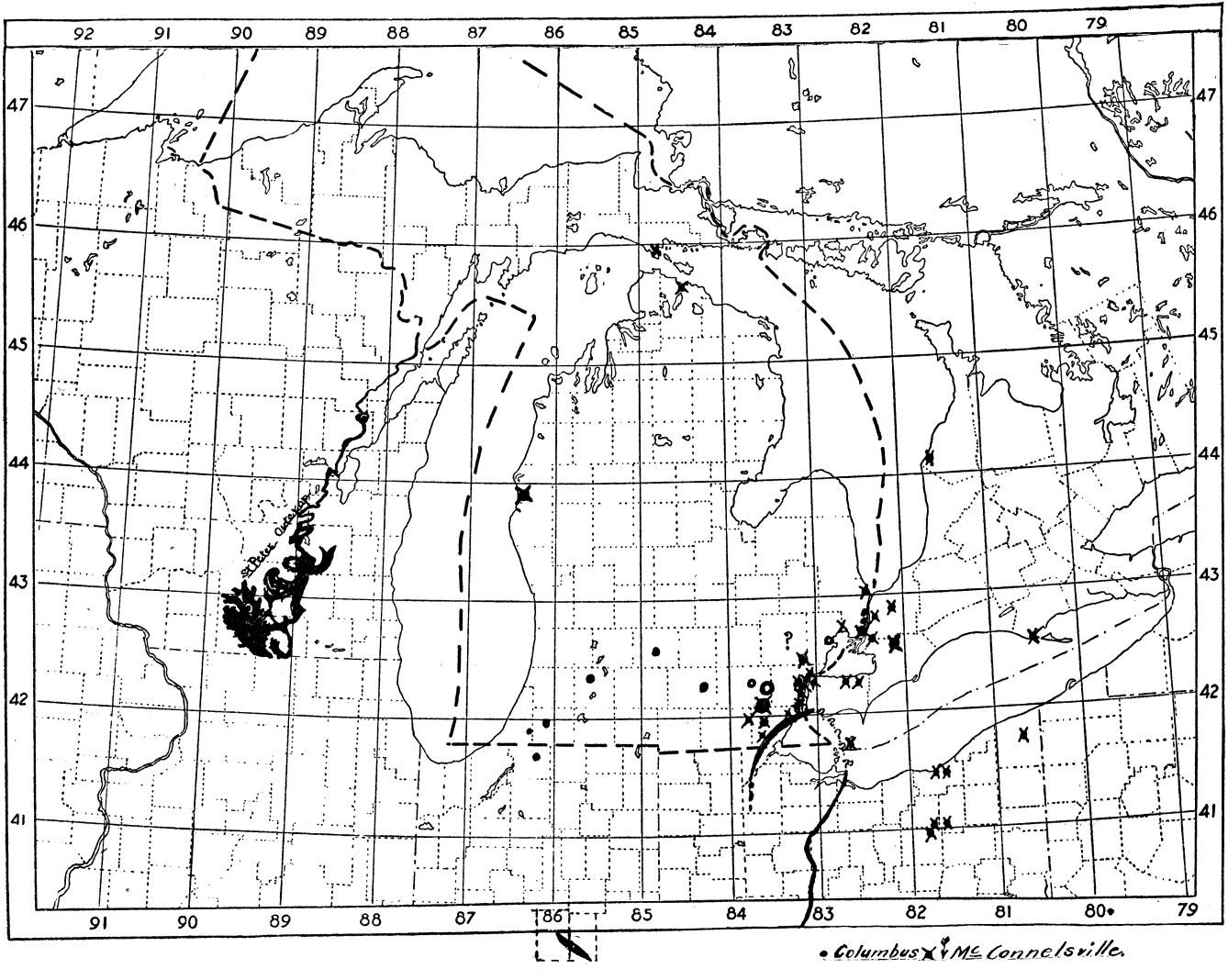
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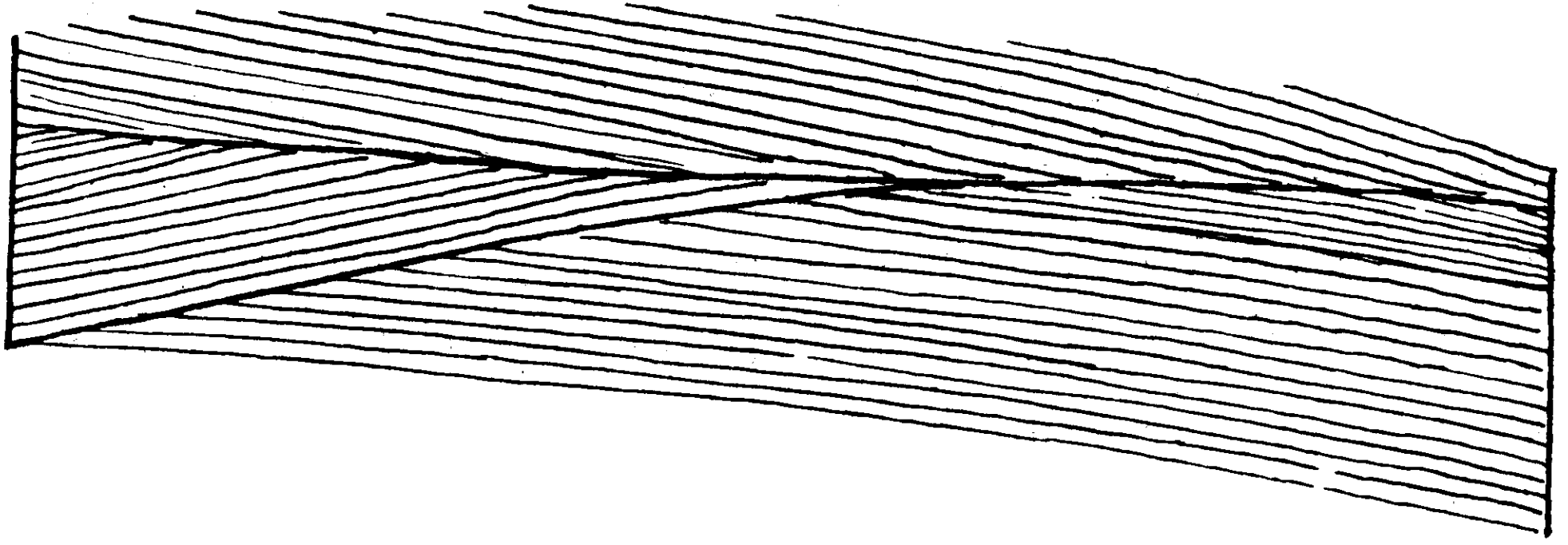
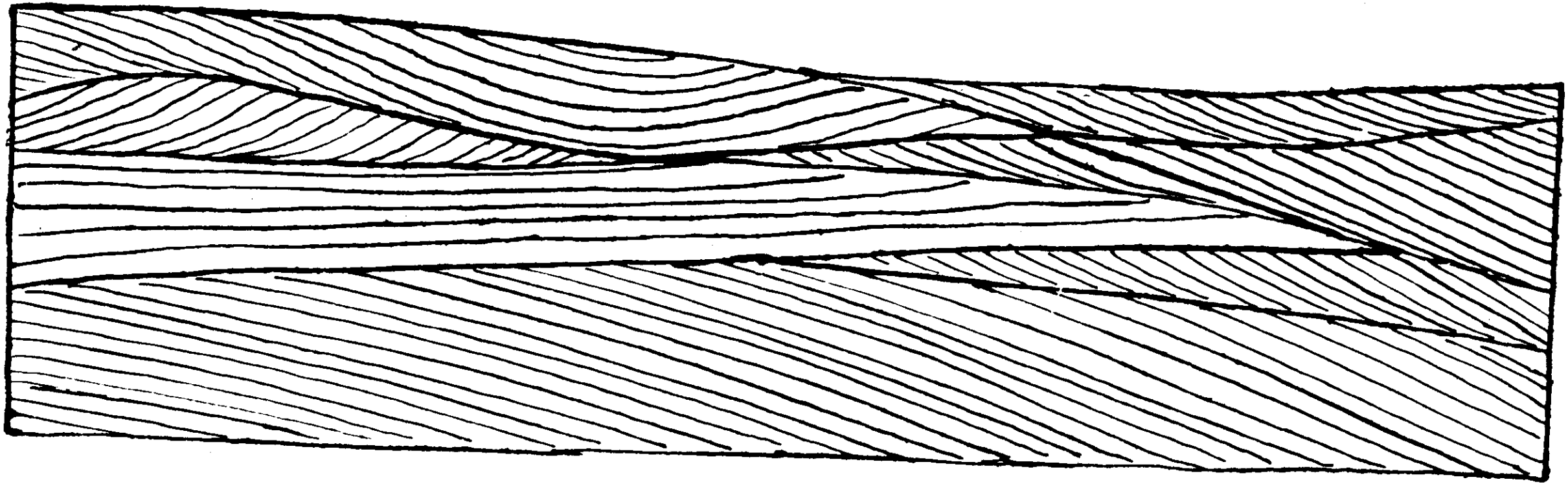
