

doc. 516

SITE 3

USBM Project 1165

SITE 3

Geologic Logs

Holes 25-

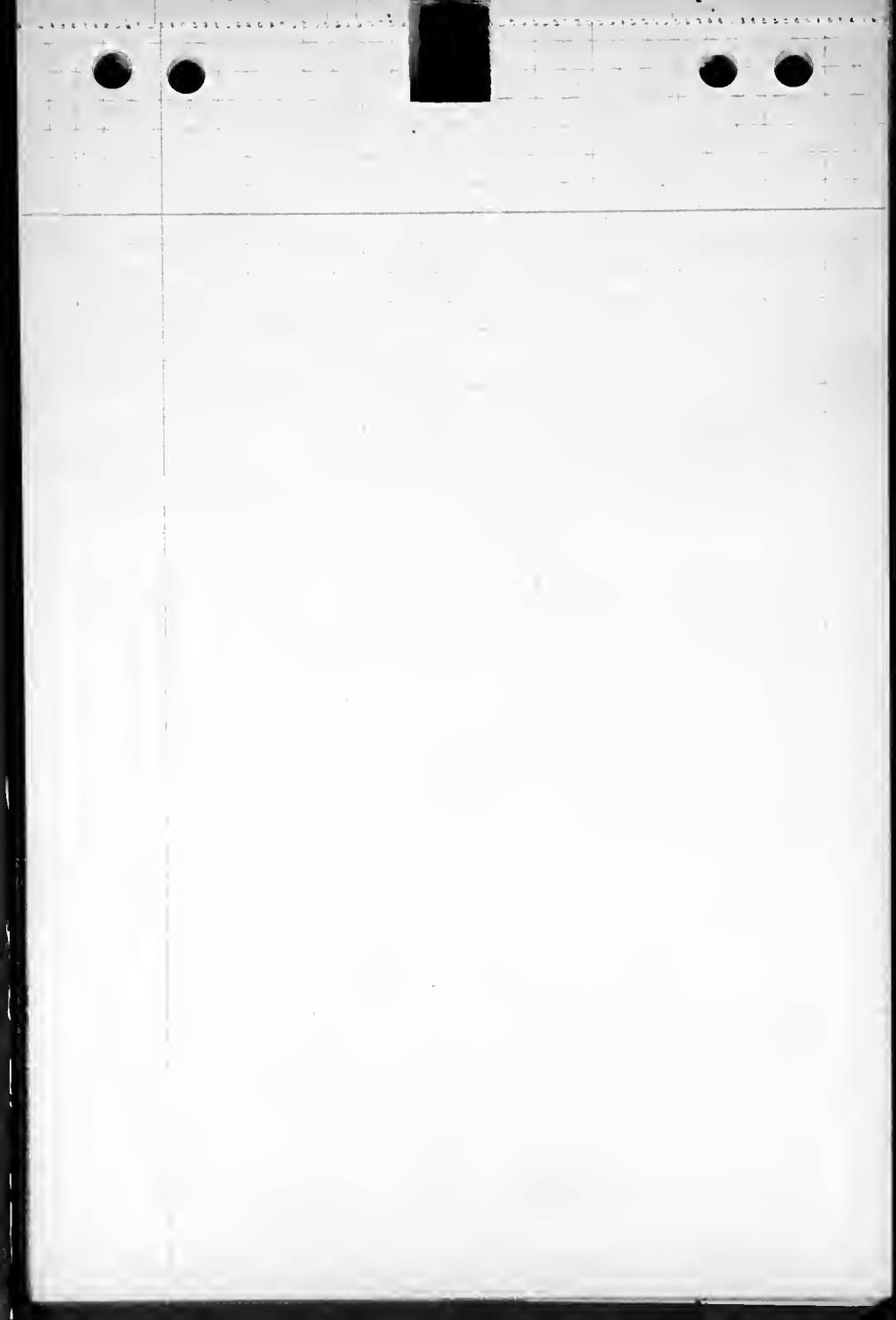
Waage, UGS

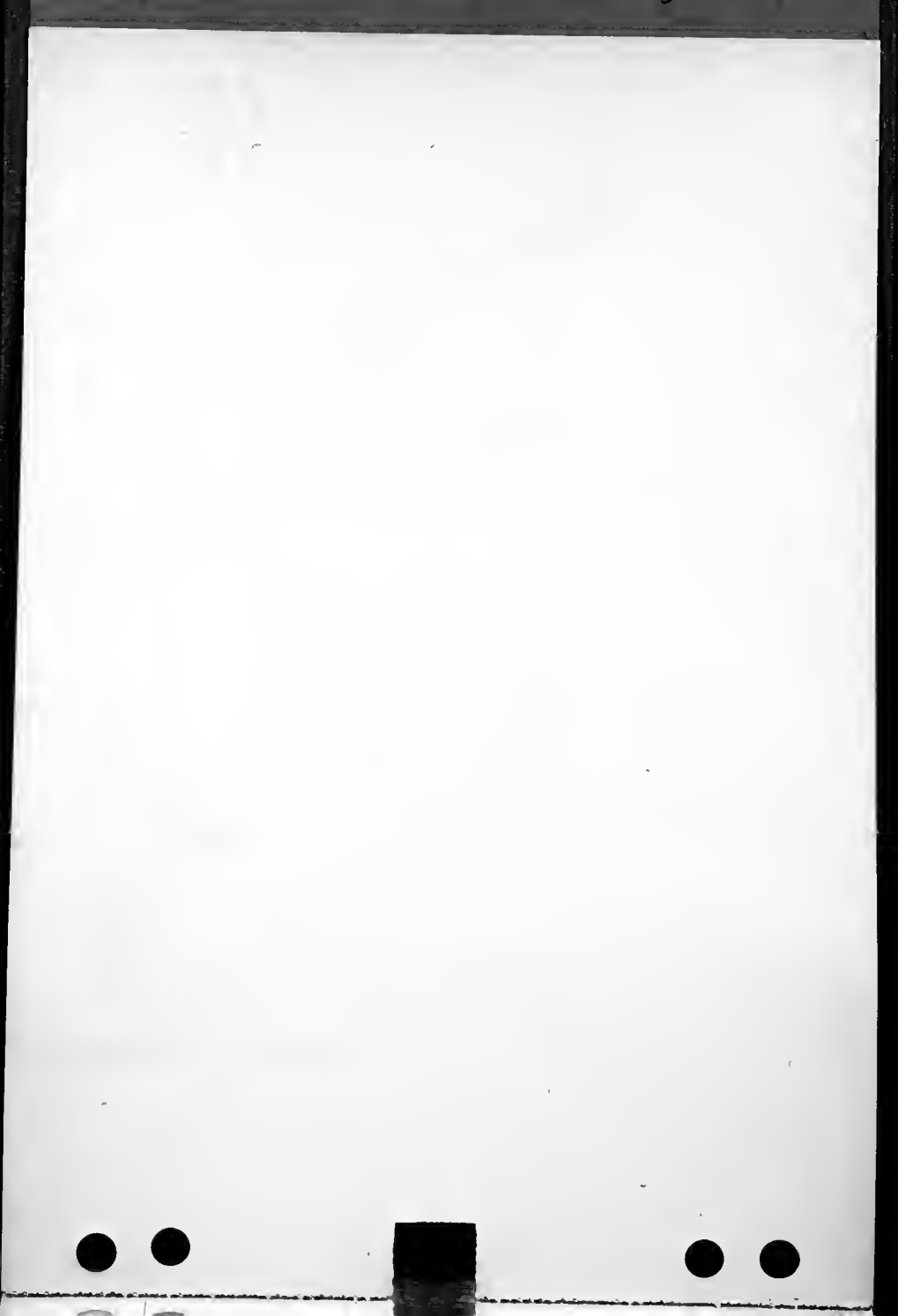
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOOSE-LEAF FIELD NOTEBOOK

9-137

K.M. Waage





Hole 25.

Surface Elev.

Depth. 66'6"

From To Th

From	To	Th	Description	Notes
0	7'6"	7'6"	Overburden, and about 2' of light brown to bluish sandy plastic clay. Minor coaly blebs and brown ss fragments.	A coal horizon.
7'6"	8'4"	10"	Slaty coal, coaly shale and highly carbonaceous sandstone streaks.	
8'4"	31'4"	23'	Sandstone, fine to medium grained, grey, micaceous. Contains carbonized root + stems impressions in upper 3'; lower 15' has numerous coaly and carbonaceous streaks.	Homewood S.S.
31'4"	31'8"	4"	Coaly clay or 'slate'.	Coal horizon
31'8"	39'2"	7'6"	Shale, grey to dark grey, locally silty, carbonized plant fragments in lower 1 1/2'.	Coal
39'2"	39'5"	3"	Coaly shale or 'slate'.	Coal horizon
39'5"	40'3"	10"	Gray micaceous shaly clay with plant fragments.	Mason
40'3"	47'	6'9"	Hard clay as follows:- 14" Dark gray 'top' block 13" Gray flint and silty block. 36" Gray sideritic block with scattered chert nodules.	
47'	47'5"	5"	24" Sideritic block clay. Shaly block clay (clay-shale gradation) of short logs.	clay
47'5"	62'3"	14'	Light greenish gray and red silty shale, small samples of iron mineral	Mason Chert.



Holo 25 (cont.)

From To Th.

62'3" 66'6" 4'3"

scattered throughout
Green silt, lower 1" is
very fine micaceous
green ss. with specks
of black mineral.



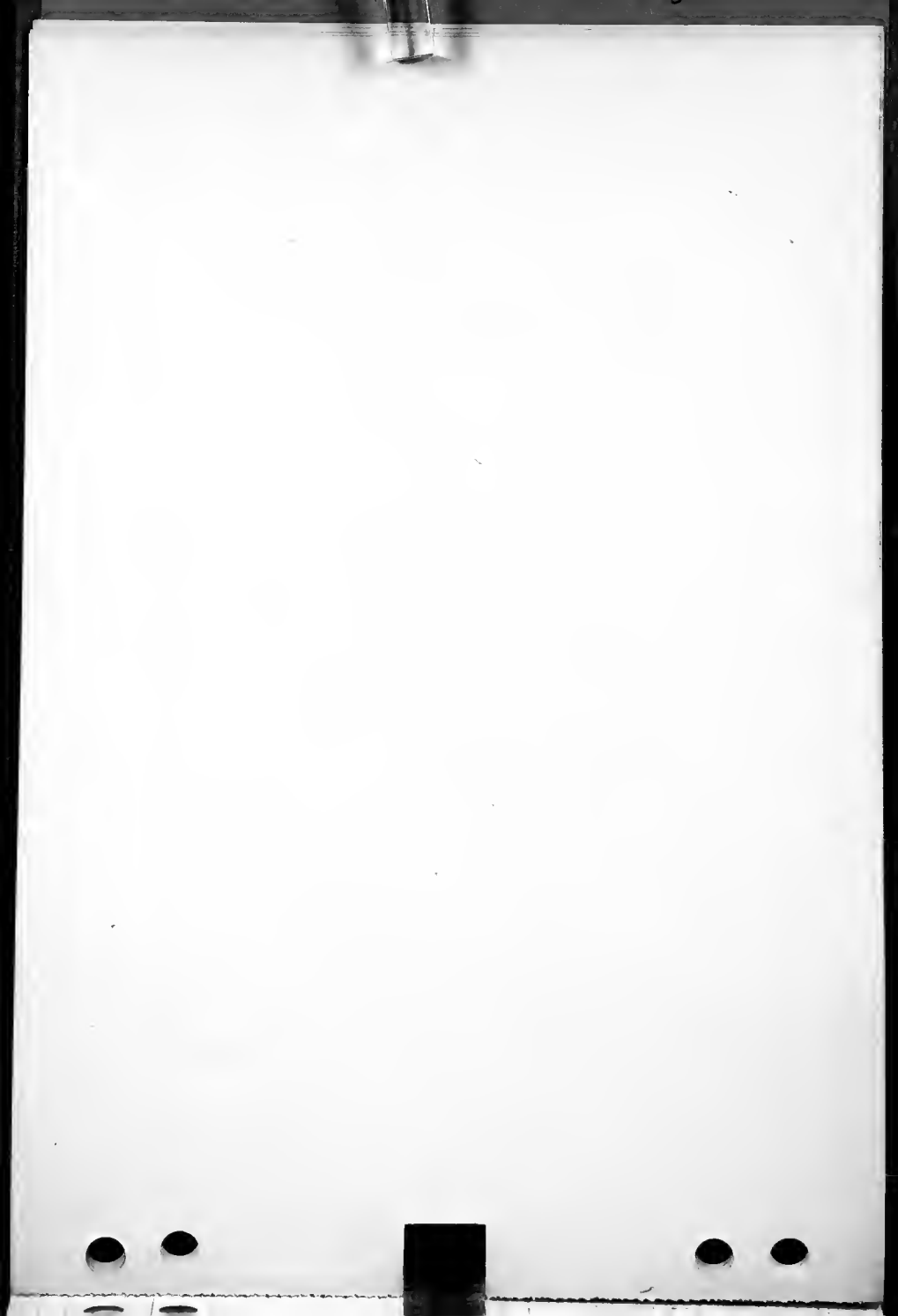
Hole 26

Surface Elev.

Depth 55' 2"

From	To	Th.			
0	4' 3"	4' 3"	Overburden and 10" of white sandstone, medium to fine grained, micaceous.	Clarion ss.	
4' 3"	17'	12' 9"	Dark blue-black carbonaceous shale, local 'slaty' streaks (interval from 7' to 13' - no recovery but no indication of change in lithology, this could have been some coal.)	Clarion sh.	
17'	18' 10"?	20"?	Coal (May be more than 20 inches as some core loss.)	A coal	
18' 10"?	34'	15' 2"	Sandstone, dark to light gray, medium (locally fine) grained micaceous. Some coaly streaks and fine grained layers in lower 8 feet.	Homewood S.S.	
34'	34' 5"	5"	Shaly coal + 'slate	Coal horizon	
34' 5"	42' 5"	8'	Shale, gray to black, silty, in upper part, more carbonaceous in lower with plant fragments.	shale	
42' 5"	42' 10"	5"	Coaly shale and slate	Coal horizon	
42' 10"	44' 1"	10"	Soft gray clay shale, plant fragments.	Morse	
44' 1"	45' 5"	5' 6"	Hard clay as follows: -		
	49' 7"		7" Dark gray 'top' block 15" Gray flinty block with scattered chapeau nodules and some siderite. 9" Nodule clay, sideritic 25" Block, sideritic scattered nodules in upper half.		
	49' 7"	52	2' 5"	Shaly block clay, gray, gray (clay-shale transition) of	clay

Discrepancy in clay shale and flinty part at 44' 1" core does not show shales.



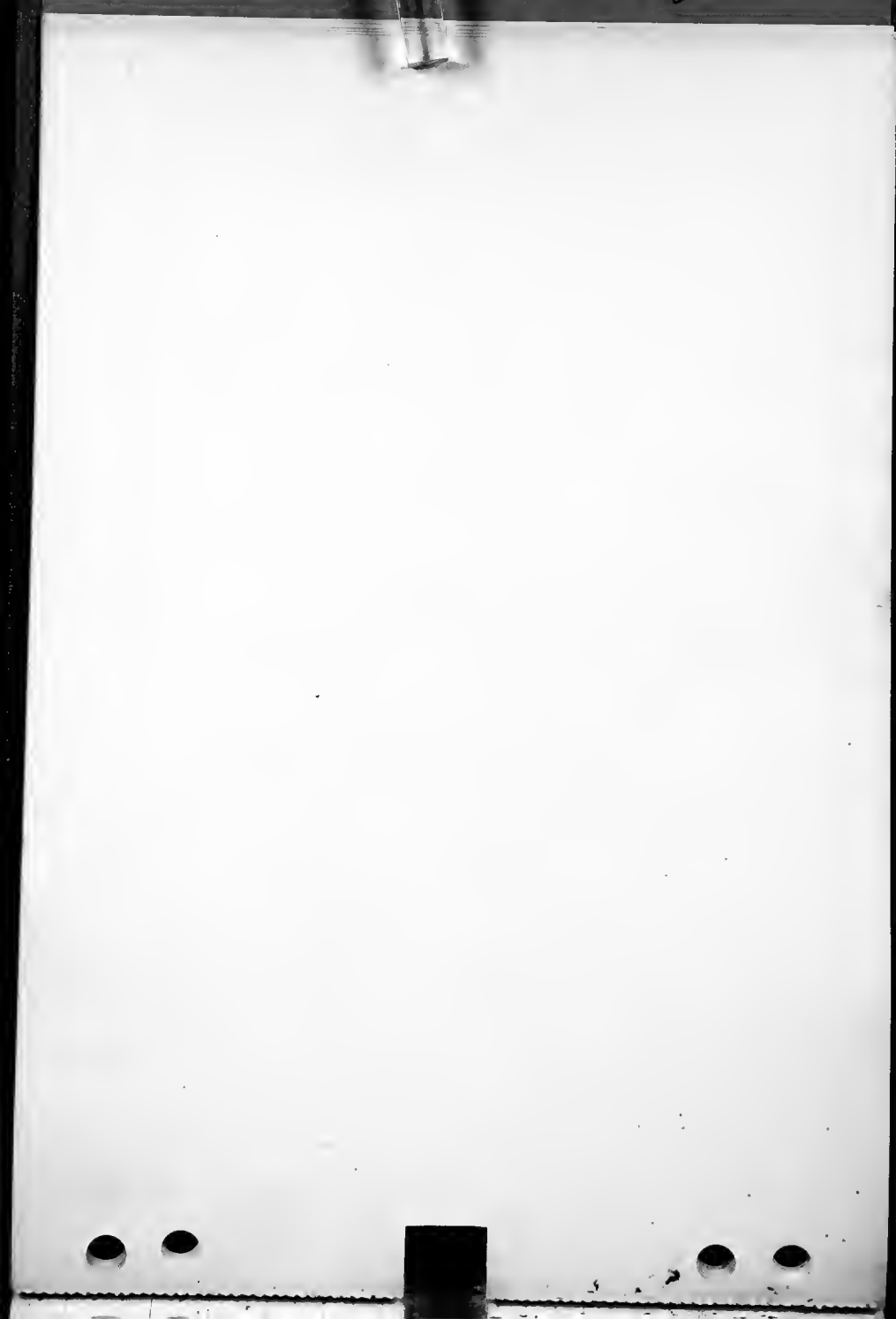
Hole 26 (cont.)

From To Th

52' 55 1/2" 3 1/2"

short logs)
gray and red silty shale

Mauch
Chunk



Hole 27

Surf. Elev.

Depth 45'3"

From To Th.

