

DEPARTMENT OF THE INTERIOR

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# WATER-SUPPLY

AND

# IRRIGATION PAPERS

OF THE

UNITED STATES GEOLOGICAL SURVEY

No. 61

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PRELIMINARY LIST OF DEEP BORINGS IN THE UNITED STATES  
PART II (NEBRASKA-WYOMING).—DARTON

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WASHINGTON  
GOVERNMENT PRINTING OFFICE

1902



UNITED STATES GEOLOGICAL SURVEY

CHARLES D. WALCOTT, DIRECTOR

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DEEP BORINGS IN THE UNITED STATES

PART II

(NEBRASKA-WYOMING)

BY

N. H. DARTON



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## LETTER OF TRANSMITTAL.

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DEPARTMENT OF THE INTERIOR,  
UNITED STATES GEOLOGICAL SURVEY,  
DIVISION OF HYDROGRAPHY,  
*Washington, D. C., November 27, 1901.*

SIR: I have the honor to transmit herewith Part II of a preliminary list of deep borings in the United States (400 feet or more in depth), by Mr. N. H. Darton, with the request that it be published in the series of Water-Supply and Irrigation Papers. Part I is in type as Paper No. 57. It has been found necessary to divide the whole into two papers, because of the statutory limit of 100 pages for these papers.

Very respectfully,

F. H. NEWELL,  
*Hydrographer in Charge.*

Hon. CHARLES D. WALCOTT,  
*Director United States Geological Survey.*





# PRELIMINARY LIST OF DEEP BORINGS IN THE UNITED STATES.

## PART II.—NEBRASKA-WYOMING.

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By N. H. DARTON.

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### INTRODUCTION.

The wells and borings reported in the paper are all more than 400 feet in depth. The information concerning them has been obtained partly from replies to circular letters sent to all parts of the United States and partly from geological reports and other published sources. Owing to the difficulty of obtaining replies to the circulars, to lack of knowledge on the part of correspondents, and to the incompleteness of published records, doubtless there are borings which have not been reported. In regions of oil and gas wells, where borings are numerous, the individual wells can not be listed here, but representative wells are given. References to logs or records of the wells, or extended descriptions of them, are given in footnotes, and after the list of wells in each State there is added a list of the principal publications relating to deep borings in that State.

The bearing of the information given in the columns of the lists probably is apparent, unless, perhaps, in the one headed "Height to which the water rises." In this column an entry such as "— 45" indicates that the water rises to within 45 feet of the surface; "+ 45" indicates that it is a flowing well and has sufficient head to raise the water 45 feet above the surface in an open pipe 45 feet or more in height. The yield in gallons per minute usually is estimated. Depths and diameters often have been reported from memory, and different sources of publication sometimes give different figures. Most wells which are not stated to be "for oil," "for gas," "brine," "abandoned," etc., in the remarks column, or "not any" in the yield column, generally afford more or less water. Many of the gas and oil wells, active or abandoned, yield salt water.

## NEBRASKA.

(Arranged by counties.)

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Hastings <sup>1</sup>	Adams	1,145			—40	Salt water at 940 feet.
Harrisburg	Banner	400-790				Several unsuccessful borings.
T. 34, R. 8, sec. —	Boyd	760	3	100	Flows.	
T. 33, R. 8, sec. 18	do	760	3	420	Flows.	
Kearney	Buffalo	2,460(?)				Unsuccessful.
T. 10, R. 13, sec. 34	Cass	480	3			Water at 30 feet.
Do	do	500	4			Water at 470 feet.
St. Helena <sup>2</sup>	Cedar	466		Many.	Flows.	Water at 400 feet.
T. 32, R. 33, sec. 23	do	400	2	30	Flows.	
T. 32, R. 23, sec. 24	do	448	2	30	Flows.	Water at 248 feet.
T. 31, R. 23, sec. 11	do	600	2		Flows.	Water at 340 feet.
T. 33, R. 13, sec. 35	do	600	2		Flows.	Water at 600 feet.
T. —, R. —, sec. —	do	602	2	25	Flows.	Water at 550 feet.
T. —, R. —, sec. 10	do	481	2		Flows.	
T. 32, R. 23, sec. —	do	445	2		Flows.	Water at 398 feet.
T. 6, R. 39, sec. 21	Chase	500	2			Water at 22 feet.
Cliff	Custer	400-485	3½	Many.	No flow.	Several wells.
Chadron	Dawes	400, 1,100, and 1,800				Three wells; no water.
T. 31, R. 5, sec. 5	Dixon	407	2	60	Flows.	
T. 31, R. 6, sec. 20	do	484	3		Many.	Water at 18 feet; supply unlimited.
Omaha (Clark and Sixteenth streets)	Douglas	664		125	+52	Temp. 58°.
Omaha (Grant smelter).	do	1,044	10-6	800	+65	Flows at 650 and 800 feet also; temp. 55°.
Omaha (Thirty-second and O streets).	do	1,800		Many.	—70	
Omaha (Elmwood Park).	do	1,845			—50	
Omaha (Hanscom Park).	do	1,120		Many.	—138	
Omaha (Riverview Park).	do	1,065		600		Temp. 62°.
Omaha (Willow Spring).	do	1,700		Many.	+100	
Omaha (Exposition grounds).	do	1,115		Many.	Flows.	First water at 700 feet; temp. 60°.
Omaha (Seymour Park).	do	1,303		500	+35	
Omaha (Pickards).	do	1,383		70	Flows.	Temp. 62°; abandoned.
Omaha (Krug brewery).	do	1,310		Many.	—142	
Omaha (Power house, Nineteenth street).	do	840				
Omaha (Cortland Beach).	do	998	6-5		+40(?)	
Farm of G. E. Hawkins.	Gage	1,260	6		Flows.	
Beatrice	do	1,200		Few.	Flows.	
Farm of W. E. Robertson.	do	1,240	6		Flows.	Water at 50 feet.
Hyannis	Grant	+400				Two wells.
O'Neill	Holt	1,300				Unsuccessful.
Farm of E. Demerit.	Hooker	1,200			Flows.	
Dannebrog <sup>3</sup>	Howard	1,011				Do.
T. 2, R. 2, sec. 4	Jefferson	500	4		+½	Seven borings for coal; strong salt water at 225-238 feet; temp. 70°.
T. 13, R. 35, sec. 5	Keith	525	6	500		Water at 7 feet.
T. 14, R. 41, sec. 2	do	407	3½	2		Water at 385 feet.
T. 12, R. 37, sec. 8	do					Water at 176 and 305 feet; 137 feet of water in well.
T. 9, R. 8, sec. 29	Kimball	460		Many.	No flow.	
T. 32, R. 6, sec. 16	Knox	656	8	Many.	Flows.	Water at 625 feet.
T. 33, R. 8, sec. 18	do	770	3		Flows.	Water at 740 feet.
T. 33, R. 3, sec. 13	do	504	2	90	Flows.	Water at 482 feet.
T. 32, R. 6, sec. 8	do	600	2	280	Flows.	Water at 435 feet.
T. 32, R. 6, sec. 16	do	656	8	2,500	Flows.	Water at 575 feet.
T. 32, R. 6, sec. 16	do	656	8	2,500	Flows.	Water at 600 feet.
T. 32, R. 6, sec. 16	do	630	8		Flows.	

<sup>1</sup> Record, U. S. Geol. Survey, Water-Supply and Irrigation Paper No. 12, pp. 37-38.<sup>2</sup> Record, Am. Assoc. Adv. Science, Proc., vol. 35, 1886, pp. 217-219.<sup>3</sup> Record, U. S. Geol. Survey, Water-Supply and Irrigation Paper No. 12, p. 47.

## NEBRASKA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
T. 32, R. 2, sec. 17 .....	Knox .....	420		50		
Santee Agency Mission. <sup>1</sup>	do .....	603	2½	20		
Lincoln (sanitarium). <sup>2</sup>	Lancaster .....	570				
Lincoln <sup>3</sup> .....	do .....	985			-100	Salt water at 244 and 544 feet.
Lincoln (Burlington Beach).	do .....	2,463		Many.	Flows.	Salt water.
Lincoln (public square).	do .....	1,050		Many.	Flows.	Salt water at 560 feet and 1,050 feet.
Tilden .....	Madison .....	400+	4		-90	
Norfolk .....	do .....	472			-100	
Brownville <sup>4</sup> .....	Nemaha .....	1,001				
Nebraska City .....	Otoe .....	448	4		+6	Mineral water.
Do .....	do .....	1,000-1,200				Several deep wells in progress.
Do .....	do .....	570				Salt water.
Dubois .....	Pawnee .....	562	6			Unsuccessful.
McCook .....	Redwillow .....	400	8			Some water at 375 feet.
Falls City .....	Richardson .....	1,300				
Rulo (2 miles west) .....	do .....	1,370				Coal prospect.
Seward <sup>5</sup> .....	Seward .....	610			No flow.	Abandoned.
Gordon .....	Sheridan .....	580				Failure; water at 180-182 feet.
York <sup>6</sup> .....	York .....	590			+16	
Ericson .....	Wheeler .....	(?)				Failure.

<sup>1</sup> Record, 51st Cong., 1st sess., Senate Ex. Doc. No. 222, pl. op. p. 55.<sup>2</sup> Descriptions, records, etc., U. S. Geol. Survey, Water-Supply and Irrigation Paper No. 12, pp. 28-30; Am. Assn. Adv. Science, Proc., vol. 35, p. 218; Physical Geography and Geology of Nebraska (Aughey), 1880.<sup>3</sup> Record, Am. Assoc. Adv. Science, Proc., vol. 35, p. 218.<sup>4</sup> Am. Assoc. Adv. Science, Proc., vol. 35, pp. 217-219.<sup>5</sup> Record, U. S. Geol. Survey, Water-Supply and Irrigation Paper No. 12, p. 31.<sup>6</sup> Ibid., pp. 33-34.

## PRINCIPAL PUBLICATIONS RELATING TO DEEP BORINGS IN NEBRASKA.

Underground Waters of a Portion of Southeastern Nebraska, by N. H. Darton, United States Geological Survey, Water-Supply and Irrigation Paper No. 12, 56 pages, maps, plates, Washington, 1898.

A Preliminary Report on the Geology and Water Resources of Nebraska west of the one hundred and third meridian, by N. H. Darton, United States Geological Survey, Eighteenth Annual Report, 1896-1897, part 4, pages 719-785, Washington, 1899.

## NEVADA.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Battle Mountain <sup>1</sup> .....	Lander .....	800	6			Strong flow.
Do. <sup>2</sup> .....	do .....	650		58		Several flows at less depths.
Dalamar .....	Lincoln .....	800				Unsuccessful.
Ely .....	Ormsby .....	400	6-7	5		Several wells.
Sierra Valley <sup>3</sup> .....	White Pine .....	600		Several.		
Vail Ranch .....	(?) .....	1,132	3	30		Hot water.
	Churchill .....	400			No flow.	

<sup>1</sup> Nevada, Report Surveyor-General and State Land Register, 1891-92, p. 72.<sup>2</sup> Ibid., 1889-90, p. 82.<sup>3</sup> Ibid., 1891-92, p. 72.<sup>4</sup> Ibid., 1889-90, p. 82.

## NEW HAMPSHIRE.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
Dover .....	Strafford .....	<i>Feet.</i> 400	<i>Inches.</i> 6	<i>Gallons.</i> 100	<i>Feet.</i> No flow.	Well abandoned; water at 935 feet.
Concord .....	Merrimac .....	1,325	6	Few.	-16	
Manchester .....	Hillsboro .....	630	8	Few.	No flow.	

## NEW JERSEY.

Allenhurst <sup>1</sup> .....	Monmouth .....	530	-----	-----	Flows.	Good water; temp. 60°.
Do .....	do .....	545	-----	-----	Flows.	
Asbury Park <sup>2</sup> .....	do .....	448	8	65½	Flows.	
Do .....	do .....	800	-----	-----	Flows.	Two wells.
Do .....	do .....	1,130-1,045	6	1,000	Flow.	
Do. <sup>3</sup> .....	do .....	1,330	-----	-----	Flows.	
Atlantic City <sup>4</sup> .....	Atlantic .....	578	8	-----	Flows.	Water at intervals from 328 to 554 feet.
Do .....	do .....	809	6	-----	Flows.	
Do .....	do .....	1,150	8-6	-----	+5	
Do .....	do .....	960	6-4½	-----	Flows.	Pumps 200 gallons.
Do .....	do .....	554	8	50	Flows.	
Do .....	do .....	735	6-4½	-----	Flows.	
Do .....	do .....	720	6	-----	Flows.	Do. Pumps 250 gallons.
Do .....	do .....	780	6-4½	150	Flows.	
Do .....	do .....	763	8	Many.	Flows.	
Do .....	do .....	1,398	10-4½	-----	-----	No water at this depth. Several flows above.
Do .....	do .....	805	8-4½	40	Flows.	
Do .....	do .....	843	6	100	Flows.	
Do .....	do .....	813	6	105	Flows.	Pumps 400 gallons; temp. 66°.
Do. <sup>5</sup> .....	do .....	1,400	10-4	-----	-----	
Do .....	do .....	-----	-----	-----	-----	
Atlantic Highlands .....	Monmouth .....	480	4½	250	Flows.	8
Avalon <sup>6</sup> .....	Cape May .....	925	10-4½	75	-----	
Avon Inn <sup>7</sup> .....	Monmouth .....	490	3	52	Flows.	
Bayhead .....	Ocean .....	710	-----	-----	Flows.	Flows.
Do .....	do .....	885	-----	-----	Flows.	
Bayhead (1 mile north). <sup>8</sup> .....	do .....	813	4½-3	85	Flows.	
Barnegat Park <sup>9</sup> .....	do .....	670	-----	-----	Flows.	Four wells.
Bayonne .....	Hudson .....	600	-----	Few.	-----	
Beach Haven <sup>10</sup> .....	Ocean .....	430	3	10	Flows.	
Do. <sup>8</sup> .....	do .....	575	8	125	Flows.	Flow.
Belmar <sup>9</sup> .....	Monmouth .....	445-480	-----	-----	Flow.	
Do .....	do .....	640-660	-----	-----	Flow.	
Berkeley Arms <sup>11</sup> .....	Ocean .....	475	-----	60	To surface.	Two wells.
Bernardsville .....	Somerset .....	621	-----	34	-----	
Brigantine <sup>12</sup> .....	Atlantic .....	798	6	100	Flows.	
Brookdale <sup>13</sup> .....	Essex .....	712	4½	174	-----	Unfinished.
Burlington .....	-----	675	-----	-----	-----	
Cape May Point <sup>14</sup> .....	Cape May .....	456	-----	-----	-----	
Crab Island .....	-----	520	3	-----	Flows.	-----
Columbus <sup>15</sup> .....	Burlington .....	715	-----	-----	-----	
Daretown <sup>16</sup> .....	Salem .....	405	-----	-----	-100	
Dealbeach .....	Monmouth .....	500-525	6	-----	Flow.	Two wells.

<sup>1</sup> Record, etc., New Jersey Geol. Surv., Report for 1893, pp. 413-414.<sup>2</sup> Record, New Jersey Geol. Surv., Reports for 1883, p. 20; 1884, p. 124; 1885, p. 129.<sup>3</sup> Record, etc., New Jersey Geol. Surv., Report for 1895, pp. 72-74.<sup>4</sup> Records, etc., of many wells at Atlantic City. New Jersey Geol. Surv., Reports for 1887, 1888, 1889, 1892, 1893, 1894, 1895, 1896, 1897, 1898, and 1899.<sup>5</sup> Record, New Jersey Geol. Surv., Report for 1890, p. 90.<sup>6</sup> Record, New Jersey Geol. Surv., Report 1898, pp. 78-82.<sup>7</sup> Record, etc., New Jersey Geol. Surv., Report for 1885, p. 130.<sup>8</sup> Record, etc., New Jersey Geol. Surv., Report for 1893, pp. 394-396; 1896, p. 152.<sup>9</sup> Records, etc., New Jersey Geol. Surv., Report for 1896, p. 154.<sup>10</sup> Record, etc., New Jersey Geol. Surv., Report for 1890, p. 266; 1893, pp. 394-396.<sup>11</sup> Record, etc., New Jersey Geol. Surv., Report for 1884, p. 127; 1885, p. 133.<sup>12</sup> Record, etc., New Jersey Geol. Surv., Report for 1895, pp. 77-79.<sup>13</sup> Record, etc., New Jersey Geol. Surv., Report for 1897, pp. 227-229.<sup>14</sup> Record, etc., New Jersey Geol. Surv., Report for 1885, p. 140.<sup>15</sup> Record, etc., New Jersey Geol. Surv., Report for 1892, pp. 305-306.<sup>16</sup> Record, etc., New Jersey Geol. Surv., Report for 1897, pp. 250-253.

## NEW JERSEY—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Farmingdale <sup>1</sup> .....	Monmouth .....	730	.....	.....	.....	Water from 530 feet.
Flemington .....	Hunterdon .....	405	.....	107	-161	.....
Fort Lee .....	.....	1,000	.....	.....	.....	Through trap into shale. No water.
Franklin <sup>2</sup> .....	Essex .....	400	8	125	.....	.....
Greenwich <sup>3</sup> .....	Cumberland .....	690	4-2½	.....	.....	No water found.
Glassboro <sup>4</sup> .....	Gloucester .....	511	.....	.....	.....	.....
Harrisonville <sup>5</sup> .....	do .....	402	.....	.....	.....	.....
Harvey Cedars .....	Ocean .....	500	4	100	Flows.	.....
Do. <sup>6</sup> .....	do .....	500	4½	120	+6	.....
Hazlet <sup>7</sup> .....	Monmouth .....	577	8-4½	.....	.....	.....
Hightstown <sup>8</sup> .....	Mercer .....	428-500	.....	Many.	.....	.....
Hoboken <sup>9</sup> .....	Hudson .....	400	.....	.....	.....	Bored in 1828. Rock at 40 feet
Holmdel <sup>10</sup> .....	Monmouth .....	601	8-4	.....	Flows.	.....
Jamesburg <sup>11</sup> .....	Middlesex .....	481	8-6	52	.....	.....
Jersey City (Limbeck's brewery). <sup>12</sup>	Hudson .....	776½	8	33	.....	.....
Jersey City (Malone & Co.).	do .....	500	.....	50	.....	.....
Jersey City (Stock Yards). <sup>13</sup>	do .....	455	8-6½	.....	.....	.....
Jersey City (Communipaw).	do .....	500	.....	.....	.....	Salt water.
Jersey City (Sugar Refinery). <sup>12</sup>	do .....	1,000	8-4	50	.....	.....
Jersey City (Cox's brewery). <sup>12</sup>	do .....	400	5	Few.	.....	.....
Jersey City (Dixon Co.).	do .....	1,205	.....	22	.....	.....
Jersey City (Colgate & Co.).	do .....	1,500	.....	15	.....	Rock 35-1,500 feet.
Jersey City (Hudson Canal Co.).	do .....	650	.....	Few.	.....	.....
Jersey City (Traction Co.).	do .....	2,200	.....	.....	.....	No water.
Jersey City (Mehl & Co.). <sup>14</sup>	do .....	1,007	.....	150	.....	.....
Jersey City (Coal dock). <sup>15</sup>	do .....	450	.....	.....	.....	Brackish water.
Jobstown. <sup>16</sup>	Burlington .....	715	.....	.....	.....	.....
Kearney .....	Union .....	600	.....	50	.....	.....
Lake Como <sup>17</sup> .....	Monmouth .....	535	.....	.....	Flows.	.....
Lakewood <sup>18</sup> .....	Ocean .....	475	.....	3½	+17	.....
Do. <sup>19</sup> .....	do .....	600-625	6	100	+200	Several wells.
Loch Arbor .....	.....	562	.....	.....	Flows.	.....
Longport. <sup>20</sup>	Atlantic .....	803	6	180	Flows.	Temp. 66°.
Mantoloking .....	Ocean .....	790	.....	25	+33	.....
Do. <sup>21</sup> .....	do .....	922	.....	60	+42	.....
Moorestown <sup>22</sup> .....	Burlington .....	457	.....	.....	.....	.....
Morristown (2 miles west).	Morris .....	438	6	2½	-60	.....
Mount Holly .....	Burlington .....	675	.....	.....	.....	Impure water.
Montclair (Mount Prospect).	Essex .....	510	7½	45	.....	Soft water.
Newark (Balentine's)	do .....	529	.....	150	.....	.....
Newark (Celluloid Co.).	do .....	827	10	200	No flow.	.....
Newark (Citizens' Gas Co.).	do .....	600	.....	50	.....	.....

<sup>1</sup> Record, etc., New Jersey Geol. Surv., Report for 1898, pp. 98-100.<sup>2</sup> Record, etc., New Jersey Geol. Surv., Report for 1884, p. 127; 1885, p. 133.<sup>3</sup> Record, etc., New Jersey Geol. Surv., Report for 1885, p. 131; 1894, pp. 190-193.<sup>4</sup> Record, etc., New Jersey Geol. Surv., Report for 1894, pp. 407-409.<sup>5</sup> Record, etc., New Jersey Geol. Surv., Report for 1896, pp. 126-127.<sup>6</sup> Record, etc., New Jersey Geol. Surv., Report for 1896, pp. 166-168.<sup>7</sup> Record, etc., New Jersey Geol. Surv., Report for 1897, pp. 247-248.<sup>8</sup> Record, etc., New Jersey Geol. Surv., Report for 1894, pp. 200-201.<sup>9</sup> Record, New Jersey Geol. Survey, Reports for 1879, p. 132; 1882, p. 139; 1885, p. 111.<sup>10</sup> Ibid., Report for 1895, pp. 147-148.<sup>11</sup> Ibid., Report for 1889, p. 165.<sup>12</sup> Ibid., Reports for 1879, pp. 130-132; 1882, pp. 138-140; 1885, p. 118.<sup>13</sup> Ibid., Reports for 1880, p. 172; 1882, p. 139; 1885, p. 111.<sup>14</sup> Ibid., Report for 1898, p. 140.<sup>15</sup> Ibid., Report for 1888, p. 77.<sup>16</sup> Ibid., Report for 1897, pp. 247-248.<sup>17</sup> Record, etc., New Jersey Geol. Surv., Report for 1894, p. 75.<sup>18</sup> Record, etc., New Jersey Geol. Surv., Report for 1885, p. 131; 1884, p. 125; 1895, pp. 148-149.<sup>19</sup> Record, etc., New Jersey Geol. Surv., Report for 1898, pp. 96-98; 1899, pp. 73-74.<sup>20</sup> Record, etc., New Jersey Geol. Surv., Report for 1895, pp. 63-65.<sup>21</sup> Record, etc., New Jersey Geol. Surv., Report for 1895, p. 77.<sup>22</sup> Record, etc., New Jersey Geol. Surv., Report for 1893, pp. 413-414.

