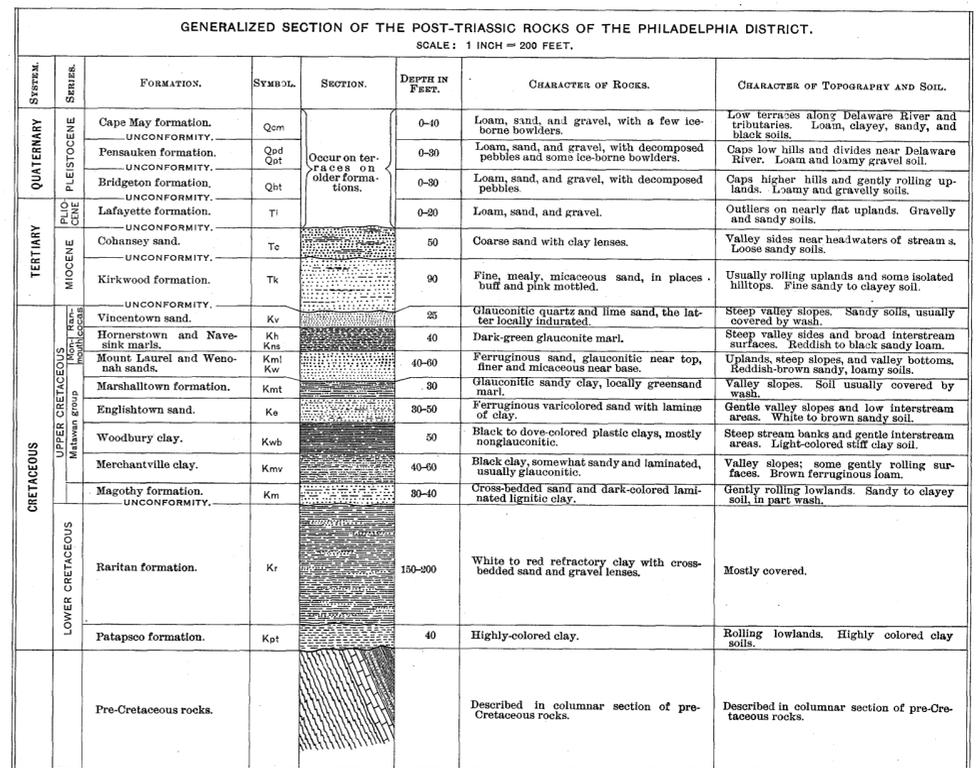
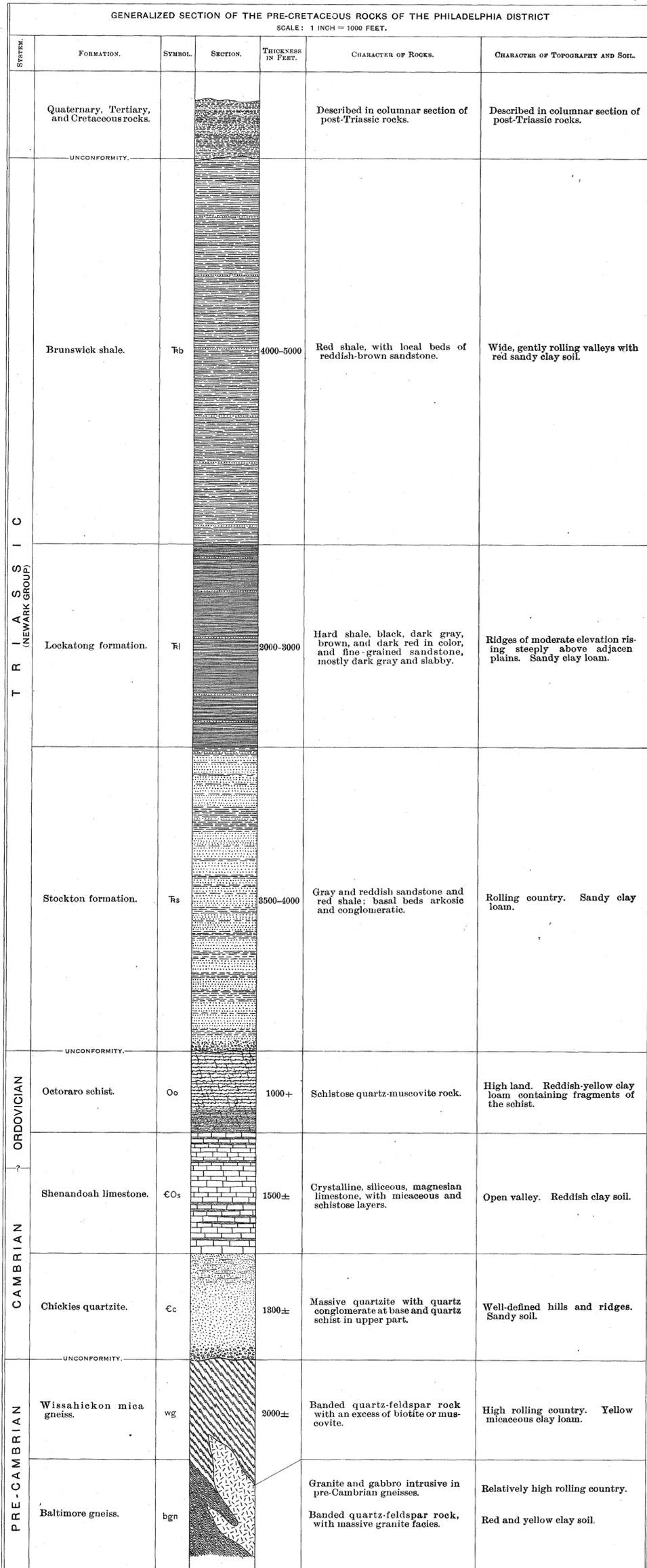


