at 1:1,000,000 (1 map inch represents 16 miles on the land) can be purchased for $1.04. (3) A multicolor topographic edition depicts the height and configuration of the land surface by contours. State and Federal parks, forests, and some wildlife refuges; roads and railroads; urbanized areas; county and city boundaries and names; and rivers and lakes are shown. This map is at the scale of 1:500,000, measures 30 x 64 inches, and sells for $2.08. (4) The multicolor shaded-relief edition highlights the major physiographic features of the State. Roads, railroads, rivers, lakes, State and Federal parks, forest and some wildlife refuge outlines, city and county boundaries and names, and contours are shown. The map is at a scale of 1:500,000, is 30 x 64 inches, and sells for $1.50.

By means of a pilot program to demonstrate the latest in the map-makers products and to obtain user need, selected slope maps and orthophotoquads are now available. Slope maps are especially useful in planning for construction projects, land-use suitability, and as another means of portraying and quantifying the inclination of the land surface. Selected percentage categories are shown by black and gray patterns. The following 1:24,000-scale slope maps that are portrayed on a topographic base can be purchased from the Division for $0.78 each: Daleville, Fredericksburg, Martinsville East, Martinsville West, Poquoson West, Richmond, Seven Pines, Staunton, Studley, and Yellow Tavern. A Stafford County slope map at the scale of 1:50,000 on which slope categories are shown on a planimetric base can be obtained for $0.78 each. Twenty-eight additional orthophotoquads can now be obtained as reproductions (see map on this page for locations). Orthophotoquads are rectified aerial photographic depictions within a standard 1:24,000-scale quadrangle format on which scale measurements can be made. Orthophotoquads are very useful for differentiation of coniferous and deciduous tree types, and for interpretation of land-use and location of individual properties. Reproductions are available either as a continuous tone print on photographic paper for $5.00 each or as a diazo (ozalid) print for $2.00 each. These are currently available *only* from Eastern Mapping Center, Topographic Division, U.S. Geological Survey, Reston, VA 22092.

A listing of map products available and in progress can be obtained on request to the Division of Mineral Resources. Please note that to defray postage and handling charges that if unfolded maps are wanted an extra charge of $2.00 is required for orders totaling 10 or fewer maps.

*All prices include 4 percent State sales tax when required.



Virginia Division of Mineral Resources
Box 3667
Charlottesville, VA 22903

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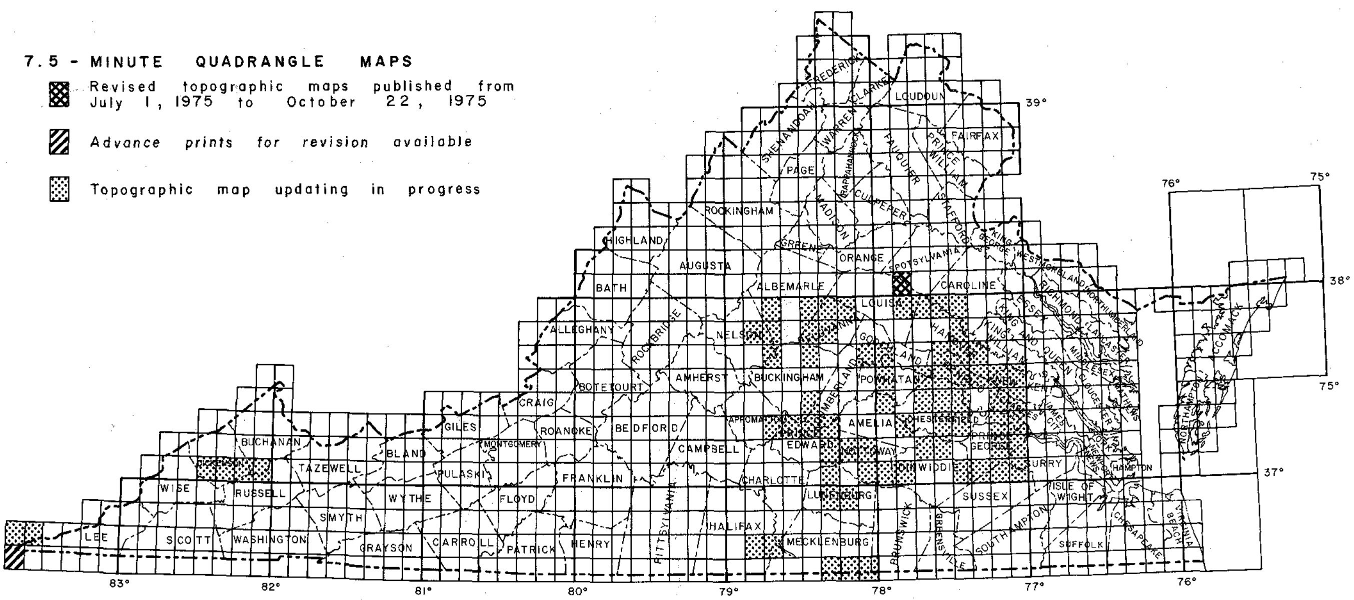
TOPOGRAPHIC MAPS



Revised 7.5-minute quadrangle maps published from July 1 to October 22, 1975:

Photorevised Map	Advance Print for Revision
Lake Anna West (formerly Contrary Creek)	Middlesboro West

ADVANCE PRINTS

Advance prints are available at 75 cents each from the Eastern Mapping Center, Topographic Division, U. S. Geological Survey, Reston, Virginia 22092.

PUBLISHED TOPOGRAPHIC MAPS

Total State coverage completed; index is available free. Updated photorevised maps, on which recent cultural changes are indicated, are now available for certain areas of industrial, residential, or commercial growth. Published maps for all of Virginia are available at 75 cents each (plus 4 percent State sales tax for Virginia residents) from the Virginia Division of Mineral Resources, Box 3667, Charlottesville, Virginia 22903.