## NEW JERSEY—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Newark .....	Essex .....	615	8	556	.....	
Newark (Balentine's), <sup>1</sup>	do .....	450	8	200	.....	
Newark (smelter) <sup>2</sup>	do .....	500	8	500	.....	
New Brunswick <sup>3</sup>	Middlesex .....	455	1½	.....	.....	
Do. <sup>4</sup>	do .....	480	.....	Few	.....	Very hard water.
Do.	do .....	976	8	7	.....	Water at 300-350 feet.
North Spring Lake	Monmouth .....	705	6	100	Flows.	
Ocean Beach <sup>5</sup>	do .....	485	3	25	+34	
Do. <sup>6</sup>	do .....	480	3	50	Flows.	
Ocean Grove <sup>6</sup>	do .....	420	6	40	Flows.	Temp. 60°.
Do. <sup>7</sup>	do .....	1,134	.....	.....	Flows.	
Ocean City <sup>8</sup>	Cape May .....	800	.....	140	Flows.	
Do. <sup>9</sup>	do .....	821	8	Many.	Flows.	
Do. <sup>10</sup>	do .....	760	.....	Many.	Flows.	
Do.	do .....	830	8-6	Many.	Flows.	
Passaic	Passaic .....	402	8	240	-28	
Do.	do .....	558	8	112	-28	Water at 400 feet.
Do.	do .....	1,000	.....	Few.	.....	
Paterson <sup>11</sup>	do .....	2,100	8-4	100	.....	Water at 900 feet only.
Do.	do .....	900	.....	100	.....	
Point Pleasant <sup>12</sup>	Ocean .....	806	.....	45	Flows.	
Poplar	do .....	520	.....	.....	-30	
Reedy Island <sup>13</sup>	do .....	570	.....	20	Flows.	
Sayreville <sup>14</sup>	Middlesex .....	976	8	7	.....	Some water at 300 feet.
Seabright <sup>15</sup>	Monmouth .....	715	6-4½	.....	-5	Water 260-300, 350-390, 685-715 feet.
Seagirt <sup>16</sup>	do .....	755	3	50	Flows.	Temp. 65°; water also at 570 and 694 feet.
Seaside Park <sup>17</sup>	Ocean .....	515	.....	16	Flows.	Temp. 58°.
Sea Isle City <sup>18</sup>	Cape May .....	464	.....	.....	Flows.	
Do. <sup>19</sup>	do .....	854	6	160	+14	
Secaucus <sup>20</sup>	Hudson .....	600	6	8	No flow.	Water from 200 to 250 feet.
Seven Islands <sup>21</sup>	do .....	408	6-3	70	Flows.	
Do.	do .....	535	.....	60	Flows.	
Sewell	Gloucester .....	420	3	.....	.....	Water also at 72, 381, and 395 feet.
Smiths Landing <sup>22</sup>	Atlantic .....	715	6	100	-17	
South Beach Haven <sup>19</sup>	Ocean .....	425	8-6	10	+14	
Spring Lake	Monmouth .....	465-730	.....	.....	Flows.	
Telegraph Hill <sup>23</sup>	do .....	575	.....	.....	.....	
Toms River <sup>24</sup>	Ocean .....	745	.....	.....	.....	
Union	Union .....	500	.....	.....	Flow.	Ten wells.
Ventnor <sup>25</sup>	Atlantic .....	813	6	.....	Flows.	
West Asbury Park <sup>26</sup>	Monmouth .....	508-558	.....	150 each	.....	Four wells.
Waverly	Union .....	450	.....	Few.	.....	
Wildwood	Cape May .....	655	.....	300	Flows.	Temp. 63°.
Do. <sup>27</sup>	do .....	1,244	.....	10	Flows.	Temp. 67°; water at 625, 750, 843, and 1,185 feet.
Woodstown	Salem .....	776	.....	.....	.....	

<sup>1</sup> Record, etc., New Jersey Geol. Surv., Reports for 1879, p. 126; 1882, p. 142; 1885, p. 115.<sup>2</sup> Record, etc., New Jersey Geol. Surv., Report for 1879, p. 126; 1882, p. 142; 1885, p. 114.<sup>3</sup> Record, etc., New Jersey Geol. Surv., Report for 1879, p. 133; 1882, p. 147; 1885, p. 113.<sup>4</sup> Record, etc., New Jersey Geol. Surv., Report for 1887, p. 27.<sup>5</sup> American Journal of Science, 3d series, vol. 30, p. 162.<sup>6</sup> Record, etc., New Jersey Geol. Surv., Reports for 1884, p. 124; 1885, pp. 129-131.<sup>7</sup> Record, etc., New Jersey Geol. Surv., Report for 1894, pp. 74-75.<sup>8</sup> Record, etc., New Jersey Geol. Surv., Report for 1893, pp. 398-399.<sup>9</sup> Record, etc., New Jersey Geol. Surv., Report for 1896, pp. 171-173.<sup>10</sup> Record, etc., New Jersey Geol. Surv., Report for 1892, pp. 279-281.<sup>11</sup> Record, etc., New Jersey Geol. Surv., Report for 1879, p. 128; 1882, p. 143; 1885, pp. 115, 117.<sup>12</sup> Record, etc., New Jersey Geol. Surv., Report for 1895, pp. 76-77.<sup>13</sup> Record, etc., New Jersey Geol. Surv., Report for 1895, pp. 141-142; 1897, pp. 248-249.<sup>14</sup> Ibid., Report for 1887, p. 27; 1888, p. 77.<sup>15</sup> Ibid., Report for 1899, pp. 76-77.<sup>16</sup> Ibid., Report for 1895, pp. 75-76.<sup>17</sup> Ibid., Report for 1898, pp. 101-102.<sup>18</sup> Ibid., Report for 1890, p. 268.<sup>19</sup> Ibid., Report for 1896, pp. 175-177; 1886, p. 211; 1899, p. 109.<sup>20</sup> Ibid., Report for 1879, p. 129; 1880, p. 172.<sup>21</sup> Ibid., Report for 1885, p. 135; 1891, pp. 230-231.<sup>22</sup> Ibid., Report for 1899, pp. 104-106.<sup>23</sup> Ibid., Report for 1896, p. 153.<sup>24</sup> Ibid., Report for 1893, pp. 399-400; 1894, pp. 159-180; 1898, pp. 102-103.<sup>25</sup> Ibid., Report for 1898, pp. 76-78.<sup>26</sup> Ibid., Report for 1899, pp. 74-76.<sup>27</sup> Ibid., Report for 1897, pp. 247-248.

## PUBLICATIONS RELATING TO DEEP BORINGS IN NEW JERSEY.

New Jersey Geological Survey, Reports of the State Geologist for 1868, 1879, 1882 to 1885, 1887 to 1889, 1890, 1892 to 1899.

United States Geological Survey, Bulletin, No. 138, Artesian Well Prospects in the Atlantic Coastal Plain Region, by N. H. Darton, pp. 39-115, plates, Washington, 1896.

## NEW MEXICO.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Deming .....	Grant .....	980	6	Many.	— 18	Never used.
Eddy <sup>1</sup> .....	Eddy .....	+600	-----	-----	No flow.	-----
Gallup .....	McKinley .....	600	10	Several.	— 225	No water below 135 feet.
Guam .....	do .....	600	10	-----	-----	-----
Las Vegas .....	San Miguel .....	1,860	6	Several.	— 30	Strongly mineral water; abandoned.
Manuelito .....	McKinley .....	610	10	Few.	-----	Unsatisfactory water.
Raton .....	Colfax .....	1,878	6	Few.	— 300	Two wells; abandoned.
Do .....	do .....	1,872	6	-----	— 300	-----
Santa Fe .....	Sante Fe .....	1,115	-----	-----	-----	-----

## PUBLICATIONS RELATING TO DEEP BORINGS IN NEW MEXICO.

Report on New Mexico, by L. G. Carpenter, Fifty-first Congress, first session, Senate Ex. Doc., No. 222, pp. 233-241, Washington, 1890.

Report of P. H. Van Diest, on the Geological Conditions of Artesian Basins in Eastern Colorado and New Mexico, Fifty-first Congress, first session, Senate Ex. Doc., No. 222, pp. 233-241, Washington, 1890.

On the Occurrence of Artesian and Other Underground Waters in Texas, eastern New Mexico, and Indian Territory west of the ninety-seventh meridian, by Robert T. Hill. A Report on Irrigation, etc., by R. J. Hinton, Fifty-second Congress, first session, Senate Ex. Doc., No. 41, part 3, pp. 41-166, Washington, 1893.

## NEW YORK.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Albany .....	Albany .....	-----	-----	-----	-----	City wells.
Alexander .....	Genesee .....	-----	-----	-----	-----	Salt well.
Do <sup>2</sup> .....	Allegany .....	839-1,800	-----	-----	-----	Important field of oil wells, embracing over 6,500 borings. Some 3,000 feet deep.
Attica <sup>3</sup> .....	Wyoming .....	1,960	-----	-----	-----	Salt well.
Auburn <sup>4</sup> .....	Cayuga .....	3,570	-----	-----	-----	Gas well.
Do .....	do .....	3,400?	-----	-----	-----	-----
Aurora <sup>5</sup> .....	do .....	1,068	-----	-----	-----	Salty water.
Baldwinsville .....	Onondaga .....	2,358	6½	-----	-----	Gas well.
Baldwinsville (1 mile south). <sup>6</sup> .....	do .....	2,250	-----	-----	-----	Do.
Baldwinsville (1 mile north). <sup>7</sup> .....	do .....	2,795	-----	-----	-----	Do.
Ballston .....	Saratoga .....	560	-----	-----	+30	Mineral water.

<sup>1</sup> Record, Report on Irrigation. Fifty-second Congress, first session, Senate Ex. Doc. No. 41, part 2, p. 16, Washington, 1893.

<sup>2</sup> Records, Am. Inst. Mining Engineers, Trans., vol. 16, pp. 930-934.

<sup>3</sup> Record, Report of Supt. Onondaga Salt Springs for 1888, pl. 2.

<sup>4</sup> Record, American Geologist, vol. 25, pp. 156-160.

<sup>5</sup> Record, Report of Supt. Onondaga Salt Springs for 1888, pl. 2.

<sup>6</sup> Record, American Geologist, vol. 25, pp. 150-152.

<sup>7</sup> Ibid., p. 154.

## NEW YORK—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Barker .....	Niagara .....	2,175				Salt, oil, and gas.
Barren Island <sup>1</sup> .....	Queens .....	720	6	50		Excellent water.
Do <sup>2</sup> .....	do .....	740			Flows.	
Batavia .....	Genesee .....				Flows.	
Bath (1 mile south) .....	Steuben .....	2,050				Gas well.
Binghamton <sup>3</sup> .....	Broome .....	3,117				
Binghamton (north of) .....	do .....	2,000				
Bristol <sup>4</sup> .....	Ontario .....	+750				Salt well.
Brockport .....	Monroe .....	2,000				For gas; unsuccessful.
Brooklyn borough (Calvary Cemetery) <sup>5</sup> .....	Kings .....	582		70		Soft water.
Brooklyn borough (foot of Thirty-ninth and Fortieth streets) .....	do .....	1,503	8-6			Salt water.
Buffalo .....	Erie .....	490	6			Gas well.
Do <sup>6</sup> .....	do .....	1,365	5½			Do.
Do .....	do .....	516-525				Several gas wells.
Burden .....	do .....	560				Gas well.
Cairo (3½ miles southwest) <sup>7</sup> .....	Columbia .....	900				
Caledonia .....	Greene .....	2,200	5½		-310	For oil or gas; abandoned.
Do <sup>8</sup> .....	Livingston .....	1,100	8-6½		-25	Salty, sulphurous water.
Do <sup>9</sup> .....	do .....	760				Salt well.
Campbell <sup>9</sup> .....	Steuben .....	2,250				For oil or gas.
Canandaigua .....	Ontario .....					Several oil wells.
Canastota .....	Madison .....	648				Bitter brines.
Canisteo .....	Steuben .....	2,000				Several unsuccessful borings for gas.
Cardiff <sup>8</sup> .....	Onondaga .....	844				
Castile <sup>8</sup> .....	Wyoming .....	2,525				Salt well.
Cedarville .....	Onondaga .....	1,157				
Charlotte Center <sup>10</sup> .....	Chautauqua .....	2,332				For oil; unsuccessful.
Do <sup>11</sup> .....	do .....	2,262				Do.
Chittenango <sup>12</sup> .....	Madison .....	3,426				Gas well.
Clifton Springs <sup>8</sup> .....	Ontario .....	710				Salt well.
Clyde .....	Wayne .....	450	6		-12	
Do <sup>13</sup> .....	do .....	1,792				
Clymer (4 miles east) <sup>14</sup> .....	Chautauqua .....	1,975				Gas well.
Cohocton (near) .....	Steuben .....					For oil.
Carfu (2 miles west) .....	Genesee .....	1,208	8-6½		-15 and -135	Several gas wells.
Do .....	do .....	1,248				
Curlerville <sup>8</sup> .....	Livingston .....	1,145				Salt well.
Dansville .....	do .....	1,800				
Dundee .....	Yates .....	2,000				
Do .....	do .....	1,200				Rocksalt at 1,800 feet.
Eagleville .....	Madison .....	1,889				
Do .....	do .....	1,465				
East Aurora <sup>8</sup> .....	Erie .....	1,503				Salt wells.
Do .....	do .....	1,000-3,000				For gas; unsuccessful.
Eden Valley <sup>8</sup> .....	do .....	1,750				Salt well.
Fredonia <sup>15</sup> .....	Chautauqua .....	1,207				Much salty water; several gas wells in vicinity.
Fulton <sup>16</sup> .....	Oswego .....	1,656-2,050				Several gas wells.
Gardenville <sup>17</sup> .....	Erie .....	800				Salt well.
Gasport .....	Niagara .....	2,007				Gas at 1,086 feet.
Geneva .....	Ontario .....	550				Flows.

<sup>1</sup> Record, N. J. Geol. Surv., Report 1896, pp. 155-156.<sup>2</sup> Ibid., pp. 156-157.<sup>3</sup> Record, Geol. Soc., of Am., Bull., vol. 4, pp. 93-94.<sup>4</sup> Record, Rept. Supt. Onondaga Salt Springs for 1888, pl. 2.<sup>5</sup> Record, U. S. Geol. Surv., Bull. 138, p. 34.<sup>6</sup> Record, Am. Inst. Mining Engineers, Trans., vol. 16, pp. 924-925.<sup>7</sup> Record, Am. Inst. Mining Engineers, Trans., vol. 16, p. 956.<sup>8</sup> Record, Report Supt. Onondaga Salt Springs for 1888, pl. 2; Report for 1885, p. 15.<sup>9</sup> Record, Geol. Soc. Am., Bull., vol. 4, pp. 97-100.<sup>10</sup> Record, Pa. 2d Geol. Surv., Rept., vol. I<sup>6</sup>, p. 325.<sup>11</sup> Ibid., pp. 325-326.<sup>12</sup> Record, Geol. Soc. Am., Bull. vol. 4, p. 101.<sup>13</sup> Record, Am. Inst. Mining Engineers, Trans., vol. 16, p. 942.<sup>14</sup> Record, Pa. 2d Geol. Surv., Rept., Vol. I<sup>6</sup>, p. 228.<sup>15</sup> Analysis, Am. Inst. Mining Engineers, Trans., vol. 16, pp. 918-923.<sup>16</sup> Record, Geol. Soc. of Am., Bull., vol. 4, pp. 105-106.<sup>17</sup> Record, Report Supt. Onondaga Salt Springs for 1888, pl. 2.



## NEW YORK—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Getzville .....	Niagara .....	1,400	.....	.....	.....	Several good gas wells.
Glen Springs .....	Schuyler .....	1,500	.....	.....	.....	For oil; unsuccessful.
Gowanda <sup>1</sup> .....	Cattaraugus .....	1,700	.....	.....	.....	Salt well.
Greenpoint <sup>2</sup> .....	Onondaga .....	1,600	.....	.....	.....	.....
Greig .....	Lewis .....	700	.....	.....	.....	Bored for oil.
Greigsville <sup>3</sup> .....	Livingston .....	1,138-1,145	.....	.....	.....	Salt wells.
Hollis Station <sup>4</sup> .....	Queens .....	406	.....	.....	.....	.....
Honeoye .....	Ontario .....	646	.....	.....	.....	Gas at 610 feet; several gas wells in vicinity.
Honeoye Falls <sup>5</sup> .....	Monroe .....	1,500	.....	.....	.....	Gas well.
Howard (one-half mile west) .....	Steuben .....	2,000	.....	.....	.....	For oil or gas; unsuccessful.
Hudson .....	Columbia .....	602	6	1	-60	.....
Hornellsville .....	Steuben .....	1,500	6½	.....	.....	Gas at 650, 940, and 1,300 feet.
Do .....	do .....	1,522	6½	.....	.....	Gas well.
Illion <sup>6</sup> .....	Herkimer .....	1,135	.....	.....	.....	Gas in small quantities at 800, 950, and 1,000 feet.
Ithaca .....	Tompkins .....	2,250	10-6½	.....	.....	Two dry salt wells.
Ithaca .....	do .....	2,250	8-5½	.....	.....	.....
Ithaca (one-fourth mile south). <sup>7</sup> .....	do .....	3,185	8-5½	.....	.....	Gas well.
Jamestown <sup>8</sup> .....	Chatauqua .....	1,807	.....	.....	.....	Unsuccessful boring for oil.
Jamesville <sup>9</sup> .....	Onondaga .....	1,040	.....	.....	.....	Salt well.
Knowersville <sup>10</sup> .....	Albany .....	3,012	.....	.....	.....	Gas at 497 feet only.
Knowersville (4½ miles north). <sup>11</sup> .....	do .....	2,200	.....	.....	.....	For gas; unsuccessful.
Lakeville <sup>12</sup> .....	Livingston .....	1,053	.....	.....	.....	Salt well.
Leicester .....	do .....	1,165	.....	.....	.....	Do.
Leroy <sup>13</sup> .....	Genesee .....	878-1,003	.....	.....	.....	Salt wells.
Limestone <sup>14</sup> .....	Cattaraugus .....	1,500	4½	.....	.....	For gas or oil.
Liverpool .....	Onondaga .....	600-1,969	.....	.....	.....	Salt wells.
Livonia <sup>15</sup> .....	Livingston .....	1,432	Shaft.	.....	.....	Salt mine.
Do .....	do .....	1,100	.....	.....	.....	Salt well.
Lockport .....	Niagara .....	.....	.....	.....	.....	Do.
Ludlowville .....	Tompkins .....	1,821	8	.....	.....	Salt wells.
Middletown .....	Orange .....	2,010	10-8	80	Flows.	.....
Do .....	do .....	600	6	.....	-60	Two wells.
Mohawk .....	Herkimer .....	420	6	.....	-30	Sulphurous water, unfit for use.
Montfredys Mills .....	Onondaga .....	1,140	.....	.....	.....	Salt well.
Morrisville <sup>16</sup> .....	Madison .....	1,889	.....	.....	.....	Gas well.
Mount Morris <sup>17</sup> .....	Livingston .....	1,130-1,422	.....	.....	.....	Several salt wells.
Naples .....	Ontario .....	1,650	.....	.....	.....	Salt well.
Neversink (near) .....	Sullivan .....	1,400	.....	.....	.....	Gas boring; abandoned.
New Dorp .....	Richmond .....	600	.....	.....	.....	No water.
New Rochelle .....	Westchester .....	1,155	10	.....	-10	.....
New York City, 10th and Washington sts. ....	New York .....	500	6	600	No flow.	.....
New York City, 11th and Greenwich sts. ....	do .....	1,047	8	10	No flow.	.....
New York City, 28th st., near Broadway. ....	do .....	500	8	100	No flow.	.....
New York City, 47th st. and 4th ave. ....	do .....	600	8	100	No flow.	.....

<sup>1</sup> Ibid.<sup>2</sup> Ibid. for 1884, pp. 12-15; 1888, pl. 2.<sup>3</sup> Ibid., 1888, pl. 2.<sup>4</sup> Record, U. S. Geol. Surv., Bull. 138, pp. 30-31.<sup>5</sup> Record, Pa. 2d Geol. Surv., Report, Vol. I<sup>3</sup>, p. 323.<sup>6</sup> Record, American Geologist, vol. 25, pp. 132-135.<sup>7</sup> Record and analysis, Am. Inst. Mining Engineers, Trans., vol. 16, p. 941; Report Supt. Onondaga Salt Springs for 1888, pl. 2.<sup>8</sup> Record, Pa. 2d Geol. Surv., Report, Vol. I<sup>4</sup>, p. 126.<sup>9</sup> Record, Report Supt. Onondaga Salt Springs for 1888, pl. 2.<sup>10</sup> Record and analysis, Am. Inst. Mining Engineers, Trans., vol. 16, pp. 951-952.<sup>11</sup> Am. Inst. Mining Engineers, Trans., vol. 16, pp. 953-954.<sup>12</sup> Record, Report Supt. Onondaga Salt Springs for 1888, pl. 2.<sup>13</sup> Ibid., Report for 1884, pp. 19-20.<sup>14</sup> Record, Pa. 2d Geol. Surv., Report, Vol. II., p. 272.<sup>15</sup> American Geologist, vol. 15, p. 379; N. Y. State Geologist Report, 1893, vol. 1, p. 13.<sup>16</sup> Record, Geol. Soc. of Am., Bull., vol. 4, pp. 96-97; Report Supt. Onondaga Salt Springs for 1888, pl. 2.<sup>17</sup> Record, Report Supt. Onondaga Salt Springs for 1888, pl. 2.