COLUMNAR SECTIONS



NAMES OF FORMATIONS
NAMES APPLIED BY VARIOUS AUTHORS TO THE FORMATIONS OF THE PHILADELPHIA DISTRICT OR THEIR APPROXIMATE EQUIVALENTS IN ADJOINING REGIONS.

SYSTEM	NAMES USED IN THIS FOLIO	SYMBOL	GEOLOGICAL SURVEY OF MARYLAND.	GEOLOGICAL SURVEY OF NEW JERSEY.	SECOND GEOLOGICAL SURVEY OF PENNSYLVANIA.	N. H. DARTON, WASHINGTON FOLIO, U. S. GEOLOGICAL SURVEY.	
QUATERNARY	Cape May formation.	Qcm	Talbot formation.	Cape May formation.	Trenton gravel. Philadelphia brick clay.	Later Columbia formation.	
	Pensauken formation.	Qpd Qpt	Wicomico formation.	Pensauken formation.	Red gravel. Philadelphia brick clay.		
	Bridgeton formation.	Qbt	Sunderland formation.	Bridgeton formation.	Yellow gravel.	Earlier Columbia formation.	
TERTIARY	Lafayette formation.	Tl		Beacon Hill(?) formation.	Bryn Mawr gravel.	Lafayette formation.	
	Cohansey sand.	Tc				Chesapeake formation (in part).	
	Kirkwood formation.	Tk					
CRETACEOUS	Vincetown sand.	Kv	Rancocas group.	Rancocas formation.	Limesand.		
	Hornerstown marl.				Middle marl.		
	Navesink marl.	Kns	Monmouth group.	Monmouth formation.	Lower marl.	Monmouth formation.	
	Mount Laurel sand.				Red sand.		
	Wenonah sand.	Kw					
	Marshalltown formation.	Kmt					
	Englishtown sand.	Ke	Matawan group.	Matawan formation.	Clay marl.	Matawan formation.	
	Woodbury clay.						
	Merchantville clay.				Kmv		
	Magothy formation.	Km	Magothy formation.				
Raritan formation.	Kr	Raritan formation.	Plastic clays.				
Patapsco formation.	Kpt	Potomac group.	Patapsco formation.	Wealdon clay.	Potomac formation (in part).		
TRIASSIC	Brunswick shale.	Tb		H. D. ROGERS, FIRST GEOLOGICAL SURVEY OF PENNSYLVANIA, 1855.	Landsdale shales (approximately).	T. D. RAND, PROG. ACAD. NAT. SCI. PHILADELPHIA, 1900.	
	Lockatong formation.	Tl			Gwynedd shales (approximately).		
	Stockton formation.	Ts			Mesozoic red sandstone.	Norristown shales (approximately).	
ORDOVICIAN	Octoraro schist.	Oo		Talcoose and micaceous slate. Primal lower slate (in part).	Hydromica slates; Hudson (Hall); Cambrian phyllites (Frazer).	Hydromica schist.	
	Shenandoah limestone.	COs			Auroral limestone.	Limestone No. II.	
CAMBRIAN	Chickies quartzite.	Cc			Primal white sandstone.	Chiques sandstone; formation No. I.	
	Wissahickon mica gneiss.	wg			First and Second gneissic belts and mica slate.	Chestnut Hill, Manayunk, and Philadelphia mica schists and gneisses (in part).	
PRE-CAMBRIAN	Baltimore gneiss.	bgn			Primal lower slate. Northern or Azole gneissic belt (in part).	Laurentian or Azole gneiss (in part).	

