

# COLUMNAR SECTIONS.

U.S. GEOLOGICAL SURVEY  
J.W. POWELL, DIRECTOR

KENTUCKY-VIRGINIA-TENNESSEE  
ESTILLVILLE SHEET

GENERALIZED SECTION NORTH OF CLINCH RIVER. SCALE: 1000 FEET = 1 INCH.						
PERIOD.	FORMATION NAME.	SYMBOL.	COLUMNAR SECTION.	THICKNESS IN FEET.	CHARACTER OF ROCKS.	CHARACTER OF TOPOGRAPHY.
CARBONIFEROUS	Harlan sandstone.	Ch		800	Coarse, white sandstone with interbedded shale and thin coal seams. The bed of sandstone at the base is particularly heavy.	Caps the summit of Big Black Mountain; forms heavy cliffs and ledges.
	Wise formation.	Cws		1200	Shale, sandstone, and coal beds. Near the top is a coal horizon containing one or two workable seams, and another occurs in the lower portion carrying several seams of importance. The main body of the formation is generally barren of workable coal beds.	Steep slopes of Big Black and Little Black mountains.
	Gladeville sandstone.	Cg		120	Coarse, white sandstone, sometimes conglomeratic.	In Wise County forms a mesa, or table-land.
	Norton formation.	Cnr		1270	Shale, sandstone, and coal, interbedded. Near the top, beds of sandstone predominate, and shales below. In the western portion of the sheet heavy coal beds are limited to the upper part, but in the eastern portion important seams occur in the lower half of the formation.	Valleys or steep hill slopes.
	Lee conglomerate.	Cle		1240-1230	Massive sandstone. Shale with coal seams. Sandstone, generally free from pebbles, with shaly layers. Shale with coal seams. Coarse conglomerate.	The principal ridge-making member of the Coal Measures. The ridges are extremely rough and rocky, the steepness of the slope depending upon the dip of the rocks. Pine and Stone mountains are the best examples of these ridges. When flat this conglomerate forms mesas.
	Pennington shale.	Cpn		1040-1100	Red, argillaceous shale. Beds of sandstone and calcareous shale.	Steep slopes and ledges along the conglomerate ridges.
	Newman limestone.	Cn		700-530	Calcareous shale with beds of impure limestone. Pure, blue limestone, becoming cherty toward the base.	Cliffs or steep slopes, and in exceptional cases low, rounded knobs in the valleys.
DEVONIAN	Grainger shale.	Dg		420-500	Calcareous sandstone. Sandy shale, merging into the black shale below.	Slopes or low ridges and knobs.
	Chattanooga black shale.	Dc		520-3000	Black, carbonaceous shale. Ash-colored, micaceous or sandy shale. Black, coal-like, carbonaceous shale.	"Poor valleys," with white and unproductive soil.
	Hancock limestone.	Sh		320-275	Blue, fossiliferous limestone, very sandy at the top and bottom.	Valleys.
	Rockwood formation.	Sr		130-470	Sandy shale, sandstone, and red, fossil iron-ore.	Sharp, narrow ridges: "poor valley" ridges or benches on the southern side of the Clinch sandstone ridges.
	Clinch sandstone.	Sc		90-180	Coarse-grained, white sandstone.	Sharp, mountainous ridges.
	Bays sandstone.	Sb		0-225	Red sandstone and sandy shale.	Steep slopes.
	Sevier shale.	Ssv		440-675	Sandy shale.	Steep slopes and irregular spurs.
SILURIAN	Chickamauga limestone.	Sc		1700-500	Blue, flaggy limestone, becoming more massive toward the base. In its lower portion occur extensive lentils of red and gray marble, below which the formation generally contains black cherts.	Broad and level valleys; rich farming country.
	Knox dolomite.	Sk		2100-2900	Magnesian limestone; the top is characterized by white, argillaceous limestone, below which the rock is generally gray and at certain horizons very cherty.	Low, rounded knobs or ridges, generally covered with a mantle of residual clay and cherts.
	Nolichucky shale.	Cn		525	Calcareous shale, carrying lentils of blue limestone.	Gentle slopes.
	Maryville limestone.	Em		500-600	Massive blue limestone.	Slopes or irregular valley lands.
	Rogersville shale.	Cr		120	Blue, calcareous shale.	Gentle slopes.
	Rutledge limestone.	Crt		260	Impure magnesian limestone.	Low ridges in the valleys.
	Russell formation.	Cr		2000+	Generally from 400 to 600 feet of brown, sandy shale at top, followed by thin-bedded sandstone, ferruginous limestone, and sandy shale of unknown thickness.	Knobs and ridges where sandstones prevail, and valleys where the shale is present.