## NEW YORK—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
New York City, 59th st. and 11th ave.	New York....	700	8	100	No flow.	
New York City, 72d st. and 8th ave.	do .....	1,200	8	8	No flow.	
New York City, 59th st. and 5th ave.	do .....	500	-----	80	No flow.	
New York City, 92d st. and 3d ave.	do .....	685	9	300	No flow.	
New York City, 145th st. and 8th ave.	do .....	605	10-8	-----	No flow.	
New York City, Washington Building.	do .....	1,000	-----	-----	No flow.	
New York City, Manhattan Insurance Building.	do .....	1,056	8	75	No flow.	
New York City, Liberty and Nassau sts.	do .....	720	-----	80	No flow.	
New York City, N. Y. Life Ins. Building.	do .....	500	-----	-----	No flow.	
New York City, Fulton Market.	do .....	626	-----	-----	No flow.	
New York City, Broadway and Bleecker st.	do .....	448	7	80	No flow.	
New York City, Lafayette and Barnard sts.	do .....	700	8	80	No flow.	
New York City, Boulevard and 72d st.	do .....	700	-----	25	-----	Hard water.
New York City, 146th st. and 8th ave.	New York ...	1,035	8	500	No flow.	
New York City, 99th st.	do .....	609	8	-----	No flow.	Abandoned.
Do .....	do .....	1,505	8	11	No flow.	Do.
New York City, 67th st. near 3d ave.	do .....	1,504	8	-----	-32	Do.
New York City, 67th st. near 2d ave.	do .....	1,502	8	50	-38	Do.
New York City, Morris and Greenwich sts.	do .....	625	8	40	No flow.	Do.
Do .....	do .....	700	8	-----	No flow.	Do.
New York Mills <sup>1</sup>	Oneida .....	2,000	-----	-----	-----	Gas at 500 feet.
Niskayuna	Schenectady.	400	6	75	-20	
Norwich	Chenango.	900	-----	-----	-----	Small amount of gas.
Do. <sup>2</sup>	do .....	2,334	-----	-----	-----	Do.
Nunda <sup>3</sup>	Livingston	-----	-----	-----	-----	
Olean <sup>4</sup>	Cattaraugus.	1,230	-----	-----	-----	Gas well.
Pearl Creek	Wyoming	1,182-1,194	-----	-----	-----	Salt wells.
Pearl Creek (1 mile south).	do .....	1,241	-----	-----	-----	Salt well.
Perry <sup>5</sup>	do .....	2,108	-----	-----	-----	Heavy bed of salt.
Penn Yan <sup>6</sup>	Yates	-----	-----	-----	-----	Small supply of gas for several weeks.
Phoenix	Oswego	2,600	-----	-----	-----	Gas well.
Piffard <sup>7</sup>	Livingston	961-1,141	-----	-----	-----	Several salt wells.
Port Colborne <sup>8</sup>	Erie	770-1,500	-----	-----	-----	Several small gas wells.
Port Jervis	Orange	1,400	-----	-----	-----	Unsuccessful.
Richland	Oswego	-----	-----	-----	-----	Numerous gas wells.
Rock City (near) <sup>9</sup>	Dutchess.	1,471-1,546	-----	-----	-----	Oil wells.
Rock Glen <sup>9</sup>	Wyoming	2,111	-----	-----	-----	Salt well.
Rome <sup>9</sup>	Oneida	1,632	-----	-----	-----	Gas wells.
Do. <sup>10</sup>	do .....	832	-----	-----	-----	Gas well.
Saltville <sup>3</sup>	Wyoming	1,436	-----	-----	-----	Salt well.
Sandy Creek	Oswego	1,000-1,300	-----	-----	-----	Numerous oil wells.
Do. <sup>11</sup>	do .....	1,145	-----	-----	-----	Gas at 675, 765, and 790 feet.

<sup>1</sup> Am. Inst. Mining Engineers, Trans., vol. 16, pp. 958-959.<sup>2</sup> Record, Geol. Soc. of Am., Bull., vol. 4, p. 95.<sup>3</sup> Record, Report Supt. Onondaga Salt Springs for 1888, pl. 2.<sup>4</sup> Am. Inst. Mining Engineers, Trans., vol. 16, pp. 939-940.<sup>5</sup> Ibid.<sup>6</sup> Record, Report Supt. Onondaga Salt Spring for 1884, pp. 20-21.<sup>7</sup> Record, Am. Inst. Mining Engineers, Trans., vol. 17, p. 401.<sup>8</sup> Record, Pa. 2d Geol. Surv. Report, vol. 14, p. 100.<sup>9</sup> Record, American Geologist, vol. 25, pp. 137-143.<sup>10</sup> Ibid., p. 145.<sup>11</sup> Record, Geol. Soc. Am., Bull., vol. 4, p. 107.

## NEW YORK—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Saratoga Springs.....	Saratoga.....	400	6	3½	-----	
Do.....	do.....	1,006	2½	2	+75	
Do.....	do.....	600	6	½	Flows.	
Do.....	do.....	440	6	½	+40	
Do.....	do.....	520	6	½	+40	
Do.....	do.....	425	6	½	-16	
Saratoga Springs.....	Saratoga.....	478½	-----	-----	+40	Mineral water.
Do.....	do.....	422	-----	-----	-16	
Shodack Landing.....	Rensselaer.....	1,000½	-----	-----	-----	Salt well.
Seneca Falls.....	Seneca.....	3,560	-----	-----	-----	Gas well.
Do.....	do.....	400-500	-----	-----	Flow.	Several salt wells in vicinity.
Do. <sup>1</sup> .....	do.....	1,500	-----	-----	-----	Gas well.
Silver Springs <sup>2</sup> .....	Wyoming.....	2,254	-----	-----	-----	Salt well.
Springfield <sup>3</sup> .....	Otsego.....	419	-----	2	No flow.	
Syracuse (near) <sup>4</sup> .....	Onondaga.....	1,115-1,969	-----	-----	-----	
Tivoli.....	Dutchess.....	400	-----	-----	-----	
Tully <sup>5</sup> .....	Onondaga.....	974-1,472	-----	-----	-----	Numerous salt wells.
Uniontown.....	Madison.....	-----	-----	-----	-----	Gas well.
Utica <sup>6</sup> .....	Oneida.....	860	-----	-----	-----	Gas well.
Do. <sup>7</sup> .....	do.....	1,720	-----	-----	-----	
Vernon <sup>8</sup> .....	do.....	1,968	-----	-----	-----	Gas well.
Warsaw <sup>9</sup> .....	Wyoming.....	1,609-2,039	-----	-----	-----	Numerous salt wells.
Watertown <sup>10</sup> .....	Jefferson.....	530	-----	-----	-----	Small flow of gas at 253 feet.
Watkins.....	Schuyler.....	±2,100	-----	-----	-----	Several salt wells.
Wellsville (4½ miles southwest). <sup>11</sup>	Allegheny.....	1,177	-----	-----	-----	Oil well.
West Bloomfield <sup>12</sup> .....	Ontario.....	500	5	-----	-----	Gas well.
Whitneys Point (near).	Broome.....	1,120	-----	-----	-----	Salt well.
Willets Point.....	Queens.....	400	-----	-----	-----	
Williamsville.....	Erie.....	Av. 875	5½	-----	No flow.	Three wells; two unsuccessful.
Wolcott <sup>13</sup> .....	Wayne.....	2,383	-----	-----	-----	Gas well.
Woodhaven <sup>14</sup> .....	Queens.....	577	-----	-----	-----	
Woodhull.....	Steuben.....	3,000	-----	-----	+50	Unsuccessful oil well; flow of water at 300 feet.
Wyoming <sup>15</sup> .....	Wyoming.....	1,321-1,530	-----	-----	-----	Salt wells.
York <sup>16</sup> .....	Livingston.....	828	-----	-----	-----	Salt well.

<sup>1</sup> Record, Am. Inst. Mining Engineers, Trans., vol. 16, p. 949.<sup>2</sup> Record, Rept. Supt. Onondaga Salt Springs for 1888, pl. 2.<sup>3</sup> Record, U. S. Geol. Surv., Bull. 138, p. 29.<sup>4</sup> Record, Geol. Soc. Am., Bull., vol. 4, pp. 102-105; Am. Inst. Mining Engineers, Trans., vol. 16, p. 944; Rept. Supt. Onondaga Salt Springs for 1888, pl. 2; for 1884, pp. 15-18.<sup>5</sup> Record, Geol. Soc. Am., Bull., vol. 4, p. 105; Rept. Supt. Onondaga Salt Springs for 1888, pl. 2.<sup>6</sup> American Geologist, vol. 25, p. 137.<sup>7</sup> Record, Geol. Soc. Am., Bull., vol. 4, p. 100.<sup>8</sup> Record, Am. Geol. vol. 25, pp. 145-149.<sup>9</sup> Record, Rept. Supt. Onondaga Salt Springs for 1888, pl. 2.<sup>10</sup> Record, Geol. Soc. Am., Bull., vol. 4, p. 107.<sup>11</sup> Record, Pa. 2d Geol. Surv., Ann. Rept., 1886, part 2, pp. 774-775.<sup>12</sup> Am. Inst. of Mining Engineers, Trans., vol. 13, p. 542.<sup>13</sup> Ibid., vol. 16, p. 943.<sup>14</sup> Record, U. S. Geol. Surv., Bull. 138, pp. 31-32.<sup>15</sup> Record, Rept. Supt. Onondaga Salt Springs for 1888, pl. 2.<sup>16</sup> Ibid.

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The Thickness of the Devonian and Silurian Rocks of Central New York, by C. S. Prosser, American Geological Society, Bulletin, vol. 4, pp. 91-118, Rochester, 1893.

United States Geological Survey, Bulletin No. 138, 232 pages, Washington, 1896.

Gas Well Sections in the Upper Mohawk Valley and Central New York, by C. S. Prosser, American Geologist, vol. 25, pp. 131-162, March, 1900.

Petroleum and Natural Gas in New York State, by C. A. Ashburner, American Institute of Mining Engineers, Transactions, vol. 16, pp. 906-953.

## NORTH CAROLINA.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Charlotte.....	Mecklenberg.	900	2			Dry.
Davidson.....	do	500				Dry below 80 feet.
Durham.....	Durham	1,637		18	No flow	
Gold Hill.....	Rowan	1,000			-20	Shaft sunk for gold.
Hammocks.....	New Hanover	400		8		Water at 100 feet.
Monroe.....	Union	720	6-5	28	To surface.	
Do.....	do	1,050	8-6	28	Near surface.	
North Wilkesboro.....	Wilkes	600	8	85		Uncompleted.
Sanford.....	Moore	515	6½	45	-3	
Selma.....	Johnston					Two deep wells.
Walnut Cove.....	Stokes	1,050	2½			Unsuccessful; bored for coal.
Do (1 mile south).....	do	500				Good flow of mineral water.
Wilmington.....	New Hanover	495			Flows.	Saline water.
Do.....	do	1,144	12-6	200		Flows of brackish water at 379, 496, 574, 608, 734, and 989 feet; 200-gallon flow at 518 feet; granite, 1,109 feet to bottom.

## PUBLICATIONS RELATING TO DEEP BORINGS IN NORTH CAROLINA.

Artesian Well Prospects in the Atlantic Coastal Plain Region, by N. H. Darton, U. S. Geological Survey, Bulletin No. 138, 232 pages, plates, Washington, 1896.

## NORTH DAKOTA.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Bismarck <sup>1</sup> .....	Burleigh.....	1,315	8-4			No flow.
Devils Lake <sup>2</sup> .....	Ramsey.....	1,520	8-3	82	+46	Flow at 1,470 feet.
Dickinson.....	Stark.....	1,325				No flow.
Edgeley.....	Lamoure.....	1,354	6	500	+138	Water at 1,300 and 1,350 feet.
Ellendale <sup>1</sup> .....	Dickey.....	860			+138	
Do.....	do.....	1,087	4½-3½	700	+260	Water at 1,042 feet.
Grafton <sup>2</sup> .....	Walsh.....	912	8	700		
Hamilton City <sup>3</sup> .....	Pembina.....	1,565	6	16½	+60	
Jamestown (asylum), <sup>3</sup> .....	Stutsman.....	1,524	8-3½	4	+161	
Jamestown <sup>1</sup> .....	do.....	1,476	6½-3½	460	+223	Water at 1,385 and 1,458 feet.
Mandan <sup>1</sup> .....	Morton.....	2,000	10-4	3		Water at 327 feet only.
Medora <sup>1</sup> .....	Billings.....	941	4	33	+34½	
Oakes <sup>1</sup> .....	Dickey.....	977				Water at 790, 845, 870, and 937 feet.
Portland.....	Trail.....	560		175	Flows.	
Rutland <sup>3</sup> .....	Sargent.....	600	2			
Sims <sup>1</sup> .....	Morton.....	1,311				No flow.
Staples.....		514		25	+115	
Towers City <sup>1</sup> .....	Cass.....	716	6-4½	20-25	+122	
Wimbleton <sup>1</sup> .....	Barnes.....	1,557		200	+184	

<sup>1</sup> U. S. Geol. Surv., 17th Ann. Rept., 1895-96, part 2, pp. 59-63.

<sup>2</sup> Record, 51st Congress, 1st session, Senate Ex. Doc. No. 222, pp. 107-108, Washington, 1890.

<sup>3</sup> 51st Congress, 1st session, Senate Ex. Doc. No. 222, p. 322, Washington, 1890.

# PRINCIPAL PUBLICATIONS RELATING TO DEEP BORINGS IN NORTH DAKOTA.

Report of F. S. Underhill for North Dakota, Fifty-first Congress, first session, Senate Ex. Doc. No. 222, pp. 105-109, Washington, 1890.

Report on Irrigation, Fifty-second Congress, first session, Senate Ex. Doc. No. 41, part 2, pp. 66-72, 87-94, Washington, 1893.

Preliminary report on Artesian Waters of a portion of the Dakotas, by N. H. Darton, United States Geological Survey, Seventeenth Annual Report, 1895-96, part 2, pp. 609-694, Washington, 1896.

## OHIO.

Location.	County.	Depth.	Diam-eter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>		
Ada <sup>1</sup>	Hardin	1,384-1,820				Several wells for gas; some successful, others yield only flows of salt water.
Amanda Township	Allen	1,200	10-5		-75	Salt water at 20 feet.
Akron <sup>2</sup>	Summit	2,250				
Do. <sup>3</sup>	do	2,450				Some gas at 172 feet.
Arcadia <sup>4</sup>	Hancock	1,365				Gas at 1,180 feet.
Arcanum <sup>5</sup>	Darke	+1,150				Gas prospects; small product.
Arlington <sup>6</sup>	Hancock	1,304				Some oil and gas at 1,304 feet. Abandoned.
Ashtabula <sup>7</sup>	Ashtabula	500				Gas from 250 to 500 feet. Strong brine at 400 and 500 feet.
Athens	Athens	±1,200				Oil and gas wells.
Bairdstown	Wood	1,058				Gas wells.
Bairdstown (1½ miles north). <sup>8</sup>	do	1,154				Gas well.
Bairdstown (near) <sup>9</sup>	do	1,154				For gas. Abandoned.
Barnesville <sup>10</sup>	Belmont	2,700				Gas wells.
Beaverdam	Allen	1,309				For oil; salt water found. Abandoned.
Beaverdam (5 miles east). <sup>11</sup>	Hancock	1,288-1,290				Gas wells.
Belden (near)	Lorain					Many oil wells.
Bellaire <sup>12</sup>	Belmont	1,550, 2,700				Small gas wells.
Belle Center <sup>13</sup>	Logan	+1,310				Very small flow of gas.
Bellefontaine <sup>14</sup>	do	1,590				Do.
Bellevue <sup>15</sup>	Huron	1,700				For gas, unsuccessful.
Belpre <sup>16</sup>	Washington	+1,740				
Berea (2½ miles north-east). <sup>17</sup>	Cuyahoga	960-1,240				Several gas wells.
Birmingham <sup>18</sup>	Erie	2,250				Salt water only.
Bloomington <sup>19</sup>	Hocking	628				Small flow of oil.
Do	do					Two borings.
Bloomdale <sup>20</sup>	Wood	1,115				Large flow of gas.
Bloomville <sup>21</sup>	Seneca	2,150				For oil unsuccessful.
Bluffton <sup>22</sup>	Allen	1,328				Unsuccessful.
Bowling Green <sup>23</sup>	Wood	±1,300				Gas well.
Do <sup>24</sup>	do	1,152				Large volume of gas.
Bradner <sup>25</sup>	do	1,244				Small flow of oil.
Brooklyn Village <sup>26</sup>	Cuyahoga	1,033				Several gas wells in vicinity.
Brownhelm <sup>27</sup>	Lorain	740				A little gas and oil.

<sup>1</sup> Ohio Geol. Surv., Report, 1888, vol. 6, p. 219; report for 1890, pp. 184-186.

<sup>2</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6, p. 319.

<sup>3</sup> Ibid., pp. 357-358.

<sup>4</sup> Ibid., p. 217.

<sup>5</sup> Ibid., pp. 272-273.

<sup>6</sup> Ibid., p. 218.

<sup>7</sup> Ibid., pp. 424-425.

<sup>8</sup> Ibid., pp. 229-232.

<sup>9</sup> Ibid., pp. 232-233.

<sup>10</sup> Ibid., Report, 1890, p. 254.

<sup>11</sup> Ibid., Report, 1888, vol. 6, pp. 215-216.

<sup>12</sup> Record, ibid, p. 406.

<sup>13</sup> Record, ibid, p. 267.

<sup>14</sup> Record, ibid, pp. 266-267.

<sup>15</sup> Ibid., pp. 214-215.

<sup>16</sup> Ibid., p. 401.

<sup>17</sup> Records, ibid, pp. 433-436.

<sup>18</sup> Ibid., pp. 346-347.

<sup>19</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6, pp. 393-394.

<sup>20</sup> Ibid., pp. 233-234.

<sup>21</sup> Ibid., p. 201.

<sup>22</sup> Ibid., p. 216.

<sup>23</sup> Ibid., pp. 156-159, pl., p. 112.

<sup>24</sup> Ibid., p. 160.

<sup>25</sup> Ibid., p. 207.

<sup>26</sup> Ibid., pp. 430-431.

<sup>27</sup> Ibid., pp. 437-438.

## OHIO—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Brownhelm <sup>1</sup>	Lorain	635				Some oil.
Brown Township	Vinton	1,000	10-5½			Oil, gas, and salt water.
Bryan <sup>2</sup>	Williams	1,974-2,037				Gas and oil wells; yield small; salt water at 2,037 feet.
Buckeye (east of) <sup>3</sup>	Knox					Gas wells.
Bucyrus <sup>4</sup>	Crawford	840-2,264				For gas or oil; salt water flow at 780 feet.
Cadiz oil field <sup>5</sup>	Harrison					Fair flow of oil.
Cambridge <sup>6</sup>	Guernsey	1,090-2,000				Gas and oil wells; yield small.
Camden <sup>7</sup>	Preble	900				Gas well.
Canal Dover <sup>8</sup>	Tuscarawas	2,760				Little gas and salt water.
Cannonsburg <sup>9</sup>	Hancock	1,300				Several oil wells.
Canton <sup>10</sup>	Starke	2,220				For oil, but only salt water found.
Do	do	+3,135				
Cardington <sup>11</sup>	Morrow	+2,300				Gas; small flow.
Carey and vicinity <sup>12</sup>	Wyandot	1,326-1,500	5½			Several gas wells; some yield large supply.
Carroll <sup>13</sup>	Fairfield	2,300				Unsuccessful.
Celina <sup>14</sup>	Mercer	1,147-1,168				Gas wells.
Chicago Junction <sup>15</sup>	Huron	1,250				
Circleville	Pickaway					
Cincinnati (vicinity)	Hamilton					Numerous oil or gas wells; unsuccessful.
Cleveland <sup>16</sup>	Cuyahoga	400-1,500				Several gas wells.
Cleveland (gas company). <sup>17</sup>	do	2,200				No product.
Cleveland (Euclid and Case avenues). <sup>18</sup>	do	1,125-1,735				Small flow of gas.
Cleveland (Rolling Mill). <sup>19</sup>	do	3,000				
Cleveland (Central avenue).	do	535		Many.	-100	Large supply of water.
Cleveland (Gordon Park). <sup>20</sup>	do	520				Abandoned.
Cleveland (2 miles east). <sup>21</sup>	do	508				For oil and coal, unsuccessful.
Clyde <sup>22</sup>	Sandusky	1,850				Unsuccessful.
Coldwater (¾ miles east).	Mercer	1,100	8-5½		15?	
Columbus Grove <sup>23</sup>	Putnam	1,278				Gas at 740 feet; some oil at bottom.
Columbus <sup>24</sup>	Franklin	2,020				No gas or oil.
Columbus (State House). <sup>25</sup>	do	2,775	6-4		+5	Saline water below 675 feet; temp. 91°.
Conneaut <sup>26</sup>	Ashtabula	850				Small gas supply.
Do	do	+1,942				Much strong brine.
Coshocton <sup>27</sup>	Coshocton	2,108				
Do. <sup>28</sup>	do	1,280				Unsuccessful.
Do. <sup>29</sup>	do	3,100				Do.
Coventry Township	Summit					
Covington <sup>30</sup>	Miami					Small supply of gas.
Crestline <sup>31</sup>	Richland	2,864				
Cridersville	Auglaize	1,237	8-5½		-40	Oil and salt water.