0	6'5"	6'5"	Overburden and recovery of 2' of light gray micaceous fine grained sandstone.	
6'5"	30'3"	23'10"	Sandstone, medium to fine grained light gray to gray micaceous, coaly partings in lower 7 feet.	Homewood S.S. (May inc. some clay with A horizon out)
30'3"	30'11"	8"	Dark blue carbonaceous clay shale; 3/4" coal streak at 30'6" and minor 'slate'.	Coal horizon
30'11"	36'9"	5'10"	Hard clay as follows:- 9" Dark gray flinty 'top' block 13" Gray block to flint. 35" Sideritic block ^{scattered} nodules 13" Coarsely nodular sideritic block.	Clay Maver
36'9"	43'9"	7'	Shaley block, light to dark gray, mottled, sideritic, (if Fe bumps are siderite) may be conglomeratic.	?
43'9"	45'3"	1'6"	Red and greenish gray silty shale with small bumps of Fe mineral.	Murch Chumk



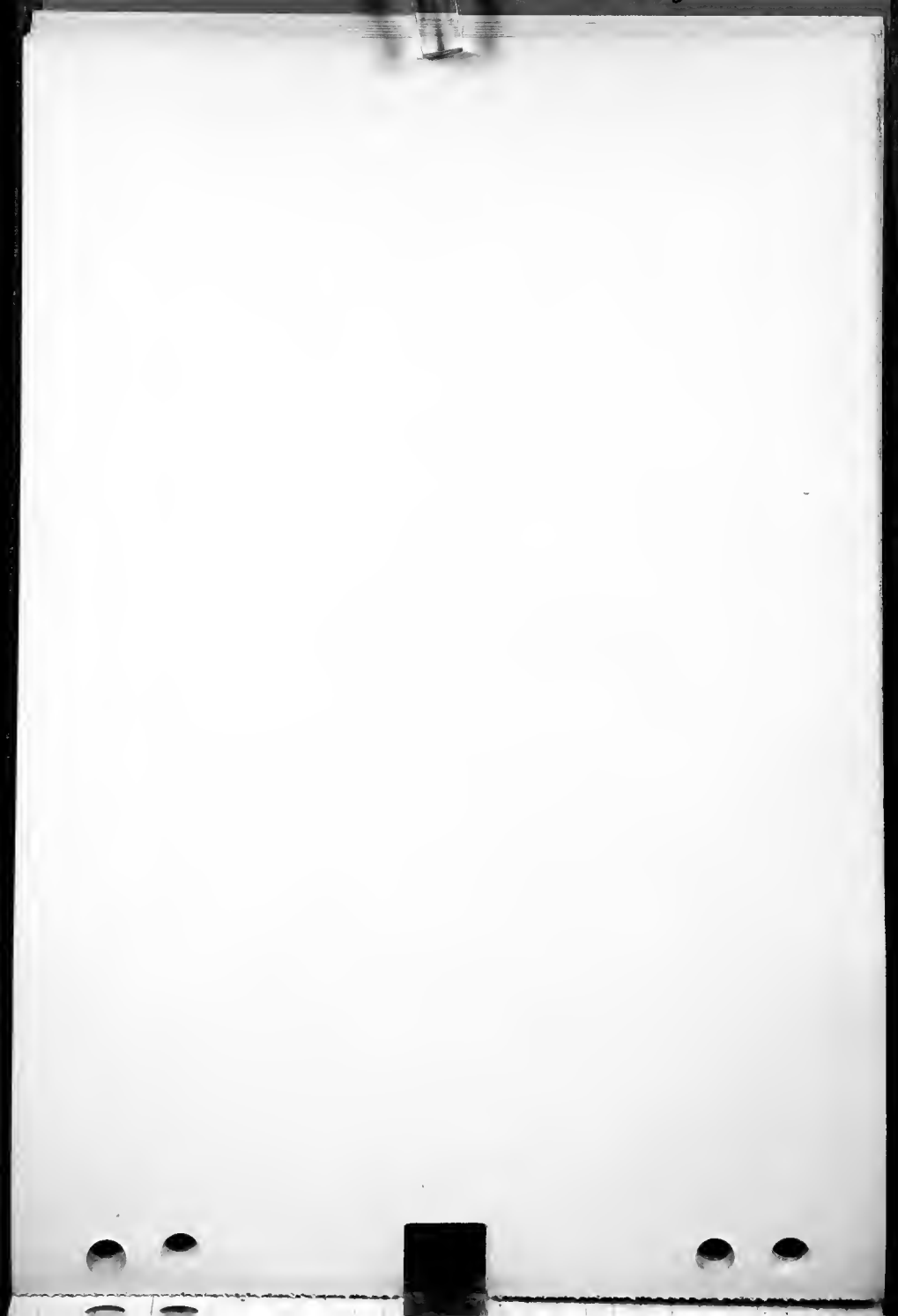
Hole 28

Surf. Elev.

Depth 54'8"

From	To	Th			
0	3'7"	3'7"	Overburden, soil + sandstone float.		
3'7"	27'2"	23'7"	Sandstone, medium to fine grained light to dark gray (locally stained tan) micaceous, with coaly streaks in lower 2 feet.	Homewood S.S.	
27'2"	28'4"	1'2"	Coaly shale and 'slate'	Coal Horizon	
28'4"	39'8"	11'4"	Shale, gray to dark gray silty, locally sandy shale. Lower 2' little silt, clay shale with plant fragments	Shale	M near
39'8"	42'3"	2'7"	Coal and coaly shale. (about 17" coal, rest shale.)	Coal Horizon	
42'3"	45'10"	3'7"	Hard clay as follows:- 10" Black to dark gray flinty 'top blocks'. 33" Gray flinty blocks.	Clay	
45'10"	47'8"	1'10"	Shaly gray block clay, mottled, appears conglomeratic, has 'bumps' of Fe mineral	?	
47'8"	54'8"	7'	Greenish gray shale with red shale from 51-10 to 54-8	Mauch Chunk	

Note: As there is no sharp break from the shaly grey blocks to the Mauch Chunk some shaly blocks may be included in the latter. However the line is drawn where the first good shaly fracture appears in the core + this generally comes just below the conglomeratic zone.

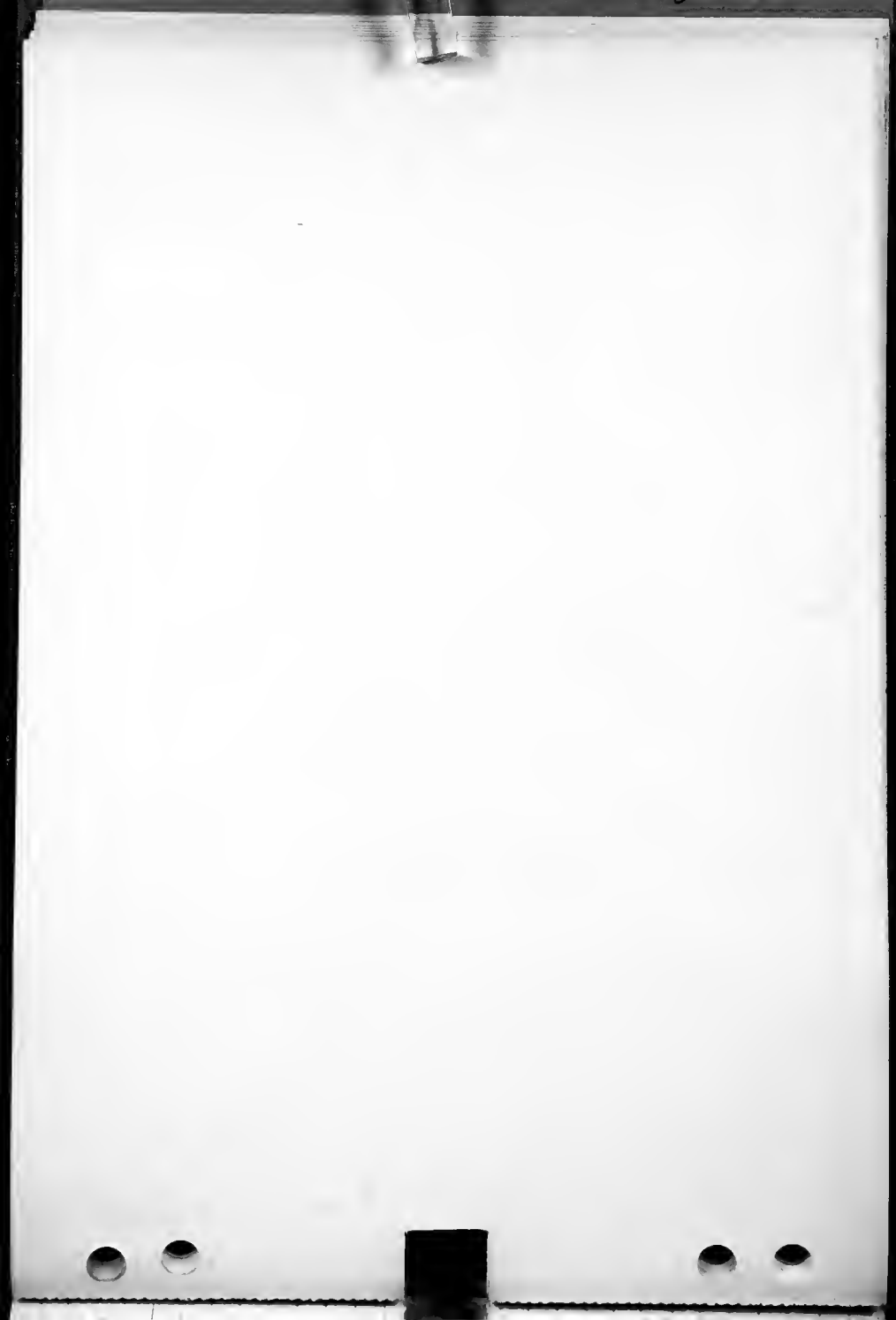


Hole 29

Surf. Elev.

Depth 73'

From	To	Th		
0	7'	7'	Clayey brown loam minor sandstone float. Brown sandy clay also in sludge	Clarion shales
7'	15'	8'	Recovery poor. Some brown sandy, plastic clay with local 'iron pans' and one larger micaceous brown sandstone.	
15'	16'11"	1'11"	Grey to dark gray mica-ceous shale. Silty to sandy in upper 1', carbonaceous below.	
16'11"	18'6"	19"	Coal, clayey streaks.	A coal
18'6"	19'7"	1'1"	No recovery - could be more coal or underclay.	
19'7"	46'6"	26'11"	Sandstone. Medium to fine grained gray mica-ceous. Carbonaceous streaks and partings, some silty layers. Partings generally show large flakes of mica	Homewood
46'6"	47'	6"	Coaly shale and 'slate'	Coal horizon
47'	57'3"	10'3"	Shale, dark gray silty in upper 9', black clayey shale with plant fragments lower 1'3".	Shale
57'3"	58'3"	1'	Soft gray shale, plant fragments.	Marker
58'3"	59'3"	1'5"	Coal	
59'8"	64'9"	5'1"	Hard clay as follows: - 18" Dark gray flinty top block. 12" Fine grained nodular 31" Sideritic block, locally nodular	
64'9"	69'	4'3"	Shaley blocky clay, greasy with Fe bumps.	?

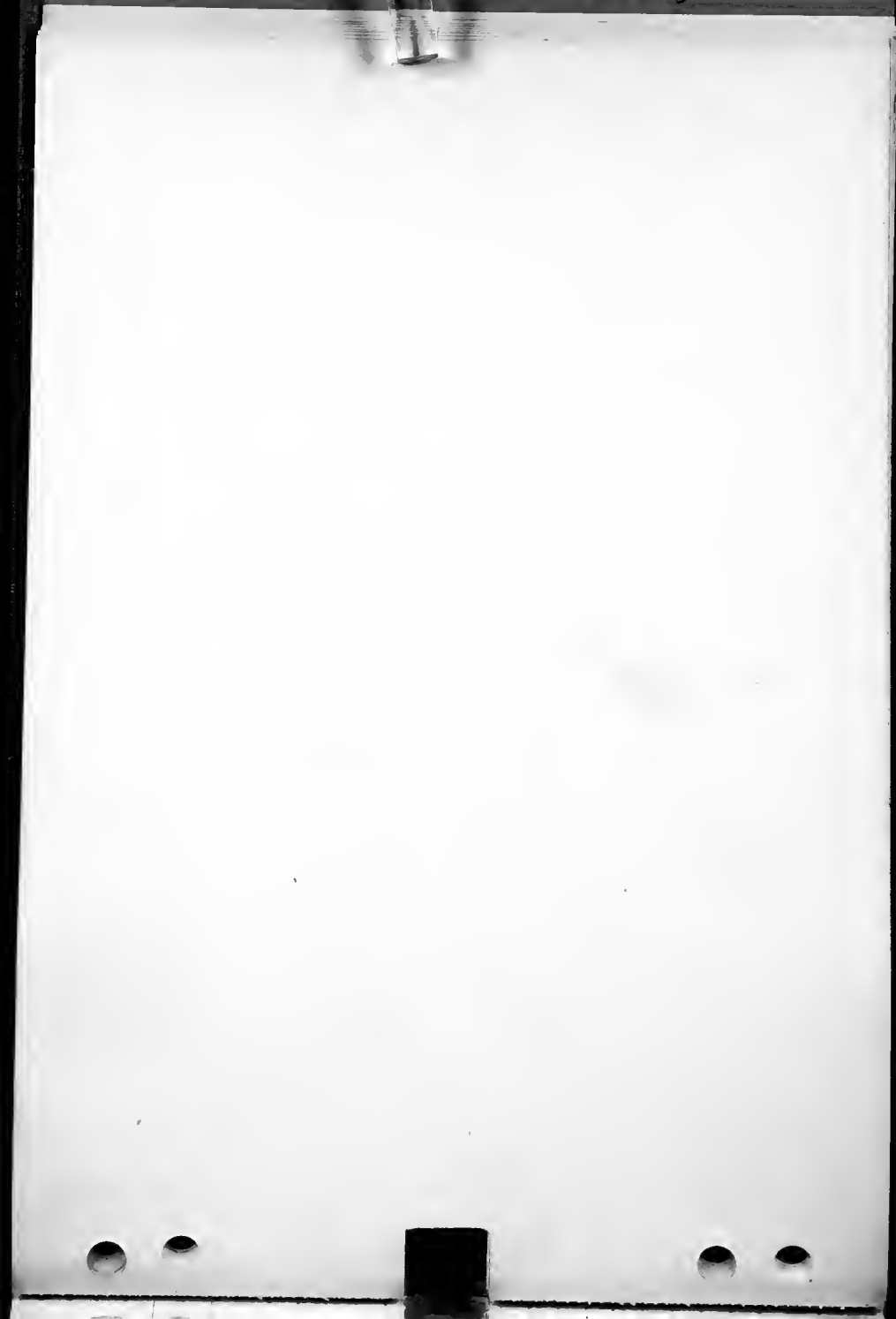


Hole 29 (cont)

From	To	Th.
69'	73'	4'

Gray shaley silty stuff Fe
bumps to 70-7 (This may
belong in Mercer). Rest is
Red shale with greenish
gray streaks.

March
chunk.



Hole 30

Surf. Elev.

Depth 76'9"

From To Th.

0	20'9"	20'9"	White sandstone, medium grained, micaceous, local brown staining. Carbonaceous streaks throughout.	Clarion SS - ?	
20'9"					
20'9"	49'2"	28'5"	Gray sandstone, medium to fine grained, micaceous, carbonaceous. Carries several zones of platy gray shale fragments in lower 15 feet, and one 7" band of black shale from 42 to 42'7".	Homewood SS	
49'2"	49'11"	9"	Coaly shale	Coal horizon	
49'11"	50'9"	10'10"	Dark gray shale, locally black, carbonaceous.	Shale	
60'9"	62'3"	1'6"	Black shale		
62'3"	63'4"	1'1"	Coal and coaly shale, at least 5" coal, some core loss either from coal or thin coaly shale below it.	Coal horizon	Mercer
63'4"	69'4"	6'	Hard clay as follows:- 8" Gray to black, ^{shaly} top block' 15" Dark gray flinty block 13" Fine grained nodular block. 36" Sideritic blocks, some nodular zones	Clay	
69'4"	70'9"	1'5"	Shaly block clay, greasy, Fe bumps. appears conglom-eratic.		
70'9"	72'7"	1'10"	Dark gray to black shale, greasy, sideritic (Fe bumps) May still be shaly block clay - should be analyzed.	Mercer or March Chunk ?	
72'7"	74'7"	2'	Silty + sandy gray shale Fe bumps.	" "	



Hole 30 (cont.)

From To Th

74'7" 76'9" 2'2"

Light greenish gray sandy
siltstone. Micaceous & has
Fe bumps.

Mauch
chunk



Hole 31

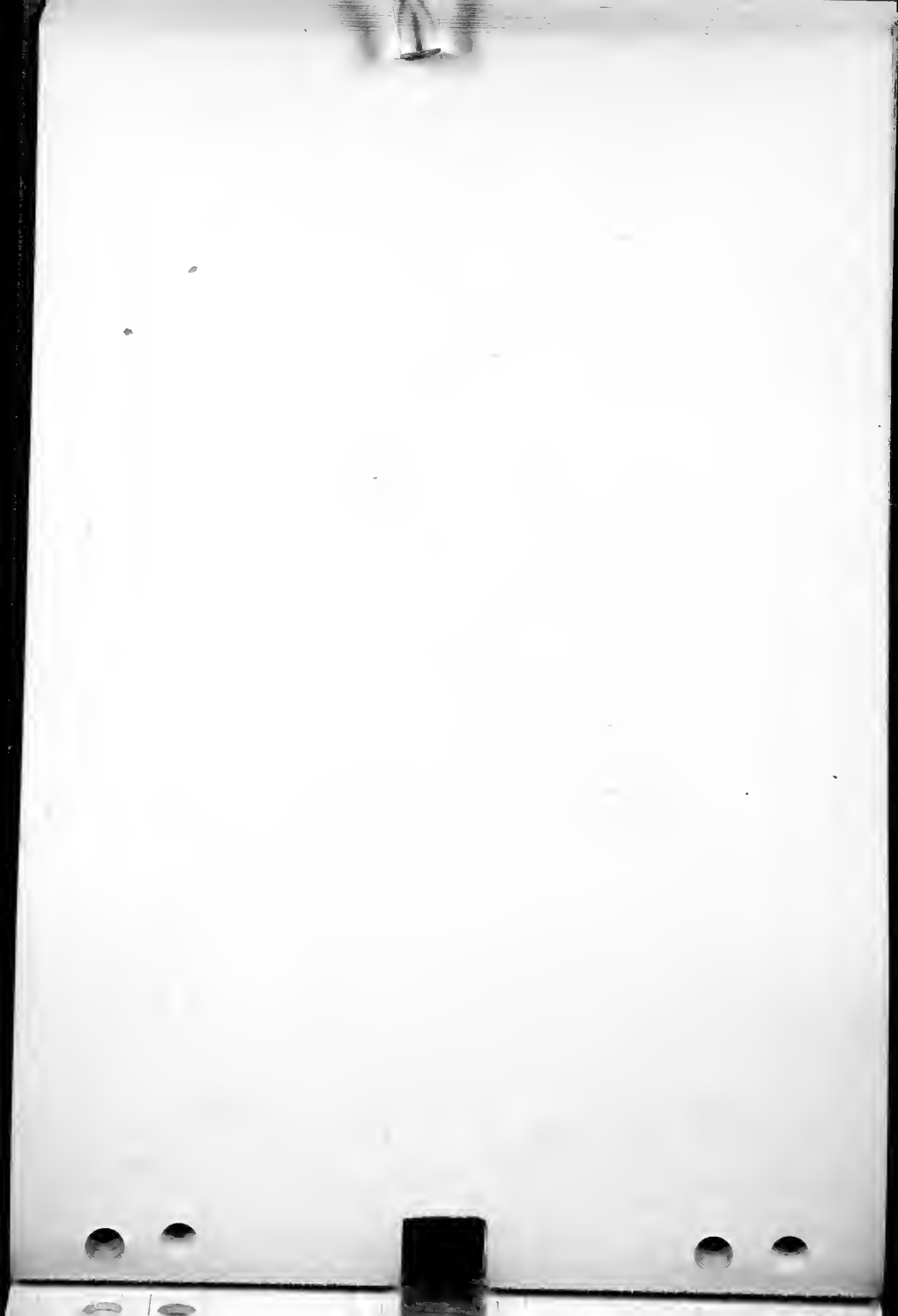
Surf. Elev.

Depth 78'7"

From To Th.