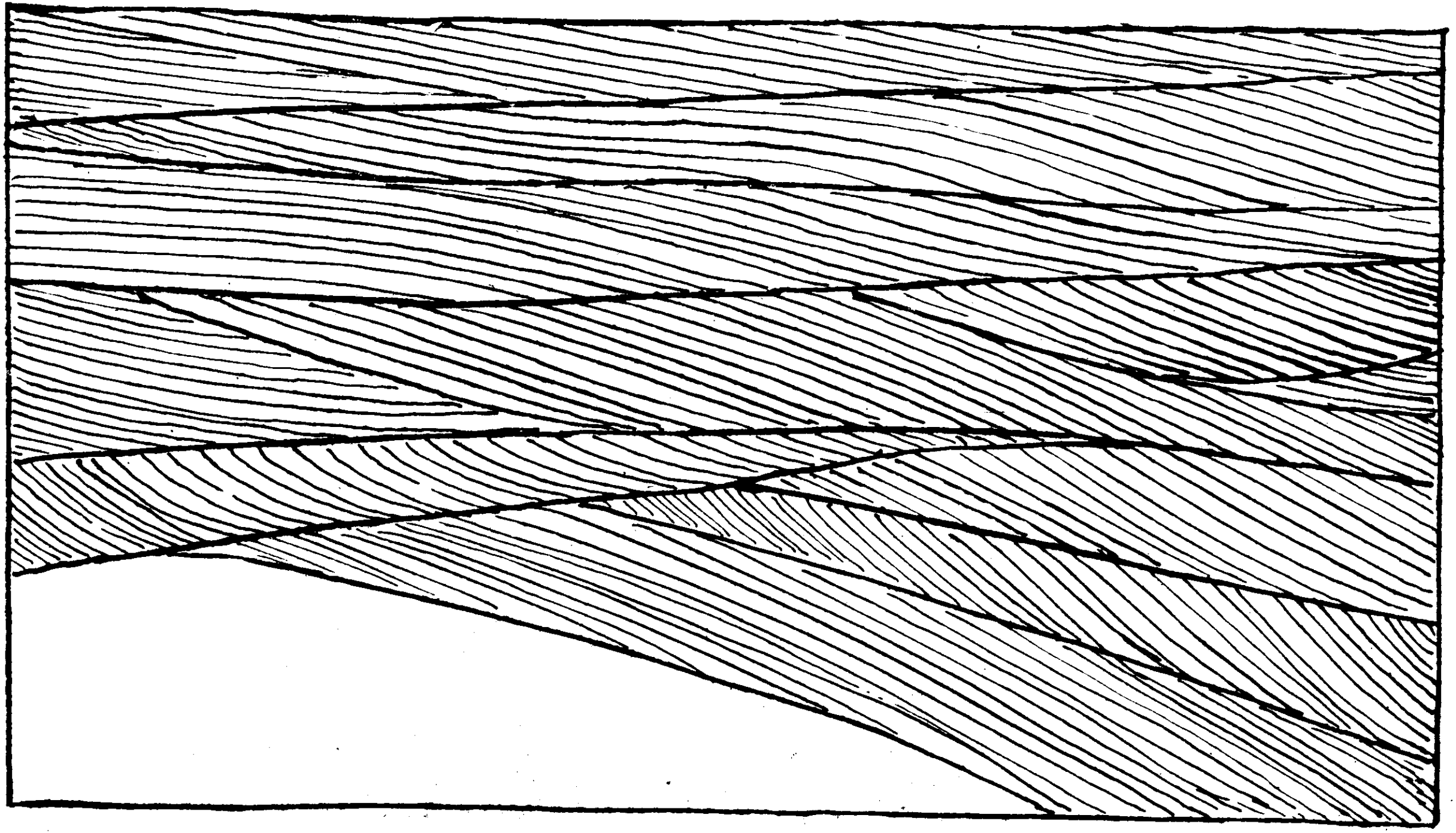
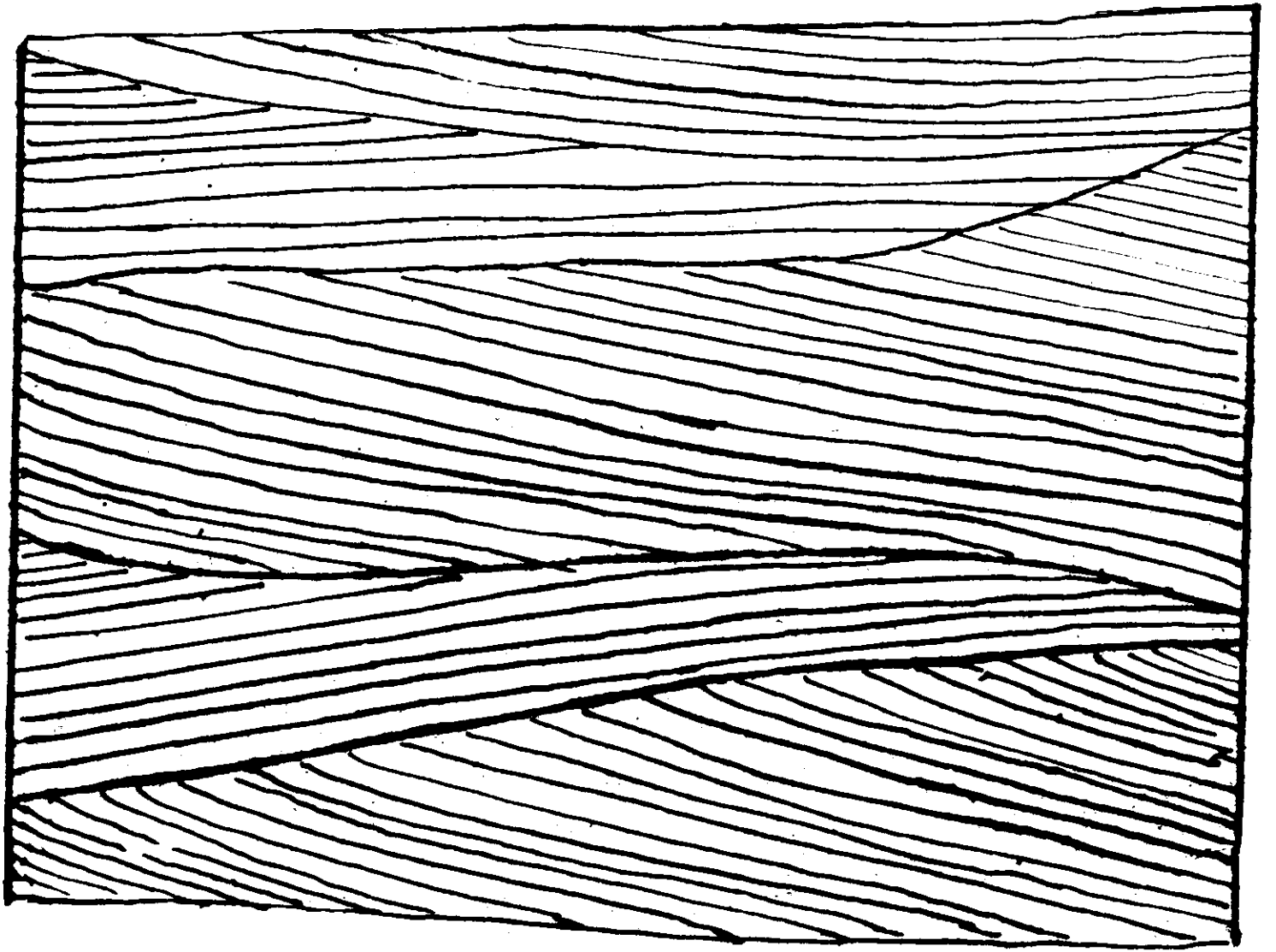
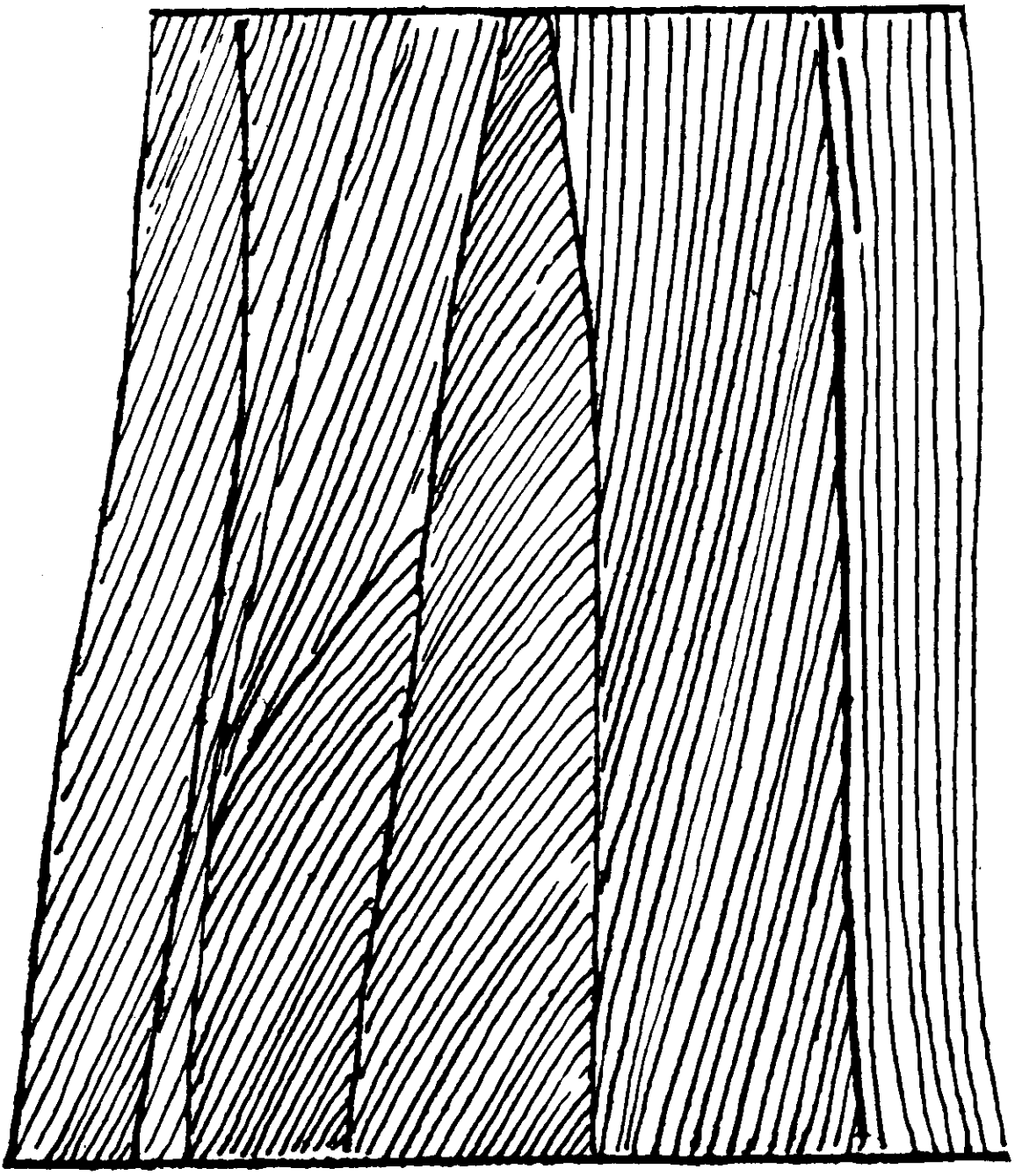
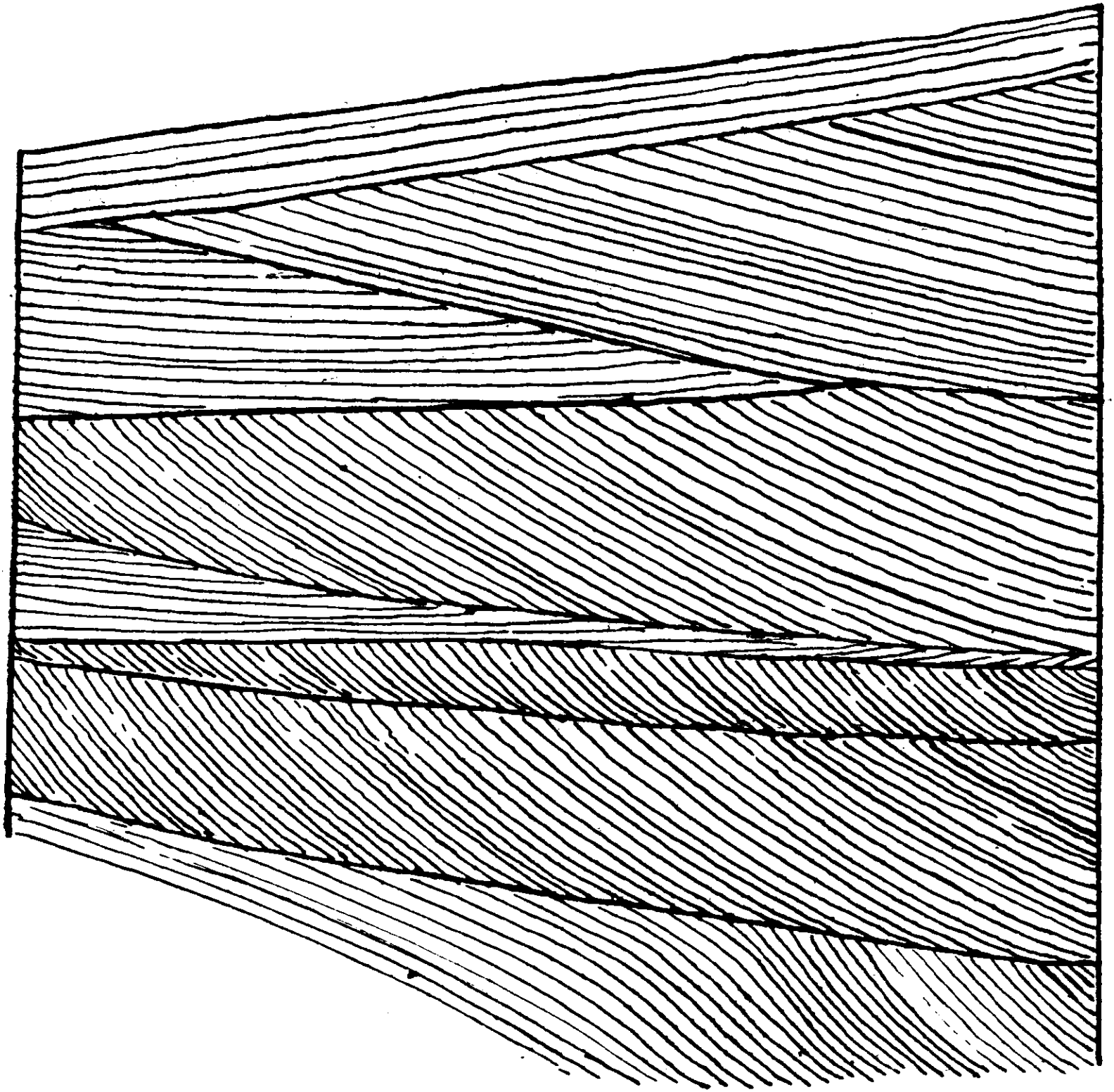