<sup>1</sup> Record, Pa., 2d Geol. Surv., Report II, p. 282.<sup>2</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6, pp. 247-249, 786.<sup>3</sup> Ibid., pp. 340-343.<sup>4</sup> Ibid., pp. 363-364.<sup>5</sup> Ibid., Report, 1890, pp. 250-252.<sup>6</sup> Ibid., Report, 1888, vol. 6, pp. 320, 377-378.<sup>7</sup> Ibid., p. 285.<sup>8</sup> Ibid., pp. 320, 369-370.<sup>9</sup> Ibid., p. 217.<sup>10</sup> Ibid., pp. 359-360.<sup>11</sup> Ibid., pp. 283-284.<sup>12</sup> Ibid., pp. 203-207.<sup>13</sup> Ibid., p. 388.<sup>14</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6, pp. 259-260.<sup>15</sup> Ibid., pp. 350-351.<sup>16</sup> Ibid., pp. 429-430.<sup>17</sup> Ibid., p. 430.<sup>18</sup> Geol. Soc. Am., Bull., vol. 8, p. 10.<sup>19</sup> Record, Mich. Geol. Surv., Report, 1881-1893, vol. 5, part 2, p. 73; Ohio Geol. Surv., Report, vol. 1, pp. 352-355; Ohio Geol. Surv., Report, 1888, vol. 6, pp. 351-355.<sup>20</sup> Geol. Soc. Am., Bull., vol. 8, p. 10.<sup>21</sup> Economic Geology of Ill., vol. 3, pp. 195-6.<sup>22</sup> Ohio Geol. Surv., Report, 1888, vol. 6, p. 214.<sup>23</sup> Ibid., p. 242.<sup>24</sup> Record, ibid., pp. 281-283.<sup>25</sup> Record, ibid., pp. 106-108; Am. Journal Science, 2d series, vol. 27, p. 276.<sup>26</sup> Ohio Geol. Surv., Report, 1888, vol. 6, pp. 422-423.<sup>27</sup> Record, ibid., p. 324.<sup>28</sup> Ibid., p. 368.<sup>29</sup> Ibid., p. 357; Report for 1890, pp. 245-246.<sup>30</sup> Ibid., p. 274.<sup>31</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6, pp. 303-304.

## OHIO—Continued.

Location.	County.	Depth.	Dia- meter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Dayton <sup>1</sup>	Montgomery	2, 870	-----	-----	-----	Some shale gas.
Do. <sup>2</sup>	do	2, 440	-----	-----	200	-----
Defiance	Defiance	1, 687	-----	-----	-----	Salt water only.
De Graff <sup>3</sup>	Logan	1, 356	-----	-----	-----	Some oil and gas.
De Graff (1 mile west)	do	1, 300	8-5½	-----	-----	-----
Delaware <sup>4</sup>	Delaware	2, 130	-----	-----	-----	Unsuccessful.
Delphos <sup>5</sup>	Allen	1, 250	-----	-----	-----	Do.
Delphos (Kill farm) <sup>6</sup>	do	1, 218	-----	-----	-----	Oil well.
Delta <sup>7</sup>	Fulton	2, 150	-----	-----	-----	Unsuccessful.
Deshler <sup>8</sup>	Henry	1, 600	-----	-----	-----	Only small flow of gas.
Dexter (near)	Noble	-----	-----	-----	-----	-----
Dresden <sup>9</sup>	Muskingum	2, 525	-----	-----	-----	Unsuccessful.
Do. <sup>10</sup>	do	+1, 000	-----	-----	-----	-----
Duchouquet	Auglaize	-----	-----	-----	-----	Two wells of moderate flow.
Dudley	Noble	-----	-----	-----	-----	-----
Dunkirk <sup>11</sup>	Hardin	1, 865	-----	-----	-445	For gas; only salt water found.
Dunkirk <sup>12</sup>	do	1, 370	-----	-----	-----	Large flow of oil.
Eagle Mills	Vinton	600	-----	-----	-----	Salt water.
Eaglesport <sup>13</sup>	Morgan	1, 134	-----	-----	-----	Salt water; abandoned.
Do	do	1, 152	8-6	-----	-----	Oil rises to 40 feet.
East Liverpool <sup>14</sup>	Columbiana	425-450	-----	-----	-----	-----
East Liverpool (on Dry Run) <sup>15</sup>	do	±3, 000	-----	-----	-----	Several gas wells.
East Liverpool (Knowles well).	do	2, 954	-----	-----	-----	Dry.
Eaton <sup>16</sup>	Preble	1, 170-1, 375	-----	-----	-----	Several wells; unsuccessful.
Elnore <sup>17</sup>	Ottawa	+1, 250	-----	-----	-----	Two oil wells.
Elyria <sup>18</sup>	Lorain	987	-----	-----	-----	Small gas supply and heavy flow of salt and sulphur water.
Felicity <sup>19</sup>	Clermont	400	-----	-----	-----	Gas well.
Findlay <sup>20</sup>	Hancock	1, 116-1, 334	-----	-----	-----	Many gas wells; some oil in several wells.
Do. <sup>21</sup>	do	1, 648	-----	-----	-----	Gas well; oil at 1, 092 feet; salt water at 1, 581 feet.
Findlay (1 mile north-west) <sup>22</sup>	do	1, 334	-----	-----	-----	Unsuccessful.
Flushing (1 mile northeast) <sup>23</sup>	Belmont	1, 680	-----	-----	-----	Salt water only.
Forest <sup>24</sup>	Hardin	1, 470	-----	-----	-----	Unsuccessful.
Forest (3 miles south-west).	do	480	-----	Many.	Flows.	White sulphur water.
Fort Jennings.	Putnam	1, 425	8	-----	-25	Salt water.
Fort Recovery <sup>25</sup>	Mercer	1, 052	-----	-----	-----	Gas for several months.
Fostoria <sup>26</sup>	Seneca	1, 136-1, 775	-----	-----	-----	Several gas wells.
Fremont and vicinity <sup>27</sup>	Sandusky	1, 300-1, 500	-----	-----	-----	Do.
Do. <sup>28</sup>	do	568	-----	-----	-----	Gas well.
Gallipolis <sup>29</sup>	Gallia	2, 910	-----	-----	-----	For oil; unsuccessful.
Geneva <sup>30</sup>	Ashtabula	850-1, 375	-----	-----	-----	Two wells; fair flow of gas; numerous other wells in the county.
Genoa <sup>31</sup>	Ottawa	1, 308	-----	-----	-----	Small flow of oil and gas.
Greenville <sup>32</sup>	Darke	1, 200-1, 700	-----	-----	-----	Several borings for gas; unsuccessful.

<sup>1</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6, p. 238.<sup>2</sup> Ibid., p. 286.<sup>3</sup> Ibid., p. 268.<sup>4</sup> Ibid., p. 270.<sup>5</sup> Ibid., p. 240.<sup>6</sup> Ibid., Report 1890, p. 217.<sup>7</sup> Ibid., Report 1888, vol. 6, pp. 244-245.<sup>8</sup> Ibid., p. 253.<sup>9</sup> Ibid., Report 1890, p. 246.<sup>10</sup> Ibid., Report 1888, vol. 6, p. 376.<sup>11</sup> Ibid., p. 223.<sup>12</sup> Ibid., Report 1890, p. 186.<sup>13</sup> Ibid., Report 1888, vol. 6, pp. 389-390.<sup>14</sup> Ibid., pp. 331-334.<sup>15</sup> Ibid., pp. 322-323.<sup>16</sup> Ibid., pp. 108, 284.<sup>17</sup> Ibid., pp. 211-212.<sup>18</sup> Ibid., pp. 347-348.<sup>19</sup> Ibid., p. 301.<sup>20</sup> Ibid., pp. 122-133, 146; Report for 1890, p. 125.<sup>21</sup> Ibid., Report 1888, vol. 6, pp. 111-117.<sup>22</sup> Ibid., pp. 131-132.<sup>23</sup> Ibid., Report 1890, pp. 253-254.<sup>24</sup> Ibid., Report 1888, vol. 6, p. 223.<sup>25</sup> Ibid., pp. 263-264.<sup>26</sup> Ibid., pp. 192-193, 146, 234.<sup>27</sup> Ibid., pp. 183-189.<sup>28</sup> Ibid., p. 188.<sup>29</sup> Record, Pa. 2d Geol. Surv., Reports, vol. I, p. 335.<sup>30</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6, pp. 425-426.<sup>31</sup> Ibid., p. 213.<sup>32</sup> Ibid., pp. 271-272.

## OHIO—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Hamden.....	Vinton.....	780	.....	.....	.....	Nothing but salt water.
Hamilton <sup>1</sup> .....	Butler.....	550-700	.....	.....	.....	Gas wells; small flow.
Hammondsburg <sup>2</sup> .....	Wood.....	1,194	.....	.....	.....	Small flow of oil.
Harrisburg <sup>3</sup> .....	Franklin.....	405	6	Many.	Flows.	
Haskins.....	Wood.....	.....	.....	.....	.....	Oil well.
Henry Township <sup>4</sup> .....	do.....	1,125-1,150	.....	.....	.....	Gas wells; some oil.
Do. <sup>5</sup> .....	do.....	1,212-1,295	.....	.....	.....	Oil.
Hicksville <sup>6</sup> .....	Defiance.....	1,710	.....	.....	.....	Salt water; some oil.
Hillsboro <sup>7</sup> .....	Highland.....	1,750	.....	.....	.....	Good water at 1,750 feet.
Huntsville.....	Logan.....	1,460	.....	.....	.....	Gas well.
Independence <sup>8</sup> .....	Cuyahoga.....	1,800	.....	.....	.....	Several borings for oil; no product.
Ironton <sup>9</sup> .....	Lawrence.....	3,600	.....	.....	.....	Unsuccessful.
Island Run <sup>10</sup> .....	Columbiana.....	600	.....	.....	.....	
Jackson <sup>11</sup> .....	Jackson.....	1,600	.....	.....	.....	Small flow of gas.
Jamestown.....	Greene.....	1,500	.....	.....	.....	Salt water only.
Jerry City <sup>12</sup> .....	Wood.....	1,155	.....	.....	.....	Two wells; one with fair supply of oil.
Joy <sup>13</sup> .....	Morgan.....	1,240	.....	.....	.....	Only small flow of gas. Two wells; much salt water.
Kalida (1 mile north). <sup>14</sup> .....	Putnam.....	1,316	.....	.....	.....	Bored for oil; salt water found.
Kenton <sup>15</sup> .....	Hardin.....	1,600	.....	.....	.....	Unsuccessful.
Do.....	do.....	.....	.....	.....	.....	Do.
Kimbolton <sup>16</sup> .....	Guernsey.....	1,087	.....	.....	.....	Do.
Do.....	do.....	.....	.....	.....	.....	Some gas.
Lacarne <sup>17</sup> .....	Ottawa.....	1,700	.....	.....	.....	Much water.
Lafayette <sup>18</sup> .....	Madison.....	.....	.....	.....	.....	Unsuccessful.
Lancaster <sup>19</sup> .....	Fairfield.....	1,030	.....	.....	.....	
Do. <sup>20</sup> .....	do.....	1,940-2,020	4-5 ft.	.....	.....	Several gas wells.
Lebanon <sup>21</sup> .....	Warren.....	700 and 1,300	.....	.....	.....	Small flow of gas; much salt water.
Leipsic <sup>22</sup> .....	Putnam.....	1,456	.....	.....	.....	Some oil and gas and great volume of salt water.
Lima <sup>23</sup> .....	Allen.....	1,200-1,400	.....	.....	.....	Numerous oil wells here and in county; much salt water found.
Lindsey <sup>24</sup> .....	Sandusky.....	1,241-1,300	4	.....	.....	Three oil and gas wells; also flow; salt water in large quantities.
Lisbon <sup>25</sup> .....	Columbiana.....	1,582	.....	.....	.....	
Little Sandusky.....	Wyandot.....	1,450	8-5 ft.	.....	-40	Salt water at 25 feet.
Logan <sup>26</sup> .....	Hocking.....	625-689	.....	.....	.....	Several wells; some oil, water, and gas.
Do.....	do.....	1,002	.....	.....	.....	Some oil.
London <sup>27</sup> .....	Madison.....	1,585	.....	.....	.....	Several wells for oil or gas.
Lorain <sup>28</sup> .....	Lorain.....	+600	.....	.....	-50	Mineral water; some gas.
Lone Star.....	Vinton.....	1,100	.....	.....	.....	Salt water; some oil.
McArthur.....	Vinton.....	900-1,000	.....	.....	.....	Fresh and salt waters.
McComb <sup>29</sup> .....	Hancock.....	1,455	.....	.....	.....	Gas well with salt water.

<sup>1</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6, pp. 292-293.<sup>2</sup> Record, *ibid.*, p. 237.<sup>3</sup> Analysis, U. S. Geol. Surv., 19th Ann. Rept., 1897-1898, part 1, p. 6614.<sup>4</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6, pp. 237-238.<sup>5</sup> Record, Pa. 2d. Geol. Surv., Ann. Report for 1886, part 2, p. 786.<sup>6</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6, pp. 250-251.<sup>7</sup> Analysis, *ibid.*, p. 297.<sup>8</sup> *ibid.*, p. 431.<sup>9</sup> Record, *ibid.*, pp. 304-306, 319.<sup>10</sup> Record, Pa. 2d Geol. Surv., Ann. Report, 1886, part 2, pp. 784-785.<sup>11</sup> Ohio Geol. Surv., Report, 1888, vol. 6, pp. 319-394.<sup>12</sup> *ibid.*, p. 233.<sup>13</sup> *Ibid.*, p. 390.<sup>14</sup> Record, *ibid.*, p. 243.<sup>15</sup> *Ibid.*, p. 220.<sup>16</sup> *Ibid.*, pp. 380-381.<sup>17</sup> *Ibid.*, p. 213.<sup>18</sup> *Ibid.*, p. 219.<sup>19</sup> Record, Ohio Geol. Surv. Report, 1886, vol. 6, p. 318.<sup>20</sup> *Ibid.*, pp. 382-388, 783.<sup>21</sup> *Ibid.*, pp. 295-296.<sup>22</sup> *Ibid.*, p. 242.<sup>23</sup> *Ibid.*, pp. 165-168.<sup>24</sup> *Ibid.*, pp. 213, 788-789.<sup>25</sup> *Ibid.*, p. 322.<sup>26</sup> *Ibid.*, pp. 318, 392-393.<sup>27</sup> *Ibid.*, pp. 280-281.<sup>28</sup> *Ibid.*, pp. 438-439.<sup>29</sup> *Ibid.*, p. 219.



## OHIO—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
McConnellsville.....	Morgan.....	<i>Feet.</i> +3,000	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	For oil or gas; unsuccessful.
Do.....	do.....	1,330	7½			Gas and salt water.
McCuneville <sup>1</sup> .....	Perry.....	1,368				Several wells; bored for salt water; some found.
Macksburg <sup>2</sup> .....	Washington.....	400-1,700				Large oil field about here.
Do. <sup>3</sup> .....	do.....	2,100				Numerous successful wells; gas also found.
Do. <sup>4</sup> .....	do.....	2,500				Oil and gas well.
Madison Township.....	Vinton.....	1,017	10-5½			Very little oil and salt water.
Magnetic Springs <sup>5</sup> .....	Union.....	1,600				Salt well.
Malta <sup>6</sup> .....	Morgan.....					Large flow of gas from several wells for oil or salt.
Mansfield <sup>7</sup> .....	Richland.....	2,005-2,415				Two borings for gas; unsuccessful.
Do. <sup>8</sup> .....	do.....	3,594	5-4			Unsuccessful.
Marietta <sup>9</sup> .....	Washington.....	1,740-2,940				Oil well.
Marietta (4 miles below). <sup>10</sup> .....	do.....	1,440				Gas well.
Marietta (near) <sup>11</sup> .....	do.....	3,015				Much salt water at 1,790 feet.
Marion <sup>12</sup> .....	Marion.....	1,790				Abandoned.
Martins Ferry <sup>13</sup> .....	Belmont.....	2,300				
Marion Township <sup>14</sup> .....	Hancock.....					Gas well.
Marysville <sup>15</sup> .....	Union.....	1,743				For gas or oil; found only water at 300 feet.
Massillon <sup>16</sup> .....	Stark.....	655-1,820				Nothing but salt water.
Do. <sup>17</sup> .....	do.....	671				Some oil; also salt water.
Do. <sup>17</sup> .....	do.....	2,547				Gas at 655 feet, shut out by salt water.
Medina <sup>17</sup> .....	Medina.....	917				Small flow of gas.
Miamisburg <sup>18</sup> .....	Montgomery.....	800-1,200				Two gas wells.
Middleport.....	Meigs.....	950-1,250	3 and 4	Av. 25		Great number of salt-water wells in county.
Do.....	do.....	1,500				Small amount of oil from 120-1,500 feet.
Middletown <sup>19</sup> .....	Butler.....	1,060				Some gas and salt water.
Milan <sup>20</sup> .....	Erie.....	2,000				For oil or gas; only salt water found.
Millersburg <sup>21</sup> .....	Holmes.....	2,100				
Millersburg (four miles from). <sup>22</sup> .....	do.....	900-1,000				Gas and oil well.
Millers Station <sup>23</sup> .....	Guernsey.....	430				Salt well.
Monroeville <sup>23</sup> .....	Huron.....					Small flow of gas only.
Mount Blanchard <sup>24</sup> .....	Hancock.....					Moderate flow of oil and gas.
Mount Orab.....	Brown.....	800-1,200	5½			Gas wells.
Mount Vernon <sup>25</sup> .....	Knox.....	{ 1,370, 1,707, 2,600 }				Three wells; unsuccessful.
Do. <sup>26</sup> .....	do.....	3,200	4½		-100	Gas well; water at 1,725 and 1,765 feet.
Do.....	do.....	2,135				Unsuccessful.

<sup>1</sup> Ibid., pp. 388-389.<sup>2</sup> Ohio Geol. Surv., Report, 1888, vol. 6, pp. 450-464.<sup>3</sup> Ibid., p. 453.<sup>4</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I<sup>5</sup>, pp. 333-334.<sup>5</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6, p. 269.<sup>6</sup> Ibid., p. 389.<sup>7</sup> Ibid., pp. 318, 365-366.<sup>8</sup> Ibid., Report 1890, p. 245.<sup>9</sup> Ibid., Report 1888, vol. 6, pp. 368-410.<sup>10</sup> Record, W. Va. Geol. Surv., Reports, vol. 1, p. 288.<sup>11</sup> Ibid., pp. 286-287.  
<sup>12</sup> Record, Ohio Geol. Surv., Reports, 1888, vol. 6, pp. 201-202.<sup>13</sup> Ibid., pp. 404-406.<sup>14</sup> Ibid., p. 236.<sup>15</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6,

pp. 269-270.

<sup>16</sup> Ibid., pp. 320, 361.<sup>17</sup> Ibid., p. 360.<sup>18</sup> Ibid., pp. 288-289.<sup>19</sup> Ibid., pp. 294-295.<sup>20</sup> Ibid., p. 346.<sup>21</sup> Ibid., pp. 367-368.<sup>22</sup> Ibid., pp. 654-655.<sup>23</sup> Ibid., pp. 439-440.<sup>24</sup> Ohio Geol. Surv., Report, 1888, vol. 6, p. 218.<sup>25</sup> Record, ibid., pp. 217, 266-267.<sup>26</sup> Ibid., Report for 1890, pp. 244-245.

## OHIO—Continued.

Location.	County.	Depth.	Dia- meter.	Yield per minute.	Height of water.	Remarks.
Napoleon <sup>1</sup>	Henry	Feet. 1,889	Inches.	Gallons.	Feet. +3	For gas; salt water at 1,889 feet.
Nelsonville <sup>2</sup>	Athens	570-950				Many salt wells; one small gas well.
Nevada <sup>3</sup>	Wyandot	2,000				Nothing but salt water.
Newark <sup>4</sup>	Licking	1,449-2,385				Several gas wells; small flows.
Newburg <sup>5</sup>	Cuyahoga	3,000	5½			Some gas; much salt water.
New Carlisle <sup>6</sup>	Clark	1,060				For gas; unsuccessful.
New Lisbon <sup>7</sup>	Columbiana	1,350-1,370				Gas wells.
New London <sup>8</sup>	Huron	998-1,030				Three wells; nothing found except salt water.
New Vienna <sup>9</sup>	Clinton	1,785				Salt water at 1,785 feet.
Niles <sup>10</sup>	Trumbull	780-900				Two borings for gas; unsuccessful.
North Baltimore <sup>11</sup>	Wood	1,104-1,295				Two gas and oil wells.
Do. <sup>12</sup>	do	1,190				
North Bend	Hamilton	1,350	5	200	+30	Good water.
Norwalk <sup>13</sup>	Huron	2,304				
Do	do	2,725	5½			For oil or gas; unsuccessful.
Oak Harbor <sup>14</sup>		1,326-1,335				Three gas wells.
Oberlin	Ottawa	700				For oil or gas; unsuccessful.
Osborn	Greene	990				Unsuccessful.
Ottawa <sup>15</sup>	Putnam	1,314-1,365				Two oil and gas wells; small product; much salt water.
Oxford <sup>16</sup>	Butler	1,365				Shale gas and sulphur water only.
Painesville <sup>17</sup>	Lake	700-1,390				Several gas wells.
Patterson (2 miles south of). <sup>18</sup>	Hardin	1,330				Gas at 835 feet; large flow of water; unsuccessful.
Patterson (2 miles west of). <sup>19</sup>	do	1,300				Large flow of gas; also large flow of water.
Perrysburg <sup>20</sup>	Wood	+1,600				Several gas wells.
Pike-ton	Pike					
Pike Township <sup>21</sup>	Clarke	1,380				For gas; unsuccessful.
Piqua <sup>22</sup>	Miami	1,673				Do.
Plain City <sup>23</sup>	Madison	1,530-2,000	8		+13	Two wells; large flows of fine water from 350, 600, and 900 feet.
Plymouth <sup>24</sup>	Richmond	742				
Do. <sup>25</sup>	do	3,020				Salt and sulphur water at 850 feet.
Pomeroy	Meigs	1,550		20	-500	Salt well; some oil and gas.
Do	do	1,100				Several salt wells; flowed originally.
Do. <sup>26</sup>	do	767				
Pemberville	Wood					Unsuccessful.
Portage (vicinity) <sup>27</sup>	do	1,177				Do.