From	To	Th.	Description	Notes
0	21'5"	21'5"	White medium, locally fine grained micaceous sandstone, minor carbonaceous streaks and partings, gray in lower 7'.	Clarion
21'5"	22'1'	8"	Coal	A coal
22'1"	25'5'	3'4"	Black to dark gray clay shale, coaly in upper part, silty in lower.	Clarion or Homewood shales?
25'5"	26'6"	1'1"	Gray siltstone and sandstone.	
26'6"	31'8"	5'2"	Black shale, locally finely silty + sandy, plant fragments.	
31'8"	33'9"	2'1"	Hard gray silty shale	?
33'9"	46'9"	13'	Gray sandstone, medium to fine grained, micaceous. Banded, x laminated, with coaly seams and partings. (1" coal from 40'10" to 40'11")	Homewood
46'9"	48'8"	1'11"	Sandy shale, shaly sandstone and fine grained coaly sandstone, gray to black.	?
48'8"	59'6"	10'10"	Gray to black shale, silty in upper 9', some coaly clay layers.	Shale
59'6"	61'10"	2'4"	Coaly shale, coal, and gray clay with plant fragments, and coal. Coal from 61' to 61'7".	Shale coal fragments
61'10"	67'4"	5'6"	Hard clay as follows :- 2" dark gray flinty 'tip black' 9" gray flinty black	Clay

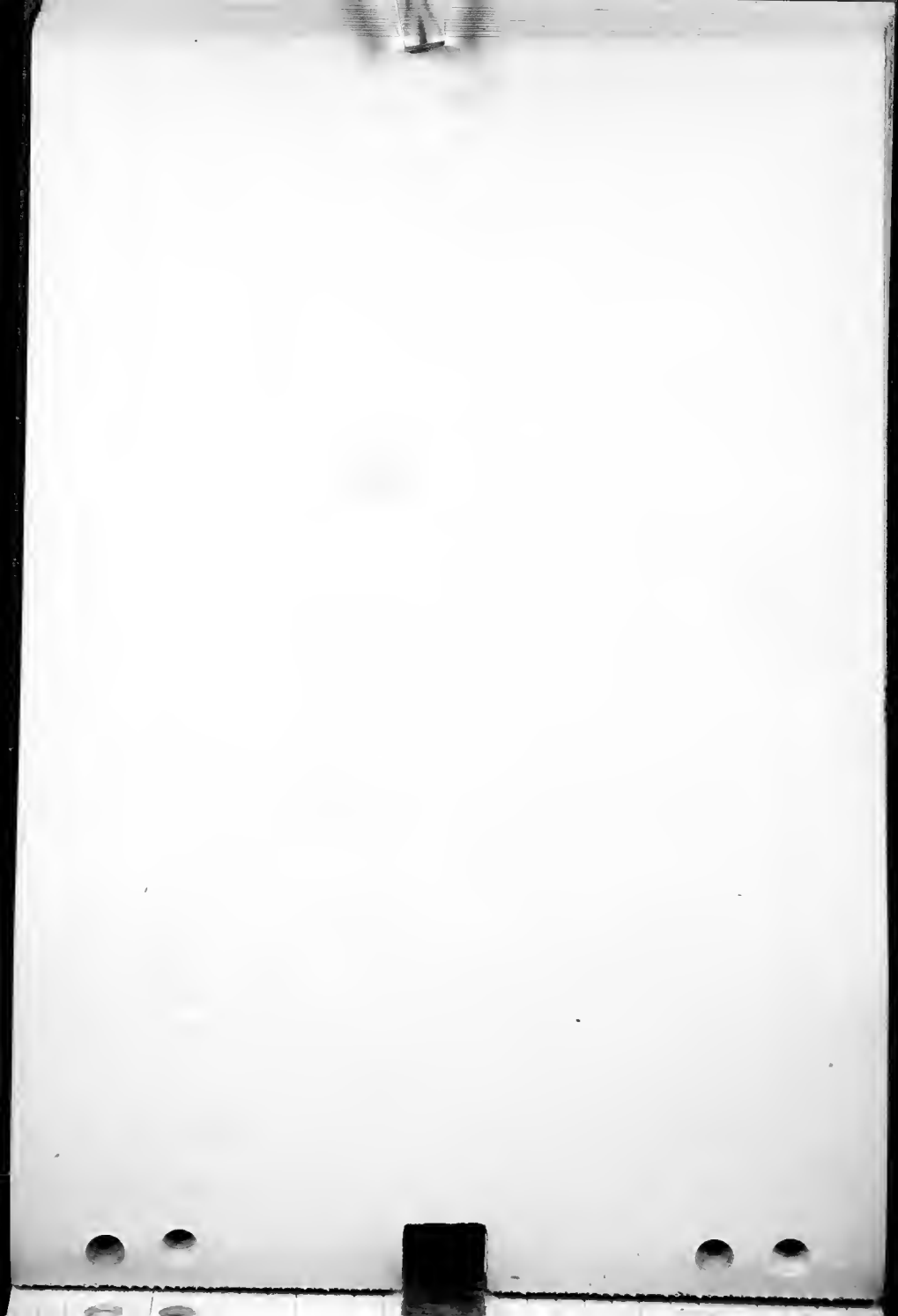
Mason



Hole 31 (cont.)

From To Th

			scattered nodules.	
			9" Gray nodular block	Mercer Clay
			29" Sideritic block, local nodular zones.	
			17" Sideritic block.	
67'4"	69'1"	1'9"	Shaley block clay, black to dark gray, greasy, appears conglomeric, has Fe lumps.	?
69'1"	78'7"	9'6"	Gray to green siltstone with zones concentrated 'Fe lumps'.	Murch Chuck ?

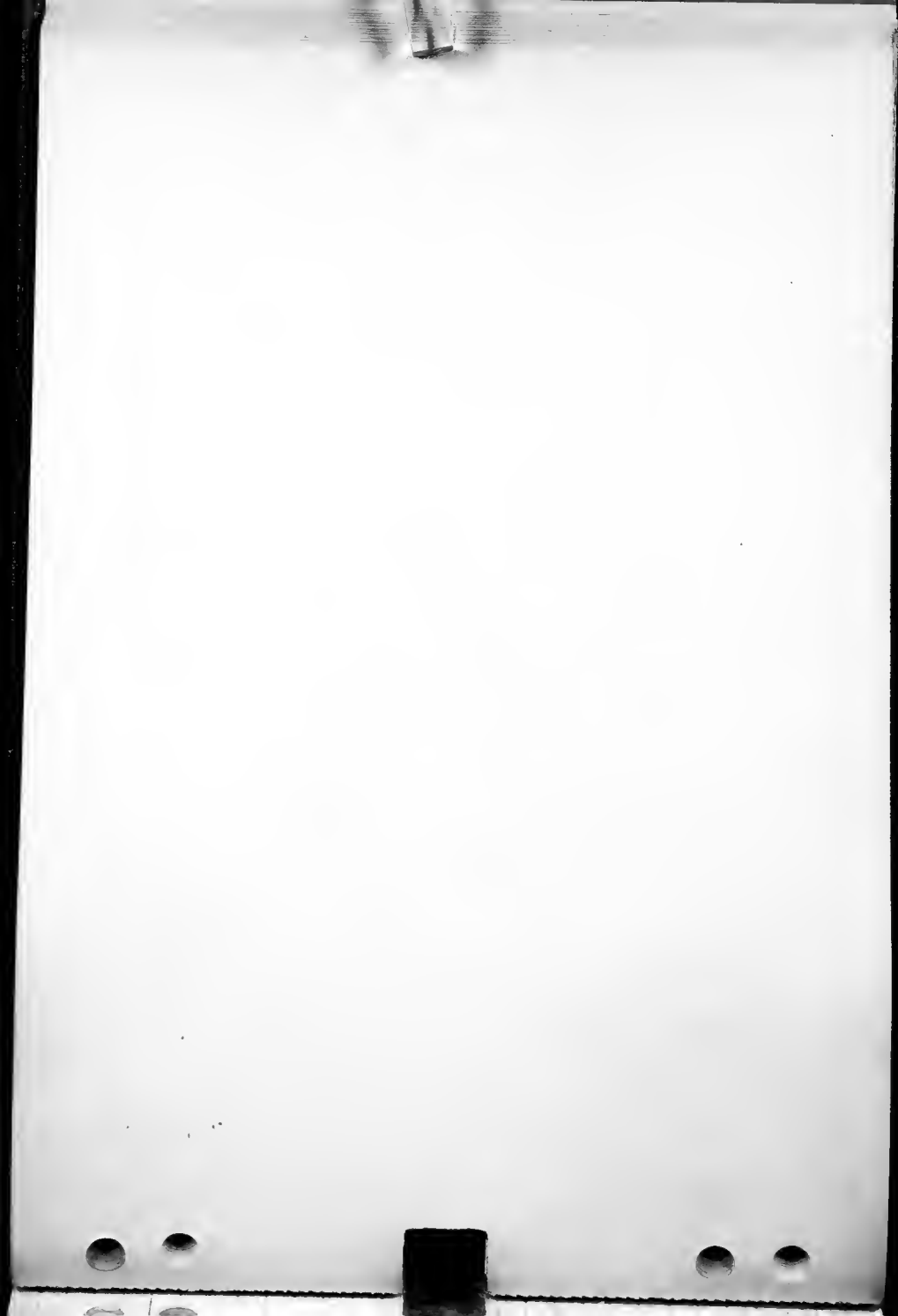


Hole 32

Surf. Elev.

Depth 56'

From	To	Th.		
0	25'	25'	Gray medium to fine grained micaceous sandstone. Local light brown and pink staining.	
25'	26'	1'	Gray fine grained micaceous shaly sandstone and sandy shale	
26'	38'	12'	Gray medium to fine grained sandstone, micaceous, coaly streaks + local shaly seams.	?
38'	39'4"	1'4"	Coarse to conglomeratic grey micaceous sandstone. 3" coarse grained, coaly streaks 5" conglomerate - quartz pebbles (1/4") and fragments soft silty gray clay 5" medium grained. 3" conglomerate - quartz pebbles, clay fragments + pellets (including silty clay with Fa lumps)	
39'4"	40'5"	1'1"	Fine grained white sandstone faintly banded may be X laminated.	Unconf. ?
40'5"	40'9"	4"	Gray siltstone	
40'9"	46'	5'3"	No recovery, probably soft siltstone.	— ? — Much chunk
46'	56'	10'	Gray + green siltstone mottled with red in lower 2 1/2 feet.	



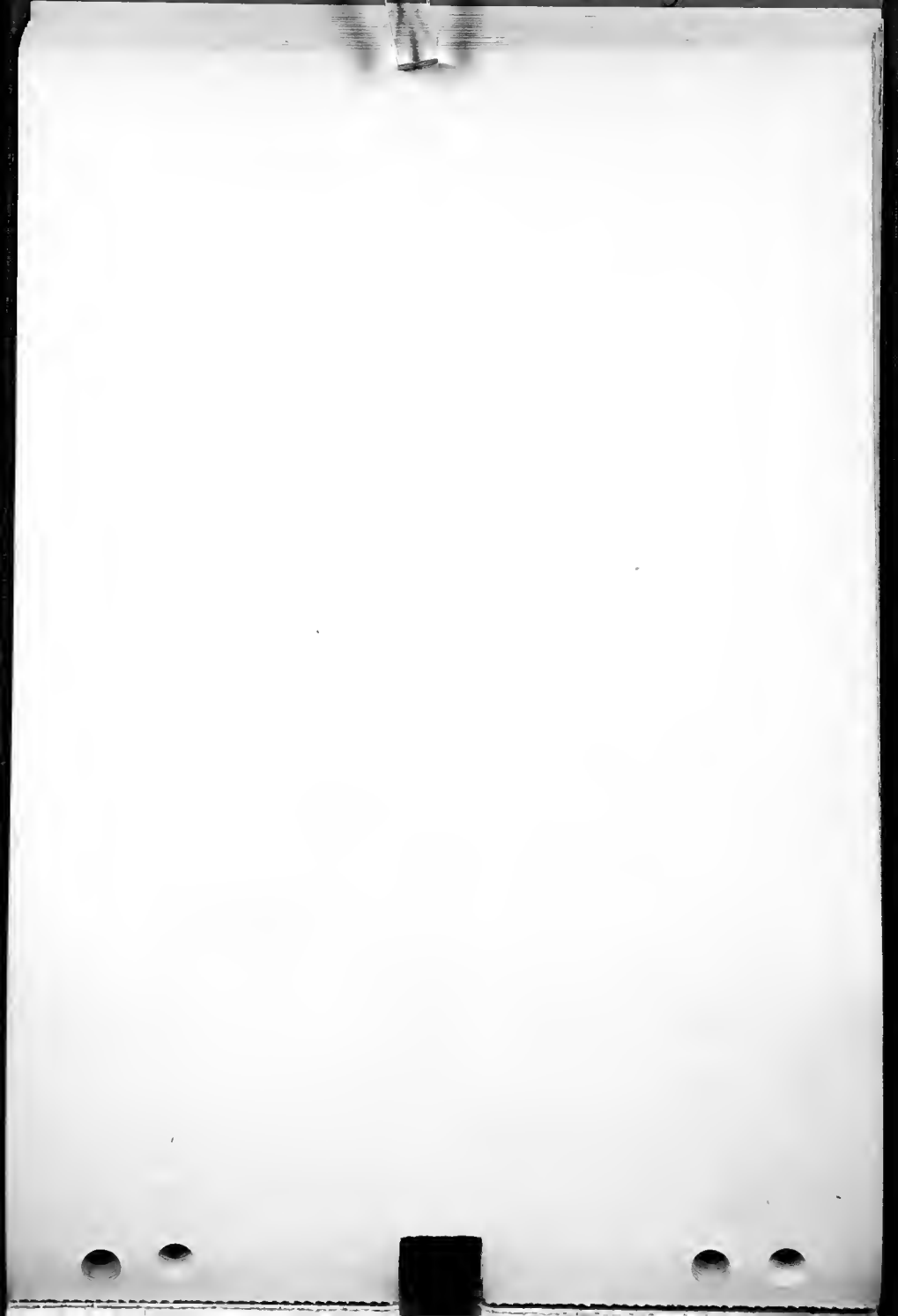
Hole 344

Surf. Elev.

Depth 106'5"

From	To	Th.		
0	12'2"	12'2"	White medium grained micaceous sandstone. Local brown discoloration.	Clarion ss?
12'2"	39'6"	27'4"	Gray sandstone, medium to fine grained, micaceous with zones as follows:- 12'11" to 13'3" contains angular fragments soft clay shale 14'8" to 15'1" as above 37'3" to 37'6" large inclusions of hard brown gray clay From 32'2" to 39'6" numerous coaly + clayey partings.	— ? —
39'6"	39'8"	2"	Coal and pyrite.	
39'8"	49'9"	10'1"	Gray sandstone, medium to fine grained, micaceous, zones with coal + clay pellets from 39'8" to 42'2" (some of clay pellets hard silty shale.)	Homewood S.S.
49'9"	62'	12'3"	Gray to black shale, silty to finely sandy from 52'5" to 57'5" other portions more clayey. Plant fragments below silty zone.	Shale
62'	62'5"	5"	Coal (may be thicker, some cores lost here or in following interval)	Lower coal
62'5"	63'10"	1'5"	Black coaly shale	Horizon
63'10"	68'	4'2"	Hard clay as follows:- 5" black 'top block' 12" gray flinty block, scattered nodules 21" nodular block 12" block, scattered nodules some siltite.	Clay

Mason

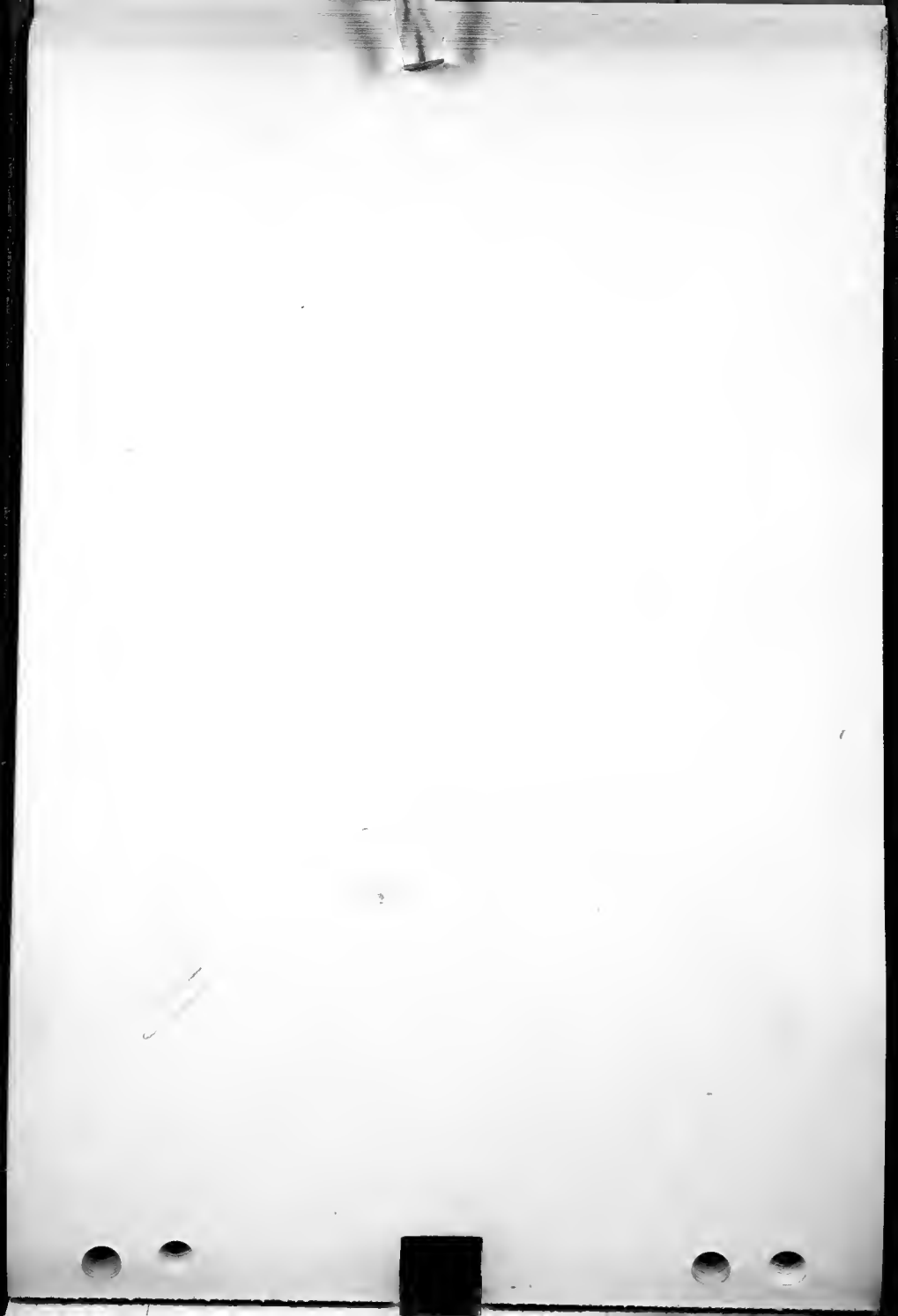


Hole # 34 (cont.)

From	To	Th.		
65'	70'9"	2'9"	Shaley block clay, suberitic (Fe lumps), greasy.	Mercer Clay - ? -
70'9"	73'11"	3'2"	Gray shale, greasy, Fe lumps, (may belong with above interval.)	X
73'11"	76'3"	2'4"	Shale as above but mottled red and gray.	
76'3"	78'8"	2'5"	Gray sandstone with conglomerate in lower 10". Coarse in basal 3" - all rounded quartz pebbles av. about 1/4" diam. in red + gray clay matrix.	Y
78'8"				
78'8"	96'8"	7'	Presumably red shale with some gray and green. all rather silty, Fe lumps present.	Manch Clunk
96'8"	96'5"	9"	Green sandy siltstone.	
96'5"	106'5"	10'	Greenish gray micaceous fine grained sandstone with layers + partings of green siltstone.	?

X - if Y is representing local shred of conglomerating then X is still Mercer + may, along with Y be indicative of reworked zone along Mercer - Manch Clunk contact.

Y - if Y is local phase in Manch Clunk, at least lower interval of X belongs to Manch Clunk.