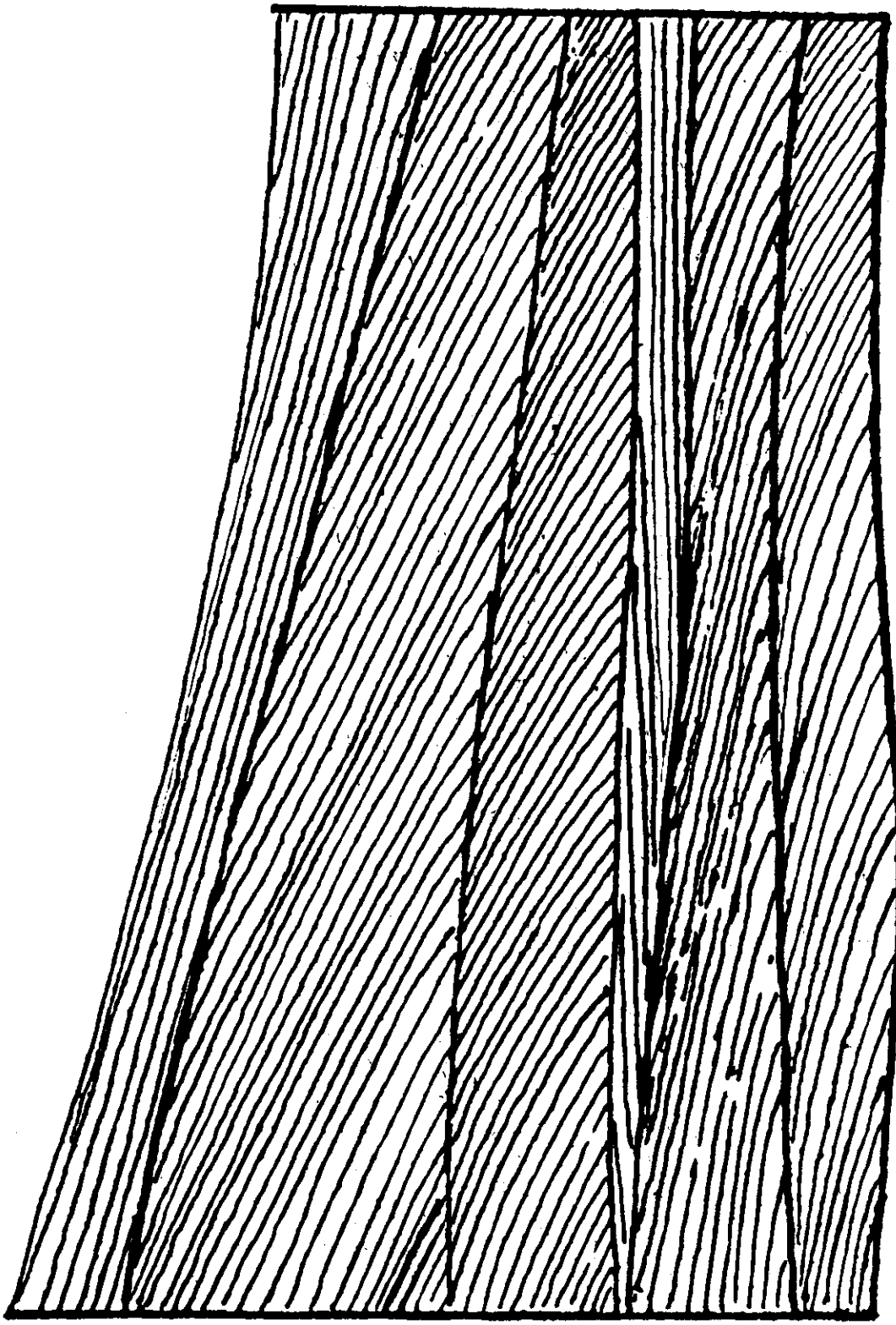


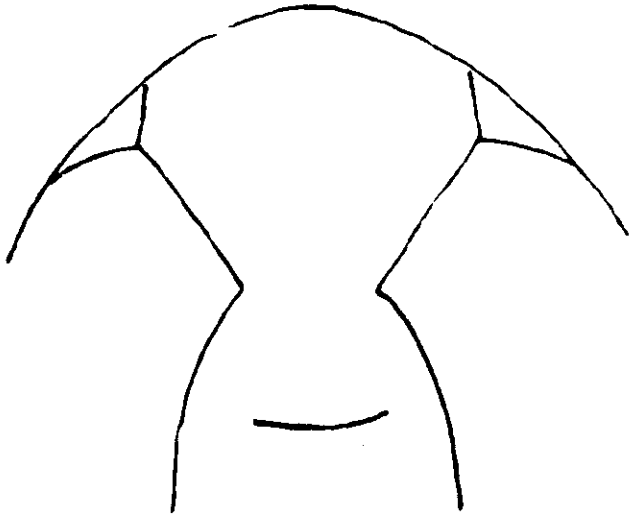




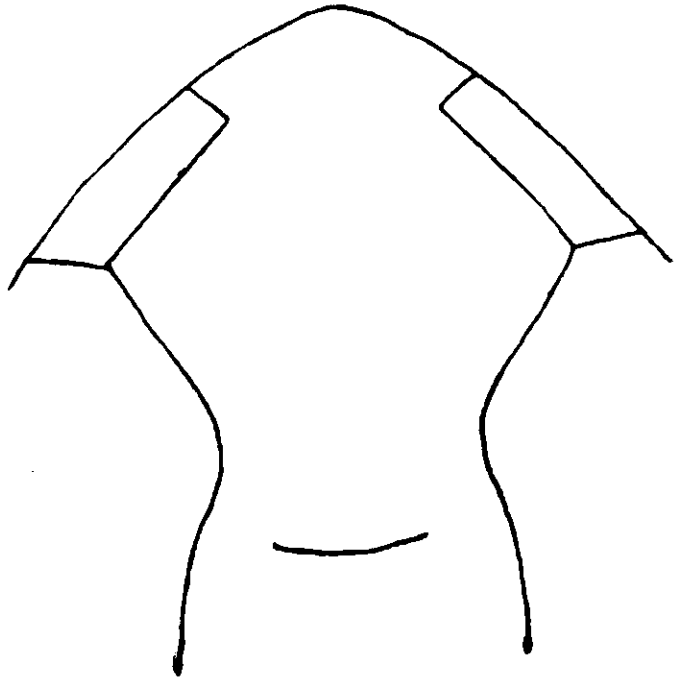




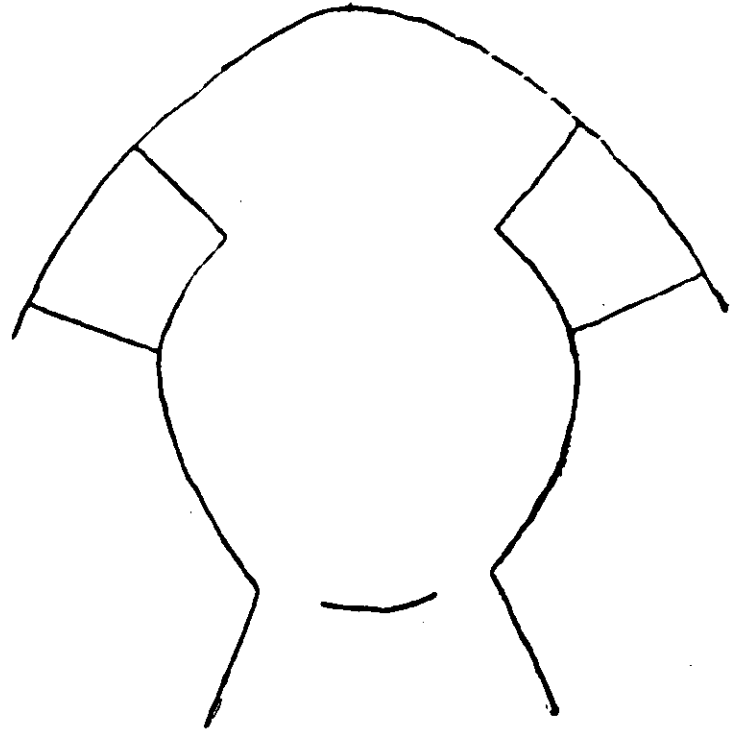




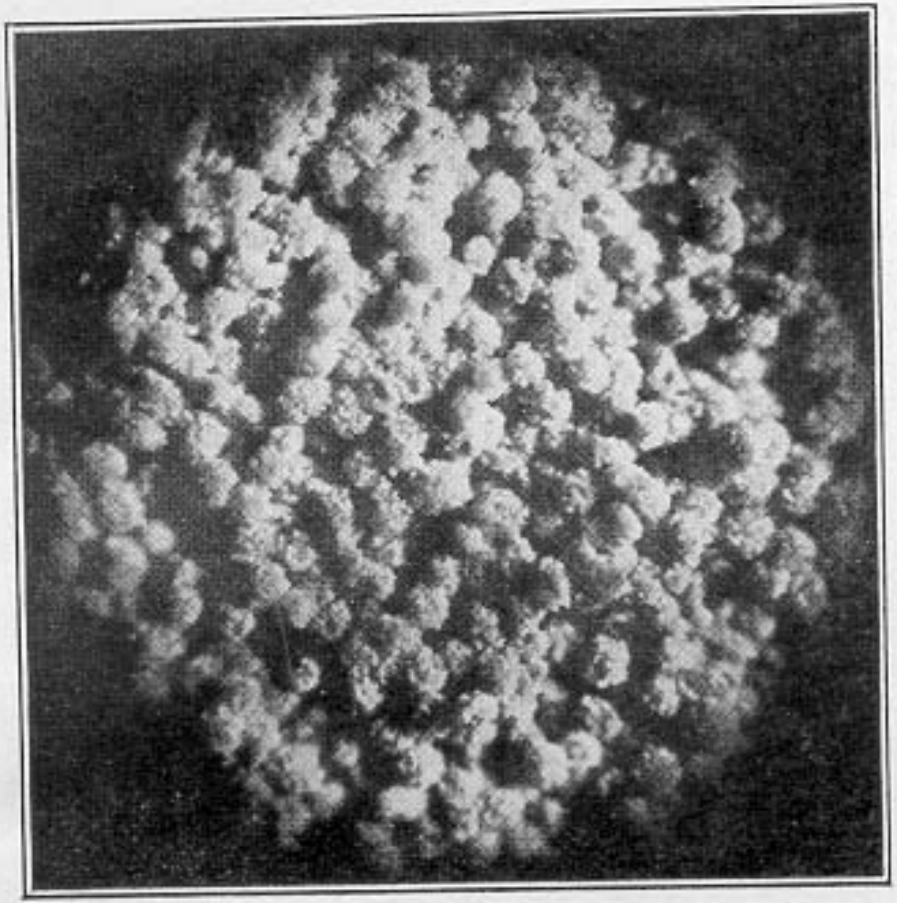
(A). *W. nitida* (Niagaran).



