

<i>Barton coal-bed</i> .....	1'
Shale 100', Crinoidal limestone 4', shale 30'.....	134'
<i>Coal-bed</i> .....	2'
Shale and sandstone 35', black limestone 4', shale 60'.....	99'
<i>Coal-bed</i> .....	1'-2'
Shale 30'-50', with <i>Mahoning sandstone</i> (divided sometimes into Upper, Middle, and Lower), with thin layers of shale and limestone, and sometimes a thin coal-bed, in all 195½' in Ligonier Valley, varying to 75' and less elsewhere.....	75'-195½'

4. *Lower Productive Coal-measures, or Alleghany River Series, W. Pa.*

<i>Freeport Upper coal, E</i> .....	2'-4'	
Fire clay 2'-8', shale with ore, Freeport Upper limestone, shales, sandstone.....	25'-40'	
<i>Freeport Lower coal, D</i> .....	2'-7'	
Fire clay 1½'-4', Freeport Lower limestone.....	42'-50'	
<i>Kittanning Upper coal, C¹</i> .....	1½'-5'	
Fire clay 2'-4', Johnstown cement-bed, shales.....	2'-8'	
<i>Coal</i> .....	0'-2'	
Fire clay 0'-2', shales and slate.....	30'-40'	
<i>Kittanning Middle coal, C</i> .....	1½'-3'	
Fire clay, shales, sandstone.....	35'-40'	
<i>Kittanning Lower coal, B</i> .....	3'-7'	
Fire clay 4'-8', sandy shales.....	} sometimes Clarion sandstone {	{ 50'-60' 1'-2' 20'-30'
<i>Clarion coal, A</i> .....		
Fire clay 2'-10', shales.....		
<i>Brookville coal, A</i> .....		0'-4'
Fire clay, brick clay.....		0'-10'
<b>POTTSVILLE CONGLOMERATE.</b>		

These sections show many alternations of sandstone, limestone, and shale, with the several coal-beds, but without giving the many minor changes.

Sections from the Anthracite region afford the same alternation of coal-beds with beds of sandstone (or conglomerate) and shale, but without even thin layers of limestone. But the coal-beds and the various rocks reach a much greater thickness, all being on a grander scale in this central part of the Appalachian area. The "Mammoth" coal-bed (numbered E by the Geological Survey) attains a maximum thickness of 50 feet; and then, above 200 to 300 feet of sandstone (or conglomerate) and shale containing two or three thin coal seams, comes the Red Ash Bed (F), 16 to 24 feet; and above another such interval, a third great bed (G), 15 to 16 feet; and so on. But these thicknesses are not constant, the minimum in each of these beds in other localities (mining shafts) being half the above or less.

The thickness diminishes not only westward, but rapidly also northward. At Carbondale, it is, for the whole Coal-measures, only 300 feet, and for the included coal-beds less than 20 feet. Near Wilkesbarre, the thickness is about 867 feet, with 85 feet of coal-beds, or about one foot of coal to 10 of rock. In the western Middle Anthracite field, the total at Hammond is 1512 feet, with 83 of coal-beds. Near Pottsville, in the southern field, the total