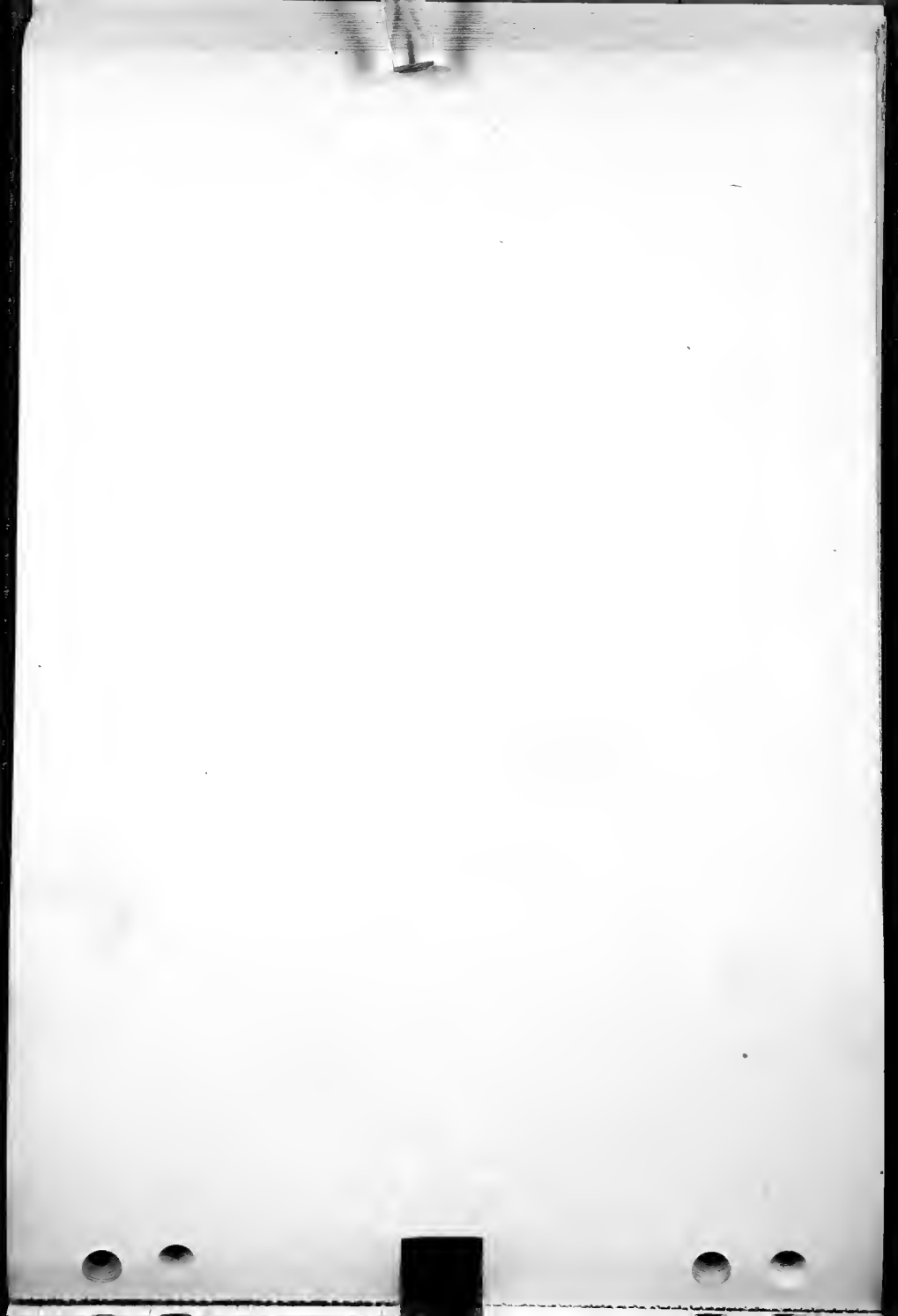


Hole #33

Surf. Elev.

Depth 56'9"

From	To	Th		
0	3'	3'	Overburden, sandstone float blocks.	
3'	12'4"	9'4"	White to light gray medium to fine grained micaceous sandstone. Zones of streaks of finely disseminated carbonaceous matter.	Clarion S.S. ?
12'4"	13'2"	10"	Brown gray shaly fine grained sandstone, micaceous with speck of carbonaceous material; grades into soft dark blue-gray clay shale. About 5" of each.	— ?
13'2"	23'10"	10'8"	Light gray sandstone, medium to fine grained (pred. med-gr.) micaceous, hard with Fe speckled stain (if fresh would probably have greenish cast. Coaly streaks lower 2½".	— ?
23'10"	25'2"	1'4"	Dark gray fine grained shaly carbonaceous micaceous sandstone with medium grained gray sandstone with coaly streaks in lower 5".	Homewood S.S.
25'2"	33'	7'10"	Gray medium grained micaceous sandstone. Carbonaceous streaks and partings chiefly in upper 1½" and lower 1".	
33'	33'4" 38'5"	5'4" 5'15"	Gray to dark gray silty shale. Lower 1" (c. med.) a non-silty dark gray clay shale.	Alsea shale
38'5"	38'9" 45'11"	7'6"	Hard clay as follows:—	



Hole 33 (cont.)

From To Th.

From	To	Th.	Description	Notes
			(Hard clay)	
			24" Flinty blocks and flint	Mercer clay.
			5" Fine grained nodule	
			39" Sideritic block with nodular zones & scattered nodules (Nodules concentrated in upper 6" and from 21" to 30") Streak of non-sideritic block 14"-17")	
			22" Sideritic block.	
45'11"	48'1"	2'2"	Shaly block clay, sideritic	- - ? -
48'1"	49'8"	19"	Transition from above thru gray shale, mottled blocky gray shale, greasy, minor Fe bumps.	- - ? -
49'8"	56'9"	7'1"	Siltstone, shaly siltstone and shale as follows:- 20" compact gray-green siltstone. 19" Very fine grained gray green sandstone 10" Green soapy siltstone Fe bumps 36" Red silty shale and siltstone	Murch Chumbe

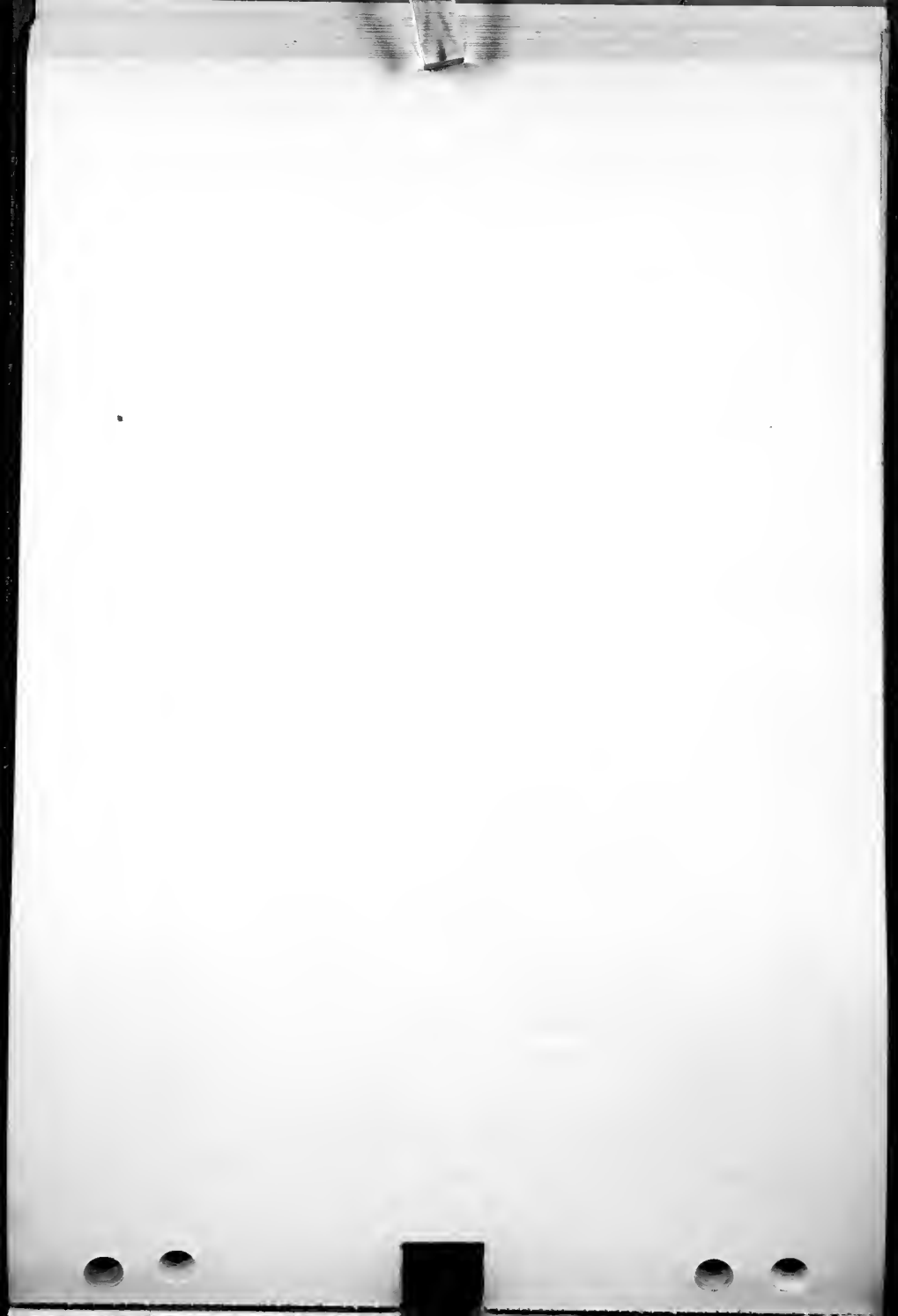
Hole 35

Surf. Elev.

Depth 90'

From To Th.

0	20'2"	20'2"	Medium to fine grained white micaceous sandstone, locally stained light brown some thin clayey partings & streaks in basal 1 foot	Clarion S.S.
20'2"	20'10"	8"	Soft light brown to brown gray silt.	
20'10"	21'8"	10"	Black silty clay with brown mottling in upper part, grades downward into black semiplastic clay with coaly streaks	Clarion shale ?
21'8"	22'3"	7"	Coaly silty shale, sandy shale and fine grained sandstone - whole micaceous	?
22'3"	23'6"	15"	Fine grained gray carbonaceous sandstone grading downward into lighter more silty sandstone with brown stained plant fragments.	
23'6"	25'2"	20"	Hard sandy siltstone, light gray with brown stained plant fragments. Zones of soft siltstone 6"-11" and 16"-20"	
[Core loss prob in 20'10" to 21'8" int.]				
25'6"	44'10"	18'4"	alternating beds of (1) micaceous sandy siltstone, light gray with greenish cast, and (2) dense, fine grained, hard, micaceous gray sandstone with greenish cast. (Some of mica dark?) as follows 14" Siltst. 17" S.S. 18" siltst. 4" S.S.	Homewood S.S. ?



Hole 35 (cont.)

From To Th

From	To	Th	Description	Notes
			14" siltst.	
			10" s.s.	
			9" siltst.	
			52" s.s. (mostly med.-grained)	
			6' 10" s.s. (local coaly streaks + shaly streaks in lower 2')	
44' 10"	54' 6"	9' 8"	Gray to dark gray micaceous sandstone, numerous thin coaly partings, blebs and streaks of black sandy shale in upper 6".	Home wood ?
54' 6"	55' 5"	11"	Gray micaceous silty shale with thin beds + layers of sandstone.	
55' 5"	59' 10"	4' 5"	Gray to light + dark gray micaceous, carbonaceous, sandstone. Chiefly medium grained, minor fine grained. Zone of coal and silty clay pellets from 57' to 57' 7". Shaly streaks and inclusion at base.	
59' 10"	61' 5"	1' 7"	Dark gray to black shale	Upper coaly zone
61' 5"	61' 10"	5"	Coaly shale or 'slate'.	
61' 10"	69' 10"	8'	Black + dark gray shale, somewhat silty in visible portions	Shale
69' 10"	70' 6"	8"	Highly carbonaceous black shale - almost 'slate'	Coaly zone
70' 6"	70' 10"	4"	Black shale with streaks and inclusions of waxy gray clay.	
70' 10"	71' 3"	5"	Waxy light brownish gray clay.	
71' 3"	72' 2"	11"	Coal	Mercer
72' 2"	72' 5"	3"	Black carbonaceous + coaly shale	Coal



Hole 35 (cont.)

From To Th

[8" core loss somewhere in 69'10" to 72'5" interval.

73'1"	78'11"	5'10"	Hard clay as follows:- 14" Hard dark gray to gray flinty 'top block'. 13" Gray flinty block with scattered fine nodules 30" Nodular block clay, lower 15" sideritic, nodules decrease greatly in lower 6"	Mercer clay
78'11"	80'	13"	Shaly block clay sideritic	---
80'	82'3"	2'3"	May be shaly block clay, tho more shaly, greasy, and greenish. Sideritic	?
82'3"	85'11"	3'8"	Greenish gray shale with Fe bumps. May have some of above interval in upper foot tho all-gradational and no sharp changes.	---
85'11"	86'9"	10"	Gray to greenish gray fine grained sandstone with thin layers of silty shale.	Mausch chunk
86'9"	87'7"	10"	Dark gray and greenish gray shale, many Fe bumps.	
87'7"	90'	2'9"	Silty gray shale, locally sandy - Fe bumps. Lower 8" red, more lacy shale.	

1068

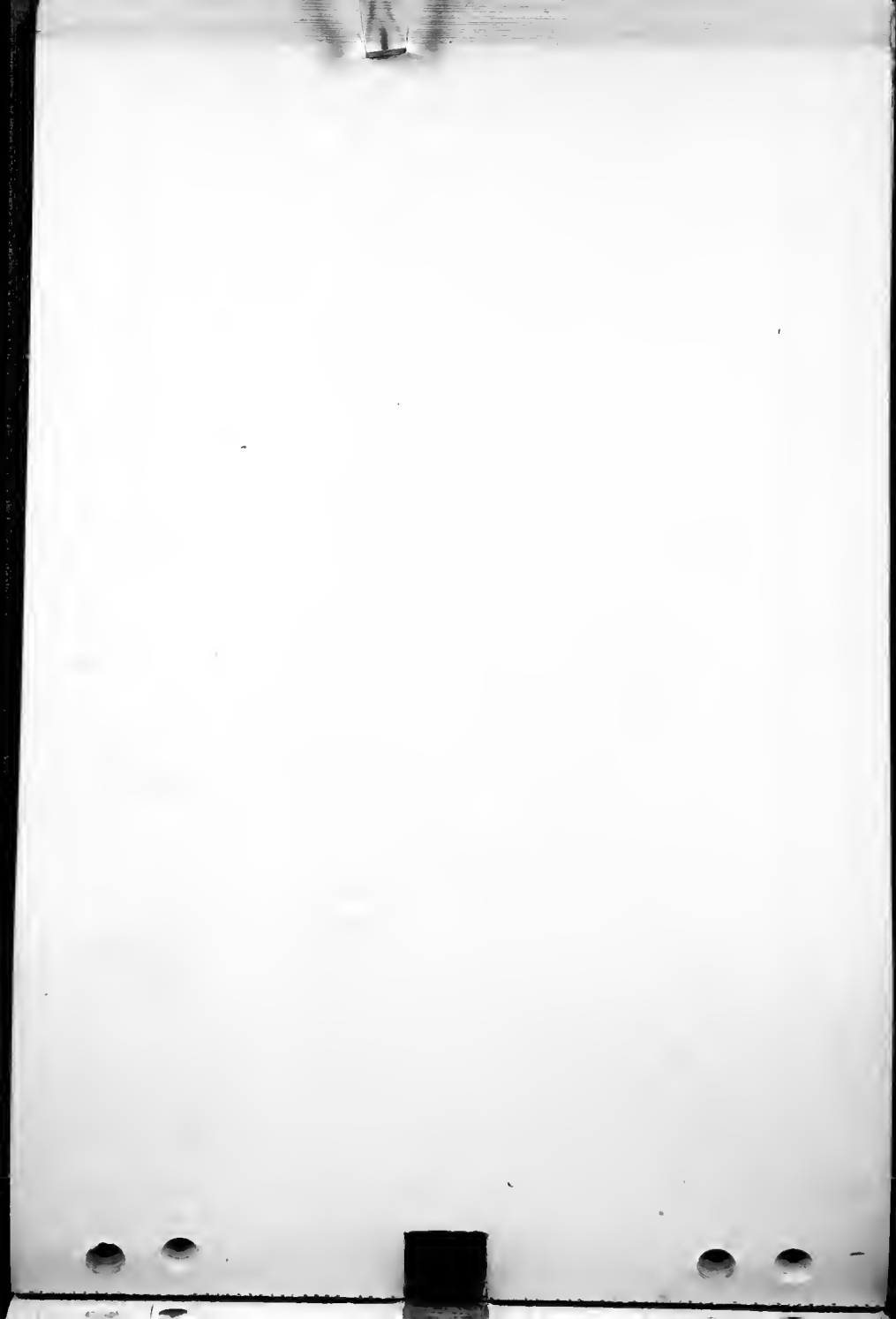
Hole 36

Surf. Elev.

Depth 101'3"

From	To	Th.		
0	3'6"	3'6"	Overburden, sandstone float blocks in sandy loam	
3'6"	11'6"	8'	Light brownish med. grained micaceous sandstone. Color due to staining.	
11'6"	24'7"	13'1"	Light gray medium, locally fine grained micaceous sandstone, Fe stained partings. Minor coaly partings from 18'8" to 19'4"	
11'6"	24'7"	41'6"	16'11"	Sandstone as above, predominantly medium grained with fine grained zones associated with coaly streaks as follows: - 27'9" to 28'2"; 28'6" to 28'11"; 30'10" to 31'9"; 33'11" to 34'4". Thick coaly clay shale parting at base
41'6"	42'6"	1'	Light gray to white dense micaceous sandstone, zone 1/2 thick of angular fragments dark gray silty shale at base.	
42'6"	44'1"	1'7"	Gray to light gray med. grained micaceous sandstone	
44'1"	44'8"	7"	Crumbly med. grained micaceous sandstone with clayey matrix.	
44'8"	45'1"	5"	Light gray silty micaceous shale.	
45'1"	45'8"	7"	Gray shaley fine grained sandstone, med grained streaks; inclusion soft gray slicked clay at base	

— ?



Hole 36 (continued)

From	To	Th.		
45'8"	63'6"	17'10"	Light gray medium grained micaceous sandstone. Coaly partings, chiefly from 50' to 52'3". Zone of silty shale pellets at 53'; minor coaly partings 54' to 63'6"	
63'6"	69'	5'6"	Dark gray, locally black, silty shale with zones and streaks of fine sandstone.	Mercer or shaly zone in Homewood
69'	78'6"	9'6"	Light gray medium grained micaceous sandstone, minor carbonaceous partings.	Homewood or sandstone base in Mercer
78'6"	80'4"	1'10" *	Medium grained light gray to gray sandstone shot thru with coaly streaks, seams and inclusions of black coaly shale.	
80'4"	81'6"	1'2"	Hard black shale, some plant fragments.	Mercer
81'6"	81'10"	4"	Gray to dark gray slicked clay, semi-lens.	
81'10"	83'10"	2'	Coal and coaly shale. (at least 18" coal, some shaly seams.)	Mercer Coal
83'10"	93'6"	9'8"	Hard clay (2 foot core loss in this interval, may be from top block or sideritic block, could be other types. Also a bare	Mercer Clay

(* 1 foot core loss in run 79-1 to 84-1 split between this interval and coal below.)



Hole in center of page

Hole 36 (continued.)

From To Th.

possibility that there was error in calculation of depth.) Following actual thicknesses of clay types recovered -

14" Hard black top block, scattered fine nodules in lower 6"

6" Gray flint, scattered nodules

22" Nodular block

33" Sideritic nodular block.

15" Sideritic block.

93'6" 94'8" 14"

94'8" 96'7" 1'11"

Shaly sideritic block.

Gray to dark gray silty shale, Fe 'bumps' -

(greatest concentration appears to be in upper few inches). Basal 6" hard dark gray siltstone.

96'7" 98'3" 1'8"

Green-gray shaly silt to silty shale. (Fe 'bumps')

98'3" 99'11" 1'8"

Green to gray and black clay shale, many Fe 'bumps'.

99'11" 101'3" 1'4"

Shale as above but red.

Mercer
Clay

Mauch
Chunk



Hole 37

Surf. Elev.

Depth. 80'9"

From	To	Th.	
0	2	2	Chiefly overburden, some light gray to whitish, brown stained micaceous sandstone in lower 1 foot
2	5'8"	3'8"	Poor recovery:- Fragments of light brown stained fine grained shaly sandstone, micaceous; and brown clayey silt and silty shale; latter probably predominates.
5'8"	11'8" 13'1"	6'9"	No recovery. Sludge clayey, locally sandy, coaly at base. and at top of following interval
13'1"	18'	4'11"	Predominantly fine grained micaceous light gray, brown stained, sandstone. Zones of shaly sandstone in upper 2'; Fe stained partings, minor carbonaceous streaks.
18'	25'7"	7'7"	Gray to dark gray predom. fine grained micaceous sandstone. Some thin zones dark gray sandy shale. Numerous vertical Fe stained fractures and Fe stained partings.
25'7"	46'1"	20'6"	Light gray medium grained micaceous sandstone. Zones of fine grained SS associated with coaly streaks as follows:- 25'7" to 26'7"; 42'7" to 46'1" (scattered). One zone fine SS with small angular flakes of black shale 32'7" to 33'3"

Classroom:

Homewood
S.S.



Hole 37 (continued).

From To Th.