(B). *W. prosseri* (Lower Monroan).



(C). *W. oblata.* (Niagaran).



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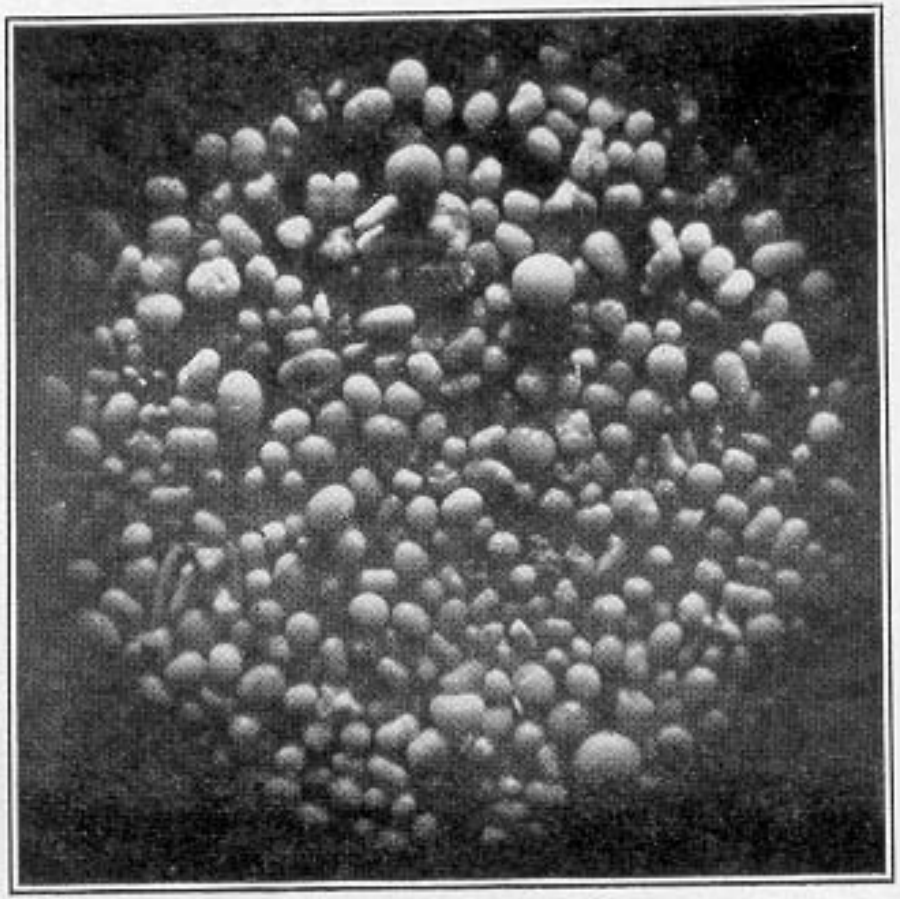