<sup>1</sup> Record, Ohio Geol. Surv., Report 1888, vol. 6, pp. 252-253.<sup>2</sup> Ibid., p. 398.<sup>3</sup> Ibid., p. 203.<sup>4</sup> Ibid., pp. 317, 370-372.<sup>5</sup> Record, Mich. Geol. Surv., 1881-1893, p. 73; Ohio Geol. Surv., Report, 1888, vol. 6, pp. 351-355; Ohio Geol. Surv., Report, vol. 1, pp. 352-355.<sup>6</sup> Ohio Geol. Surv., Report, 1888, vol. 6, p. 280.<sup>7</sup> Record, Ohio Geol. Surv., Report, vol. 6, 1888, p. 404.<sup>8</sup> Ibid., pp. 440, 348-350.<sup>9</sup> Ibid., pp. 296-297.<sup>10</sup> Ibid., p. 401.<sup>11</sup> Ibid., pp. 228-229; Pa. 2d Geol. Surv., Report for 1886, p. 786.<sup>12</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6, p. 228.<sup>13</sup> Ibid., pp. 440-441.<sup>14</sup> Ibid., pp. 210-211.<sup>15</sup> Ibid., p. 241.<sup>16</sup> Ibid., p. 294.<sup>17</sup> Ibid., pp. 427-428.<sup>18</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6, pp. 221-222.<sup>19</sup> Ibid., p. 222.<sup>20</sup> Ibid., pp. 225, 788.<sup>21</sup> Ibid., p. 280.<sup>22</sup> Ibid., p. 273.<sup>23</sup> Ibid., Report 1890, p. 246; U. S. Geol. Surv., 19th Annual Report, 1897-98, p. 663.<sup>24</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6, p. 315.<sup>25</sup> Ibid., pp. 302-303.<sup>26</sup> Ibid., p. 367.<sup>27</sup> Ohio Geol. Surv., Report 1888, vol. 6, pp. 164-165, 228.

## OHIO—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Portage (vicinity) <sup>1</sup>	Wood	1,134				Unsuccessful.
Do. <sup>1</sup>	do					Large flow of gas.
Port Clinton <sup>2</sup>	Ottawa	+1,660				No product.
Portsmouth <sup>3</sup>	Scioto	2,000				No product, but salt water at 1,000 feet.
Prospect <sup>4</sup>	Marion	1,650				No product.
Quaker City <sup>5</sup>	Guernsey	1,347				Gas well.
Do	do	1,352				
Radcliff	Vinton	700 or 800				Water and gas.
Rarden	Scioto	1,710	10		-510	Water.
Rawson <sup>6</sup>	Hancock	1,337				For gas or oil; found salt water only.
Richland Furnace	Vinton					Gas well.
Ripley	Brown					No product.
Rising sun	Wood					Only small flow of oil.
Rockport <sup>7</sup>	Cuyahoga	527-1,335				Two gas wells; small flows.
Rutland Township	Meigs	1,560		10-25	-500	Salt water only.
Sabina	Clinton					
St. Henry <sup>8</sup>	Mercer	1,160-1,183				Gas well.
St. Marys <sup>9</sup>	Auglaize	1,230				Salt water only.
Do. <sup>10</sup>	do	1,132-1,225				Several oil wells.
Do. <sup>10</sup>	do	1,092-1,138				Several gas wells; large flows.
St. Paris <sup>11</sup>	Champaign	+1,000				Two unsuccessful borings.
Salem <sup>12</sup>	Columbiana	800-810+				Do.
Do	do	2,930				Unproductive.
Salem Township <sup>13</sup>	Wyandot	1,323				Small flow of oil.
Sandusky <sup>14</sup>	Erie	2,260				Some oil, gas, and salt water.
Saline Township <sup>15</sup>	Jefferson	1,105				Unproductive.
Sardis (SW of) <sup>16</sup>	Monroe	1,815				Oil well.
Sciotoville	Scioto	800				Unsuccessful.
Sevenmile	Butler	1,220	8		-6	Salt water and some gas.
Sheffield <sup>17</sup>	Lorain	720				Bored for oil; some gas found; unsuccessful.
Shelby <sup>18</sup>	Richland	1,480-1,796				Small flow of gas; 2 wells.
Sidney <sup>19</sup>	Shelby	1,205-1,250				Several gas wells; much salt water at 1,445 feet.
Somerset <sup>20</sup>	Perry	2,850			-400	Salt water at 2,850 feet.
South Kingsville <sup>21</sup>	Ashtabula	1,200				Gas well; some oil.
South Olive	Noble					Unproductive.
South Toledo <sup>22</sup>	Lucas	+1,012				Do.
Springfield <sup>23</sup>	Clarke	1,140-1,200				Several wells; unsuccessful.
Spring Valley <sup>24</sup>	Greene	1,500				Unsuccessful.
Steubenville <sup>25</sup>	Jefferson	1,290				Transient gassupply.
Do. <sup>26</sup>	do	2,519				
Stuartsville Township. <sup>27</sup>	Hancock	450				Oil wells.
Stryker	Williams	860				Mineral water at 230 feet.
Sunbury <sup>28</sup>	Delaware	2,530				
Tiffin <sup>29</sup>	Seneca	1,467-1,494				Several wells; large flow of gas; some oil.

<sup>1</sup> Ohio Geol. Surv., Report 1888, vol. 6, pp. 164-165, 228.<sup>2</sup> Ibid., p. 212.<sup>3</sup> Ibid., p. 395.<sup>4</sup> Analysis, Ibid., pp. 270-271.<sup>5</sup> Record, Ibid., pp. 324, 381-382.<sup>6</sup> Ibid., p. 217.<sup>7</sup> Record, Ohio Geol. Surv., Report 1888, vol. 6, pp. 432-434.<sup>8</sup> Ibid., pp. 260-262.<sup>9</sup> Ibid., pp. 255-258.<sup>10</sup> Ibid., pp. 255-258.<sup>11</sup> Ibid., pp. 276-277.<sup>12</sup> Ibid., pp. 403-404, 452.<sup>13</sup> Record, Pa. 2d Geol. Surv., Ann. Report for 1886, part 2, pp. 785-786.<sup>14</sup> Record, Michigan Geol. Surv., 1881-1893, p. 83; Ohio Geol. Surv., Report, 1888, vol. 6, pp. 194-196.<sup>15</sup> Record, Pa. 2d Geol. Surv., Report II, p. 282.<sup>16</sup> Record, W. Va. Geol. Surv., Reports, vol. 1, pp. 356-357.<sup>17</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6, p. 437.<sup>18</sup> Ibid., pp. 316, 364-365.<sup>19</sup> Ibid., pp. 264-266.<sup>20</sup> Ibid., Report 1890, p. 247.<sup>21</sup> Ibid., 1888, vol. 6, pp. 423-424.<sup>22</sup> Ibid., p. 225.<sup>23</sup> Ibid., pp. 278-280.<sup>24</sup> Ibid., p. 291.<sup>25</sup> Ibid., pp. 336-337.<sup>26</sup> Record, Pa. 2d Geol. Surv., Ann. Report for 1886, part 2, p. 784.<sup>27</sup> Ohio Geol. Surv., Report, 1890, pp. 219-220.<sup>28</sup> Ibid., 1888, vol. 6, p. 283.<sup>29</sup> Record, Ibid., pp. 197-201.

## OHIO—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Tiffin (vicinity of) <sup>1</sup>	Seneca	1,505-1,753				Several borings; all unsuccessful.
Tinney (south of)	Sandusky	1,220	8-5½		-10	Gas, oil, and salt water.
Tippecanoe <sup>2</sup>	Miami	1,025				Small flow of gas.
Toledo <sup>3</sup>	Lucas	1,425				Several borings for gas and oil; unsuccessful.
Tontogany (2½ miles southeast).	Wood	1,425	8-5½		-30	Some salt water, oil, and gas.
Toronto (4 miles west). <sup>4</sup>	Jefferson	1,455				For oil; unsuccessful.
Troy <sup>5</sup>	Miami	1,170				Some gas at 510, 680, and 880 feet.
Uniopolis	Auglaize					Very small flow of gas; abandoned.
Upper Sandusky <sup>6</sup>	Wyandot	1,340-1,347½				Two borings for oil or gas; unsuccessful.
Urbana <sup>7</sup>	Champaign	1,307-1,350				Very small showing of gas.
Vanlue <sup>8</sup>	Hancock	1,294				Small flow of gas.
Vanwert <sup>9</sup>	Vanwert	1,240				Very small flow of gas.
Vinton Township <sup>10</sup>	Vinton	490-1,057	10-5½			Gas, oil, and salt water.
Wakeman	Huron	3,000				For oil; found salt water only at 1,950 feet.
Wapakoneta <sup>11</sup>	Auglaize	1,600				For oil or gas; salt water only.
Washington <sup>12</sup>	Fayette	1,850				For gas or oil; found salt water only.
Waterville <sup>13</sup>	Lucas	1,153				Small flow of gas.
Wauseon <sup>14</sup>	Fulton	+2,158				Oil at 2,158 feet.
Wellington <sup>15</sup>	Lorain	1,030-1,050				Several small gas wells.
Westerville <sup>16</sup>	Franklin	+2,300				
Westminster <sup>17</sup>	Allen	1,400				For oil or gas; unsuccessful.
West Newton <sup>18</sup>	do	1,440				
Weston <sup>19</sup>	Wood	1,575				Oil, gas, and sulphur water.
Whartonsburg <sup>20</sup>		1,427				For oil or gas; unsuccessful.
Williamsburg	Clermont	660	6			Small flow of gas.
Do	do	660	6			Unsuccessful.
Willoughby <sup>21</sup>	Lake					Several small gas wells.
Wilmington <sup>22</sup>						
Woodville <sup>23</sup>	Sandusky	1,460				For oil or gas; only salt water found.
Wooster <sup>24</sup>	Wayne	1,805-2,000				Three borings for oil or gas; unsuccessful.
Xenia <sup>25</sup>	Greene	1,200				For oil or gas; unsuccessful.
Youngstown <sup>26</sup>	Mahoning	2,480				For gas or oil; unsuccessful.
Zanesville <sup>27</sup>	Muskingum	1,098-2,019				Three wells; some oil.

<sup>1</sup> Record, Ohio Geol. Surv., Report 1890, pp. 784-785.<sup>2</sup> Ohio Geol. Surv., Report 1888, vol. 6, p. 274.<sup>3</sup> Record, *ibid.*, pp. 203-209; Michigan Geol. Surv., 1881-1893, p. 85.<sup>4</sup> Pennsylvania 2d Geol. Surv., Report I<sup>5</sup>, p. 236.<sup>5</sup> Ohio Geol. Surv. Report, 1888, vol. 6, p. 274.<sup>6</sup> *Ibid.*, p. 202.<sup>7</sup> Record, *ibid.*, p. 275.<sup>8</sup> *Ibid.*, p. 219.<sup>9</sup> *Ibid.*, pp. 239-240.<sup>10</sup> *Ibid.*, p. 304.<sup>11</sup> *Ibid.*, p. 254.<sup>12</sup> Record, Ohio Geol. Surv., Report 1888, vol. 6, p. 291.<sup>13</sup> *Ibid.*, p. 225.<sup>14</sup> *Ibid.*, pp. 246-247.<sup>15</sup> *Ibid.*, pp. 348-349.<sup>16</sup> *Ibid.*, p. 283.<sup>17</sup> *Ibid.*, p. 220.<sup>18</sup> *Ibid.*, p. 220.<sup>19</sup> *Ibid.*, pp. 223-224.<sup>20</sup> *Ibid.*, p. 203.<sup>21</sup> *Ibid.*, p. 428.<sup>22</sup> *Ibid.*, pp. 296-297.<sup>23</sup> *Ibid.*, pp. 213-214.<sup>24</sup> Record, Ohio Geol. Surv., Report, 1888, vol. 6, pp. 361-363.<sup>25</sup> *Ibid.*, pp. 289-290.<sup>26</sup> *Ibid.*, pp. 321, 402-403.<sup>27</sup> *Ibid.*, pp. 372-375.

## PRINCIPAL PUBLICATIONS RELATING TO DEEP BORINGS IN OHIO.

Report of the Geological Survey of Ohio, Volume VI, Economic Geology, 831 pages, plates, Columbus, 1888.

First Annual Report of the Geological Survey of Ohio (third organization), by Edward Orton, State geologist, 323 pages, plates, Columbus, 1890..

Water Resources of Indiana and Ohio, by Frank Leverett, U. S. Geological Survey, Eighteenth Annual Report, 1896-97, part 4, pp. 423-559, plates, Washington, 1897.

The Rock Waters of Ohio, by Edward Orton, U. S. Geological Survey, Nineteenth Annual Report, 1897-98, part 4, pp. 633-717, plates, Washington, 1899.

## OKLAHOMA.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Fect.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Fort Reno .....	Canadian .....	1,200	-----	-----	-----	
Oklahoma City .....	-----	780	-----	-----	-----	For oil or gas; unsuccessful.
Pawhuska .....	Osage .....	1,700	-----	-----	-----	Oil well.
Mangum .....	Greer .....	500	-----	-----	-----	For oil; unsuccessful.
Do .....	do .....	400	-----	-----	-----	Abandoned.

## OREGON.

Baker City .....	Baker .....	400	-----	Many.	-----	
Blalock .....	Gilliam .....	400	-----	-----	-----	Unsuccessful.
Bliss Water Station .....	-----	418	4-3 $\frac{1}{2}$	42	+10	Water tepid.
Burns .....	Harney .....	750	8	-----	-----	Abandoned. Only a very small flow at 300 feet.
Cleft Water Station .....	-----	425	3	+28	+10	Water tepid.
Fort Stevens .....	Clatsop .....	400	-----	-----	-----	Unsuccessful.
Do .....	do .....	800	-----	-----	-----	Do.
Heppner .....	Morrow .....	650	-----	-----	-----	
Portland .....	Multnomah .....	1,850	-----	-----	-----	
The Dalles .....	Wasco .....	1,020	4 $\frac{1}{2}$ -1 $\frac{1}{2}$	-----	-----	Bored for oil; no water below 350 feet.

## PENNSYLVANIA.

Abbot Township .....	Potter .....	2,100	-----	-----	-----	Oil boring; unsuccessful.
Do <sup>1</sup> .....	do .....	2,029	-----	-----	-----	Small gas well.
Allegheny .....	Allegheny .....	1,760	-----	-----	-----	Salt well.
Allegheny Township .....	Butler .....	1,055-1,408	-----	-----	-----	Oil and gas wells.
Do. <sup>2</sup> .....	Venango .....	850	-----	-----	-----	For oil; unproductive.
Do. <sup>3</sup> .....	Westmoreland .....	1,250-2,847	-----	-----	-----	For oil or gas; mostly unproductive.
Allen Township <sup>4</sup> .....	Washington .....	2,060	-----	-----	-----	Gas well.
Altoona .....	Blair .....	2,066	-----	-----	-----	Abandoned.
Amity Township .....	Erie .....	500-630	-----	-----	-----	Several oil and gas wells.
Amwell Township <sup>5</sup> .....	Washington .....	2,385	-----	-----	-----	For oil or gas; unproductive.
Ashland (vicinity) .....	Schuylkill .....	1,830	2	139	Flows.	Temp. 54°.
Ashland Township <sup>7</sup> .....	Clarion .....	1,128	-----	-----	-----	For oil or gas; unproductive.

<sup>1</sup> Records, Pa. 2d Geol. Surv., Ann. Rept. for 1885, pp. 85-86.

<sup>2</sup> Ibid., Vol. II., pp. 238-240.

<sup>3</sup> Ibid., Vol. I<sup>4</sup>, pp. 58-59.

<sup>4</sup> Ibid., Vol. I<sup>5</sup>, pp. 211-215; Vol. II, pp. 277-278.

<sup>5</sup> Ibid., pp. 301-302.

<sup>6</sup> Ibid., pp. 307-308.

<sup>7</sup> Ibid., p. 230.

## PENNSYLVANIA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Baden (1 mile north) <sup>1</sup>	Beaver	1,366				For oil or gas.
Barnet Township <sup>2</sup>	Forest	2,428				For oil or gas; unsuccessful.
Beaver Falls <sup>3</sup>	Beaver	2,330				Do.
Beaver Falls (2 miles above) <sup>4</sup>	do	982				Gas well.
Beaver Township <sup>5</sup>	Clarion	1,001-1,200				For oil or gas.
Belle Vernon <sup>6</sup>	Fayette	2,065				Small gas well.
Benezette <sup>7</sup>	Elk	721	3			For oil or gas; abandoned.
Black Ash <sup>8</sup>	Crawford	777				Do.
Blacklick (vicinity) <sup>9</sup>	Indiana	1,728				Do.
Black's Siding <sup>10</sup>	Venango	1,650				For oil or gas; unproductive.
Blacksville <sup>11</sup>	Greene	500?				For oil.
Blairsville <sup>12</sup>	Westmoreland.	2,060				For oil or gas; abandoned.
Bloomfield Township <sup>13</sup>	Crawford	500-1,000				Several oil wells.
Bradford <sup>14</sup>	McKean	1,085				For oil.
Bradford (vicinity) <sup>15</sup>	do	1,010-1,719				Numerous oil and gas wells.
Brady Township <sup>16</sup>	Butler	1,458-1,506				For oil.
Bradys Bend	Armstrong	+1,089				Oil and gas well.
Bradys Bend Township <sup>17</sup>	do	1,100-1,260				For oil.
Bridgeville (vicinity) <sup>18</sup>	Allegheny	2,250				
Bridgewater (near)	Beaver					For gas; small supply.
Brookston	Forest	2,200				For oil or gas; unsuccessful.
Brookville <sup>19</sup>	Jefferson	3,100				For oil or gas; unproductive.
Do. <sup>20</sup>	do	1,700				Gas well.
Brookville Borough <sup>21</sup>	do	2,430				Do.
Brownsville <sup>22</sup>	Fayette	+2,106				Do.
Brush Run <sup>23</sup>	Clarion	1,047-1,636				Oil and gas wells.
Brushston Station	Allegheny	1,615				Unsuccessful.
Bryn Mawr	Montgomery	550	8	83	-310	
Do	do	600	6	120		
Burrell Township <sup>24</sup>	Westmoreland.	2,500				
Do. <sup>25</sup>	do	1,850				For oil or gas; abandoned.
Butler <sup>26</sup>	Butler	3,055				Do.
Do	do	1,500-1,950				Several oil and gas wells.
Butler (3 miles south)	do	3,008	5			
Do <sup>27</sup>	do	1,500-1,795				Gas and oil wells.
Butler Township <sup>28</sup>	do	1,524-1,637				For oil.
Cambria Mill <sup>29</sup>	Cambria	653(?)				Gas well.
Cameron Station (1 mile northeast) <sup>30</sup>	Cameron	971				For oil.
Cannonsburg (vicinity) <sup>31</sup>	Washington	1,763-2,502				Numerous oil and gas wells; some unproductive.
Canton Township <sup>32</sup>	do	2,727				For oil or gas.
Carlisle (1½ miles SE)	Cumberland	864	5-4½			
Carlisle (5 miles west).	do	420	5-4½			

<sup>1</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I<sup>6</sup>, p. 232.<sup>2</sup> Ibid., p. 154.<sup>3</sup> Ibid., Vol. III, pp. 401-404.<sup>4</sup> Ibid., Vol. I<sup>4</sup>, pp. 142-143.<sup>5</sup> Ibid., Vol. II, pp. 223-229.<sup>6</sup> Ibid., Ann. Rept., 1886, part 2, pp. 778-779.<sup>7</sup> Ibid., Vol. I<sup>4</sup>, pp. 133-134; Vol. R R, p. 248.<sup>8</sup> Ibid., Vol. I<sup>6</sup>, p. 186.<sup>9</sup> Ibid., p. 168.<sup>10</sup> Ibid., pp. 184-185.<sup>11</sup> Ibid., Vol. K, pp. 108-109.<sup>12</sup> Ibid., Vol. I<sup>6</sup>, pp. 223-225.<sup>13</sup> Records, Pa. 2d Geol. Surv., Reports, Vol. Q, pp. 224-226; Vol. II, pp. 273-274; Vol. I<sup>4</sup>, p. 119.<sup>14</sup> Ibid., Vol. I<sup>4</sup>, pp. 97-103.<sup>15</sup> Ibid., Vol. I<sup>4</sup>, p. 89; Vol. R, pp. 287-290.<sup>16</sup> Ibid., Vol. G<sup>4</sup>, pp. 150-151; Vol. III, pp. 418-419.<sup>17</sup> Ibid., Vol. II, pp. 258-259.<sup>18</sup> Ibid., Vol. I<sup>6</sup>, p. 272.<sup>19</sup> Ibid., pp. 163-164.<sup>20</sup> Ibid., Vol. I<sup>4</sup>, p. 139.<sup>21</sup> Ibid., Ann. Rept., 1886, part 2, p. 778.<sup>22</sup> Ibid., Vol. I<sup>6</sup>, pp. 317-318.<sup>23</sup> Ibid., pp. 235-236.<sup>24</sup> Ibid., pp. 212-213.<sup>25</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 686-687.<sup>26</sup> Ibid., Vol. I<sup>6</sup>, pp. 193-194.<sup>27</sup> Ibid., pp. 209-210.<sup>28</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 711-718.<sup>29</sup> Ibid., Vol. HH, pp. 176-180.<sup>30</sup> Ibid., Vol. RR, part 2, p. 23; Vol. G<sup>4</sup>, p. 138.<sup>31</sup> Ibid., Vol. I<sup>6</sup>, pp. 281-297.<sup>32</sup> Ibid., pp. 279-280.