46'1" 58'7" 12'6"

Shale and minor clay
as follows:-
(46'1"-58'5" interval has
recovery exceeding thickness
by $\frac{2}{4}$ " - following by
actual recovery)

- 9" Dark gray to black shale
coaly shale & slate.
- 10'8" Dark gray silty shale,
locally less fine sandy
- 2'10" ~~Dark gray clay shale~~ streaks -
- 1'4" Black, locally coaly,
hard clay shale.
- 6" Gray shelled clay,
fairly hard, subplastic

Mercer
Shale

58'7" 61'6" 2'11"

as follows:-
29" (21" actual recovery)
Coal

- 3" Hard black coaly clay
- 3" Coal.

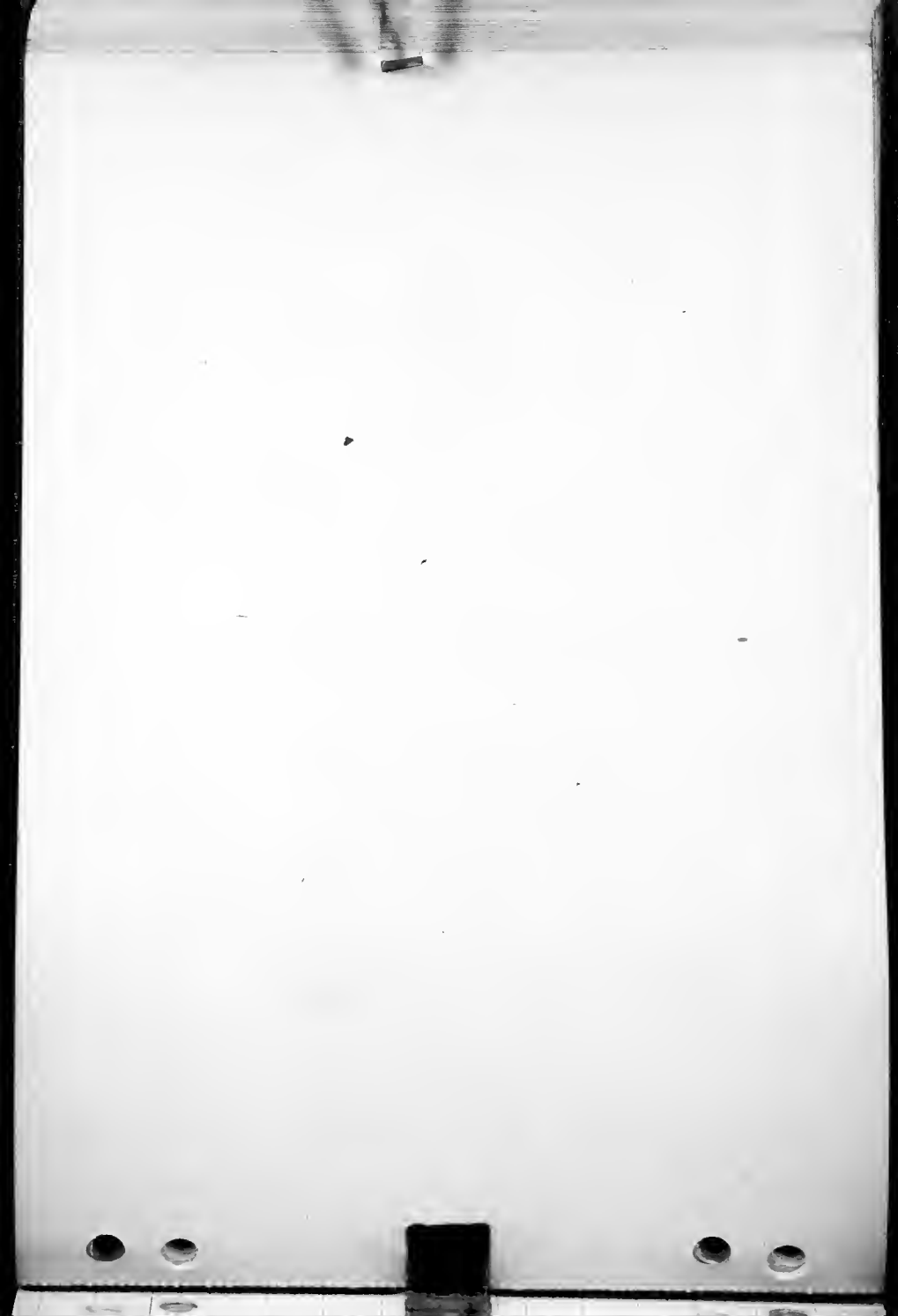
Mercer
Coal (lower)

61'6" 66'3" 4'9"

- Hard clay as follows
- 8" Hard black coaly top
blocks, scattered fine
nodules in lower 3"
 - 16" Dark to light gray
flinty block modular
(nods. increase in
size downward)
 - 15" Flint clay? Gray,
shelled clay, softer
than normal. Goes
into flinty block-
blocks. Scattered
nodules.
 - 18" Sideritic block, also
somewhat softer
than normal.

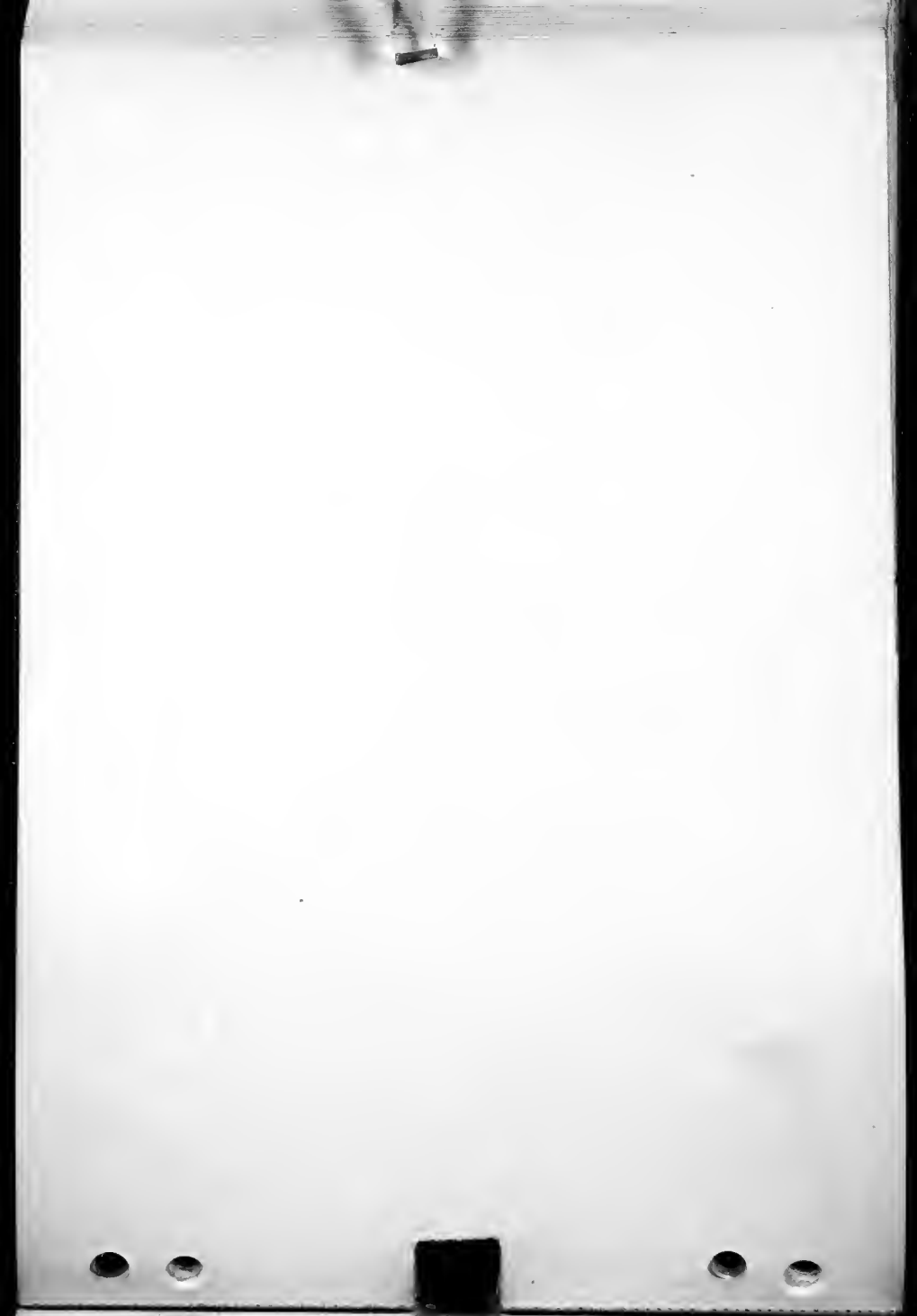
Mercer
Clay

? >



Hole 37 (continued)

From	To	Th.		
66'3"	68'11"	2'8"	Shaly block clay, Fe 'bumps' (Heavy concentrations of 'bumps at 68'7")	Mercer Clay
68'11"	69'2"?	3"	Greenish clay shale, no Fe 'bumps', slicked. (May be more than 3" - core loss of 2'2" between 68'11 and 80'9".	- - - ?
69'2"?	80'9"	11'7"	As follows (according to actual recovery)	
		11"	Hard dark gray shaly siltstone	
		17"	Dark gray clayey shale and shaly clay, Fe 'bumps', finely silty, in lower 6"	Mauch Chunk.
		23"	Dark gray silty shale Fe 'bumps'	
		12"	As above but siltier with light gray + red streaks	
		44"	As above but red.	



Hole 38

Surf. Elev.

Depth 70'2"

From	To	Th.		
0	3'10"	3'10"	Overburden, sandy loam with sandstone float blocks	
3'10	30'9"	26'11"	Chiefly medium grained light gray micaceous sandstone, brownish stain to 10'6". Fe stained partings thruout, some fine grained zones, minor coaly streaks and partings. No noticeable break or lithologic change thruout.	Homewood SS
30'9"	32'2"	1'5"	(8" actual rec.) Dark gray to black shale and 'slaty' shale.	Upper coaly horizon
32'2"	37'2"	7'	Light to dark gray silty shale, some streaks of fine sandstone.	
37'2"	40'11"	1'9"	Dark gray to blue-black clay shale, plant fragments.	
40'11"	42'1"	1'2"	(8" actual recovery) Black coaly shale	Coaly zone
42'1"	43'2"	1'1"	Gray waxy 'slicked' clay, coaly streaks in lower 2".	
43'2"	44'6"	1'4"	Coal (8" + actual recovery)	Coal
44'6"	54'6"	10'	(Recovery of 8' in this interval. Following actual recovery - loss could be from lithologies starved)	Mercer Coal
			* 1' Hard black coaly clay and coal (3" seams 8" to 11")	
			Hard clay	
			10" Dark gray flinty top block	
			* 25" Gray flinty clay, softer than normal, slicked.	Mercer clay

Mercer

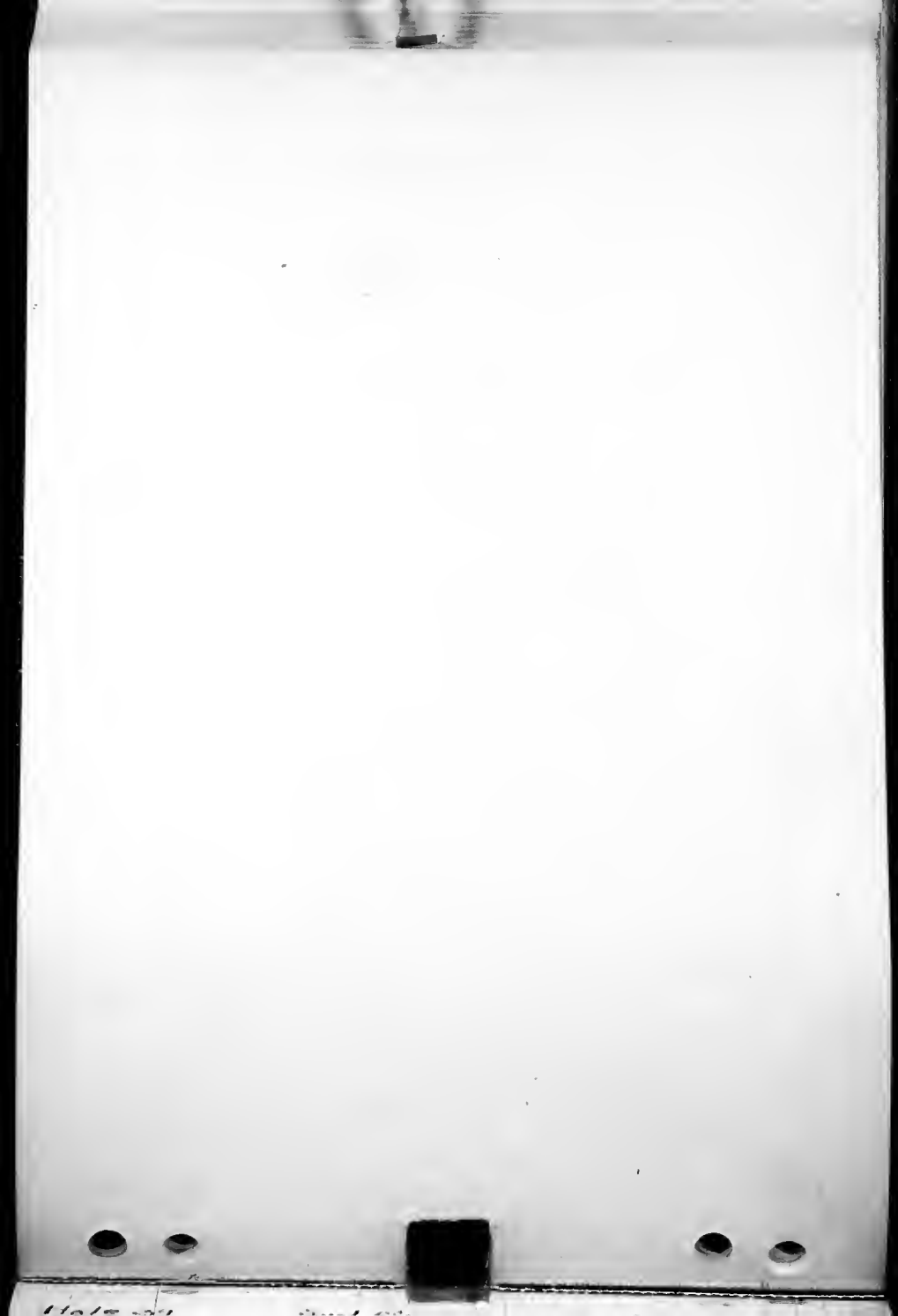
Hole 38 (continued)

From To Th

			15" Clay as above with scattered fine nodules	
			19" Nodular block clay	
			9" Sideritic block clay	
			(End of Hard clay)	
			* 6" Shaly block clay Fe 'bumps'	Merces Clay
54'6"	70'2"	15'8"	(1'8" loss in rec. from red + green silty shales)	
			7" Shaly block clay Fe 'bumps' (great concentration in upper 4")	---
			11'4" Gray to greenish gray silty clay shale + clayey siltstone. Fe 'bumps'	---
			2'5" Red silty clay and clay shale. Fe 'bumps'	Mauch Chunk

Note: Core loss in clay interval divided as follows (for tonnage estimates.

- 1 foot added to hard black coaly clay + coal zone at top
 - 1/2 foot added to 25" zone gray flinty clay
 - 1/2 foot added to 6" zone shaly block clay at base.
- (See short logs.)



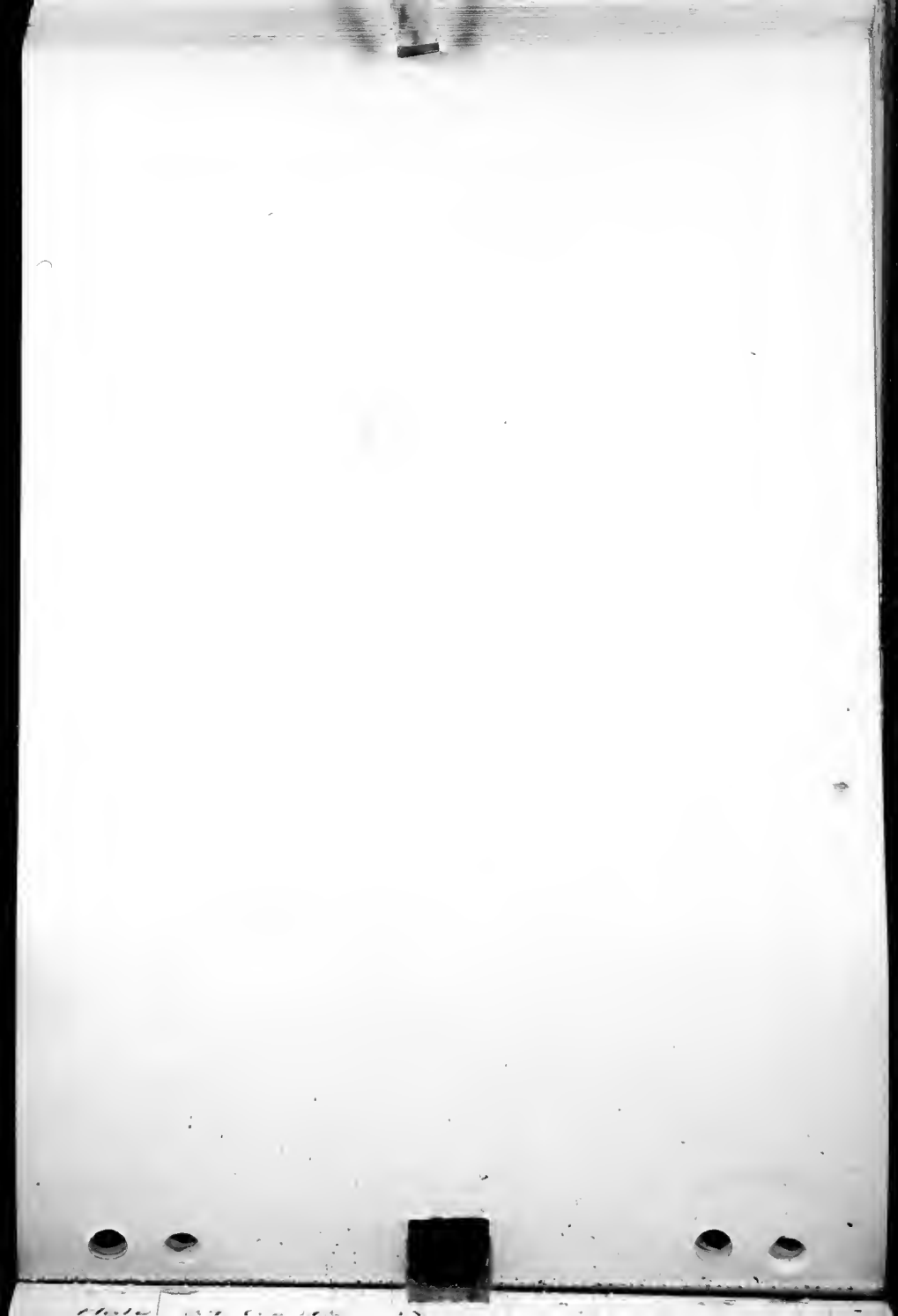
Hole 39

Surf. Elev.

Depth 121'4"

From To Th.