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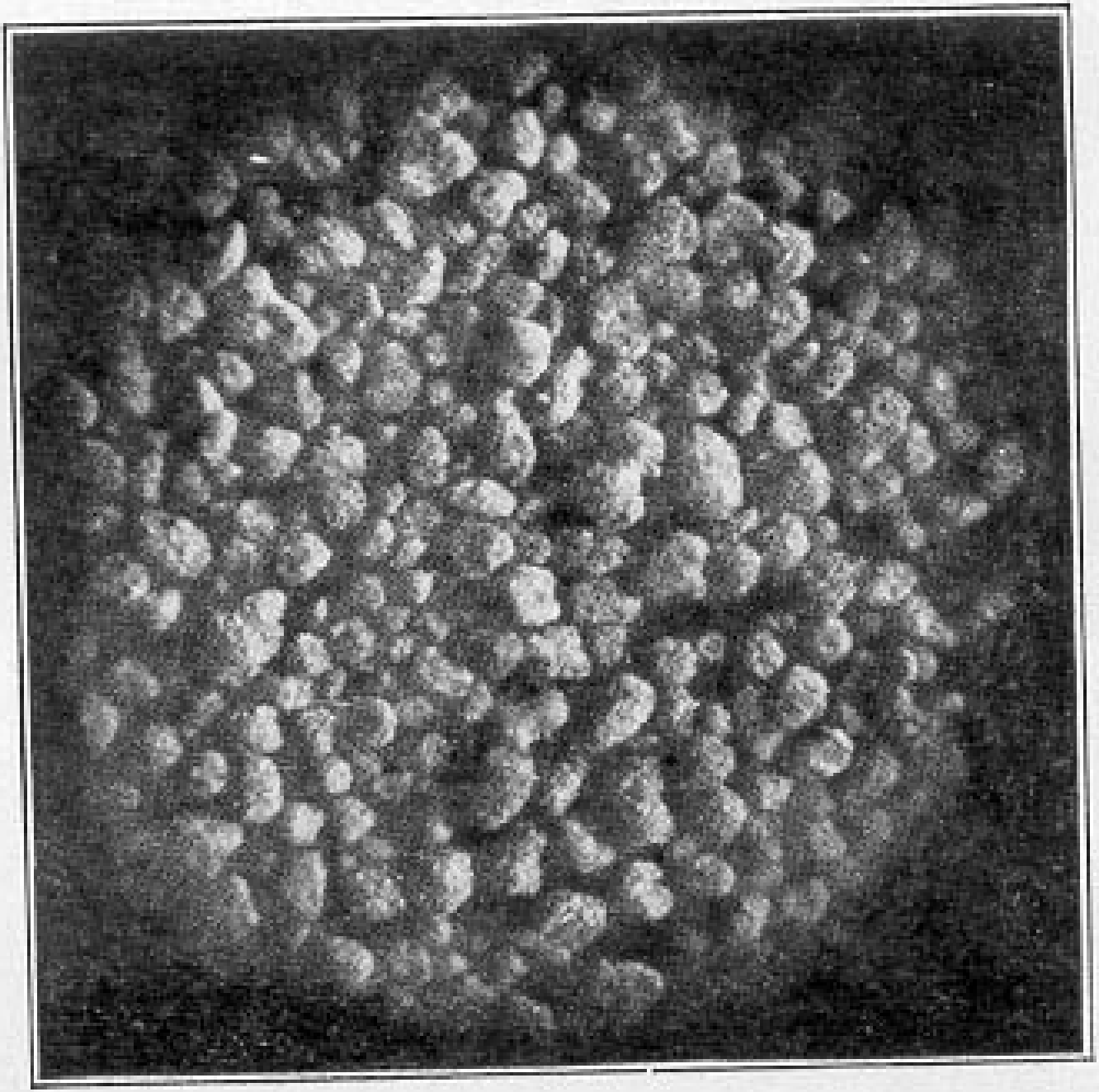
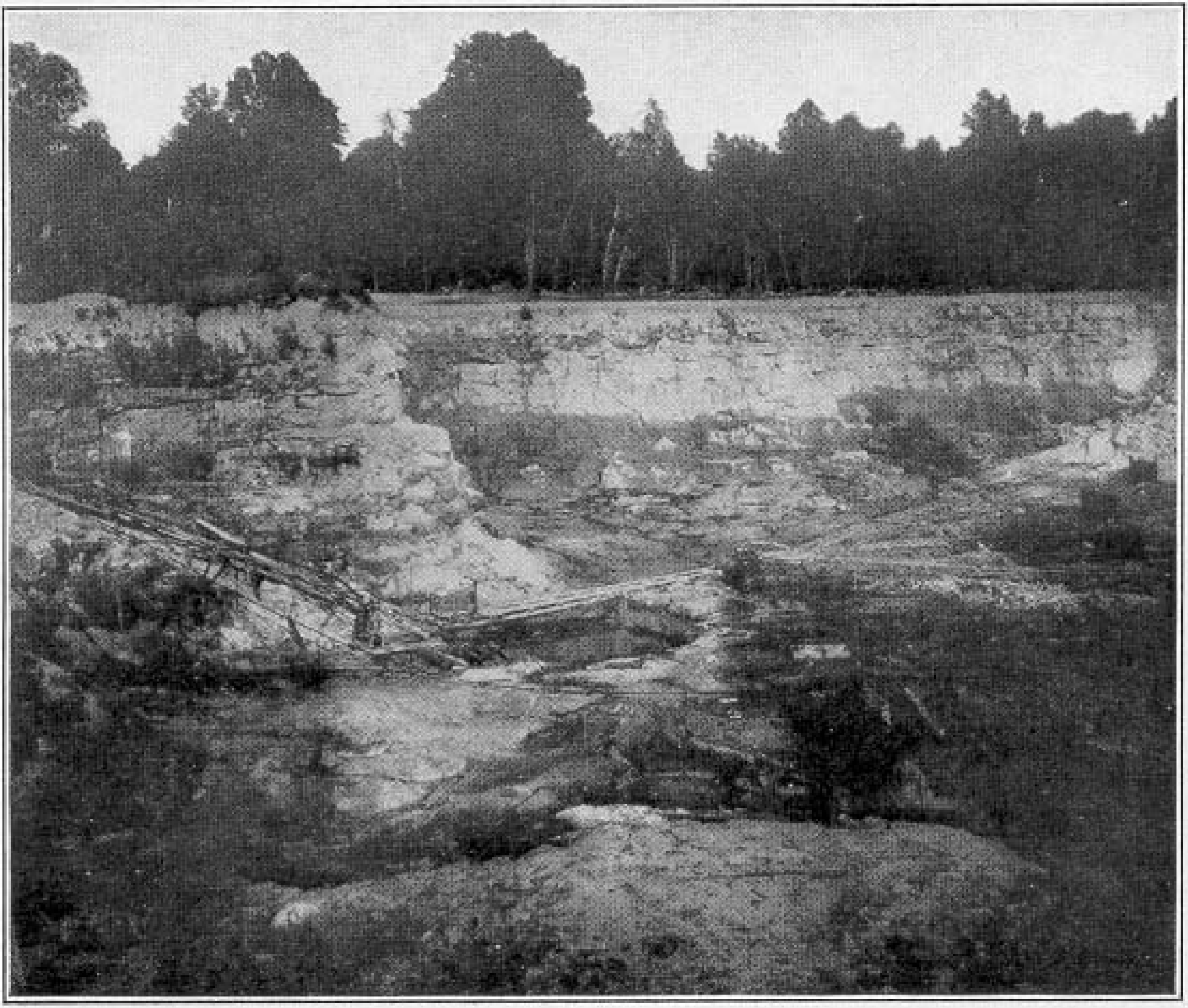
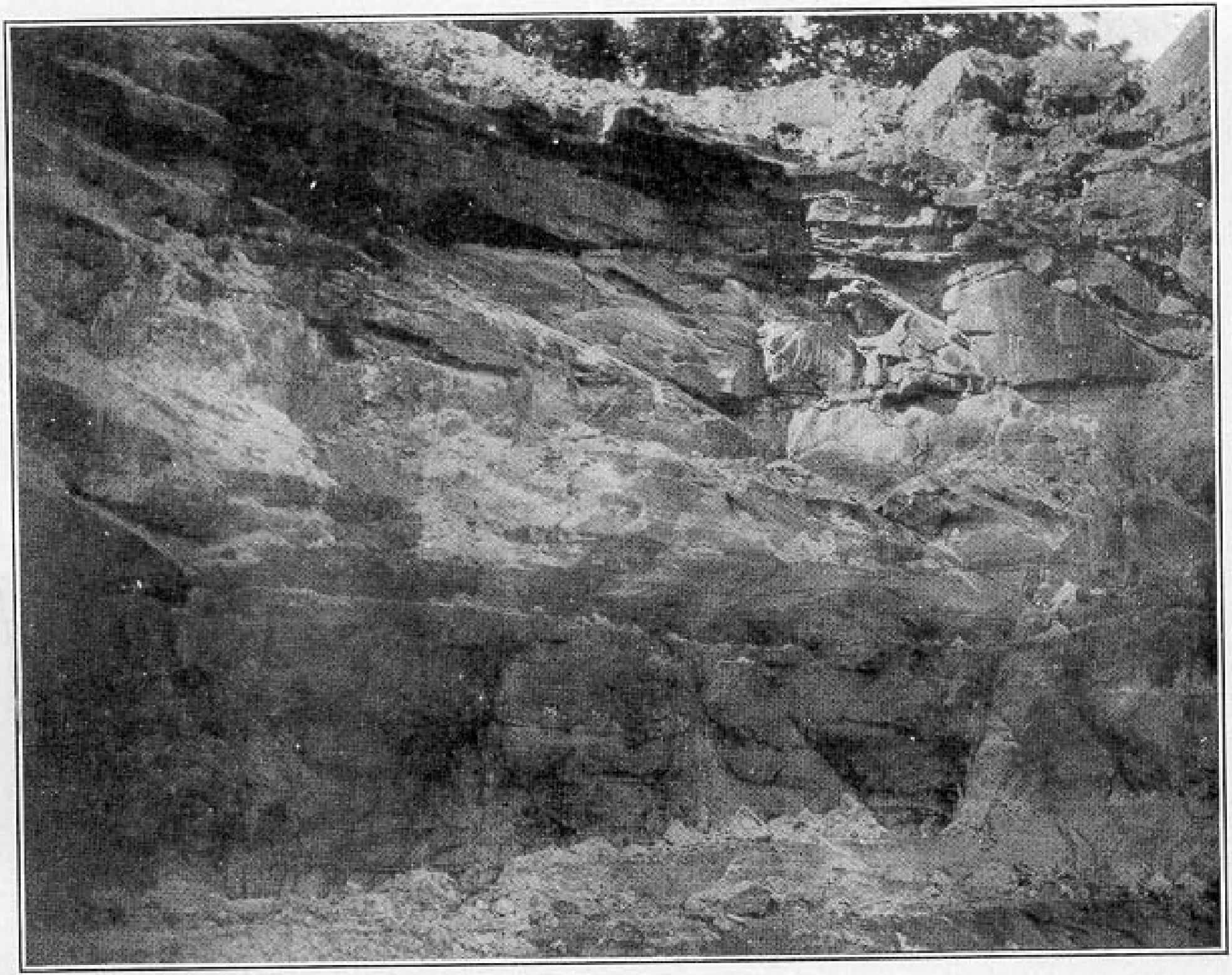
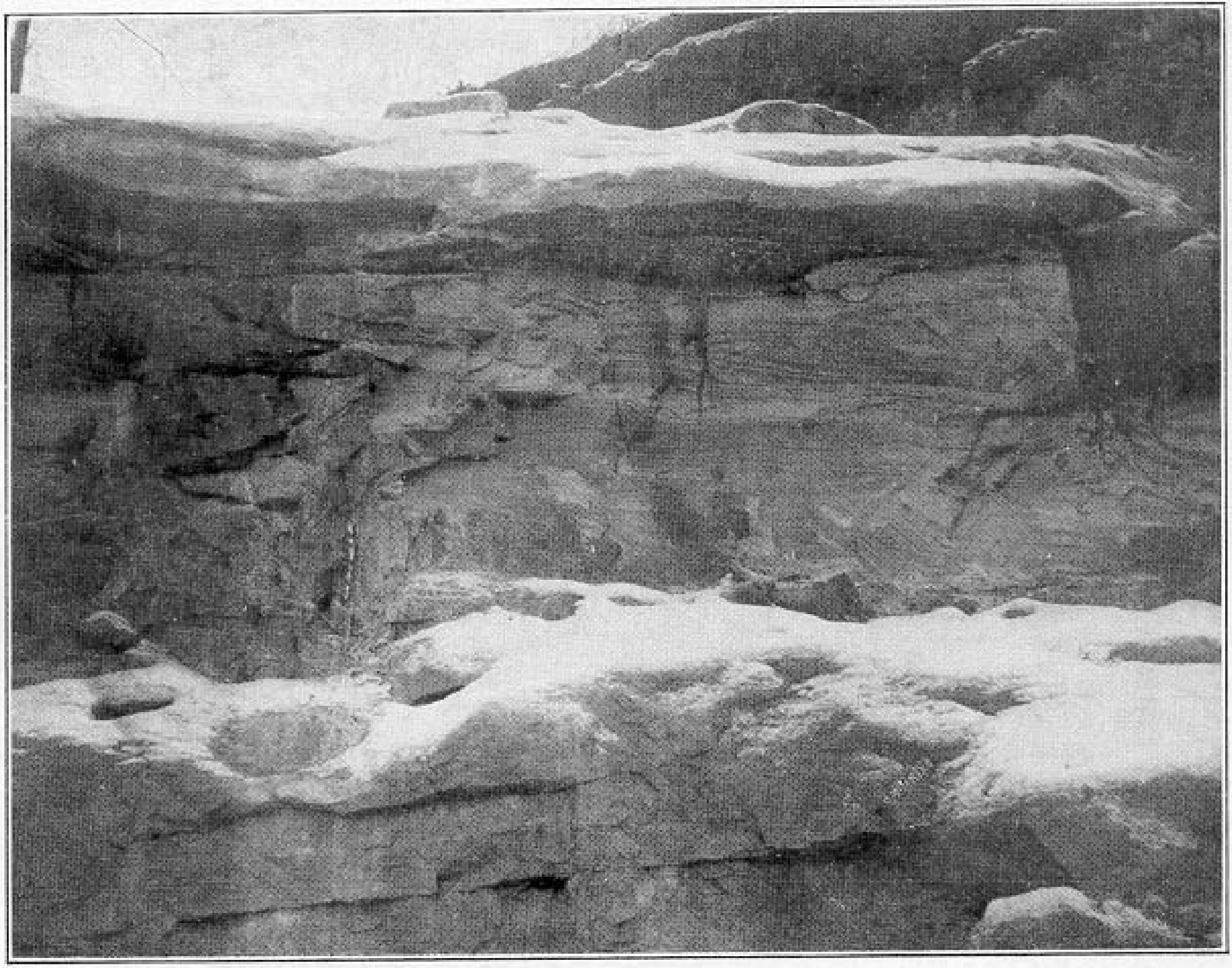
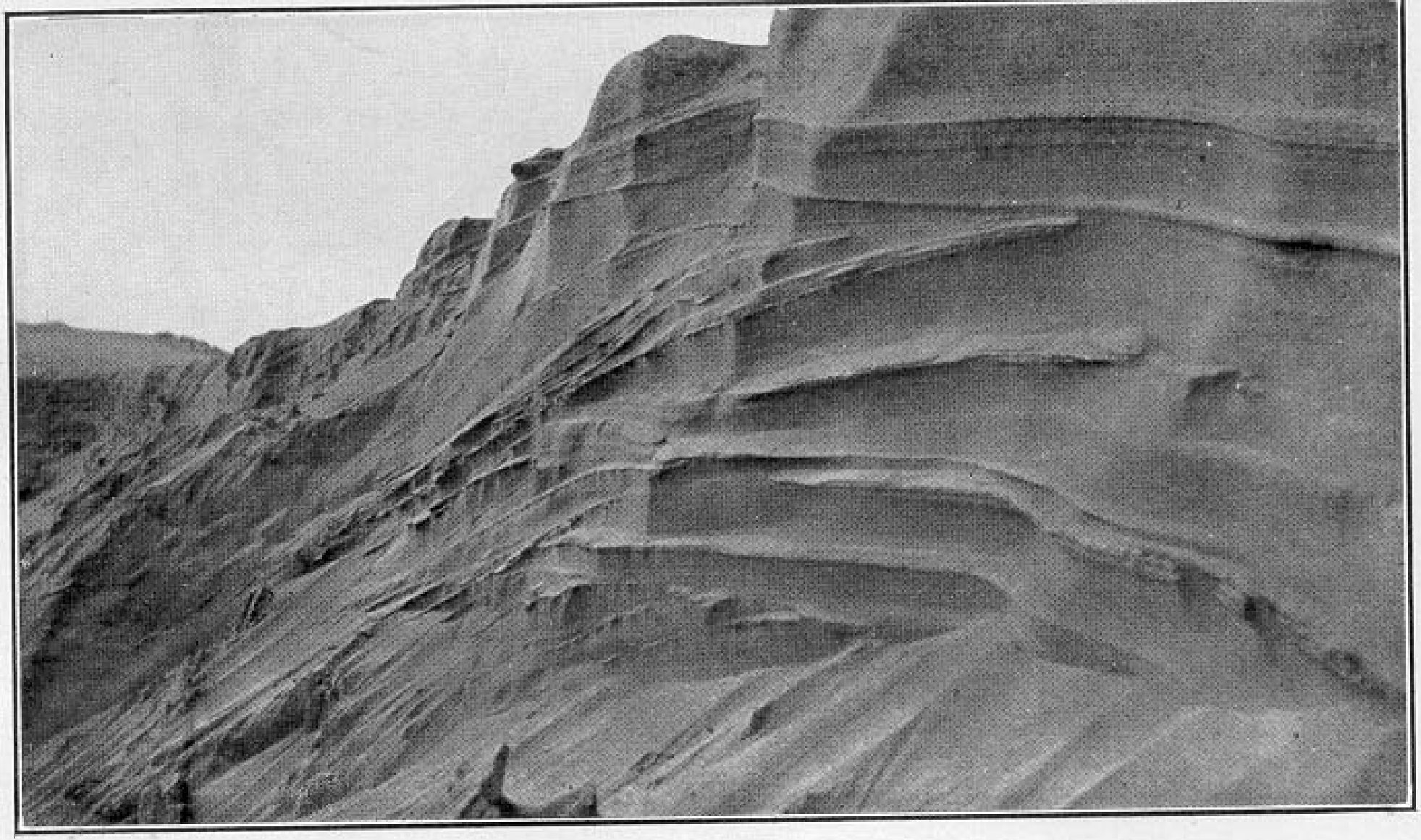
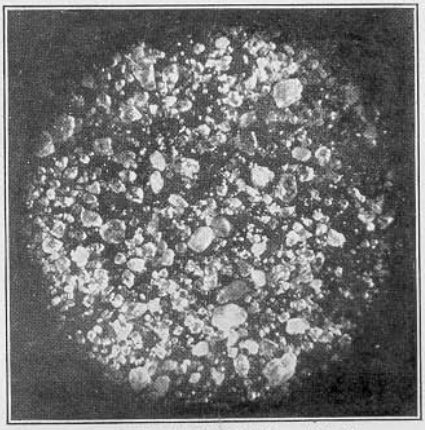