## PENNSYLVANIA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Carmichaels (vicinity). <sup>1</sup>	Greene .....	2,432	.....	.....	.....	For oil or gas.
Carpenters Station (near). <sup>2</sup>	Westmoreland .....	1,541	.....	.....	.....	Do.
Chambersburg .....	Franklin .....	+400	.....	.....	.....	
Chambersburg (2 miles west). <sup>3</sup>	do .....	600	6	.....	-17	Water at 427 feet.
Cherry Grove Township. <sup>4</sup>	Warren .....	1,548-2,004	.....	.....	.....	Several oil and gas wells; some unproductive.
Cherry Tree Borough. <sup>4</sup>	Cambria .....	653	.....	.....	.....	Gas well.
Church Run. <sup>5</sup>	Crawford .....	415-700	.....	.....	.....	Several oil wells.
Clarion. <sup>6</sup>	Clarion .....	1,238-1,367	.....	.....	.....	Several oil wells; one unproductive.
Clearfield (2 miles southwest). <sup>7</sup>	Clearfield .....	2,900	.....	.....	.....	For oil or gas; unproductive.
Clearfield Township. <sup>8</sup>	Butler .....	1,558-1,925	.....	.....	.....	Several oil and gas wells; one unsuccessful.
Clinton Township. <sup>9</sup>	Venango .....	836-1,266	.....	.....	.....	Several oil wells; mainly productive.
Cooksburg. <sup>10</sup>	Forest .....	2,100-2,726	.....	.....	.....	For oil or gas, unsuccessful.
Cooksburg (vicinity). <sup>11</sup>	Clarion .....	843-2,050	.....	.....	.....	For oil or gas, one unproductive.
Collier Township. <sup>12</sup>	Allegheny .....	2,400	.....	.....	.....	Gas well.
Concord Township. <sup>13</sup>	Crawford .....	845	.....	.....	.....	Oil and gas well.
Conneautville (1 mile below). <sup>14</sup>	do .....	750	.....	.....	.....	For oil or gas.
Cornplanter Township. <sup>15</sup>	Venango .....	451-924	.....	.....	.....	Do.
Corry. <sup>16</sup>	Erie .....	2,340	.....	.....	.....	Gas and oil well.
Corydon (1 mile from). <sup>17</sup>	McKean .....	1,532-1,601	.....	.....	.....	Gas wells.
Corydon Township.	Warren .....	720	.....	.....	.....	For oil.
Coudersport. <sup>18</sup>	Potter .....	2,100	.....	.....	.....	Small gas well.
Cranberry Township. <sup>19</sup>	Venango .....	600-1,506	.....	.....	.....	Numerous oil and gas wells, mainly productive.
Crawford Township.	Clinton .....	458	.....	.....	.....	Coal prospect, unsuccessful.
Crescent Township. <sup>20</sup>	Allegheny .....	2,106	.....	.....	.....	For oil or gas, unproductive.
Cresson. <sup>21</sup>	Cambria .....	677	.....	.....	.....	For oil.
Criswell (vicinity). <sup>22</sup>	Armstrong .....	1,394-1,618	.....	.....	.....	Oil and gas wells.
Darlington. <sup>23</sup>	Beaver .....	2,444	.....	.....	.....	For oil or gas, unproductive.
Degolia (near). <sup>24</sup>	McKean .....	1,404	.....	.....	.....	For oil or gas.
Delano .....	Schuylkill .....	515	2	.....	.....	Coal prospect.
Demmler .....	Allegheny .....	1,600	.....	.....	.....	For oil or gas, abandoned.
Dennis Run. <sup>25</sup>	Warren .....	426-632	.....	.....	.....	Several oil and gas wells.
Dicksonburg .....	Crawford .....	680?	.....	.....	.....	Oil well.
Dixmont. <sup>26</sup>	Allegheny .....	1,802	.....	.....	.....	Oil and gas well.
Donegal Township. <sup>27</sup>	Butler .....	1,565-1,740	.....	.....	.....	Many oil and gas wells.
Doylestown .....	Bucks .....	750	.....	.....	.....	
Dubois Station. <sup>28</sup>	Clearfield .....	3,020	.....	.....	.....	For oil or gas, unproductive.
Dunkard Township.	Greene .....		.....	.....	.....	Several oil wells.

<sup>1</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I<sup>5</sup>, pp. 315-316.<sup>2</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 725-726.<sup>3</sup> Ibid., Vol. I<sup>4</sup>, pp. 26-27, 375-376.<sup>4</sup> Ibid., p. 146.<sup>5</sup> Ibid., Vol. II, pp. 66-69.<sup>6</sup> Ibid., Vol. I<sup>5</sup>, pp. 157-159; Vol. III, pp. 413-414.<sup>7</sup> Ibid., Vol. I<sup>5</sup>, pp. 166-167.<sup>8</sup> Ibid., Ann. Rept. for 1886, part 2, p. 178; Vol. II, pp. 266-268.<sup>9</sup> Ibid., Vol. II, pp. 219-222.<sup>10</sup> Records, Pa. 2d Geol. Surv., Reports, Vol. I<sup>5</sup>, pp. 159-161.<sup>11</sup> Ibid., Vol. I<sup>4</sup>, pp. 140-141.<sup>12</sup> Ibid., Vol. I<sup>5</sup>, pp. 261-262.<sup>13</sup> Ibid., Vol. Q<sup>4</sup>, p. 212.<sup>14</sup> Ibid., Vol. Q<sup>4</sup>, pp. 216, 234-236.<sup>15</sup> Ibid., Vol. I<sup>4</sup>, pp. 59-61.<sup>16</sup> Ibid., Vol. I<sup>4</sup>, p. 228.<sup>17</sup> Ibid., Vol. I<sup>4</sup>, pp. 259-261.<sup>18</sup> Ibid., Ann. Rept., 1886, part 2, pp. 775-776.<sup>19</sup> Ibid., Vol. II, pp. 203-207, 210-214; Vol. I<sup>4</sup>, pp. 62-63.<sup>20</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I<sup>5</sup>, pp. 264-265.<sup>21</sup> Ibid., Vol. HH, p. 30.<sup>22</sup> Ibid., Vol. II, pp. 253-258.<sup>23</sup> Ibid., Ann. Rept., 1886, part 2, pp. 780-781.<sup>24</sup> Ibid., Vol. I<sup>4</sup>, p. 90.<sup>25</sup> Record. Am. Phil. Soc., Proc., vol. 16, pp. 367-370.<sup>26</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I<sup>5</sup>, pp. 257-258.<sup>27</sup> Ibid., pp. 199-203; Vol. II, pp. 263-265.<sup>28</sup> Ibid., Vol. I<sup>5</sup>, pp. 165-166.

## PENNSYLVANIA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons. Few.</i>	<i>Feet.</i>	
Eagle Station .....	Delaware .....	1,700				
East Bethlehem Township. <sup>1</sup>	Washington .....	604				Salt well, abandoned.
East Brookside .....	Schuylkill .....	585	8			Oil well.
East Deer Township <sup>2</sup>	Allegheny .....	1,194-1,243				Several gas wells, one abandoned.
Easton .....	Northampton .....	500		105	-43	
East Pike Run Township. <sup>3</sup>	Washington .....	1,950				Gas well.
Ebensburg .....	Cambria .....	1,000	5½	Many.	No flow.	
Edenburgh <sup>4</sup> .....	Clarion .....	1,268				Good oil well.
Edenburgh (1 mile southeast). <sup>5</sup>	Clarion .....	1,046				
Eldred Township <sup>6</sup> .....	Warren .....	415-481				Oil and gas wells.
Elkland .....	Tioga .....					For oil or gas.
Elklick .....	Somerset .....	+1,500				
Do .....	do .....	2,900				For oil.
Elk Township <sup>7</sup> .....	Clarion .....	977-1,450				Several oil or gas wells, some unproductive.
Do. <sup>8</sup> .....	Warren .....	1,500				For oil, abandoned.
Elrod .....	Allegheny .....	+1,500				For oil or gas, abandoned.
Do. <sup>9</sup> .....	do .....	1,486			Flows	For oil or gas, unsuccessful.
Elrod (1 mile north) .....	do .....	1,510				For gas, abandoned.
Elrod Township <sup>10</sup> .....	Warren .....	588-914				For oil or gas.
Emelton (vicinity) <sup>11</sup>	Venango .....	720-1,000				Numerous oil wells, mainly productive.
Emporium <sup>12</sup> .....	Cameron .....	1,410				For oil.
Do .....	do .....	+400				
Emporium (4 miles northwest). <sup>13</sup>	do .....	1,607				For oil or gas, unproductive.
Enterprise <sup>14</sup> .....	Warren .....	474-487				Several oil wells.
Enterprise (vicinity). <sup>15</sup>	do .....	462-800				Do.
Erie <sup>16</sup> .....	Erie .....	4,460				For oil or gas, abandoned.
Do. <sup>17</sup> .....	do .....	1,250-1,418				Gas wells.
Do .....	do .....	470-800				Numerous gas and oil wells.
Fairoaks <sup>18</sup> .....	Beaver .....	1,645				Small oil well.
Fairoaks (vicinity) <sup>19</sup>	do .....	1,606				Gas well.
Falls Creek Station (near). <sup>20</sup>	Jefferson .....	3,040				Do.
Fairview Township <sup>21</sup>	Butler .....	1,421-1,694				Numerous oil and gas wells.
Do. <sup>22</sup> .....	Erie .....	700-1,000				Several gas wells.
Farrentown <sup>23</sup> .....	Armstrong .....	1,140-1,166				Several oil and gas wells.
Fawn Township .....	do .....	1,147-1,550				Several good gas wells.
Forest City .....	Wayne .....					Coal prospect.
Foresthill .....	Union .....	480			Flows.	Sulphur water.
Fort Hunter .....	Dauphin .....	2,675	6			Abandoned.
Forward Township <sup>24</sup>	Butler .....	1,553-1,683				Oil and gas wells.
Foxburg <sup>25</sup> .....	Armstrong .....	805-944				Small oil wells.
Franklin (¼ mile northeast). <sup>26</sup>	Venango .....	490			Flows.	Good oil well.
Franklin (8 miles south). <sup>27</sup>	do .....	3,880				For oil or gas, unproductive.
Franklin Township <sup>28</sup>	Washington .....	2,608				For oil or gas, abandoned.

<sup>1</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. K, pp. 178-179.<sup>2</sup> Ibid., Vol. I<sup>5</sup>, pp. 237-238.<sup>3</sup> Ibid., pp. 302-303.<sup>4</sup> Ibid., Vol. I<sup>4</sup>, pp. 139-140.<sup>5</sup> Ibid., Vol. II, p. 229.<sup>6</sup> Ibid., Vol. I<sup>4</sup>, pp. 52-53.<sup>7</sup> Ibid., Vol. II, pp. 230-232; Vol. III, pp. 415-416.<sup>8</sup> Ibid., Vol. I<sup>4</sup>, p. 30.<sup>9</sup> Record, Pa. 2d Geol. Surv., Report for 1886, part 2, pp. 667-668.<sup>10</sup> Ibid., Vol. II, pp. 195-196.<sup>11</sup> Ibid., pp. 222-225.<sup>12</sup> Ibid., Vol. G<sup>4</sup>, p. 140.<sup>13</sup> Ibid., p. 141.<sup>14</sup> Ibid., Vol. II, pp. 65-66.<sup>15</sup> Record, Am. Phil. Soc., Proc., vol. 16, pp. 367-369.<sup>16</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I<sup>5</sup>, pp. 387-392.<sup>17</sup> Ibid., Vol. I<sup>4</sup>, pp. 122, 290.<sup>18</sup> Ibid., Vol. I<sup>5</sup>, pp. 232-233.<sup>19</sup> Ibid., p. 233.<sup>20</sup> Ibid., p. 164.<sup>21</sup> Records, Pa. 2d Geol. Surv., Reports, Vol. II, pp. 246-262.<sup>22</sup> Ibid., Vol. Q<sup>4</sup>, pp. 262-263.<sup>23</sup> Ibid., Vol. II, pp. 242-243.<sup>24</sup> Ibid., Vol. I<sup>5</sup>, p. 208.<sup>25</sup> Ibid., Vol. II, pp. 237-238.<sup>26</sup> Ibid., Vol. I<sup>4</sup>, p. 65.<sup>27</sup> Ibid., Vol. I<sup>5</sup>, pp. 185-186.<sup>28</sup> Ibid., p. 279.



## PENNSYLVANIA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Franklin Township <sup>1</sup> .	Allegheny	1,905-2,150	.....	.....	.....	Several oil or gas wells.
Do. <sup>2</sup>	do	{ 1,492 ±1,500 }	.....	.....	.....	For oil or gas.
Gaines <sup>3</sup>	Tioga	1,345	.....	.....	.....	For oil or gas, abandoned.
Gallagher Township.	Clinton	3,525	.....	.....	.....	For oil or gas, abandoned.
Georgetown <sup>4</sup>	Beaver	1,430	.....	.....	.....	Gas well.
German Township <sup>5</sup>	Fayette	1,196	.....	.....	.....	For oil or gas, abandoned.
Gerties Run <sup>6</sup>	Allegheny	±1,600	.....	.....	.....	For oil or gas.
Gibsonia (½ mile west). <sup>7</sup>	do	2,017	.....	.....	.....	For oil or gas.
Girard Township <sup>8</sup>	Erie	980	.....	.....	.....	For oil, unsuccessful.
Good Intent (2½ miles southwest). <sup>9</sup>	Washington	2,720	.....	.....	.....	For oil or gas, unproductive.
Great Belt City (vicinity). <sup>10</sup>	Butler	1,875	.....	.....	.....	Do.
Greece City (3 miles west). <sup>11</sup>	do	1,500	.....	.....	.....	Several oil and gas wells.
Greece City (vicinity). <sup>12</sup>	do	1,423-1,530	.....	.....	.....	Oil and gas well.
Greene Township	Greene	.....	.....	.....	.....	Large gas well.
Greenfield	Erie	780	.....	.....	.....	Oil well.
Greensboro <sup>13</sup>	Greene	668	.....	.....	.....	Do
Greensburg (4 miles southwest). <sup>14</sup>	do	769	.....	.....	.....	Oil well.
Hamilton Township <sup>15</sup>	McKean	2,011	.....	.....	.....	Oil well.
Hamlin Township <sup>16</sup>	do	2,315-2,400	.....	.....	.....	Several oil wells; some unproductive.
Do. <sup>17</sup>	do	1,613-1,768	.....	.....	.....	Several oil wells; one abandoned.
Hammersley Fork	Clinton	-1,800	.....	.....	.....	For oil.
Hanover Township <sup>18</sup>	Beaver	1,644	.....	.....	.....	For gas. Abandoned.
Harrisburg	Dauphin	2,800	6	.....	.....	Two wells.
Do	do	+400	.....	.....	.....	Several gas wells.
Harrison Township <sup>19</sup>	Allegheny	1,109-1,200	.....	.....	.....	For gas or oil.
Do. <sup>20</sup>	Potter	1,995	.....	.....	.....	Coal prospects.
Harrisville (vicinity). <sup>21</sup>	Butler	880-1,367	.....	.....	.....	For oil.
Hazleton	Luzerne	482-690	2	.....	.....	Gas well.
Hebron <sup>22</sup>	Potter	1,286	.....	.....	.....	Several oil and gas wells.
Hempfield Township. <sup>23</sup>	Westmoreland.	1,255	.....	.....	.....	Gas well.
Herman <sup>24</sup>	Butler	1,784-1,901	.....	.....	.....	Large gas well.
Hickory	Washington	.....	.....	.....	.....	Large flow of gas.
Hickory (2½ miles southwest). <sup>25</sup>	do	2,245	.....	.....	.....	Several large gas wells.
Hickory (2 miles southeast). <sup>26</sup>	do	2,205	.....	.....	.....	Many oil and gas wells; some abandoned.
Hickory (vicinity). <sup>27</sup>	do	700-1,151	.....	.....	.....	For oil or gas.
Highland Township <sup>28</sup>	Elk	2,095-2,448	.....	.....	.....	Do.
Hollenback	Bradford	600	.....	.....	.....	
Homestead (vicinity). <sup>29</sup>	Allegheny	1,744	.....	.....	.....	
Homewood Station	Beaver	1,500(?)	.....	.....	.....	

<sup>1</sup>Records, Pa. 2d Geol. Surv., Reports, Vol. I<sup>5</sup>, pp. 251-254.<sup>2</sup>Ibid., Vol. I<sup>4</sup>, p. 144.<sup>3</sup>Ibid., Vol. I<sup>5</sup>, pp. 147-148.<sup>4</sup>Ibid., p. 233.<sup>5</sup>Ibid., pp. 321-322.<sup>6</sup>Ibid., Ann. Rept. for 1886, part 2, pp. 742-744.<sup>7</sup>Ibid., Vol. I<sup>5</sup>, p. 242.<sup>8</sup>Ibid., Vol. I<sup>4</sup>, p. 259.<sup>9</sup>Ibid., Vol. I<sup>5</sup>, pp. 305-306.<sup>10</sup>Ibid., Vol. I<sup>4</sup>, p. 138.<sup>11</sup>Ibid., p. 141.<sup>12</sup>Ibid., Vol. II, pp. 247-248.<sup>13</sup>Ibid., Ann. Rept. for 1886, part 2, p. 774.<sup>14</sup>Ibid., Vol. I<sup>4</sup>, p. 145.<sup>15</sup>Record Pa. 2d Geol. Surv., Reports, Vol. R,

pp. 266-267.

<sup>16</sup>Ibid., Vol. I<sup>5</sup>, pp. 151-152.<sup>17</sup>Ibid., Vol. R, pp. 179-182; Vol. I<sup>4</sup>, pp. 111-113.<sup>18</sup>Ibid., Vol. I<sup>5</sup>, pp. 235-236.<sup>19</sup>Ibid., Ann. Rept. for 1886, part 2, pp. 684-686.<sup>20</sup>Ibid., Vol. G<sup>3</sup>, pp. 80-81.<sup>21</sup>Ibid., Ann. Rept. for 1886, part 2, pp. 718-719.<sup>22</sup>Ibid., Vol. G<sup>3</sup>, p. 79.<sup>23</sup>Ibid., Vol. I<sup>5</sup>, p. 223.<sup>24</sup>Ibid., pp. 195-197.<sup>25</sup>Ibid., Ann. Rept. for 1886, part 2, pp. 754-755.<sup>26</sup>Ibid., pp. 769-772.<sup>27</sup>Ibid., pp. 758-760; Am. Phil. Soc., Proc., vol. 16,

p. 489.

<sup>28</sup>Ibid., Pa. 2d Geol. Surv., Ann. Rept. for 1886, part 2, pp. 707-709; Vol. I<sup>4</sup>, p. 155.<sup>29</sup>Ibid., pp. 744-746.

## PENNSYLVANIA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Homewood Station (vicinity). <sup>1</sup>	Beaver .....	925	.....	.....	.....	For oil or gas.
Honesdale (5 miles from).	Wayne .....	2,500	.....	.....	.....	Two oil wells; abandoned.
Honesdale (6 miles north). <sup>2</sup>	.....do .....	1,505	.....	.....	.....	For oil.
Hopewell Township. <sup>3</sup>	Beaver .....	1,490-1,572	.....	.....	.....	Several oil wells. Gas well. For gas; unsuccessful.
Horatio .....	Jefferson .....	543	.....	.....	-10	
Howe Township. <sup>4</sup>	Forest .....	1,475-1,985	.....	.....	.....	
Do. (?) <sup>5</sup>	.....do .....	2,233	.....	.....	.....	For oil or gas; unproductive.
Hulton Station (near).	Allegheny .....	.....	.....	.....	.....	For oil or gas; unproductive.
Humes Station (near). <sup>6</sup>	Clinton .....	1,821	.....	.....	.....	Several wells.
Huntingdon .....	Huntingdon .....	400	.....	.....	.....	For oil.
Hyner Station (near). <sup>7</sup>	.....do .....	1,187	.....	.....	.....	For oil or gas; unproductive.
Independence Township. <sup>8</sup>	Beaver .....	+1,223	.....	.....	.....	Do.
Irwin .....	Westmoreland .....	4,380	.....	.....	.....	Fresh water at 1,600 feet.
Do. <sup>9</sup>	.....do .....	2,340	.....	.....	.....	Oil well.
Jacks Run. <sup>10</sup>	Allegheny .....	1,724	.....	Many.	Flows.	Oil and gas well.
Jackson Township. <sup>11</sup>	Venango .....	688	.....	.....	.....	Oil well.
Jamestown. <sup>12</sup>	Mercer .....	1,063	.....	.....	.....	Oil and gas well.
Jefferson. <sup>13</sup>	Greene .....	2,658	.....	.....	.....	Oil well.
Jefferson Center. <sup>14</sup>	Butler .....	1,732	.....	.....	.....	Gas well.
Jefferson Township. <sup>15</sup>	Allegheny .....	2,014	.....	.....	.....	Several gas or oil wells; unproductive.
Jenks Township. <sup>16</sup>	Forest .....	400-1,003	.....	.....	.....	Several wells; mainly unproductive.
Do. <sup>17</sup>	.....do .....	1,310-2,505	.....	.....	.....	Large gas well.
Jermyn .....	Lackawanna .....	780	6	25	.....	For oil or gas; unproductive.
Johnsonburg Station. <sup>18</sup>	Elk .....	2,510	.....	.....	.....	Do.
Johnstown. <sup>19</sup>	Cambria .....	2,856	.....	.....	.....	Two oil wells; one abandoned.
Johnstown (4 miles west). <sup>20</sup>	.....do .....	2,500	.....	.....	.....	For oil or gas; unproductive.
Jones Township. <sup>21</sup>	Elk .....	1,335-1,756	.....	.....	.....	Do.
Karns City (½ mile south). <sup>22</sup>	Butler .....	1,454	.....	.....	.....	For oil or gas; unproductive.
Kingsley Township. <sup>23</sup>	Forest .....	2,200	.....	.....	.....	Several oil wells; mainly unproductive.
Kinzua Township. <sup>24</sup>	Warren .....	1,048-2,285	.....	.....	.....	Moderate gas wells.
Knox Township. <sup>25</sup>	Jefferson .....	1,608-2,000	.....	.....	.....	Several oil and gas wells.
Lafayette Township. <sup>26</sup>	McKean .....	2,111-2,490	.....	.....	.....	Gas well.
Lardens Mills. <sup>27</sup>	Butler .....	1,140	.....	.....	.....	For oil or gas.
Latrobe. <sup>28</sup>	Westmoreland .....	1,980	.....	.....	.....	.....
Lawrenceburg (south of). <sup>29</sup>	Armstrong .....	1,017	.....	.....	.....	.....
Layton Station. <sup>30</sup>	Fayette .....	2,100	.....	.....	.....	For oil or gas; unproductive.
Leboeuf .....	Erie .....	780	.....	.....	.....	Oil and gas well.
Limestone (3 miles south).	McKean .....	1,130	.....	.....	.....	Oil well.