0	12'3"	12'3"	Overburden (3'±), silty to sandy shale, carbonaceous from 7'6" and including coaly shale, sandy coal, minor coal.
12'3"	12'11"	8"	Carbonaceous fine grained micaceous sandstone, black to dark gray minor shaley streaks
12'11"	15'9"	2'10"	Light gray micaceous sandstone, medium to fine grained with carbonaceous streaks and bands of dark gray fine gr. carbonaceous sandstone
15'9"	21'3"	5'6"	White to light gray, medium grained micaceous sandstone, few fine grained zones with minor coaly streaks, some Fe stained partings and some carbonaceous shaley partings.
21'3"	22'11"	1'8"	Light gray medium + fine grained sandstone, micaceous, lower 6" shot with coaly and clayey streaks, partings.
22'11"	24'2"	1'3"	Hard gray fine grained sandstone to siltstone minor shaley zones.
24'2"	35'3"	11'6"	Predominantly gray to black shaley ^{sandy} siltstone, locally silty shale, with light gray streaks and laminae of fine sandstone also some carbonaceous shale laminae. Sandstone



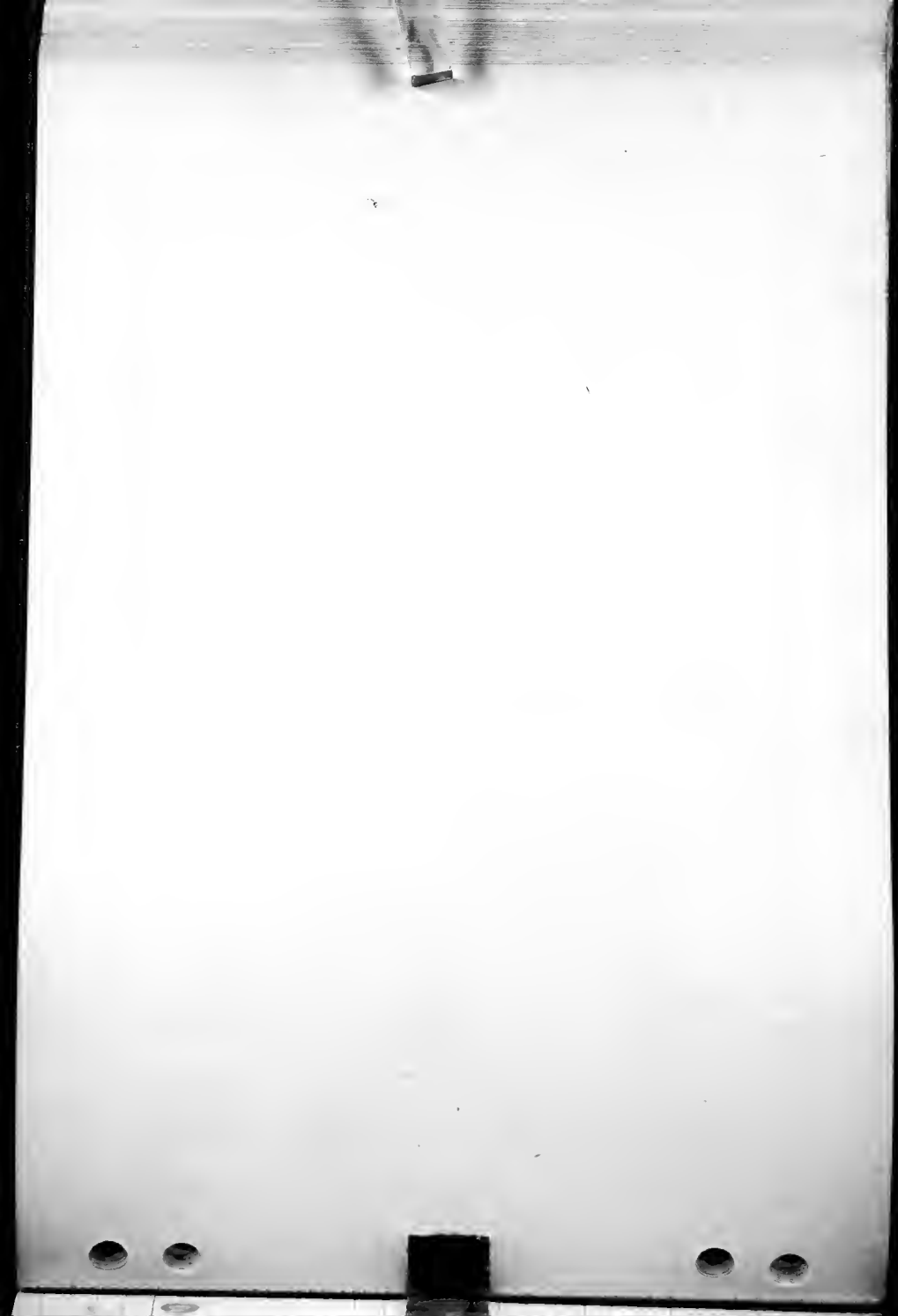
Hole 39 (continued)

35'8"	40'10"	5'2"	laminæ locally intersecting light gray medium to fine grained sandstone with streaks and laminæ of darker fine grained sandstone and large inclusions of lithology of above interval showing contortion of siltstone + sandy laminæ. Minor carbonaceous partings throughout.
40'10"	46'	5'2"	Light gray medium to fine grained sandstone. Uniform, micaceous. 2 zones showing laminæ of darker fine grained sandstone from 43'6" to 44'7" and from 45' to 45'5"
46'	50'10"	4'10"	Light gray medium grained micaceous sandstone with occasional inclusions of solitary angular shale fragments. These of dark sandy-silty shale.
50'10"	62'2"	11'4"	Chiefly gray sandstone, scattered streaks dark fine grained sandstone + silty shale, zones of shaly clay fragments, coaly streaks + partings in basal 4 feet.
62'2"	62'8"	6"	Black shale, upper 2" slaty.
62'8"	72'5"	9'9"	Dark gray to (locally) black shale, silty from 65'5".
72'5"	73'10"	1'5"	Black shale



Hole 39 (continued)

73'10"	74'4"	6"	Dark gray semi-hard clay, (plant remains as in flint clay.)
74'4"	75'8"	1'4"	Coaly, minor shaly partings.
75'8"	81'1"	5'5"	Hard clay: - 7" Black top block 19" Dark gray to gray block, scattered fine nodules. 6" Gray block scattered nodules 33" Sideritic block
81'1"	83'1"	2'	Shaly block, both sideritic + with Fe bumps
83'1"	85'6"	2'5"	Dark to light gray silty shale, Fe bumps.
85'6"	86'8"	7"	Gray fine grained cross-laminated sandstone.
86'8"	93'1"	7'	Greenish gray to gray shale, locally silty, Fe bumps.
93'1"	98'11"	5'10"	Red and green shale, clayey to silty, local Fe bumps.
98'11"	116'8"	17'9"	Alternating gray to green siltstone and fine grained sandstone. Sandstone predominates in lower 9 feet with siltstone as bands and partings.
116'8"	121'4"	4'8"	Gray to light gray fine grained micaceous sandstone, locally cross-laminated.

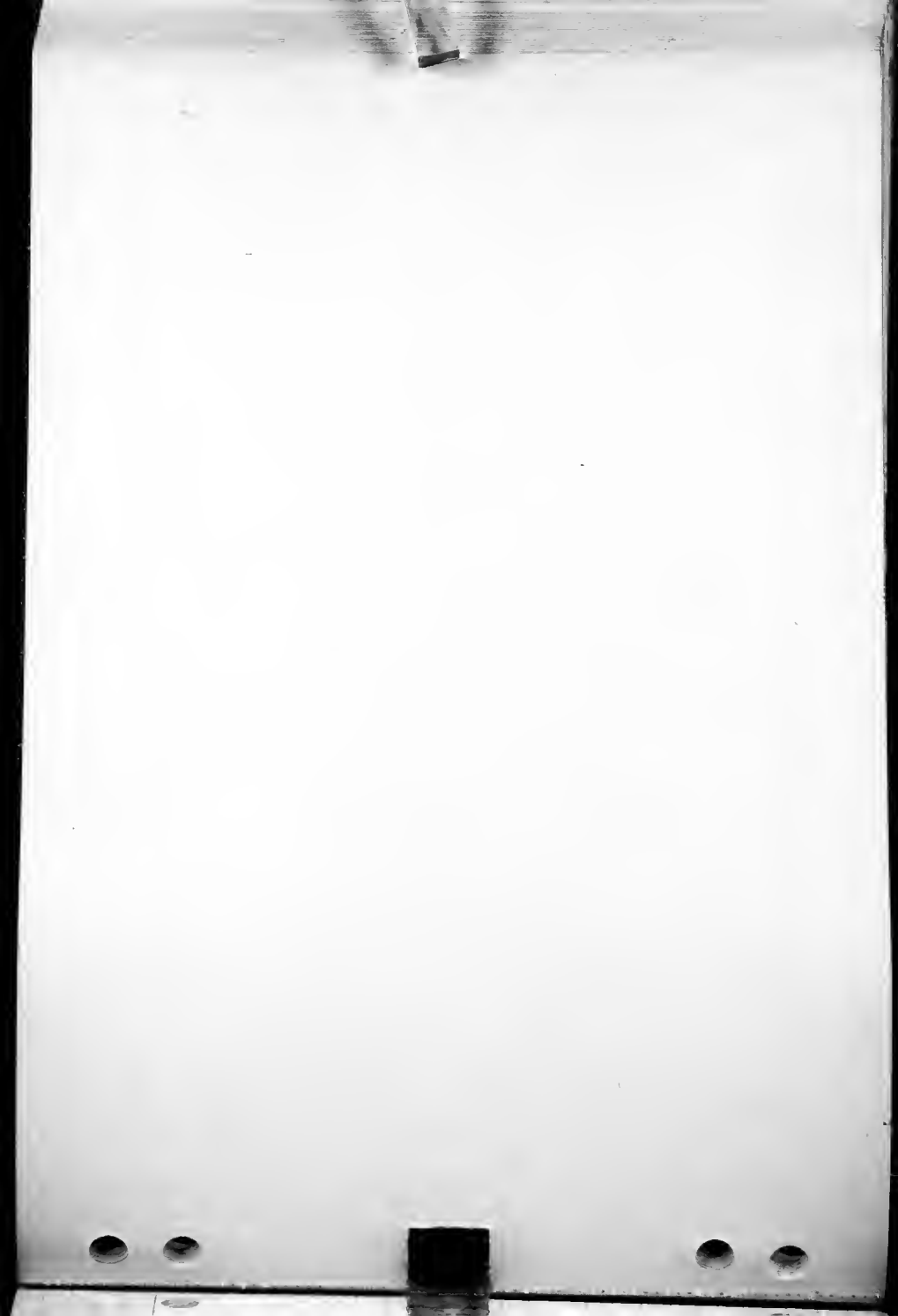


Hole 40

Surf. Elev.

Depth. 76'4"

From	To	Th.		
0	3'5"	3'5"	Overburden	
3'5"	18'6"	15'1"	White to light gray medium to fine grained micaceous sandstone, with partings of white sandy plastic clay (often weathered out leaving Fe brown stain on ss faces). Upper 3' with brownish stain. Coaly partings in lower 3'.	Clarion
18'6"	20'2"	1'8"	Light gray medium grained micaceous sandstone coaly partings & minor shaly streaks.	
20'2"	22'1"	1'11"	Coaly black shale, sandy.	Clarion shale
22'1"	23'2"	1'1"	Gray shaly clay, some plant impressions.	and A coal
23'2"	24'6"	1'4"	Coal	
24'6"	24'9"	3"	Gray carbonaceous sandstone coaly & clayey streaks.	
24'9"	30'	5'3"	Light gray medium, locally fine grained, sandstone, micaceous, scattered coaly streaks.	
30'	43'4"	13'4"	Alternating gray med. to fine grained sandstone and sandy to shaly gray siltstone, latter often shows bands & laminae of light gray sandstone. From 40-5 to 43'4" siltstone out except where large inclusions present in medium grained sandstone with coaly streaks.	Homewood
43'4"	50'5"	7'1"	Gray medium grained sandstone, coaly streaks and partings locally with shale inclusions.	



Hole 40 (continued)

50'5"	62'4"	11'11"	Gray to black shale as follows:- 50'5" to 51'4" Gray silty 51'4" to 52' Black to slaty 52' to 60'1" Gray to black silty 60'1" to 62'4" Black clay shale coaly in basal part.	Shale	Mercer
62'4"	62'9"	5"	Gray semi-hard clay	Lower Coal	
62'9"	64'	1'3"	Coal		
64'	70'2"	6'2"	Hard clay, as follows:- 19" Dark gray flinty block with scattered fine nodules. 8" Gray block, may be somewhat sandy or silty, some carbonaceous streaks. 30 ⁴⁷ " Sideritic blocks. (Shows 'conglomeratic' structure in lower 16") Both fresh siderite and Fe bumps	Clay	
70'2"	71'8"	1'6"	Shaly block clay, very iron (Fe bumps)	- - - - - ?	
71'8"	74'1"	2'5"	Dark gray shaly clay to clay shale with Fe bumps - may be a shaly block clay, but seems more of a true shale.	Mercer?	
74'1"	76'	1'11"	Sandy shale, mottled red and green + shot with seams of light sandstone (May be large shale inclusions in s.s.)	? March Chunk ? (Reworked?)	
76'	76'4"	4"	Light gray s.s., inclusions of red + green sandy shale.		

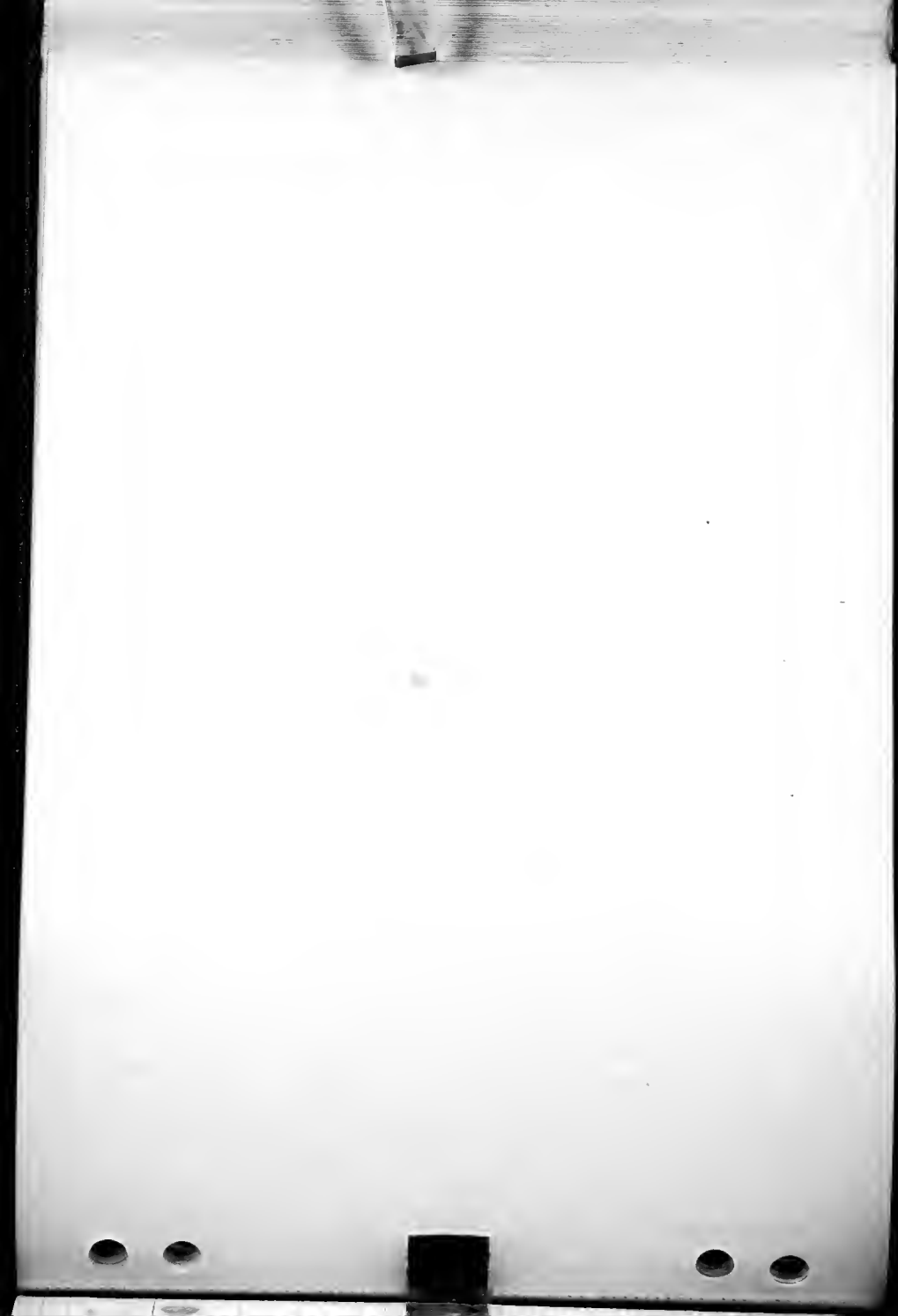


Hole 41

Surf. Elev.

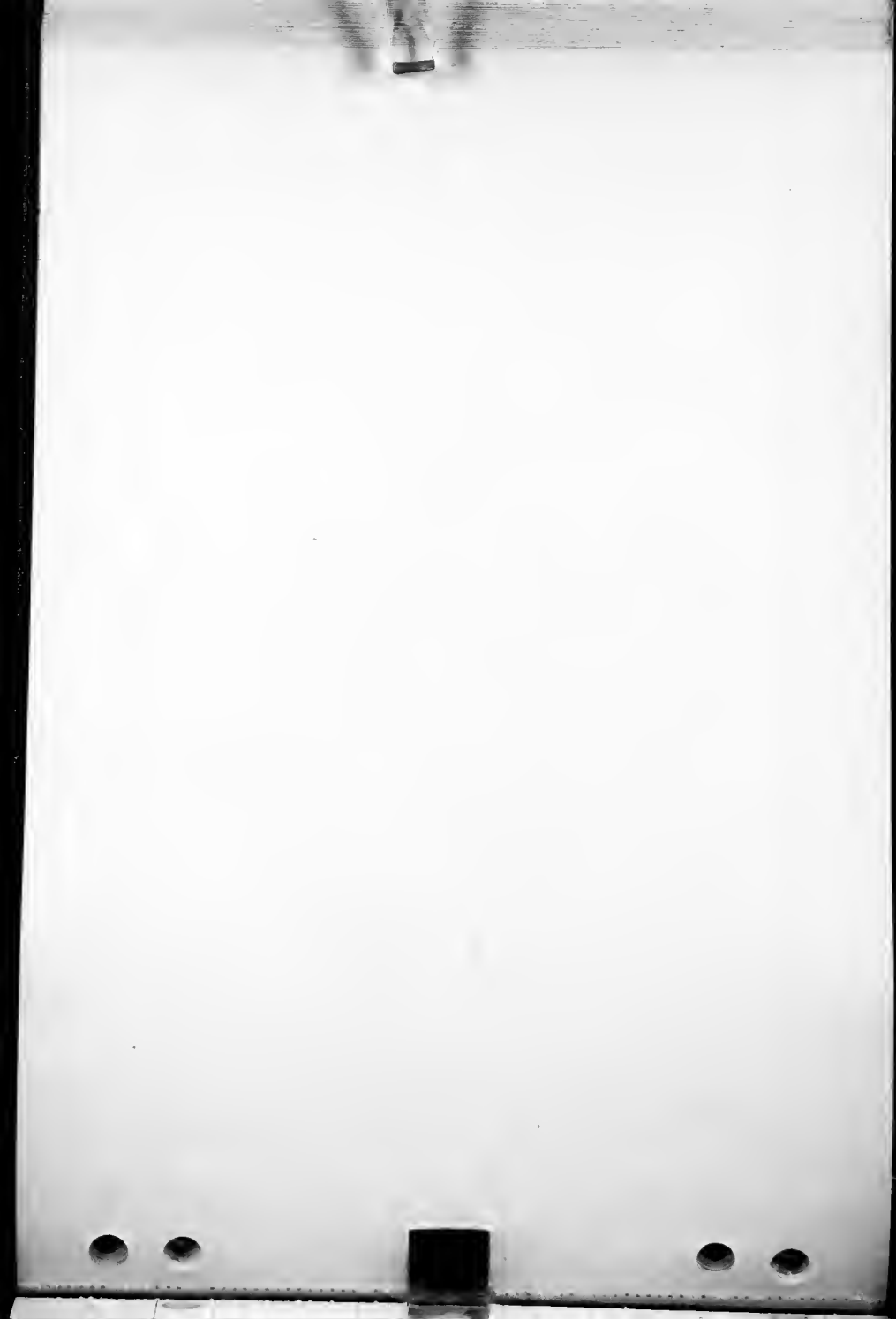
Depth: 74'2"

From	To	Th.	
0	3'6"	3'6"	Overburden
3'6"	16'9"	13'3"	White medium grained sparingly micaceous sandstone with streaks + partings of white sandy plastic clay. Locally brown stained.
16'9"	20'2"	3'5"	Gray to brownish gray med. to fine grained sandstone with streaks and seams clayey brown silt.
20'2"	32'7"	12'5"	Alternating zones of 1) light gray med. grained mic sandstone with minor coaly and Fe partings; and 2) Gray fine grained sandstone coaly partings.
32'7"	40'3"	7'8"	Light gray micaceous sandstone, medium grained. Minor coaly streaks.
40'3"	44'1"	3'10"	Gray silty shale, sandy laminar in lower 2 feet.
44'1"	56'5"	12'4"	Gray and light gray fine to medium grained sandstone. Coaly streaks common, some zones shale and clay inclusions, $\frac{3}{4}$ inch coal at 49'.
56'5"	59'1"	2'8"	Dark gray finely silty ^{partly} black shale.
59'1"	60'2"	1'1"	Black clay shale
60'2"	60'6"	4"	Coaly black shale + slate.
60'6"	60'10"	4"	Dark gray to black semi hard to hard flinty clay.
60'10"	61'3"	5"	Coal
61'3"	68'5"	7'2"	Hard clay, as follows 9" Hard black top block upper 4" somewhat shaley - coaly



Hole 41 (cont.)