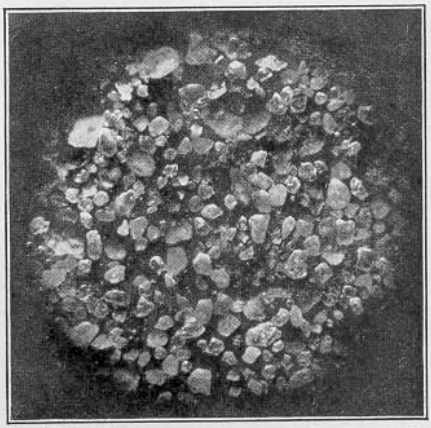




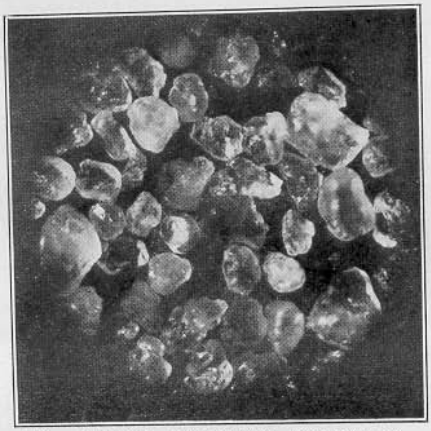




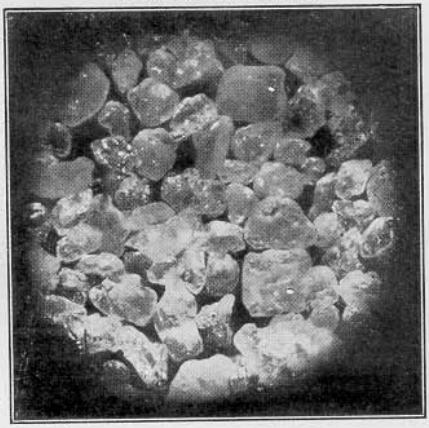
(A). MER-DE-GLACE, ALPS.



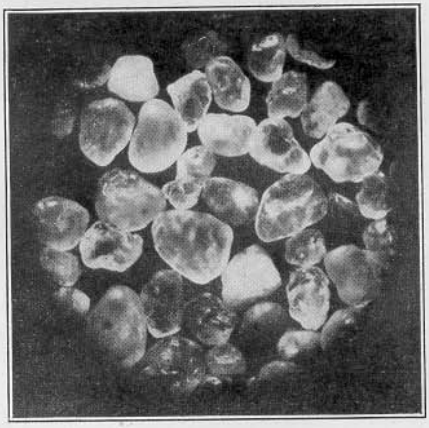
(B). WASHED FROM TILL, YPSILANTI, MICHIGAN.



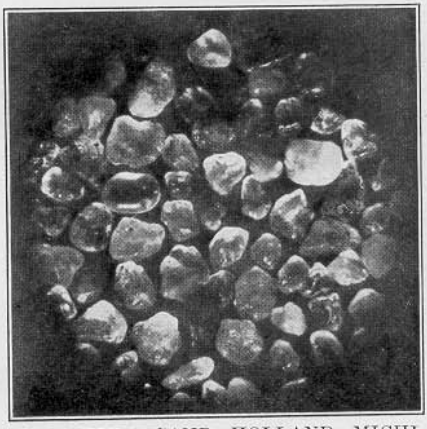
(C). BEACH, MARTHA'S VINEYARD.



(D). BEACH, GULF OF MEXICO, ESCAMBIA COUNTY, FLORIDA.

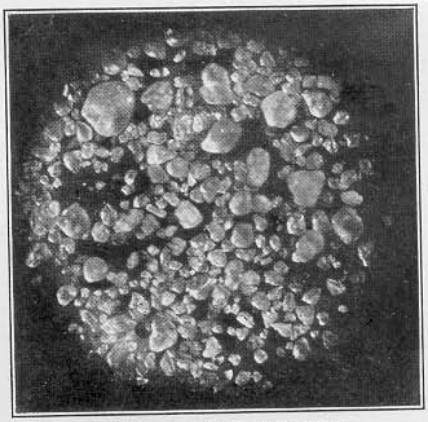


(E). BEACH, HOLLAND, LAKE MICHIGAN.

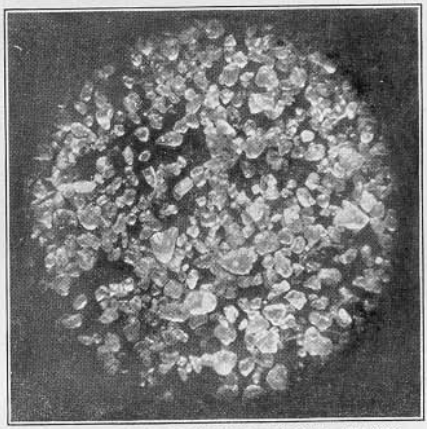


(F). DUNE SAND, HOLLAND, MICHIGAN.

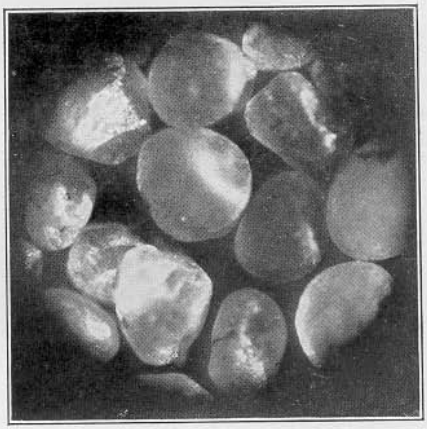
(A). LIBYAN DESERT, NEAR GHIZEH, EGYPT.



(B). LIBYAN DESERT.

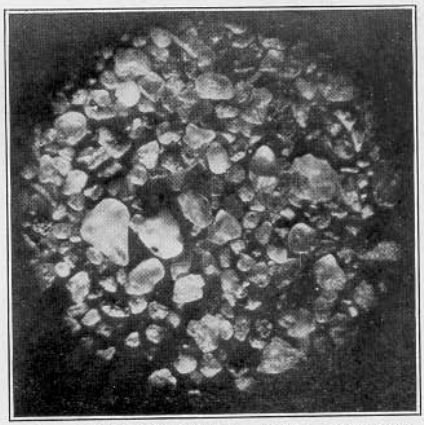


(C). LIBYAN DESERT, FINER SAND.

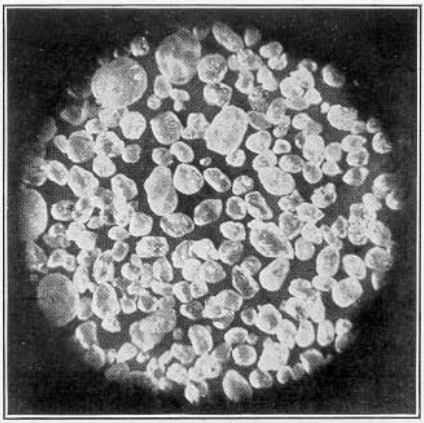


(D). LIBYAN DESERT, COARSER SAND.

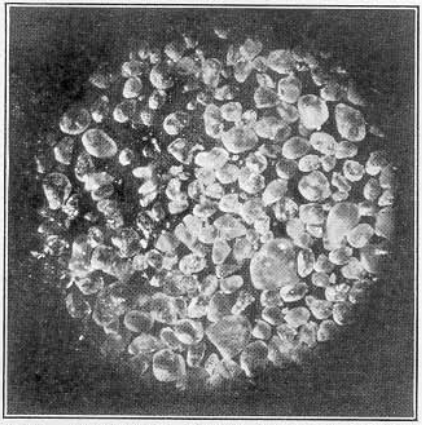
(E). ALBUQUERQUE, NEW MEXICO.



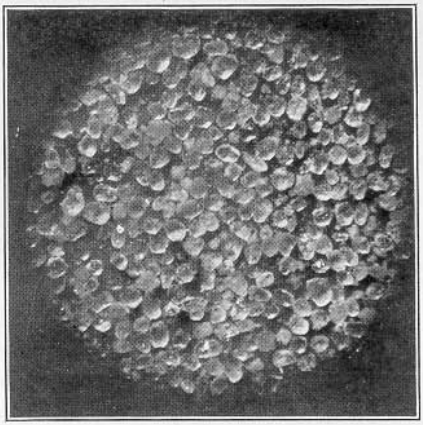
(F). ALBUQUERQUE, NEW MEXICO.



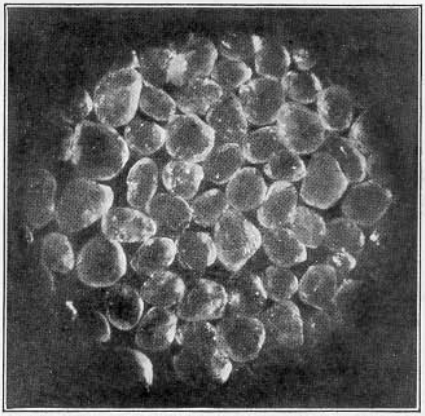
(A). FROM PELLETS, NATIONAL SILICA CO., MONROE COUNTY.



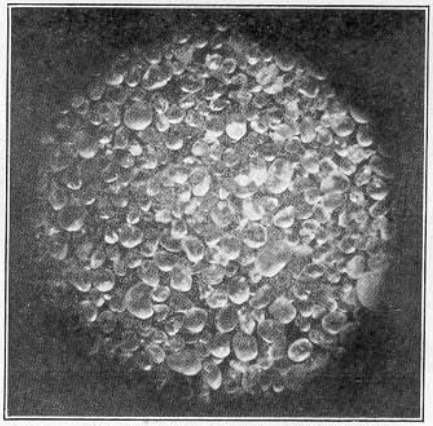
(B). DETROIT SALT SHAFT, NEAR TOP.