<sup>1</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. QQ, pp. 250-251.<sup>2</sup> Ibid., Vol. G<sup>6</sup>, pp. 91-93.<sup>3</sup> Ibid., Vol. I<sup>9</sup>, pp. 234-235.<sup>4</sup> Ibid., Vol. I<sup>4</sup>, pp. 79-81; Ann. Rept. for 1886, part 2, p. 700.<sup>5</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 700-701.<sup>6</sup> Ibid., Vol. I<sup>9</sup>, p. 197.<sup>7</sup> Ibid., Vol. G<sup>4</sup>, pp. 131-134.<sup>8</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 779-780.<sup>9</sup> Ibid., Vol. I<sup>9</sup>, pp. 221-222.<sup>10</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 748-749.<sup>11</sup> Ibid., Vol. II, p. 201.<sup>12</sup> Ibid., pp. 274-275.<sup>13</sup> Ibid., Vol. I<sup>9</sup>, pp. 314-315.<sup>14</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 716-717.<sup>15</sup> Ibid., pp. 752-753.<sup>16</sup> Ibid., Reports, Vol. I<sup>4</sup>, pp. 81-83.<sup>17</sup> Ibid., pp. 83-86; Ann. Rept. for 1886, part 2, pp. 702-705.<sup>18</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 710-711.<sup>19</sup> Ibid., Reports, Vol. I<sup>9</sup>, pp. 169-170.<sup>20</sup> Ibid., pp. 170-171.<sup>21</sup> Ibid., Vol. I<sup>4</sup>, pp. 127-128.<sup>22</sup> Ibid., Vol. II, pp. 262-263.<sup>23</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 703-704.<sup>24</sup> Ibid., Vol. I<sup>4</sup>, pp. 27-29.<sup>25</sup> Ibid., Vol. I<sup>9</sup>, pp. 162-163.<sup>26</sup> Records, Pa. 2d Geol. Surv., Repts., Vol. I<sup>9</sup>, pp. 152-53.<sup>27</sup> Ibid., Vol. II, pp. 270-271.<sup>28</sup> Ibid., Vol. I<sup>9</sup>, pp. 223-224.<sup>29</sup> Ibid., Vol. II, p. 243.<sup>30</sup> Ibid., Vol. I<sup>9</sup>, pp. 318-319.

## PENNSYLVANIA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Littlestown	Adams	500				Two gas wells.
Little Washington	Washington					For oil or gas; unsuccessful.
Lockhaven	Clinton	3,525	6 $\frac{1}{2}$			Two oil or gas wells; abandoned.
Lottsville <sup>1</sup>	Warren	960-1,515				Deep well.
Lovelton (near)	Wyoming					Temp. 51°.
Mahanoy City (near)	Schuylkill	1,130	2	Many.	Flows.	For oil or gas.
Manchester <sup>2</sup>	York	1,520				
Marienville (near) <sup>3</sup>	Forest	1,305				
Marion Township <sup>4</sup>	Butler	765				
Mars Station (near) <sup>5</sup>	do	1,900				For oil or gas; unproductive.
Marshall Township <sup>6</sup>	Allegheny	1,830				
Masontown <sup>7</sup>	Payette	2,525				Gas well.
McCandless Township <sup>8</sup>	Allegheny	2,110				For oil or gas.
McDonald <sup>9</sup>	Washington	2,342				Gas well.
McKeesport Borough	Allegheny	1,640				Do.
Meadville <sup>10</sup>	Crawford	900				Several oil wells in this vicinity.
Mercer (near) <sup>11</sup>	Mercer	1,702				Gas well.
Miam Hollow <sup>12</sup>	McKean	1,390				
Middlesex (near) <sup>13</sup>	Mercer	2,030				For oil or gas; unproductive.
Middlesex, West (1 mile south) <sup>14</sup>	do	3,484				Do.
Middlesex Township <sup>15</sup>	Butler	1,785-1,930				Do.
Mill Creek Township <sup>16</sup>	Clarion	2,323				Several oil and gas wells.
Millvale <sup>17</sup>	Allegheny	1,655				For oil or gas; unproductive.
Millville <sup>18</sup>	Clarion	2,280				For oil or gas; unsuccessful.
Monongahela <sup>19</sup>	Washington	2,152-2,218				Oil and gas well.
Moon Township <sup>20</sup>	Allegheny	1,800-2,337				Gas wells.
Do. <sup>21</sup>	Beaver	1,257-1,680				Several oil and gas wells.
Monroeville (1 mile southeast) <sup>22</sup>	Allegheny	1,798		Many.	Flows.	Several oil or gas wells.
Montana	Columbia	717-722	2			Fresh water.
Mount Carmel	Northumberland	900	2			
Mount Morris (near) <sup>23</sup>	Greene	1,772				Oil well.
Murrysville <sup>24</sup>	Westmoreland	1,337-1,440				Numerous oil and gas wells.
Murrysville (vicinity) <sup>25</sup>	do	1,312-1,465				Large oil field.
Neiltown (vicinity) <sup>26</sup>	Forest	780-995				Numerous oil and gas wells; some unproductive.
Neville Island <sup>27</sup>	Allegheny	1,686-1,837				Several oil and gas wells.
Newcastle <sup>28</sup>	Lawrence	2,700	5 $\frac{1}{2}$			For oil or gas; unproductive.
Newcastle (vicinity)	do	1,912				Gas and oil well.
Do	do	700-900				Several wells.
New Sewickley Township <sup>29</sup>	Beaver	1,820				For oil or gas; unproductive.
Newton Hamilton	Mifflin	800				Not in operation.
Nineveh (vicinity) <sup>30</sup>	Greene	2,970-3,221				Several wells.

<sup>1</sup> Records, Pa. 2d Geol. Surv., Repts., Vol. I<sup>5</sup>, pp. 232-233.<sup>2</sup> Ibid., Vol. II, pp. 278-279.<sup>3</sup> Ibid., Vol. I<sup>4</sup>, pp. 146-147.<sup>4</sup> Ibid., Ann. Rept. for 1886, part 2, p. 720.<sup>5</sup> Ibid., Vol. I<sup>5</sup>, p. 210.<sup>6</sup> Ibid., pp. 242-243.<sup>7</sup> Ibid., pp. 322-323.<sup>8</sup> Ibid., p. 254.<sup>9</sup> Record, W. Va. Geol. Surv., Repts., Vol. I, 1889, pp. 214-30.<sup>10</sup> Pa. 2d Geol. Surv., Repts., Vol. Q<sup>4</sup>, p. 175.<sup>11</sup> Record, Ibid., Vol. II, p. 275.<sup>12</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I<sup>4</sup>, p. 97.<sup>13</sup> Ibid., Vol. I<sup>5</sup>, pp. 229-230.<sup>14</sup> Ibid., pp. 230-231.<sup>15</sup> Ibid., Vol. II, p. 271; Vol. I<sup>5</sup>, pp. 197-198; Vol.

III, pp. 404-405.

<sup>16</sup> Ibid., Vol. II, pp. 232-234.<sup>17</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 741-742.<sup>18</sup> Ibid., Reports, Vol. III, pp. 411-412.<sup>19</sup> Ibid., Vol. I<sup>5</sup>, p. 301.<sup>20</sup> Ibid., pp. 263-268.<sup>21</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 688-689.<sup>22</sup> Ibid., pp. 746-747.<sup>23</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I<sup>5</sup>, pp. 316-317.<sup>24</sup> Ibid., pp. 215-218.<sup>25</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 673-674, 721-724.<sup>26</sup> Ibid., Reports, Vol. I<sup>4</sup>, pp. 69-77.<sup>27</sup> Ibid., Vol. I<sup>5</sup>, pp. 258-260.<sup>28</sup> Ibid., Vol. G<sup>4</sup>, pp. 151-152; Vol. II, pp. 275-276.<sup>29</sup> Ibid., Vol. I<sup>5</sup>, pp. 231-232.<sup>30</sup> Ibid., pp. 308-312.

## PENNSYLVANIA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
North Mahoning Township.	Indiana .....	2,615(?)	-----	-----	-----	Gas well.
North Strabane Township.	Washington .....	1,800	-----	-----	-----	Small gas well.
North Warren (near) <sup>1</sup>	Warren .....	475-965	-----	-----	-----	Numerous gas and oil wells; some unproductive.
Do. <sup>2</sup>	do .....	1,200-1,400	-----	-----	-----	Several oil and gas wells; unproductive.
Do. <sup>3</sup>	do .....	1,835	-----	-----	-----	For oil; abandoned.
Oakdale Station (3 miles north). <sup>4</sup>	Allegheny .....	2,164	-----	-----	-----	For oil or gas.
Oakland Township. <sup>5</sup>	Venango .....	640	-----	-----	-----	
O'Harra Township. <sup>6</sup>	Allegheny .....	1,950-2,060	-----	-----	-----	For oil or gas; unproductive.
Ohio Township. <sup>7</sup>	do .....	1,715-2,240	-----	-----	-----	Numerous gas and oil wells.
Oil City. <sup>8</sup>	Venango .....	1,070	-----	-----	-----	
Do. <sup>9</sup>	do .....	540-818	-----	-----	-----	Several oil wells.
Oil Creek Township. <sup>10</sup>	Crawford .....	3,500	-----	-----	-----	For oil.
Do. <sup>10</sup>	Venango .....	902-1,000	-----	-----	-----	Several oil wells.
Olmstead (near)	McKean .....	1,040	-----	-----	-----	Oil well.
Oneida Station (1½ miles east). <sup>11</sup>	Butler .....	2,135	-----	-----	-----	Gas well.
Osterburg (2 miles northwest).	Bedford .....	800	-----	-----	+3	
Parker City. <sup>12</sup>	Armstrong .....	850	-----	-----	-----	Oil well.
Parker Township. <sup>13</sup>	Butler .....	1,183-1,418	-----	-----	-----	For oil.
Pennsburg	Montgomery .....	1,000	-----	-----	-----	
Penn Township. <sup>14</sup>	Allegheny .....	1,750	-----	-----	-----	For oil or gas; unproductive.
Do. <sup>15</sup>	Butler .....	1,523-1,825	-----	-----	-----	Numerous oil and gas wells; some good producers.
Do. <sup>16</sup>	Westmoreland .....	2,495	-----	-----	-----	Large gas well.
Do. <sup>17</sup>	do .....	1,580-1,690	-----	-----	-----	Several large gas wells.
Perry Township. <sup>18</sup>	Armstrong .....	801-950	-----	-----	-----	For gas or oil.
Do. <sup>19</sup>	do .....	791	-----	-----	-----	Oil and gas well.
Petroleum Center. <sup>20</sup>	Venango .....	500-900	-----	-----	-----	Numerous oil wells; mainly productive.
Petrolia (vicinity). <sup>21</sup>	Butler .....	1,400-1,631	-----	-----	-----	Numerous gas and oil wells.
Philadelphia (Melrose).	Philadelphia .....	553	10-8	150	-6	
Philadelphia (Ambler Works).	do .....	500	6	250	-----	
Philadelphia (Morocco Works).	do .....	500	6	500	-----	
Philadelphia (N. & G. N. Taylor).	do .....	670	12	250	-----	
Philadelphia (League Island).	do .....	600	-----	-----	-----	
Philadelphia (Hog Island).	do .....	456	-----	-----	-----	
Philadelphia (Twenty-fourth and Brown streets).	do .....	495	6	60	-----	
Philadelphia (Thirteenth and Mount Vernon streets).	do .....	3,031	8	2,600	-----	
Philadelphia (Seventh and Calow Hill streets).	do .....	452	8	150	-----	

<sup>1</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I<sup>4</sup>, pp. 10-15.<sup>2</sup> Ibid., pp. 11-13.<sup>3</sup> Ibid., p. 12.<sup>4</sup> Ibid., Vol. I<sup>5</sup>, pp. 262-263.<sup>5</sup> Ibid., Vol. II, p. 202.<sup>6</sup> Ibid., Vol. I<sup>5</sup>, pp. 239-241.<sup>7</sup> Ibid., pp. 244-251.<sup>8</sup> Ibid., Vol. III, p. 416.<sup>9</sup> Record, Am. Philos. Soc., Proc., Vol. 16, pp. 482-487; Pa. 2d Geol. Surv., Reports, Vol. II, pp. 204-205.<sup>10</sup> Ibid., Pa. 2d Geol. Surv., Reports, Vol. I<sup>4</sup>, pp. 53-54.<sup>11</sup> Ibid., Pa. 2d Geol. Surv., Ann. Rept., 1886, part 2, pp. 717-718.<sup>12</sup> Ibid., Reports, Vol. II, p. 242.<sup>13</sup> Ibid., pp. 243-246.<sup>14</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 749-750.<sup>15</sup> Ibid., pp. 713-716; Vol. I<sup>5</sup>, pp. 203-208.<sup>16</sup> Ibid., pp. 219-220.<sup>17</sup> Ibid., pp. 218-219; Ann. Rept. for 1886, part 2, pp. 724-725.<sup>18</sup> Ibid., Vol. II, pp. 240-241.<sup>19</sup> Ibid., Vol. III, pp. 416-417.<sup>20</sup> Records, Am. Phil. Soc., Proc., vol. 16, pp. 470-477.<sup>21</sup> Records, Pa. 2d Geol. Surv., Reports, Vol. II, pp. 260-261, 283-296.

## PENNSYLVANIA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Philadelphia (Crown and Willow streets).	Philadelphia.	1,000	10	100	-----	
Philadelphia (Fifteenth and Market streets).	do	500	8	100	-----	
Philadelphia (108 South Broad street).	do	484	8	60	-----	
Philadelphia (Broad street below Locust).	do	525	8	110	-----	
Philadelphia (Amholt & Schaefer Brewing Co.).	do	1,500	-----	50	-----	
Pike Township <sup>1</sup>	Potter	1,835	-----	-----	-----	For oil or gas; unproductive.
Do. <sup>2</sup>	do	1,500	-----	-----	-----	For oil or gas; abandoned.
Pinegrove	Schuylkill	450	8	Many.	No flow.	
Pinegrove Township. <sup>3</sup>	Venango	1,869-2,060	-----	-----	-----	Several oil wells.
Do. <sup>4</sup>	do	912-1,070	-----	-----	-----	For oil.
Do. <sup>5</sup>	Warren	750-1,830	-----	-----	-----	Several oil and gas wells; small production.
Pine Township <sup>6</sup>	Allegheny	2,010	-----	-----	-----	Two gas and oil wells.
Do. <sup>7</sup>	Armstrong	1,410-1,693	-----	-----	-----	Oil and gas wells.
Pioneer (vicinity) <sup>8</sup>	Venango	437-980	-----	-----	-----	Numerous oil wells; large production.
Pithole City <sup>9</sup>	do	747	-----	-----	-----	For oil or gas; unproductive.
Pittsburg	Allegheny	5,500	-----	-----	-----	No water below 1,100.
Pittsburg (Langavene and Grazier street). <sup>10</sup>	do	4,700?	-----	-----	-----	For oil or gas; abandoned.
Pittsburg (Twenty-first Ward).	do	1,616	-----	-----	-----	Gas well.
Do	do	1,620	-----	-----	-----	For oil or gas; abandoned.
Pittsburg (Twenty-fifth Ward). <sup>11</sup>	do	3,000	5½-5¾	-----	-----	Large gas well.
Pittsburg (Twenty-fourth Ward). <sup>12</sup>	do	1,826	-----	-----	-----	Gas well.
Pittsburg (Fourteenth Ward). <sup>13</sup>	do	2,007	5½	-----	-----	Dry hole.
Pittsburg (near steel works). <sup>14</sup>	do	2,360	-----	-----	-----	For oil or gas.
Pittsburg (just outside of city).	do	1,901	-----	-----	-----	Gas well.
Do	do	1,600	-----	-----	-----	Small flow of gas.
Pittsburg (Thirty-fourth Ward). <sup>15</sup>	do	2,014	5½	-----	-----	For gas; unsuccessful, owing to salt water.
Pittsburg (Twenty-first Ward). <sup>16</sup>	do	1,635	-----	-----	-----	
Pittsburg (Twenty-third Ward).	do	1,600	-----	-----	-----	For gas; flooded with salt water.
Pittsburg (Thirty-third Ward). <sup>17</sup>	do	1,577	-----	-----	-----	For oil or gas; abandoned on account of salt water.
Pittsburg (Fifteenth Ward). <sup>18</sup>	do	1,576	-----	-----	-----	For oil or gas; abandoned.
Pittsburg (Twenty-first Ward).	do	1,575	-----	-----	-----	For gas; flooded with water.
Pittsburg (Twenty-sixth Ward)	do	1,535	-----	-----	-----	For oil or gas; abandoned on account of salt water.

<sup>1</sup> Records, Pa. 2d Geol. Surv., Reports, Vol. I<sup>5</sup>, pp. 148-149.<sup>2</sup> Ibid., pp. 149-150.<sup>3</sup> Ibid., p. 184.<sup>4</sup> Ibid., Vol. I, p. 64.<sup>5</sup> Ibid., pp. 16-18.<sup>6</sup> Ibid., Vol. I<sup>5</sup>, pp. 243-244.<sup>7</sup> Ibid., Vol. III, pp. 409-410; Vol. II, p. 277.<sup>8</sup> Ibid., Vol. II, pp. 43-64; Am. Phils. Soc., Proc., vol. 10, pp. 498-471.<sup>9</sup> Records, Pa. 2d Geol. Surv., Reports, Vol. I<sup>5</sup>, p. 173.<sup>10</sup> Ibid., pp. 276-277.<sup>11</sup> Ibid., Ann. Rept., 1886, part 2, pp. 730-732.<sup>12</sup> Ibid., pp. 733-736.<sup>13</sup> Ibid., pp. 736-737.<sup>14</sup> Record Pa. 2d Geol. Surv., Reports, Vol. III, pp. 398-400.<sup>15</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 739-741.<sup>16</sup> Ibid., Vol. I<sup>5</sup>, pp. 275-276.<sup>17</sup> Ibid., Ann. Rept. for 1886, part 2, p. 738.<sup>18</sup> Ibid., p. 741.

## PENNSYLVANIA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Pittsfield (Township). <sup>1</sup>	Warren	747				For oil or gas; unproductive.
Do. <sup>2</sup>	do	1,500				For oil or gas; unsuccessful.
Pittston	Luzerne	464-511	2			Two wells.
Pleasantville (2½ miles northwest). <sup>3</sup>	Venango	415				Oil well.
Pleasantville (4½ miles southeast). <sup>4</sup>	do	1,000				Gas and oil well.
Pleasantville (2 miles northeast). <sup>5</sup>	do	885				Do.
Pleasantville Borough. <sup>6</sup>	do	693-1,044				Numerous oil and gas wells.
Pleasant Township. <sup>7</sup>	Warren	1,586				For oil or gas; unproductive.
Do. <sup>8</sup>	do	818-900				Several small oil wells.
Pleasant Unity (2½ miles northwest). <sup>9</sup>	Westmoreland	650				For oil or gas; unproductive.
Plumer (1 mile south). <sup>10</sup>	Venango	464				
President (near). <sup>11</sup>	do	1,280				For oil or gas; abandoned.
Punxutawney (vicinity). <sup>12</sup>	Indiana	2,745				Gas well.
Kadnor Station	Delaware	500	12			Abandoned.
Do	do	975	12-8	40-50	Pumped.	Probably surface water.
Randolph (vicinity). <sup>13</sup>	Crawford	565-950				Several oil wells.
Raymilton. <sup>14</sup>	Venango	893-1,410				Numerous oil or gas wells.
Raymilton (near). <sup>15</sup>	do	845-1,410				Several oil or gas wells.
Reagantown (south of). <sup>16</sup>	Westmoreland	2,070				For oil or gas; unproductive.
Reeds Corners. <sup>17</sup>	Crawford	500				For oil or gas; abandoned.
Reibold. <sup>18</sup>	Butler	1,707-1,711				Two oil wells.
Reno. <sup>19</sup>	Venango	570-590				Several oil wells.
Do	do	1,090				For oil; unproductive.
Renovo	Clinton	4,000			-600	For oil; unsuccessful.
Do	do	3,460				Gas well.
Do	do	450-1,350				For oil or gas.
Richland Township. <sup>20</sup>	Clarion	1,040-1,700				Several oil wells.
Richmond Township	Crawford	900				Oil and gas well.
Ridgway. <sup>21</sup>	Elk	1,820				Small gas well.
Do. <sup>22</sup>	do	772				
Ridgway Township. <sup>23</sup>	do	1,678				For oil; unsuccessful.
Riverton	Cumberland (?)	485	5			
Robinson Township. <sup>24</sup>	Allegheny	1,770-2,427				Two oil and gas wells.
Rochester. <sup>25</sup>	Beaver	965				For gas and oil.
Rockland Station. <sup>26</sup>	Venango	701				For oil; abandoned.
Rockland Township. <sup>27</sup>	do	600-1,100				Numerous oil wells.
Ross Township. <sup>28</sup>	Allegheny	1,915-2,037				Two gas wells.
Rouseville (vicinity). <sup>29</sup>	Venango	450-800				Numerous oil wells.
Ryerson Station (north of). <sup>30</sup>	Greene	2,716				For oil or gas.

<sup>1</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. II, p. 196.

<sup>2</sup> Ibid., p. 197.

<sup>3</sup> Ibid., Vol. I, p. 175.

<sup>4</sup> Ibid., Am. Philos. Soc., Proc., Vol. 16, p. 497.

<sup>5</sup> Ibid., Pa. 2d Geol. Surv., Reports, Vol. I, pp. 54-55.

<sup>6</sup> Ibid., Vol. II, pp. 9-34; Vol. III, p. 420; Vol. I, p. 55; Am. Philos. Soc., Proc., Vol. 16, pp. 435-460.

<sup>7</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I, p. 174.

<sup>8</sup> Ibid., Vol. I, p. 19.

<sup>9</sup> Ibid., Vol. II, pp. 280-281.

<sup>10</sup> Ibid., Vol. I, p. 180.

<sup>11</sup> Ibid., pp. 180-181.

<sup>12</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 776-777.

<sup>13</sup> Pa. 2d Geol. Surv., Reports, Vol. Q, pp. 178-179.