GENERALIZED SECTION SOUTH OF CLINCH RIVER. SCALE: 1000 FEET = 1 INCH.							
PERIOD.	FORMATION NAME.	SYMBOL.	COLUMNAR SECTION.	THICKNESS IN FEET.	CHARACTER OF ROCKS.	CHARACTER OF TOPOGRAPHY.	
CARBONIFEROUS	Newman limestone.	Cn		1500	Argillaceous limestone, interbedded with calcareous shale and sandstone. This becomes purer toward the base, with gray crystalline limestone that carries some chert.	Rolling valley lands, deeply and sharply cut where streams are actively corrodng their channels.	
	Grainger shale.	Dg		800-860	Black, calcareous shale at the top, graduating into sandy shale and sandstone.	Sharp ridges.	
DEVONIAN	Chattanooga black shale.	Dc		900	Black, carbonaceous shale. Ash-colored, micaceous or sandy shale. Black, carbonaceous shale.	"Poor valleys," white, poor soil.	
	Hancock limestone.	Sh		0-30	Blue limestone, becoming cherty toward the top.	Slopes of Clinch ridges.	
	(Rockwood sandstone.) Rockwood formation.	(Srs) Sr		20-200	Coarse sandstone or conglomerate. Sandy shale.	Slopes of Clinch ridges.	
	Clinch sandstone.	Sc		300-500	Coarse, white sandstone, containing locally a few beds of red shale.	Sharp, mountainous ridges.	
	Bays sandstone.	Sb		125-175	Red sandstone.	Steep slopes.	
	Sevier shale.	Ssv		1400-4000	Yellow or blue, calcareous shale, which, toward the southeast, becomes quite sandy in its upper part.	Steep slopes or knobs.	
SILURIAN	Moccasin limestone.	Smc		0-500	Red, argillaceous limestone.	Slopes.	
	Chickamauga limestone.	Sc		300-2050	Blue limestone with lentils of red, mottled marble.	Rolling valley land.	
	Knox dolomite.	Sk		2200-2900	Gray or white magnesian limestone, generally quite cherty.	Low, rounded ridges, generally covered with a mantle of residual clay and cherts.	
	Nolichucky shale.	Cn		450-730	Yellow, calcareous or sandy shale, containing a heavy lentil of blue limestone.	Gentle slopes or knobs.	
	Maryville limestone.	Em		500-600	Massive gray limestone that in places contains very heavy, nodular cherts.	Low ridges or slopes.	
	Rogersville shale.	Cr		0-120	Blue, calcareous shale.	Valleys.	
	Rutledge limestone.	Crt		260	Impure magnesian limestone.	Valleys.	
	Russell formation.	Cr		1400+	Brown shale at the top, grading through sandy shale into sandstone; with beds of limestone.	Knobs or ridges.	
	CAMBRIAN	Nolichucky shale.	Cn		450-730	Yellow, calcareous or sandy shale, containing a heavy lentil of blue limestone.	Gentle slopes or knobs.
		Maryville limestone.	Em		500-600	Massive gray limestone that in places contains very heavy, nodular cherts.	Low ridges or slopes.
Rogersville shale.		Cr		0-120	Blue, calcareous shale.	Valleys.	
Rutledge limestone.		Crt		260	Impure magnesian limestone.	Valleys.	
Russell formation.		Cr		1400+	Brown shale at the top, grading through sandy shale into sandstone; with beds of limestone.	Knobs or ridges.	
Nolichucky shale.		Cn		450-730	Yellow, calcareous or sandy shale, containing a heavy lentil of blue limestone.	Gentle slopes or knobs.	
Maryville limestone.		Em		500-600	Massive gray limestone that in places contains very heavy, nodular cherts.	Low ridges or slopes.	
Rogersville shale.		Cr		0-120	Blue, calcareous shale.	Valleys.	
Rutledge limestone.		Crt		260	Impure magnesian limestone.	Valleys.	
Russell formation.		Cr		1400+	Brown shale at the top, grading through sandy shale into sandstone; with beds of limestone.	Knobs or ridges.	

### NAMES OF FORMATIONS.

PERIOD.	NAMES AND SYMBOLS USED IN THIS FOLIO.	SAFFORD: GEOLOGY OF TENNESSEE, 1869.	STEVENSON: A GEOLOGICAL RECONNAISSANCE IN PART OF LEE, WISE, SCOTT, AND WASHINGTON COUNTIES, VA., 1881.
CARBONIFEROUS	Harlan sandstone.	Ch	
	Wise formation.	Cws	
	Gladeville sandstone.	Cg	Coal Measures.
	Norton formation.	Cnr	
	Lee conglomerate.	Cle	Coal Measures.
DEVONIAN	Pennington shale.	Cpn	Quinnemont or Seral conglomerate.
	Grainger shale.	Dg	Mountain limestone.
	Chattanooga black shale.	Dc	Siliceous group.
	Hancock limestone.	Sh	Black shale.
	Rockwood formation.	Sr	Chemung and Hamilton.
SILURIAN	Clinch sandstone.	Sc	Meniscus limestone.
	Bays sandstone.	Sb	Dyestone group.
	Sevier shale.	Ssv	
	Moccasin limestone.	Smc	Oriskany and Lower Helderberg.
	Chickamauga limestone.	Sc	Clinton group.
CAMBRIAN	Knox dolomite.	Sk	Clinch Mountain sandstone.
	Nolichucky shale.	Cn	Medina sandstone.
	Maryville limestone.	Em	
	Rogersville shale.	Cr	Trenton and Nashville series.
	Rutledge limestone.	Crt	Trenton and Nashville group.
CAMBRIAN	Russell formation.	Cr	
	Nolichucky shale.	Cn	Knox dolomite.
	Maryville limestone.	Em	
	Rogersville shale.	Cr	Knox shale.
	Rutledge limestone.	Crt	Knox shale.
Russell formation.	Cr	Knox sandstone.	