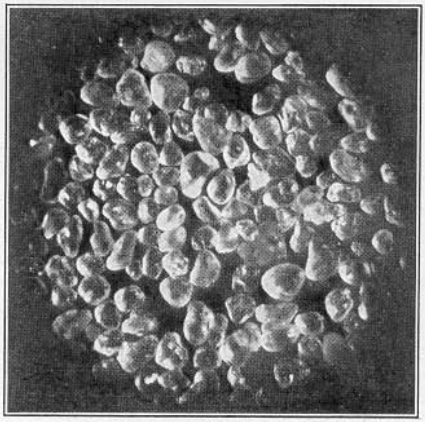
(C). NATIONAL SILICA CO., NEAR TOP.



(D). ROCKWOOD PITS, FOUR FEET DOWN. AMERICAN SILICA CO.



(E). ST. PETER SAND, MISSOURI.



(F). ST. PETER SAND, MINNEAPOLIS.

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TABLE III.

Showing the Distribution of the Fossils of the Monroe Formation.	Lucas Dolomite.	Amherstburg Dolomite.	Anderdon Limestone.	Flatrock.	Raisin River Dolomite.	Put in Bay Dolomite.	Greenfield Dolomite.	Akron Dolomite.	Niagara.	Guelph.	Cobleskill.	Manlius.	Helderberg.	Schoharie Onondaga.	Hamilton.	Other localities.
STROMATOPOROIDEA.																
1. *Clathrodictyon ostiolatum* Nicholson		×	×							×	×					
2. *C. variolare* v. Rosen			×						×							
3. *Stromatopora galtense* Dawson			×							×	×					
4. *Coenostroma pustulosum* Grabau			×													
5. *Stylodictyon sherzeri* Grabau			×													
6. *Idiostroma nattressi.* Grabau		?	×													
ANTHOZOA.																
7. *Helenterophyllum caliculoides* Grabau			×									×				
8. *Cyathophyllum thoroldense* Lambe			×						×							
9. *Cyathophyllum hydraulicum* Simpson								×								
10. *Heliophrentis alternatum* Grabau	?	×												×		
11. *H. alternatum* mut. *compressum* Grabau		×														
12. *H. alternatum* mut. *magna* Grabau		×														
13. *H. carinata.* Grabau	?	×														
14. *Cylindrohelium profundum* Grabau	×															a
15. *C. heliophylloides* Grabau	×									×						
16. *Cystiphyllum americanum* mut. *anderdonense* Grabau		×	×													
17. *Acervularia* sp.		×														
18. *Synaptophyllum multicaule* Hall		×	×						×							
19. *Diplophyllum integumentum* Barrett		×	×								×					
20. *Romingeria umbellifera* Billings		×												×		
21. *Ceratopora regularis* Grabau		×														
22. *C. tenella* (Rominger)			×						×							
23. *Favosites basaltica* mut. *nana.* Grabau			×											O		
24. *F. rectangularis* Grabau			×											O		
25. *F. tuberoides* Grabau		×														
26. *F. concava* Grabau			×													
27. *F.* cf. *maximus* Troost				×											×	
28. *Cladopora bifurcata* Grabau	×	×	×						O							a
29. *C.* cf. *cervicornis* Hall		×														
30. *Cladopora* sp	×															
31. *Syringopora microfundulus* Grabau			×	×												
32. *S. cooperi* Grabau				×												b
33. *S. hisingeri* Billings		×		×												
BRYOZOA.																
34. *Fenestella* sp. 1		×														
35. *Fenestella* sp. 2		×														
BRACHIOPODA.																
36. *Pholidops* cf. *ovata.* Hall					×						×					
37. *Schuchertella hydraulica* Whitfield					×		×									
38. *S. interstriata* (Hall)	×	×			×			×			×					
39. *S. amherstburgense* Grabau		×														
40. *Stropheodonta vasculosa* Grabau		×														
41. *Stropheodonta demissa* mut. *homolostriata.* Grabau		×														
42. *S. præplicata* Grabau		×														
43. *Stropheodonta* sp		×														
44. *Pentamerus pes-ovis.* Whitfield							?									
45. *Camarotoechia hydraulica* Whitfield							×									
46. *C. semiplicata* Conrad	×													×		
47. *Camarotoechia* sp					×											
48. *Rhynchospira preaformosa* Grabau							×									
49. *Spirifer eriense* Grabau								×			×					
50. *Sp. ohioense* Grabau						×										
51. *Spirifer sulcata* mut. *submersa* Grabau		×														
52. *Sp. modestus* Hall	×															
53. *Prosserella modestoides* Grabau		×	×													
54. *P. modestoides* mut. *depressus* Grabau		×														
55. *P. lucasi* Grabau	×		×													

TABLE III.—CONTINUED.

Showing the Distribution of the Fossils of the Monroe Formation.	Lucas Dolomite.	Amherstburg Dolomite.	Anderdone Limestone.	Flatrock.	Raisin River Dolomite.	Put in Bay Dolomite.	Greenfield Dolomite.	Akron Dolomite	Niagara.	Guelph.	Cobleskill.	Manlius.	Helderberg.	Schoharie Onondaga.	Hamilton.	Other localities.
56. *P. subtransversa* Grabau	X	X														
57. *P. subtransversa* mut. *alta* Grabau	X	X														
58. *P. unilamellosus* Grabau	X															
59. *P. planisinosus* Grabau	X															
60. *Hindella (Greenfieldia) whitfieldi* Grabau							X									
61. *H. (Greenfieldia) rostralis* Grabau							X									
62. *H. (Greenfieldia)* ? *rotundata* (Whitfield)							X									
63. *Whitfieldella nucleolata* (Whitfield)								X								
64. *W. prosseri* Grabau					X	?										
65. *W. subsulcata* Grabau							X	X								
66. *W. sulcata* Vanuxem								X				X				
67. *Whitfieldella* sp		X														
68. *Meristospira michiganense* Grabau	?	X														c
69. *Meristina profunda* Grabau		?			X											
70. *M. profunda* mut. *sinosus* Grabau					X											
71. *Atrypa reticularis* Linn		X														
PELECYPODA.																
72. *Panenka canadensis* Whiteaves	X	X												O		
73. *Pterinea lanii.* Grabau					X											d
74. *P. bradti* Grabau	X									?						
75. *Goniophora dubia* Hall					X	X										
76. *Goniophora* sp	X															
77. *Cypricardinia canadensis* Grabau		X														
78. *Tellinomya* sp					X											
79. *Modiomorpha* sp					X											
80. *Conocardium monroicum* Grabau	X	X	X											O		
GASTROPODA.																
81. *Hormotoma subcarinata* Grabau	X	X														
82. *H. tricarinata* Grabau	X															
83. *Solenospira minuta* (Hall)	X				X							X				
84. *S. extenuatum* (Hall)	X											X				
85. *Loxonema parva* Grabau	X															
86. *Loxonema* sp. 1					X											
87. *Loxonema* sp. 2								X								
88. *Holopea subconica* Hall	X											X				
89. *H. antiqua var pervetusta* (Conrad)		X										X				
90. *Holopea* sp. 1					X											
91. *Holopea* sp. 2					X											
92. *Holopea* sp. 3					X											
93. *Pleurotrochus tricarinatus* Grabau	X															
94. *Acanthonema holopiformis* Grabau	X	X														
95. *A. holopiformis* mut. *obsoleta.* Grabau	X															
96. *A. laxa* Grabau	X	X														
97. *A. Newberryi* (Meek)	X															
98. *Strophostylus cyclostomus* (Hall.)		X							X	X						
99. *Pleuronotus subangulatus* Grabau	X													O		
100. *Euomphalus* cf. *fairchildi* (Clarke and Ruedemann)	X									X						
101. *Eotomari areyi* (Clarke and Ruedemann)	X	X								X						
102. *Eotomaria galtensis* (Billings)	X	X	?							X						
103. *Eotomaria* sp		X														
104. *Lophospira bispiralis* (Hall)	X	X								X						
105. *Euomphalopteris* cf. *valeria* (Billings)	X								X	X						
106. *Pleurotomaria* cf. *velaris* Whiteaves			X							X						
107. *Trochonema ovoides* Grabau	X	X											O			
108. *Poleumita* cf. *crenulata* (Clarke and Ruedemann)	X									X						
109. *Hercynella canadense* Grabau		X														
CEPHALOPODA.																
110. *Orthoceras* cf. *trusitum* (Clarke and Ruedemann)	X									X	X					
111. *Dawsonoceras annulatum* var. *americanum* Foord		X								X						

TABLE III.—Concluded.

Showing the Distribution of the Fossils of the Monroe Formation.	Lucas Dolomite.	Amherstburg Dolomite.	Anderdone Limestone.	Flatrock.	Raisin River Dolomite.	Put in Bay Dolomite.	Greenfield Dolomite.	Akron Dolomite.	Niagara.	Guelph.	Cobleskill.	Manlius.	Helderberg.	Schoharie Onondaga.	Hamilton.	Other localities.
112. *Cyrtoceras* (*Cyclostomiceras*) *orodes* Billings	..	X	..	..	X	..	..	..	..	X	..	..	..	..	..	..
113. *Poterioceras* cf. *sauridens* Clarke and Ruedemann	..	X	..	..	..	..	..	..	..	X	..	..	..	..	..	..
114. *Trochoceras* (*Mitroceras*) *gebhardi* Hall	..	..	..	..	..	..	..	X	..	..	X	..	..	..	..	..
115. *Trochoceras anderdonense* Grabau	..	X	..	..	..	..	..	..	..	..	..	..	..	..	..	..
ANNELIDA.																
116. *Spirorbis laxus* Hall	..	..	..	..	X	..	..	..	..	..	..	X	..	..	..	..
117. *Cornulites arcuatus* Conrad	..	X	..	..	..	..	..	..	..	X	..	..	..	..	..	..
OSTRACODA.																
118. *Leperditia scalaris* Jones	..	..	..	..	..	..	..	X	..	..	X	..	..	..	..	..
119. *L. angulifera* Whitfield	..	..	..	..	..	..	X	..	..	..	..	..	..	..	..	..
120. *L. altoides* Grabau	..	..	..	..	..	..	X	..	..	..	..	..	..	..	..	..
121. *L. alta* Conrad	..	..	..	..	..	X	..	..	..	..	..	X	..	..	..	..
122. *Kloedenia monroensis* Grabau	..	..	..	..	X	..	..	..	..	..	..	..	..	..	..	..
TRILOBITA.																
123. *Proetus crassimarginatus* Hall	..	X	..	..	..	..	..	..	..	..	..	..	..	X	..	..
MEROSTOMATA.																
124. *Eurypterus eriensis* Whitfield	..	..	..	..	..	X	..	..	..	..	..	..	..	..	..	..
PLANTAE.																
125. *Bythotrephis clavelloides* Grabau	..	..	..	..	..	..	..	X	..	..	..	..	..	..	..	..
126. *Sphaerococcites? glomeratus*. Grabau	..	..	..	..	X	..	X	..	..	..	..	..	..	..	..	..

a In the Siluric beds of the headquarters of the Saskatchawan River, Canada.
b Monroe beds of Mackanic Island.
c Upper Siluric (Corrigan) formation of Maryland.
d Monroe beds of eastern Wisconsin.