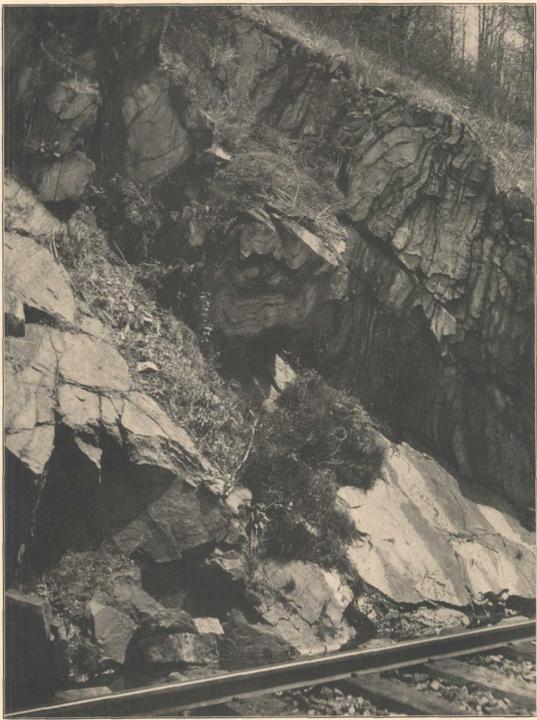


FIG. 10.—BALTIMORE GNEISS ON WEST FLANK OF ANTICLINE, SCHUYLKILL RIVER SECTION, SOUTH OF SPRING MILL, MONTGOMERY COUNTY, PA.



FIG. 11.—GRANITE GNEISS AT LEIPERVILLE QUARRY, CRUM CREEK, DELAWARE COUNTY, PA.

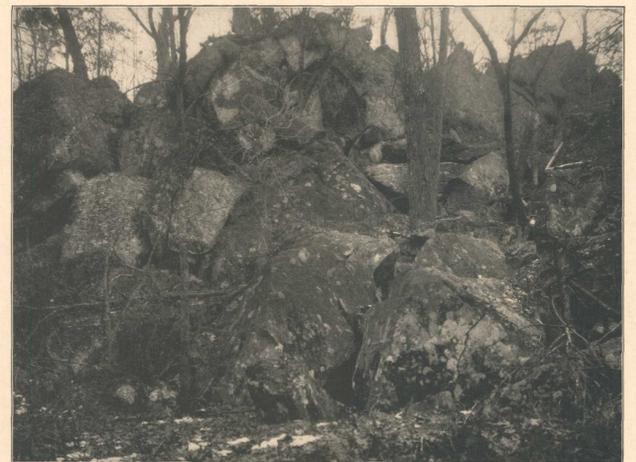


FIG. 12.—CASTLE ROCK, A PYROXENITE DIKE, DELAWARE COUNTY, PA.