			12' Dark gray to gray flinty block, scattered fine nodules. (coaly streak 4" to 5")
			10" Gray block, nodules in upper 2"
			55" (33" actual recovery) Gray sideritic block, heavy concentration of siderite in basal 6", may be silty in upper 8"
68'5"	69'11"	1'6"	Shaly block clay, sideritic becoming softer in lower 9"
69'11"	73'	3'1"	Gray to dark gray sideritic shale, hard locally silty.
73'	74'2"	1'2"	Red clayey shale, locally hard, silty & sideritic, minor gray streaks.



Hole 42

Surf. Elev.

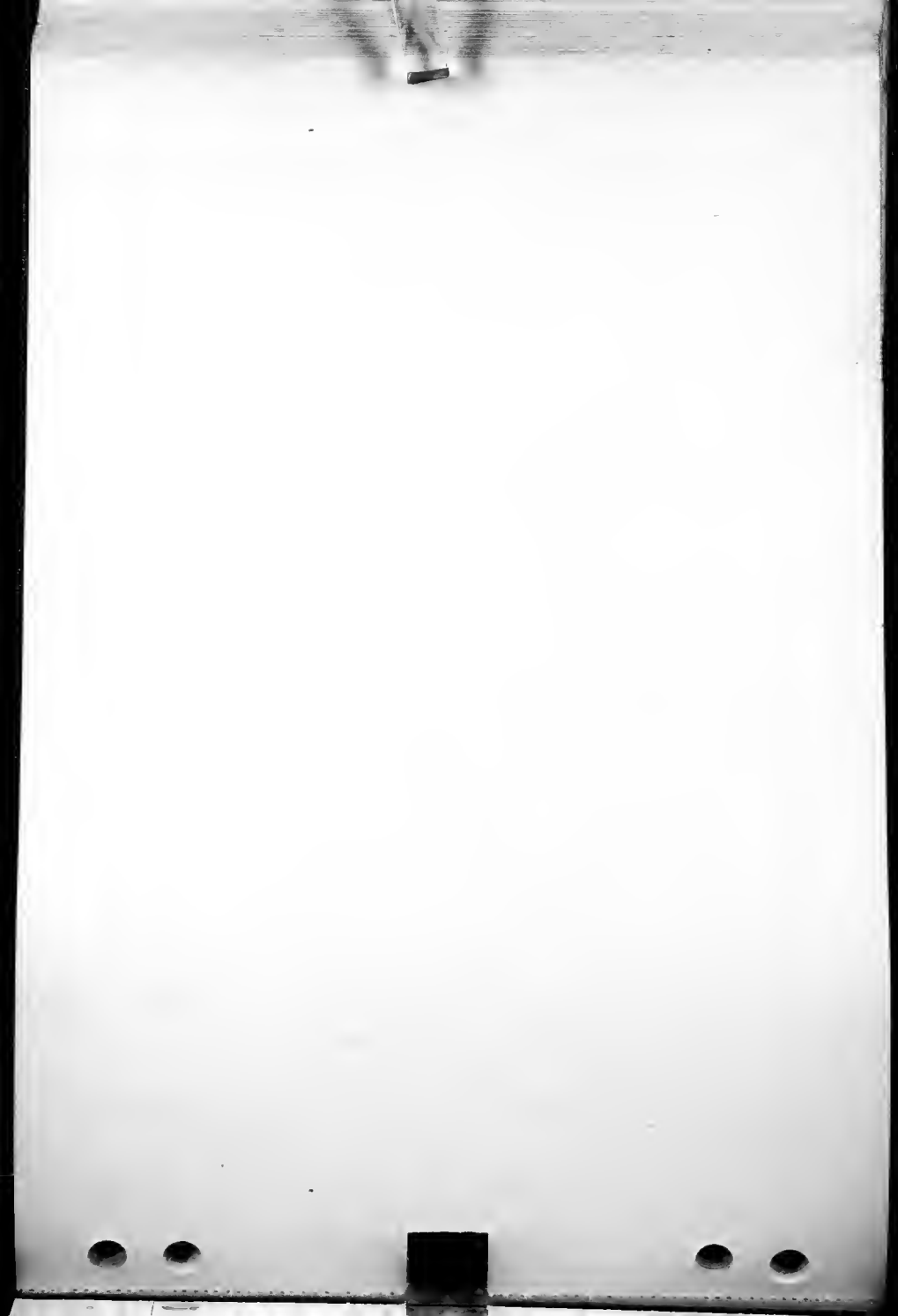
Depth 75'11"

From	To	Th.	
0	2'11"	2'11"	Overburden
2'11"	9'9"	6'10"	White sandstone, medium grained, micaceous. Partings of sandy white plastic clay. Local iron staining, minor coaly streaks near base.
9'9"	10'9"	1'	Light brown gray sandy plastic clay with zones of hard sandstone.
10'9"	20'6"	9'9"	Medium to, locally, fine grained light sandstone with reddish brown to pink Fe stain, Fe stained clayey partings, coaly streaks and inclusions in basal 4". Whole is probably light gray in color.
20'6"	22'10"	2'4"	Medium to fine grained carbonaceous sandstone, cross-laminated shot with coaly, shaly, + clayey streak partings and inclusions. Sandstone shows abrupt grade size changes.
22'10"	29'6"	6'8"	Gray silty shale and shaly siltstone with laminae of light gray fine grained sandstone. Occasional identifiable fossils and bedding planes.
29'6"	38'	8'6"	Light gray, locally gray, medium grained micaceous sandstone, numerous coaly partings. 1/2" coal at 33'6", scattered minor clay + shale pellets 32'6"



Hole 42 (continued)

38' 38'6"	6"	Dark gray micaceous silt to sandy shale. (May be inclusion - sharp contacts - irreg.) 1" sand stone streak in middle.	
38'6" 38'6"	47'3"	8'9"	Medium to fine grained light gray micaceous sandstone, locally banded with darker gray, zones of coaly streaks and partings
47'3"	49'	1'9"	Hard gray silty to sandy shale, streaks of lighter gray sandstone.
49'	49'11"	11"	Gray, chiefly fine grained sandstone, shaly streaks.
49'11"	50'5"	6"	Dark gray to black shale
50'5"	50'9"	4"	Dark gray shaly sandstone.
50'9"	52'6"	1'8"	Black clay shale
52'6"	52'9"	3"	Gray waxy clay, plant remains as in flint clays.
52'9"	53'4"	7"	Black coaly shale + clay.
53'4"	60'11"	7'7"	Hard clay as follows: - 12" Black to dark gray top block, locally coaly, scattered fine nodules. 22" Gray flinty block, scattered fine nodules, some carbonaceous mottling. 7" 58" (Actual recovery 38'5") sideritic blocky clay, siderite locally weathered out.
60'11"	61'6"	11"	Shaly block clay, sideritic, concentration siderite 61'1" to 61'6"



Hole 42 (continued)

- | | | | |
|--------|--------|------|---|
| 61'10" | 62'9" | 11" | Gray silty shale, scleritic. |
| 62'9" | 70'11" | 8'2" | Greenish gray shale, siltstone
and fine grained sandstone,
interbedded, 'Fe lumps'
throughout. |
| 70'11" | 75'11" | 5' | Green and red silty shale |

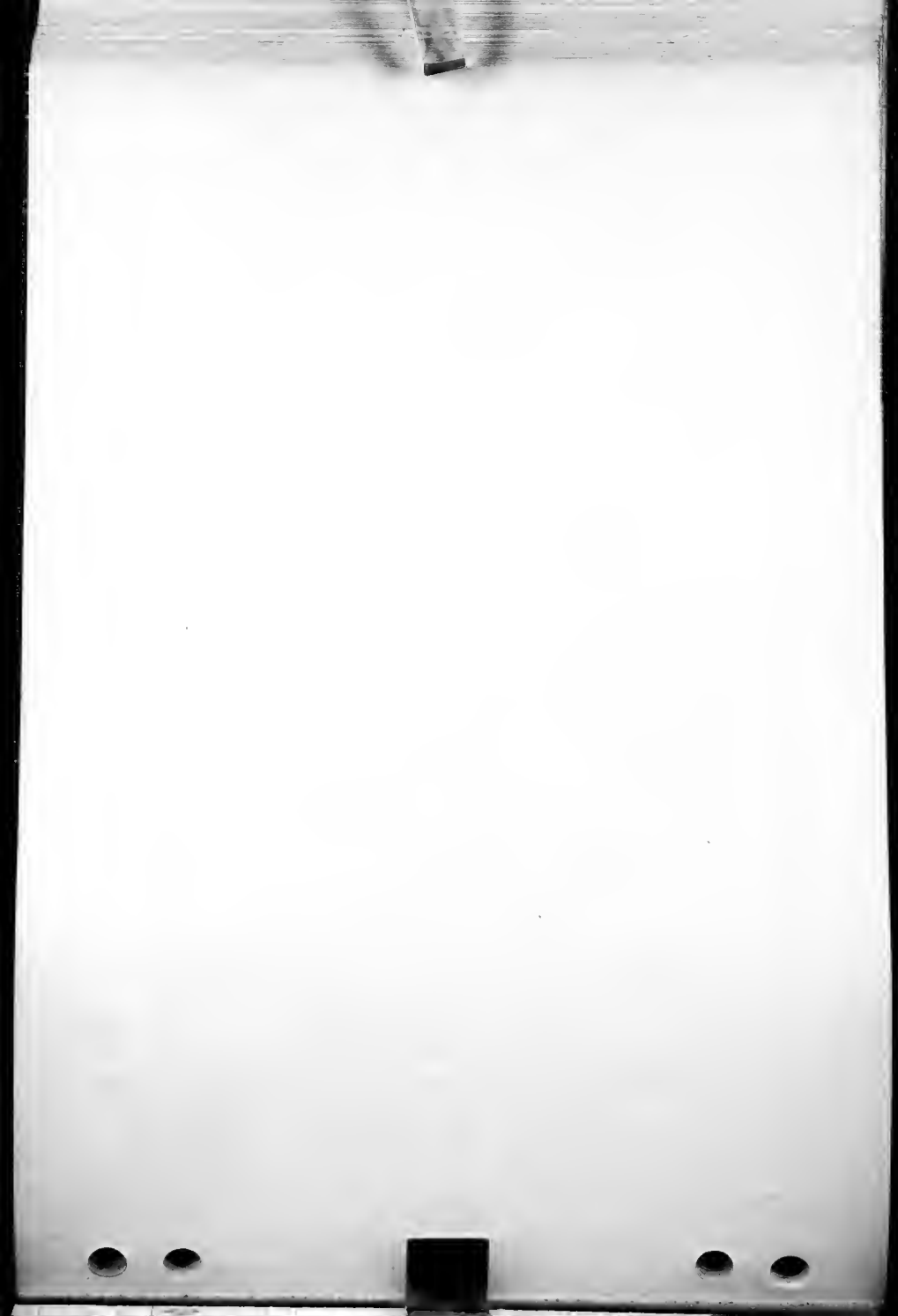


Hole 43

Surf. Elev.

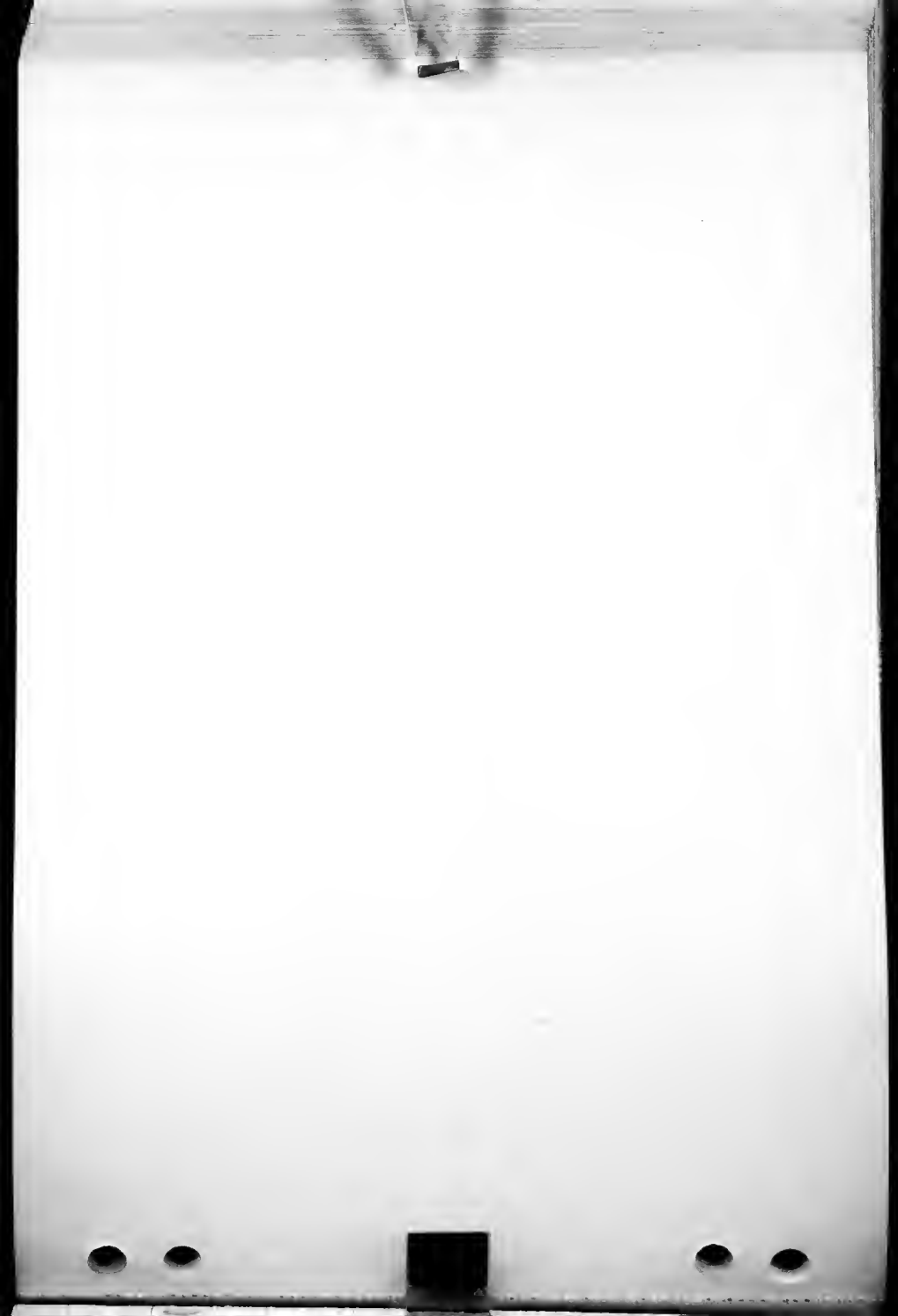
Depth 78' 4"

From	To	Th.	
0	1'	1'	Overburden
1'	13'	12'	White medium grained sandstone locally brown stained. Clay partings locally present, more prevalent in lower 2'.
13'	14'	1'	Predominantly fine grained locally shaly brown stained micaceous sandstone.
14'	22' 6"	8' 6"	Medium grained light gray to white sandstone with reddish stain, (mic.)
22' 6"	25'	2' 6"	Gray carbonaceous micaceous sandstone with coaly streaks.
25'	25' 11"	11"	Light brown silty to sandy shale becoming gray downward. Conglomerate of clay shale + carbonaceous fragments in lower 2", (1 1/2" carbonaceous sandstone at top belonging to interval above).
25' 11"	26' 10"	11"	Dark gray shaly siltstone laminated with zones of fine sandstone.
26' 10"	29' 6"	2' 8"	Gray medium grained sandstone with scattered inclusions of dark shale.
29' 6"	30' 2"	8"	Gray shaly siltstone with sandy laminae.
30' 2"	30' 8"	6"	Gray medium to fine grained sandstone with many angular inclusions of black silty shale.
30' 8"	32' 2"	18"	Fine grained lite gray, locally shaly laminated (+ cross-laminated) sandstone.
32' 2"	36' 8"	4' 6"	Gray to light gray medium grained uniform micaceous sandstone.



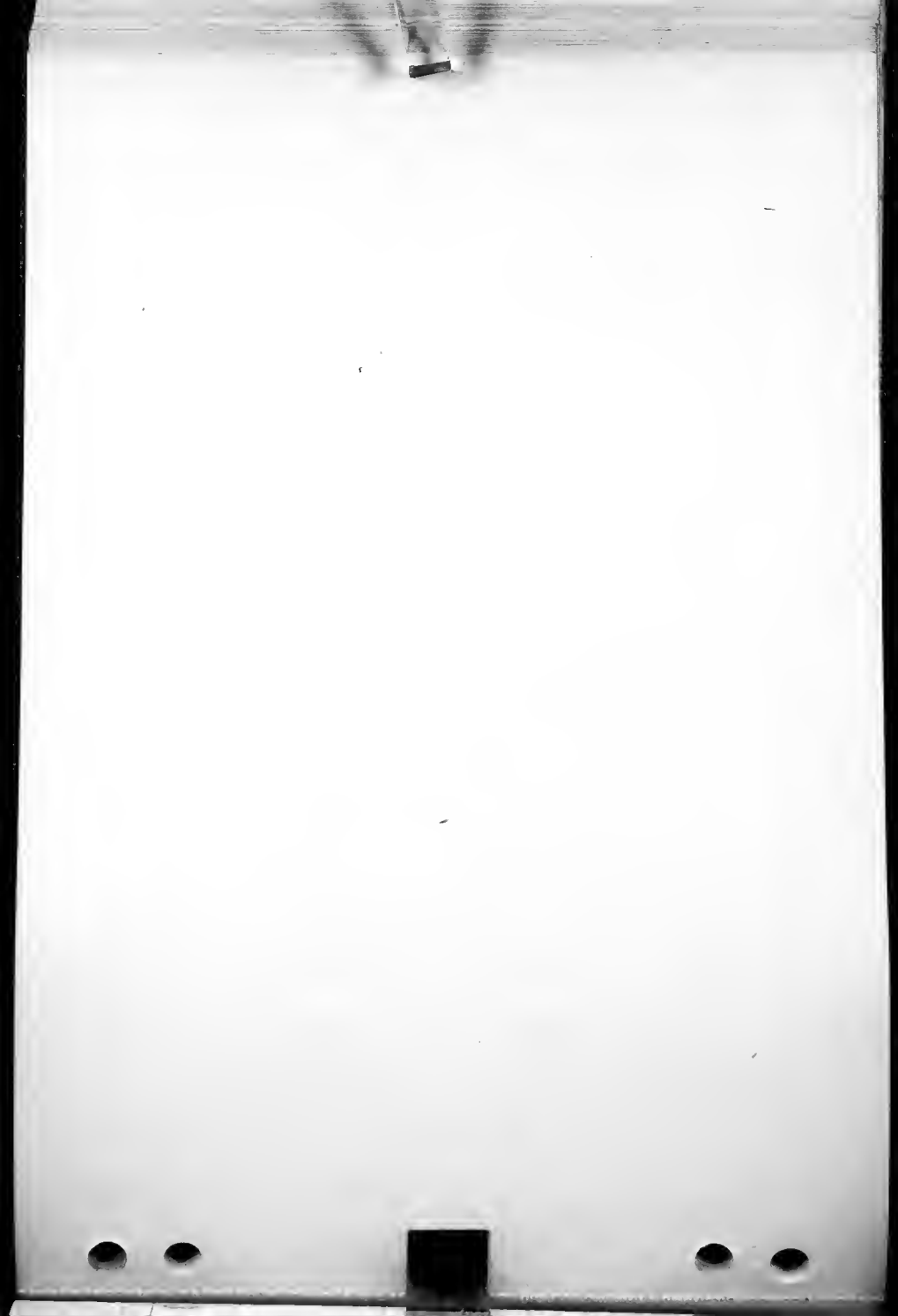
Hole 43 (continued)

36'8"	39'4"	2'8"	Gray medium to fine grained micaceous sandstone showing rapid changes grain size; upper 1' carries streaks and inclusions black silty shale; lower 1' shot with coaly + clayey streaks and partings.
39'4"	49'4"	10'	Light gray medium grained sandstone, zone of coaly partings 42-8 to 44-8, some scattered below this.
49'4"	50'2"	10"	Black clay shale
50'2"	50'11"	9"	Silty shale + slate
50'11"	55'11"	5'	Gray to dark gray silty shale
55'11"	57'6"	1'7"	Black clay shale
57'6"	57'10"	4"	Black waxy semi-hard clay
57'10"	58'1"	3"	Coaly black shale
58'1"	63'5"	5'4"	Hard clay as follows:- 5" Black 'top block' clay 33" Gray flinty block clay numerous scattered dark specs but no true nodules. 26" Sideritic block clay (becomes gradually softer downward + siderite content increased)
63'5"	64'5"	1'	Extremely sideritic shaly block. So much siderite that character of matrix is obscured.
64'5"	65'10"	1'5"	Extremely sideritic greenish gray shale, gradational with above.
65'10"	66'3"	5"	Greenish highly micaceous fine grained sandstone.
66'3"	69'1"	2'10"	Greenish siltstone, sandy streaks 68-2 to 68-6, sideritic



Hole 43 (continued)

69'1"	70'	11"	Gray green to gray silty shale, 'Fe bumps'
70'	74'2"	4'2"	Red silty shale, scattered Fe bumps
74'2"	76'3"	2'1"	Red and green silty shale
76'3"	78'4"	2'1"	Green silty shale.