WELL RECORDS OF SYLVANIA SANDSTONE.

Well Locality.	Total Depth.	Approximate elevation of mouth.	Distance to Sylvania.	Approx. elev. of top of Sylvania.	Separate Sand Beds.	Total thickness.	Associated Silicious Dolomite.	Depth in Monroe.	General Remarks.
Ludington, Mich.	2220	590 A. T.	2100	−1510 A. T.	one	40 ft.‡	95 ft.	95 ft.	Sandstone absent in adjacent well.
Cheboygan, Mich.	2750	.....	375	.....	two?	.....	.....	.....	Record incomplete.
Ann Arbor, Mich.	1326	875	1245	−370	.....	20+	265‡	200	Record incomplete.
Ypsilanti, Mich.	1210	682	885	−203	90 & 210+	300+	25+	.....	Lower bed not fully penetrated.
Milan, Mich.	1643	685	535	+150	one	288	.....	110	Sylvania pebbly at base.
Britton, Mich.	1700	705	750	−45	25 & 100	125	75	250	Sandstone is dolomitic.
Emil Twark farm, Mich.	1820	633‡	385	+248	5, 87 & 45	137	.....	.....	Sec. 12, Romulus Twp., Wayne Co.
Royal Oak, Mich.	2502	655‡	836	−181	269 & 15	284	65	.....	Probably some dolomite in heavy bed.
Mt. Clemens, Mich.	1060	617	985	−368	one	75?	95	375	Apparently stopped in Sylvania.
Port Huron, Mich.	1685+	611‡	1165	−554‡	one	50	95	480	Sandstone is calcareous.
Marine City, Mich.	1608	600	1095	−495	one	67	165	271	Averages of three wells.
Kincardine, Ont.	1007	.....	297	.....	one	29	.....	.....	.....
Courtwright, Ont.	1665	588	1062	−474	one	32	.....	370	.....
Petrolea, Ont.	1314	647‡	1076	−429	16, 26 & 47	89	28	.....	Sylvania just above salt.
Pt. Lambton, Ont.	1720	600‡	1200	−600	50 & 40	90	480	370	Wide interval between beds.
Wallaceburg, Ont.	2100+	.....	1000	.....	one	100	.....	.....	.....
Detroit, Mich.	2097	610	615	−5	one	85	.....	.....	Stroh's brewery, Gratiot Ave.
Detroit, Mich.	1656	585	450	+135	one	175	100	.....	Edison Power Co., Well No. 1.
Delray, Mich.	.....	575	365	+210	one	58	50+	230	Drilling samples examined.
Delray, Mich.	1572	575	419	+156	one or two	93.5	.....	.....	Average of 17 Solvay wells.
Oakwood, Mich.	1660	575	410	+165	one	117	.....	265	Detroit Salt shaft well.
River Rouge, Mich.	.....	575	365	+210	one	127	.....	.....	Tecumseh Salt Co.
Windsor, Ont.	1167	610‡	535	+75	one	55	.....	.....	Canadian Pacific, Well No. 11.
Windsor, Ont.	1445	610	550	+60	one	65	15+	350	Canadian Pacific, Well.
Ecorse, Mich.	1200	575	395	+180	87 & 6	93	37+	.....	Saw mill, Brownlee & Co.
Ecorse, Mich.	1096	580	438	+142	78 & 36	114‡	.....	.....	Well of Detroit Salt Co.
Ford City, Mich.	.....	580	235	+345	90 & 90	180	.....	.....	Michigan Alkali Co., No. 23.
Ford City, Mich.	1603	580‡	350	+230	one	150	.....	270+	Michigan Alkali Co.
Wyandotte, Mich.	1070	574	197	+377	65 & 35	100	105‡	135+	Morton Salt Co.
Wyandotte, Mich.	2500	580	230	+350	one?	60	.....	105‡	Well Eureka Iron Works.
Trenton, Mich.	1600	580	280	+300	60 & 30	90	.....	.....	Church & Co., Well No. 4.
Trenton, Mich.	1246	580	290	+290	120 & 60	180	20‡	.....	Church & Co., Well No. 5.
Rockwood, Mich.	1040	580	15	+565	one	75	.....	.....	Well of Dr. Dayton Parker.
Woolmith, Mich.	130+	632	79	+553	one or two	50	30‡	.....	Test well at quarry.
Dundee, Mich.	2277	680	193	+487	12, 18 & 7	37	.....	90‡	Based only on driller's record.
Dundee, Mich.	2194	675‡	235	+440	18 & 7	25	.....	132	Well No. 2, driller's record.
Ida, Mich.	1200	643	32	+611	one	45	.....	.....	Well of Simion VanAkin.
Cranberry Marsh, Mich.	327	675	80	+595	one	45‡	.....	.....	Sec. 24, Summerfield twp., Monroe Co.
Sucker Creek.	1144	609	410	+199	one	30	.....	260	Anderdon twp., Essex Co., Ont.
Park's Well.	1004	.....	258	.....	one	84	.....	.....	Malden twp., Essex Co., Ont.
Colwell Grove.	1418	.....	260	.....	.....	60	.....	.....	Malden twp., Essex Co., Ont.

Belle River	1465	600	275	+325	one	25			Shore of Lake St. Clair.
Pelee Island	800‡			+312‡		40			
Newberg, Ohio	3000‡	780	1660	−880	one	40			Cleveland Rolling Mill.
Pt. Rowan, Ont	1460		554			15‡		141?	Shore of Lake Erie.
Comber, Ont	1306		360		one	10			Near Comber, Essex Co., Ont.
Ravey Well	1000		555		75 & 85	160			Orford Tp., Kent Co., Ont.
Grant Well	500		410		several	90‡			Orford Tp., Kent Co., Ont.
Camden Well	500		413		one	46			Camden Tp., Kent Co., Ont.
2nd Camden Well	569		559		one?	10‡			Camden Tp., Kent Co., Ont.
Jefferson, Ohio	1992+		1992			30 to 40			Furnishes gas.
McConnelsville, O	3186	725	3133+	−2408+					Sandstone and limestone mixed.
Barberton, Ohio	3006		2500		one	30			Columbia Chemical Co.
Jefferson, Ohio	2140		2098		13 & 13	26			Lot of J. A. Giddings.
Rittman, Ohio	2624		2303		one	30			Well No. 1., Ohio Salt Co.
Newberg, Ohio	2006		1380		33 & 16	49			Well No. 4, Union Salt Co.
Pendleton, Ind	947	841	7	+834	one	14			Well drilled for gas.
Franklin, Ind	1113	736	275	+461	one	27			Well drilled for gas.
Plainfield, Ind	1386	742*	350‡	+392	one				Gas from sandstone.
Rockville, Ind	2169		1369		one	36			Sand rock is brown.
Albion, Ind	1914	729	505	+224	one	5			Between Corniferous and Niagara.

MECHANICAL ANALYSIS OF THE SANDS.

No.	Sand. No. 10 sieve= 1.80 mm. mesh.	On No. 20 .80 mm. mesh.	On No. 30 .50 mm. mesh.	On No. 40 .42 mm. mesh.	On No. 50 .35 mm. mesh.	On No. 80 .18 mm. mesh.	On No. 100 .16 mm. mesh.	On No. 200 .08 mm. mesh.	Through No. 200 .08 mm. mesh.	Average size of grain determined by the aspirator method.
	Toll's pit.	%	%	%	%	%	%	%	%	mm.
1	One ft. down.....	0.05	0.40	3.50	9.05	58.78	16.52	9.80	1.90	0.2454
2	6 ft. down.....	0.00	1.55	9.42	19.98	51.70	6.25	6.25	4.85	0.2385
3	11 ft. down.....	0.00	0.55	2.10	18.18	65.72	7.05	4.65	1.75	0.2841
4	16 ft. down.....	0.00	0.00	3.40	29.03	61.52	1.95	2.10	2.00	0.2967
5	21 ft. down.....	0.00	0.00	2.85	6.31	76.83	8.36	4.20	1.45	0.2660
6	26 ft. down.....	0.00	1.80	1.95	4.05	42.46	31.92	13.37	4.45	0.1810
	Rockwood.									
7	4 ft. down.....	0.00	0.40	7.65	40.50	50.60	0.50	0.25	0.10	0.3950
8	15 ft. down.....	0.00	0.60	0.60	2.35	70.45	16.60	9.10	0.30	0.2392
9	20 ft. down.....	0.00	0.35	6.65	34.10	53.70	2.30	2.25	0.65	0.3497
	Detroit salt shaft									
10	Near top.....	0.00	1.00	7.51	11.51	43.20	19.52	16.11	1.15	0.2448
11	440 ft. down.....	0.00	0.10	3.00	15.35	64.93	8.35	6.85	1.40	0.2513
12	450 ft. down.....	0.00	0.65	6.90	15.95	59.70	11.10	5.30	0.40	0.3071
13	460 ft. down (a)	0.00	0.85	7.55	14.45	44.90	18.70	12.20	1.35	0.2766
14	460 (b).....	0.00	0.75	7.23	16.00	47.35	16.16	11.65	0.82	0.2760
	Dune sand									
15	Mich. City, Ind....	0.15	0.15	1.95	10.40	80.90	5.35	1.05	0.05	0.2990
16	Albuquerque (a)	0.05	1.15	5.80	8.59	45.85	14.36	21.48	2.69	0.1990
17	Albuquerque (b)	0.20	1.40	17.56	24.16	41.38	7.30	5.43	0.54	0.2970
18	Albuquerque (c)	3.20	2.45	6.10	6.73	28.14	9.62	27.44	15.86	0.1340
19	Albuquerque (d)	0.00	0.13	17.90	40.14	35.56	3.33	2.50	0.39	0.2990

The loss in each case amounted from 0.03 to 0.05 of 1% and was distributed proportionally among the separations.

Michigan and Ohio.	Western New York.	Eastern New York.	Appalachians.
Dundee.	Onondaga.	Onondaga to Coeymans.	Coeymans.
Hiatus and disconformity	Hiatus and disconformity.	Continuity of deposition.	Continuity of deposition.
Lucas dolomite.	wanting.	Manlius limestone. Rondout waterline.	Corrigan formation of Maryland with perhaps part of Upper "Salina" of Schuchert's section. Lewistown formation of Pennsylvania.
Amherstburg dolomite. Anderdon limestone.	Akron dolomite. Bertie waterlime.	Cobleskill limestone. Rosendale waterlime.	
Flat Rock dolomite. Hiatus.	Hiatus and Disconformity.	Hiatus and Disconformity.	
Sylvania sandstone. Hiatus.			
Raisin River beds. Put-in-bay limestone. Tymochtee shale. Greenfield dolomite.			Continuity of depositon. "Salina" of Maryland. Wanting (?) in Pennsylvania.
Hiatus and disconformity.			
Salina formation. Niagaran series. Continuous deposition from Ordovicic.	Salina series. Niagaran series. Continuous deposition from Ordovicic.	Longwood High Falls shales (N. Y. to Penn.) Shawangunk conglom. (N. Y. to Penn.)	Hiatus and disconformity in Maryland.
		Hiatus and unconformity.	Niagaran.
		Ordovicic beds.	