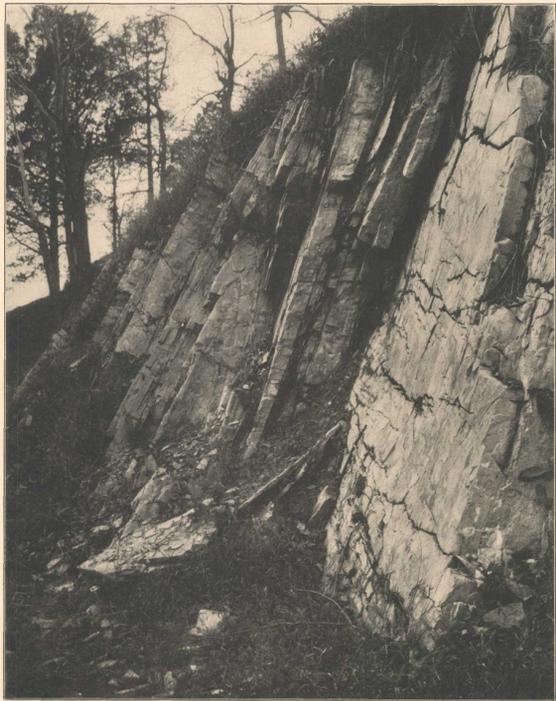


FIG. 13.—COMPRESSED ANTICLINE IN SHENANDOAH LIMESTONE, CHESTER VALLEY, CHESTER COUNTY, PA.



FIG. 14.—SECTION OF THE BRIDGETON FORMATION AT IRISH HILL, 1 1/2 MILES SOUTHEAST OF BELLMAWR, N. J.



FIG. 16.—DETAILED SECTION OF THE PENSUKEN FORMATION AT HYLTON'S PITS, SHOWING COBBLE BEDS AT TWO HORIZONS.
 The sand is partly cemented by iron oxide.



FIG. 15.—THE PENSUKEN FORMATION RESTING ON THE CRETACEOUS AT HYLTON'S PITS, ON PENSUKEN CREEK, NEAR PALMYRA, N. J.
 The structure of the Pensauken is characteristic of the formation in general.



FIG. 17.—SAND IN THE PENSUKEN FORMATION, CEMENTED BY IRON OXIDE, 2 MILES SOUTHEAST OF SWEDESBORO, N. J.

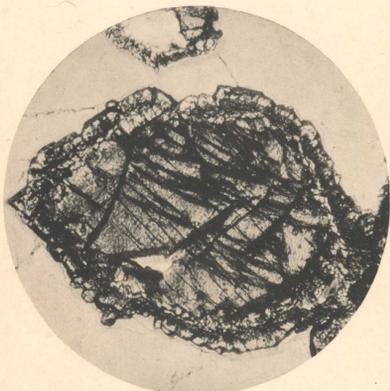


FIG. 18.—HYPERSTHENE WITH GARNET RIM.
 From gabbro. Plain polarized light. Enlarged 67 diameters.

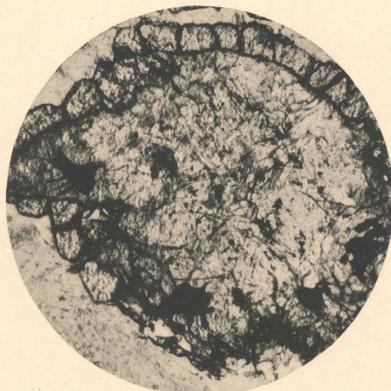


FIG. 19.—PYROXENE REPLACED BY HORNBLLENDE;
 GARNET RIM PERSISTENT.
 From gabbro. Plain polarized light. Enlarged 90 diameters.

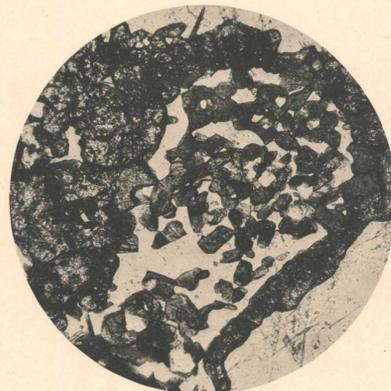


FIG. 20.—PYROXENE REPLACED BY HORNBLLENDE,
 BIOTITE, AND QUARTZ.
 From gabbro. Plain polarized light. Enlarged 90 diameters.



FIG. 21.—PENETRATION TWIN CRYSTALS OF OLIVINE, PRODUCING CROSS AND STELLATE FORMS, IN SERPENTINE, FROM VICINITY OF MILL CREEK, PA.