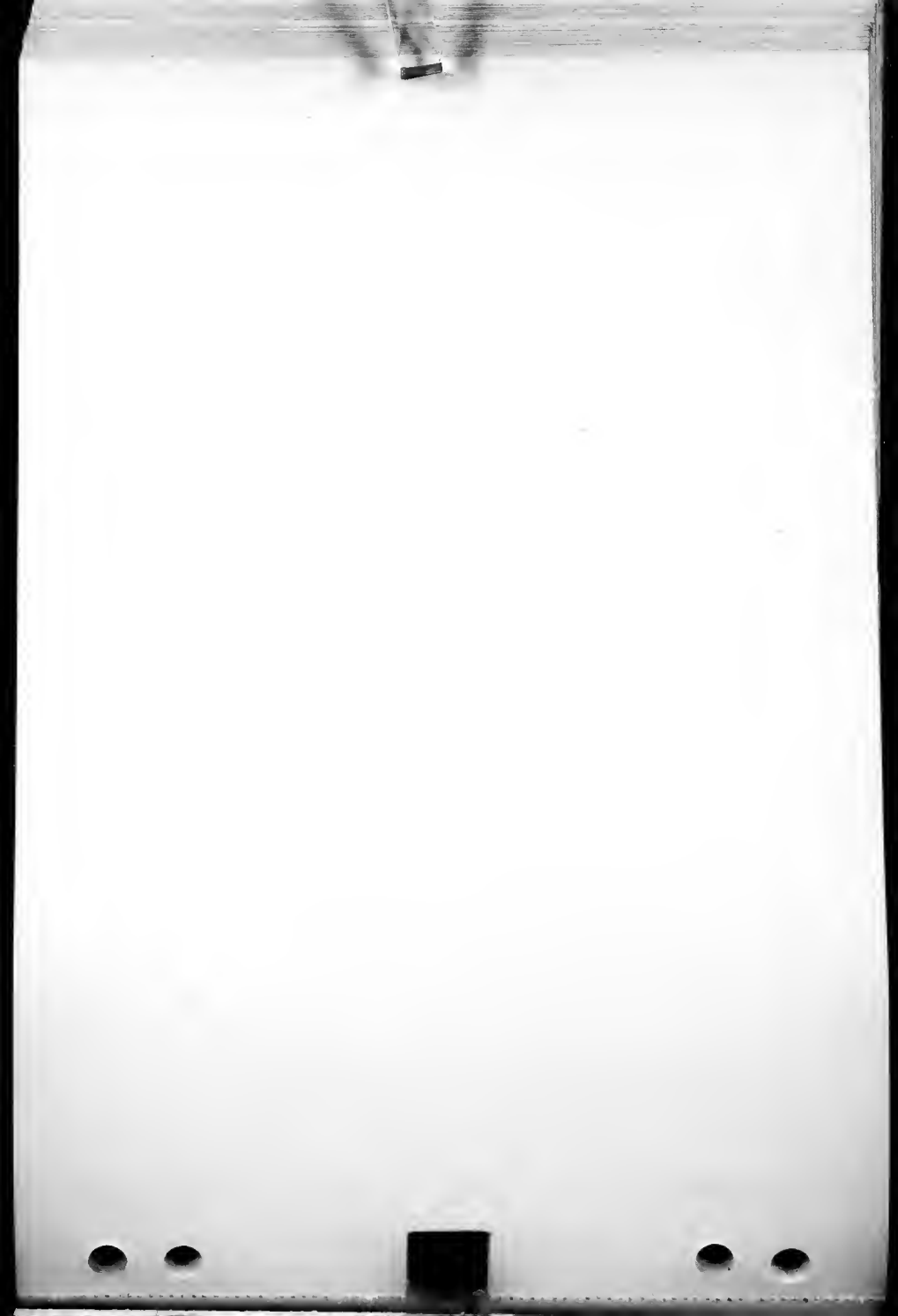


Hole 44

Surface Elev.

Depth 64'7"

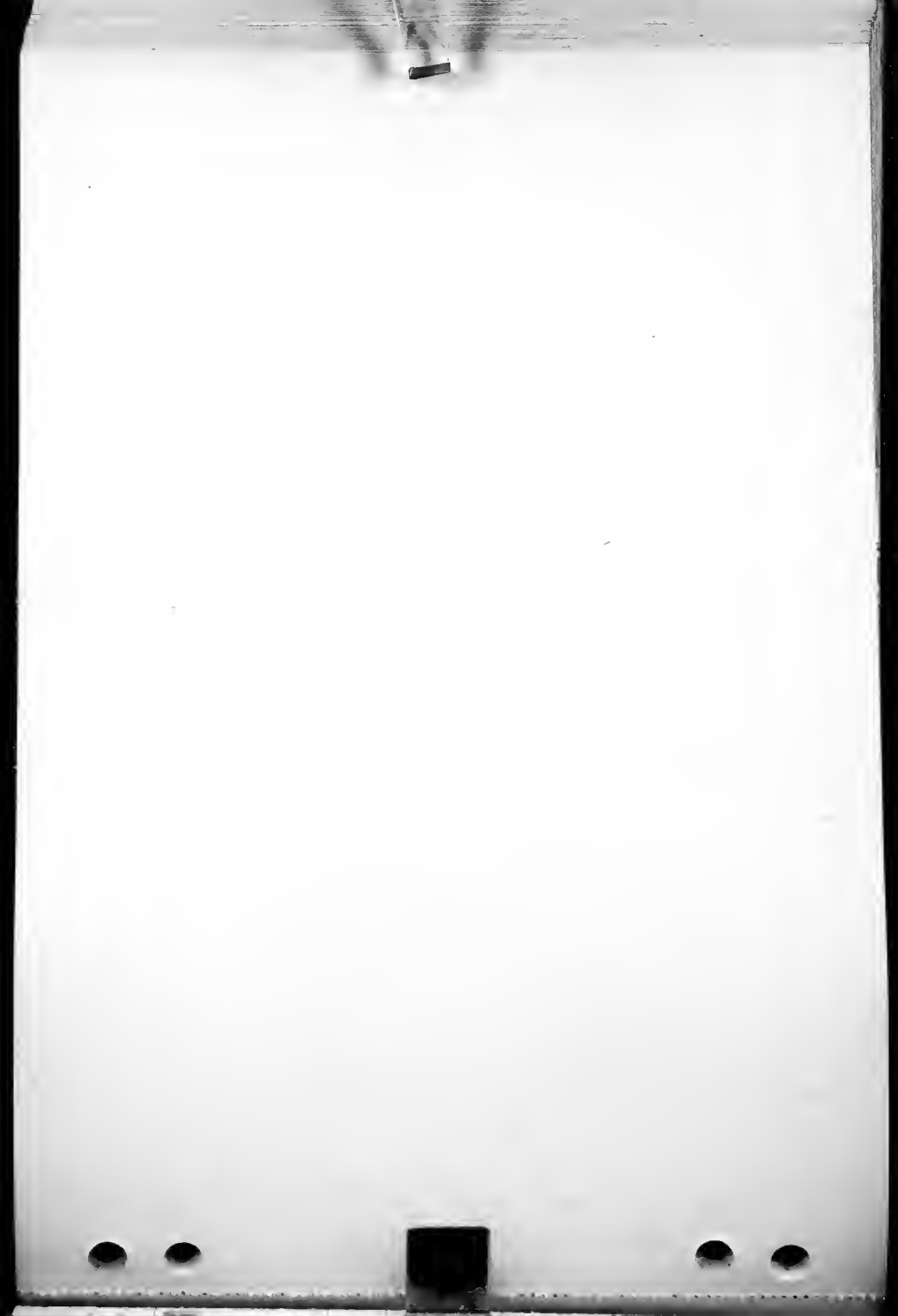
From	To	Th.		
0	11-3	11-3	White medium grained mic sandstone, local clayey streaks. Zone of carbonaceous shales inclusions 7-7 to 8-3. Brown to pink stain locally.	Clarion - ? -
11-3	20-4	9-1	Brown stained fine grained locally shaly sandstone, micaceous with sandy plastic brown clay in upper 1/4.	Brookville Horizon ? - ? -
20-4	42-6	22-2	Chiefly gray to light gray micaceous sandstone, predominantly medium grained, local fine grained zones. Coaly streaks throughout, several zones of coaly shales + shaly inclusions. These zones as follows. 21' to 21'9" 23'11" to 24'9" 31'5" to 32'5" 34'2" to 35'2" 40'4" to 41'3"	Homewood
42-6	48-9	6-3	Gray to black shale as follows 42-6 to 42-10, Gray silty sh. 42-10 to 44-9, Gray + black sh. 44-9 to 45-1, Black sh. 45-1 to 48-1, Gray to black silty 48-1 to 48-9, Black clayey	
48-9	53-7	4-10	Hard clay:- 27" Gray, locally darker, flint and flinty black. Some scattered blebs indurite. 5" Nodules, relatively small nodules 10" Sideritic nodule 16" Sideritic blocks + nodules upper 6".	



Hole 44 (continued)

53'-7"	54'-3"	8"	Hard dark gray to black highly siltitic, possibly silty clay or clay shale. Not good shaly blocks.
54'-3"	58'-3"	4'	Gray to greenish siltitic micaceous shale and sandy shale, fairly hard, soapy.
58'-3"	60'-3"	2'	Olive gray to greenish crumbly siltstone + clayey silt.
60'-3"	60'-5"	-2"	Light greenish gray clayey silt with pebbles of green clay shale, soft mealy orange clay, and <u>medium grained white sandstone</u> .
60'-5"	61'-8"	1'-3"	Greenish silty clay shale, 'Fo lumps.'
61'-8"	62'-4"	8"	Gray to white fine grained micaceous sandstone.
62'-4"	63'-7"	1'-3"	Silty to sandy gray to olive clay shale, upper 2" sandy. Fe <u>pockets</u> (weathered?).
63'-7"	64'-7"	1'	Red silty clay shale

- ?
- - ? - - -



Hole 46

Surf. Elev.

Depth 65' 8"

From To Th.

0 6" 6"
6" 6' 5'6"

Overburden

White medium grained sparingly micaceous sandstone with partings and seams ($\frac{1}{4}$ to $\frac{3}{8}$ ") of white to yellowish sandy plastic clay. Clay seams increase in thickness downward. Locally clay occurs as pockets in ss.

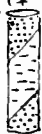
6' 14' 1" 8' 1"

From 6' to 10' 8" as follows:-

White sandstone with large zones of clay.-

6 to 8 feet includes 8" seam of brownish to gray sandy plastic clay with occasional inclusion of ss. This seam, as penetrated, is at a high angle to the horizontal axis of core -

6' →



6' 10" →



8' →



Hashed up core, poor recovery, pred. clay. as above.

From 8' to 10' 8" sandstone as above with big irregular filling of dark brown dirty (loamy?) clay with ss, brown clay, & coaly fragments.



Only 9' recovery rest probably all dirty clay



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hole 46 (cont.)

10'8" to 14'1"
 10-8 to ^{12'3"} Brown sandy shale to
 fine grained shaly sandstone
 with plant fragments.
 12'3"
~~#~~ to 14'1" White to brownish
 fine grained sandstone
 minor sandy shale
 zones + partings

- 14'1" 17' 2'11" White to light gray medium
 grained micaceous sandstone.
 17' 21' 4' Gray medium grained micaceous
 sandstone, minor fine grained
 zones, carbonaceous streaks
 and partings.
 21' 30' 9' Gray to light gray medium grained
 micaceous sandstone. Few
 scattered shale inclusions at
 26'6".
 30' 30'2" 2" Dark gray silty shale.
 30'2" 31'9" 1'7" Medium grained light gray ss.
 with zones + inclusions of
 gray silty shale as follows.
 30'2" to 30'11"
 31'6" to 31'9"
 31'9" 41'9" 10' Light gray medium grained
 micaceous sandstone
 carbonaceous streaks and
 partings, basal 1' blocky and
 micaceous pellets gray shale.
 41'9" 46'7" 4'10" Dark gray to black shale
 46'7" 47'2" 7" Slaty, ~~gray~~ or 'boney' shale.
 47'2" 47'8" 6" Dark gray to black shale
 47'8" 49'9" 2'1" Dark gray silty shale
 49'9" 51'6" 1'9" Black clay shale
 51'6" 55' 3'6" Coal ^{with} ~~and~~ black coaly shale
 at base ~~(7'4")~~. Coal at least 12"
 probably 25"+)



(Notes of ...)

Hole 46 (cont.)

55'	60'10"	5'10"	Hard clay as follows:- 6" Black to dark gray hard 'top block' clay with scattered fine nodules in lower 3 1/2". 4" Nodule clay, nodules in semihard matrix. 5' Sideritic block clay. Upper 15" nodular, with scattered thin nodular zones throughout remainder.	
60'10"	62'11"	2'1"	Sideritic shaley block clay	---
62'11"	64'	1'1"	Black to gray sideritic locally silty hard shale, may be clayey at top.	---
64'	65'5"	1'5"	Gray to light gray siltstone grading downward into gray micaceous silty shale concentration of siderite at about 64'8".	---
65'5'	65'8"	3"	Mottled red and gray greasy micaceous silty shale with large blebs and stringers of siderite.	---

WAVE 117

SUNK 8100

DEPTH 400'

Hole 47

Surf. Elev. +

Depth. 66'3"

From To Th.

0 4'-4" 4'-4"

4'-4" 7'-10" 3'-6"

~~7'-10" 10'-3" 2'-5"~~

7'-10" 10'-3" 2'-5"

10'3" 20'9" 10'6"

20'9" 22' 1'3"

22' 24'5" 2'5"

24'5" 35'1" 10'8"

35'1" 41' 5'11"

41' 48'4" 7'4"

48'4 50'4 2'

50'4 51'11" 1'7"

51'11" 57'6" 5'7"

Overburden

Sandy plastic clay mottled and stained white, gray, and brown.

Light brown shaly fine grained micaceous sandstone minor clayey streaks.

Medium grained sandstone, light gray, local brownish stain, wavy streaks and partings, minor fine grained zones.

Gray medium to fine grained sandstone, med. grained occurs as laminae in other.

Dark gray sandy shaly shale with streaks of fine ss.

Light gray medium grained micaceous sandstone with wavy streaks and partings. Basal 7" very hard.

Dark gray to black, locally silty shale.

Black clay shale

Coal

Waxy gray shaly clay with root remains. A sandstone clay increasing in hardness downward. (The basal would be a typical flint.)

Hard clay, as follows:

15" Clay flint to shaly block (hard equivalent of above)

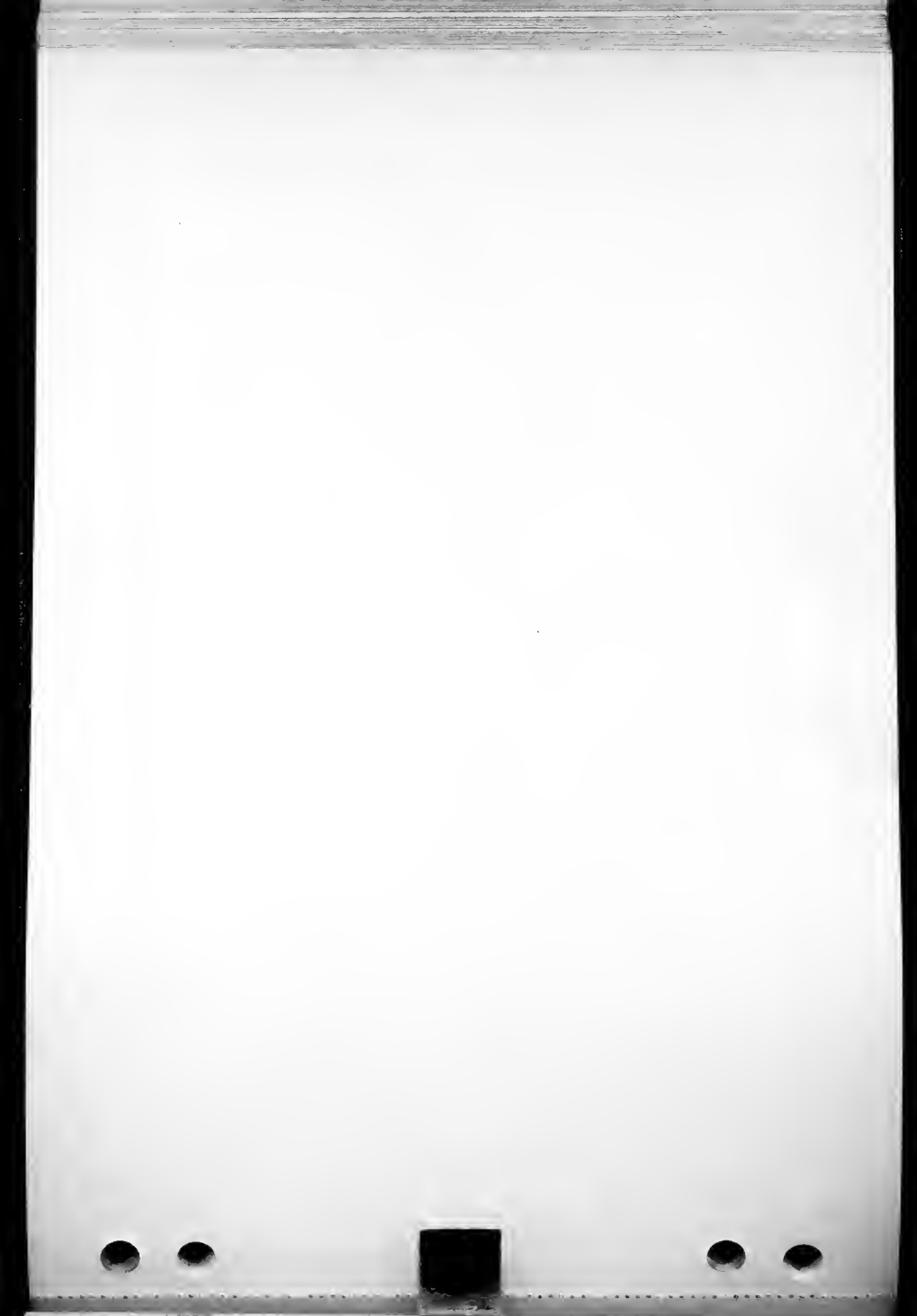
15" Nodule clay (nodular block)

15" Sideritic nodular block

22" Block-sideritic - to 2' long

Hole 47 (cont)

57'6"	62'-6"	5'	Dark gray to black shaley block, Fe lumps. Becomes silty in lower 1/2.
62'-6"	63'4"	10"	silty hard gray clay
63'4"	64'8"	1'4"	Red clay shale, Fe lump.
64'8"	65'4"	8"	Green gray silty shale.
65'4"	66'3"	11"	Gray to light gray sandy clay shale & clayey sandstone.



Hole 10

2017 11/10

Hole 48

Surf Elev.

Depth

From To Th.

From	To	Th.
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