<sup>14</sup> Record, ibid., Vol. I, pp. 181-183; Vol. I, p. 68; Vol. III, pp. 419-420.

<sup>15</sup> Ibid., Vol. I, pp. 68-69.

<sup>16</sup> Ibid., Vol. I, pp. 227-228.

<sup>17</sup> Ibid., Vol. Q, p. 212.

<sup>18</sup> Ibid., Vol. I, pp. 194-195.

<sup>19</sup> Ibid., Vol. II, pp. 208-210.

<sup>20</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. II, pp. 226-227.

<sup>21</sup> Ibid., Ann. Rept. for 1886, Part II, p. 711.

<sup>22</sup> Ibid., Vol. Q, pp. 142-143.

<sup>23</sup> Ibid., pp. 129-131.

<sup>24</sup> Ibid., Vol. I, pp. 268-269.

<sup>25</sup> Ibid., Vol. II, pp. 279-280.

<sup>26</sup> Ibid., Vol. II, p. 207.

<sup>27</sup> Ibid., pp. 215-218.

<sup>28</sup> Ibid., Vol. I, pp. 255-257.

<sup>29</sup> Ibid., Amer. Phil. Soc., Proc., vol. 16, pp. 477-486.

<sup>30</sup> Ibid., Pa. 2d Geol. Surv., Reports, Vol. I, pp. 312-313.

## PENNSYLVANIA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
St. Joe (vicinity) <sup>1</sup>	Butler	1,445-1,577				Gas wells.
St. Marys (west of) <sup>2</sup>	Elk	2,010				Gas well.
Salem (vicinity) <sup>3</sup>	Venango	962-1,200				Several oil or gas wells.
Salem Township <sup>4</sup>	Clarion	1,198-1,200				Oil and gas wells.
Salisbury Basin <sup>5</sup>	Somerset	678				
Saltsburg (near) <sup>6</sup>	Indiana	2,014				For oil or gas; unproductive.
Sandy Creek Township. <sup>7</sup>	Venango	792				Small oil well.
Sarvers Station <sup>8</sup>	Butler	3,055				For oil or gas; abandoned.
Do <sup>9</sup>	do	1,930				
Saxon Station <sup>10</sup>	do	1,857				Gas well.
Saxonburg (2 miles west). <sup>11</sup>	do	1,825				For oil or gas.
Scranton (1 mile southeast).	Lackawanna	2,050	6			Abandoned.
Scranton (2 miles northwest).	do	+700	6	30	Flows.	
Scranton (3 miles west).	do	±1,000	6	40		
Scranton (6 miles northeast).	do	2,200	8-6			
Sergeant Station <sup>12</sup>	McKean	2,000				For oil or gas; abandoned.
Sergeant Station (near). <sup>13</sup>	do	2,263				Dry hole.
Do. <sup>14</sup>	do	2,000				
Sergeant Township <sup>15</sup>	do	2,004				For oil or gas.
Do. <sup>16</sup>	do	1,850				For oil and gas.
Do. <sup>17</sup>	do	1,785				For oil or gas; abandoned.
Do. <sup>18</sup>	do	2,043				Excellent gas well.
Do. <sup>19</sup>	do	1,802				Good gas well.
Do. <sup>20</sup>	do	2,000-2,380				Several oil and gas wells.
Sewickley Township. <sup>21</sup>	Allegheny	2,008-2,133				Gas and oil wells.
Shaler Township <sup>22</sup>	Allegheny	1,393				For gas; abandoned.
Shamburg <sup>23</sup>	Venango	547-972				Numerous oil wells.
Sharon (1½ miles above). <sup>24</sup>	Mercer	1,600				For gas or oil.
Sharpsburg (near) <sup>25</sup>	Allegheny	2,010				For oil or gas; abandoned.
Sheffield (vicinity) <sup>26</sup>	Warren	1,645				Good gas well.
Do <sup>27</sup>	do	1,565 (?)				For oil or gas; unsuccessful.
Do	do	825				For oil or gas; abandoned.
Do <sup>28</sup>	do	961-1,200				For oil or gas.
Sheffield Township <sup>29</sup>	do	1,435-2,016				Numerous oil and gas wells.
Shenandoah (near)	Schuylkill	538	8			Oil well.
Shippensburg (1½ miles south). <sup>30</sup>	Clarion	2,025				For oil or gas; unproductive.
Sligo <sup>31</sup>	do	1,151				Oil well.
Slippery Rock Township. <sup>32</sup>	Butler	1,411				For oil or gas.
Do <sup>33</sup>	do	1,400-1,436				For oil; unproductive.

<sup>1</sup> Record, Pa. Geol. Surv., Ann. Rept. for 1886, Part II, pp. 713-714; Vol. I<sup>4</sup>, p. 138.<sup>2</sup> Ibid., Pa. 2d Geol. Surv., Reports, Vol. I<sup>4</sup>, pp. 131-132.<sup>3</sup> Ibid., Vol. II, pp. 205-206.<sup>4</sup> Ibid., pp. 227-229.<sup>5</sup> Ibid., Vol. I<sup>4</sup>, pp. 146-147.<sup>6</sup> Ibid., Vol. I<sup>4</sup>, pp. 167-168.<sup>7</sup> Ibid., Vol. II, p. 201.<sup>8</sup> Ibid., Vol. I<sup>4</sup>, pp. 193-194.<sup>9</sup> Ibid., p. 194.<sup>10</sup> Ibid., Vol. II, p. 269.<sup>11</sup> Ibid., p. 270.<sup>12</sup> Analysis, Pa. 2d Geol. Surv., Reports, Vol. R, p. 92.<sup>13</sup> Ibid., pp. 243-245.<sup>14</sup> Ibid., pp. 245-248.<sup>15</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I<sup>4</sup>, pp. 106-108.<sup>16</sup> Ibid., pp. 108-111.<sup>17</sup> Ibid., pp. 104-106.<sup>18</sup> Ibid., Pa. 2d Geol. Surv., Ann. Rept. for 1886, Part II, pp. 695-696.<sup>19</sup> Ibid., p. 698.<sup>20</sup> Ibid., pp. 696-698, Vol. I<sup>4</sup>, p. 117.<sup>21</sup> Ibid., Pa. 2d Geol. Surv., Reports, Vol. I<sup>4</sup>, p. 243.<sup>22</sup> Record, Pa. 2d Geol. Surv., Ann. Rept. for 1886, Part II, pp. 752-753.<sup>23</sup> Ibid., Vol. II, pp. 34-42, Amer. Philos. Soc., Proc., Vol. 16, pp. 460-468.<sup>24</sup> Ibid., Pa. 2d Geol. Surv., Reports, Vol. I<sup>4</sup>, p. 419.<sup>25</sup> Ibid., Vol. I<sup>4</sup>, pp. 138-139.<sup>26</sup> Ibid., pp. 23, 379-380.<sup>27</sup> Ibid., pp. 24, 380-381.<sup>28</sup> Ibid., Vol. II, pp. 194-195.<sup>29</sup> Ibid., pp. 193-194; Vol. I<sup>4</sup>, pp. 24-26, Vol. I<sup>5</sup>, pp. 174-175; Ann. Rept. for 1886, Part II, pp. 698-700.<sup>30</sup> Ibid., Vol. I<sup>4</sup>, pp. 414-415.<sup>31</sup> Ibid., Vol. G<sup>4</sup>, pp. 149-150; Vol. II, pp. 234-235.<sup>32</sup> Ibid., Vol. Q<sup>4</sup>, p. 154.<sup>33</sup> Ibid., Vol. I<sup>4</sup>, pp. 143-144, Vol. I<sup>5</sup>, 417-418.

## PENNSYLVANIA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Smethport (west of). <sup>1</sup>	McKean.....	2,004	-----	-----	-----	For oil; abandoned.
Smethport (vicinity). <sup>2</sup>	.....do.....	1,263-1,900	-----	-----	-----	Several oil and gas wells; small production.
Smiths Ferry. <sup>3</sup>	Beaver.....	500	-----	-----	-----	For oil or gas; unproductive.
Snowden Township. <sup>4</sup>	Allegheny.....	2,348	-----	-----	-----	Gas well.
Snydersburg. <sup>5</sup>	Clarion.....	1,207	-----	-----	-----	Oil well.
Sodom (near). <sup>6</sup>	Allegheny.....	2,275-2,502	-----	-----	-----	Several gas wells.
South Fayette Township. <sup>7</sup>	.....do.....	2,140	-----	-----	-----	Oil well.
South Shenango Township. <sup>8</sup>	Crawford.....	1,065	-----	-----	-----	Do.
South Strabane Township. <sup>9</sup>	Washington.....	2,410-2,503	-----	-----	-----	Gas wells.
South Versailles Township. <sup>10</sup>	Allegheny.....	1,550	-----	-----	-----	Gas well.
Do. <sup>10</sup>	.....do.....	1,510-1,624	-----	-----	-----	For oil or gas; abandoned on account of salt water.
Southwest Township. <sup>11</sup>	Warren.....	500-1,550	-----	-----	-----	Numerous oil and gas wells.
Sparta Township. <sup>12</sup>	Crawford.....	465-1,507	-----	-----	-----	Several oil and gas wells; some productive.
Spartansburg (2½ miles southeast). <sup>13</sup>	.....do.....	745	-----	-----	-----	Gas well.
Spence Run. <sup>14</sup>	Allegheny.....	1,990	-----	-----	-----	For oil or gas.
Spring Township.	Crawford.....	512	-----	-----	-----	Gas well.
Spring Creek Township. <sup>15</sup>	Elk.....	880	-----	-----	-----	For oil; unsuccessful.
Do. <sup>16</sup>	Warren.....	600-1,061	-----	-----	-----	Several oil and gas wells; small production.
Springdale Station (near).	Allegheny.....	-----	-----	-----	-----	For gas; unsuccessful.
Springfield Township.	Erie.....	400	-----	-----	-----	For oil; unsuccessful.
Stoneboro (near). <sup>17</sup>	Mercer.....	950	-----	-----	-----	Oil well.
Stoneham (vicinity). <sup>18</sup>	Warren.....	1,025-1,600	-----	-----	-----	Several oil and gas wells; mostly productive.
Sugar Run. <sup>19</sup>	McKean.....	970	-----	-----	-----	Oil well.
Sugar Creek Township. <sup>20</sup>	Venango.....	583-606	-----	-----	-----	Two oil wells; one abandoned.
Sulphur Run. <sup>21</sup>	.....do.....	925-1,350	-----	-----	-----	Two oil wells.
Summit. <sup>22</sup>	Butler.....	1,822	-----	-----	-----	Gas well.
Summit Township. <sup>23</sup>	.....do.....	1,735	-----	-----	-----	Oil well.
Do	Erie.....	400	-----	-----	-----	Gas well.
Tarentum.....	Allegheny.....	+1,160	-----	-----	-----	For gas or oil; abandoned.
Tarentum (vicinity). <sup>24</sup>	.....do.....	482-1,705	-----	-----	-----	Several gas and oil wells; small production.
Tarentum (3½ miles northeast). <sup>25</sup>	.....do.....	2,010	-----	-----	-----	For oil or gas; unproductive.
Tarentum (1½ miles southeast).	Westmoreland.....	-----	-----	-----	-----	For oil or gas; abandoned.
Taylorstown. <sup>26</sup>	Washington.....	2,350-2,760	-----	-----	-----	Several gas and oil wells.
Throop.....	Lackawanna.....	2,380	-----	-----	-----	Water in small quantity.

<sup>1</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. R, pp. 271-272.<sup>2</sup> Ibid., pp. 272-276.<sup>3</sup> Ibid., Vol. II, pp. 281-282.<sup>4</sup> Ibid., Vol. I, pp. 275-274.<sup>5</sup> Ibid., Vol. G, p. 149; Vol. I, p. 140.<sup>6</sup> Ibid., Vol. I, p. 269-273.<sup>7</sup> Ibid., p. 273.<sup>8</sup> Ibid., Vol. Q, p. 153.<sup>9</sup> Ibid., Vol. I, p. 280.<sup>10</sup> Ibid., Ann. Rept. for 1886, Part II, pp. 751-752.<sup>11</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I, pp. 49-52; Vol. I, p. 855; Am. Phil. Soc., Trans., vol. 16, pp. 346-367.<sup>12</sup> Ibid., Vol. I, pp. 186-187; Vol. Q, p. 227.<sup>13</sup> Ibid., Vol. II, p. 69; Am. Philos. Soc., Proc., vol. 16, p. 493.<sup>14</sup> Ibid., Pa. 2d Geol. Surv., Ann. Rept., 1886, part 2, p. 744.<sup>15</sup> Ibid., Vol. I, pp. 132-133.<sup>16</sup> Ibid., pp. 252-263.<sup>17</sup> Ibid., p. 121.<sup>18</sup> Ibid., pp. 20-23.<sup>19</sup> Ibid., Vol. I, p. 91.<sup>20</sup> Ibid., Vol. II, pp. 200-201.<sup>21</sup> Ibid., Vol. I, pp. 182-183.<sup>22</sup> Ibid., Vol. I, p. 404.<sup>23</sup> Ibid., Vol. II, pp. 268-269.<sup>24</sup> Ibid., Vol. I, pp. 405-408.<sup>25</sup> Ibid., Vol. I, pp. 238-239.<sup>26</sup> Ibid., pp. 238-239.



## PENNSYLVANIA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Tidioute (vicinity) <sup>1</sup> .....	Warren.....	463-715	-----	-----	-----	Numerous oil and gas wells; none large producers, and many abandoned.
Tionesta (near) <sup>2</sup> .....	Forest.....	437	-----	-----	-----	Oil and gas well.
Tionesta Township <sup>3</sup> .....	do.....	554-2,177	-----	-----	-----	For oil or gas; unproductive.
Titusville.....	Crawford.....	600	10	-----	-----	For oil or gas.
Titusville (near) <sup>4</sup> .....	do.....	3,553	-----	-----	-----	Numerous oil and gas wells.
Titusville (vicinity) <sup>5</sup> .....	do.....	400-806	-----	-----	-----	Do.
Do. <sup>6</sup> .....	Venango.....	538-966	-----	-----	-----	Oil well.
Toby Township <sup>7</sup> .....	Clarion.....	1,400	8	-----	-----	Do.
Towet City.....	Schuylkill.....	418	-----	-----	-----	For oil; unsuccessful.
Tremont.....	do.....	-----	8	-----	-----	Several oil wells.
Triumph <sup>8</sup> .....	Warren.....	+472	-----	-----	-----	For oil or gas; unsuccessful.
Triumph (vicinity) <sup>9</sup> .....	do.....	739-815	-----	-----	-----	For oil or gas; unsuccessful.
Triumph Township <sup>10</sup> .....	do.....	2,464-2,700	-----	-----	-----	Numerous oil and gas wells.
Do. <sup>11</sup> .....	do.....	805-908	-----	-----	-----	Several oil and gas wells; some unproductive.
Troy Township.....	Crawford.....	500-1,700	-----	-----	-----	Oil and gas wells.
Tryonville (vicinity).....	do.....	600-1,000	-----	-----	-----	Several oil and gas wells.
Tuna Valley <sup>12</sup> .....	McKean.....	1,035-1,919	-----	-----	-----	For oil or gas.
Turkey City (near) <sup>13</sup> .....	Clarion.....	1,150	-----	-----	-----	For oil or gas; unsuccessful.
Union City <sup>14</sup> .....	Erie.....	1,523	-----	-----	-----	For oil; unsuccessful.
Union Township.....	do.....	1,600	-----	-----	-----	Gas well.
Uniontown (3 miles northwest). <sup>15</sup> .....	Fayette.....	2,001	-----	-----	-----	For oil or gas; unproductive.
Upper Middletown <sup>16</sup> .....	do.....	2,440	-----	-----	-----	Gas well.
Upper St. Clair Township. <sup>17</sup> .....	Allegheny.....	2,442	-----	-----	-----	For oil or gas; unsuccessful.
Venice (1 mile northwest). <sup>18</sup> .....	Washington.....	2,247	7½-5½	-----	-----	Water charged with soda; temp. 65°-70°; also gas well.
Wall Station (near).....	Allegheny.....	1,850	-----	Many.	Flows.	Two borings for oil or gas; unproductive.
Waltz Mill (near) <sup>19</sup> .....	Westmoreland.....	1,769-3,151	-----	-----	-----	Numerous oil and gas wells; some good producers.
Warren (near) <sup>20</sup> .....	Warren.....	531-1,065	-----	-----	-----	Several oil and gas wells.
Washington <sup>21</sup> .....	Washington.....	2,285-2,599	-----	-----	-----	Do.
Washington (near) <sup>22</sup> .....	do.....	1,977-2,420	-----	-----	-----	Gas wells.
Washington Township. <sup>23</sup> .....	Westmoreland.....	1,301-1,638	-----	-----	-----	Oil and gas wells.
Waterford (2 miles west). <sup>24</sup> .....	Erie.....	650	-----	-----	-----	For oil or gas; unproductive.
Watson Township <sup>25</sup> .....	Warren.....	1,936	-----	-----	-----	For oil; unsuccessful.
Wayne Township <sup>26</sup> .....	Lawrence.....	790	-----	-----	-----	Gas and oil well.
Do.....	Erie.....	600	-----	-----	-----	Several oil and gas wells.
Do. <sup>27</sup> .....	Crawford.....	600-1,100	-----	-----	-----	Oil well; abandoned.
Waynesburg <sup>28</sup> .....	Greene.....	2,745	-----	-----	-----	

<sup>1</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I<sup>4</sup>, pp. 31-48; Am. Phil. Soc., Proc., vol. 16, pp. 372-374.

<sup>2</sup> Record, Am. Philos. Soc., Proc., vol. 16, p. 488.

<sup>3</sup> Ibid., Pa. 2d Geol. Surv., Reports, Vol. I<sup>4</sup>, pp. 77-79; Ann. Rept. for 1886, part 2, pp. 705-707.

<sup>4</sup> Ibid., Vol. Q<sup>4</sup>, p. 184; Vol. I<sup>3</sup>, p. 154; Vol. I<sup>4</sup>, p. 284.

<sup>5</sup> Ibid., Am. Philos. Soc., Proc., vol. 16, pp. 490-493; Pa. 2d Geol. Surv., Reports, Vol. I<sup>4</sup>, pp. 118-119.

<sup>6</sup> Ibid., Pa. 2d Geol. Surv., Reports, Vol. I<sup>4</sup>, p. 56.

<sup>7</sup> Ibid., Vol. I<sup>3</sup>, pp. 412-413.

<sup>8</sup> Record, Am. Philos. Soc., Proc., vol. 16, p. 494.

<sup>9</sup> Ibid., pp. 370-372.

<sup>10</sup> Records, Pa. 2d Geol. Surv., Reports, Vol. I<sup>4</sup>, pp. 280-283.

<sup>11</sup> Ibid., Vol. I<sup>3</sup>, pp. 173-174; Vol. I<sup>3</sup>, pp. 283-286.

<sup>12</sup> Ibid., Vol. I<sup>4</sup>, pp. 87-92.

<sup>13</sup> Ibid., Vol. II, p. 227.

<sup>14</sup> Ibid., Vol. I<sup>4</sup>, p. 121.

<sup>15</sup> Ibid., Vol. I<sup>5</sup>, pp. 320-321.

<sup>16</sup> Ibid., p. 319.

<sup>17</sup> Ibid., pp. 271-272.

<sup>18</sup> Record, Pa. 2d Geol. Surv., Ann. Rept. for 1886, part 2, pp. 759-760.

<sup>19</sup> Ibid., Vol. I<sup>5</sup>, pp. 225-227.

<sup>20</sup> Ibid., Vol. I<sup>4</sup>, pp. 1-9.

<sup>21</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 764-767.

<sup>22</sup> Ibid., pp. 760-769.

<sup>23</sup> Ibid., pp. 726-730.

<sup>24</sup> Ibid., Vol. I<sup>4</sup>, p. 20.

<sup>25</sup> Ibid., Vol. Q<sup>4</sup>, p. 89.

<sup>26</sup> Ibid., Vol. Q<sup>4</sup>, pp. 122-125.

<sup>27</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 772-773.

## PENNSYLVANIA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Waynesburg (vicinity). <sup>1</sup>	Greene.....	2,675-2,900	-----	-----	-----	Two oil and gas wells; one unproductive. Good water.
Wellersburg .....	Somerset .....	1,207	-----	-----	-----	
Wellsboro .....	Tioga .....	-----	-----	-----	-----	
West Alexander (3 miles west). <sup>2</sup>	Washington ..	3,200	-----	-----	-----	For oil or gas; unproductive. Gas well.
West Amity Station (near). <sup>3</sup>	do .....	+2,390	-----	-----	-----	
West Branch Township. <sup>4</sup>	Potter .....	1,750-2,750	-----	-----	-----	For oil; unsuccessful.
West Deer Township. <sup>5</sup>	Allegheny .....	2,243	-----	-----	-----	For oil or gas; unproductive.
West Middletown. <sup>6</sup>	Washington ..	3,455	-----	-----	-----	For oil or gas; abandoned.
Wicks Station. <sup>7</sup>	Butler .....	912	-----	-----	-----	
Wilcox (4½ miles north). <sup>8</sup>	Elk .....	1,850	-----	-----	-----	Small oil well.
Wilkesbarre .....	Luzerne .....	536	2	-----	-----	
Do .....	do .....	466	-----	-----	-----	For water; unsuccessful.
Willow Tree. <sup>9</sup>	Greene.....	2,165	-----	-----	-----	For oil or gas; abandoned.
Winfield Township. <sup>10</sup>	Butler .....	1,685	-----	-----	-----	For oil or gas; unsuccessful.
Woodcock Township	Crawford .....	+600	-----	-----	-----	For oil; unsuccessful.
Woodrow (near). <sup>11</sup>	Washington ..	+4,303	-----	-----	-----	Gas well.
Wrightsville (1 mile northeast). <sup>12</sup>	Warren .....	1,200	-----	-----	-----	Abandoned as dry hole.

<sup>1</sup> Record, Pa. 2d Geol., Surv., Reports, Vol. I<sup>5</sup>, p. 312.<sup>2</sup> Ibid., pp. 304-315.<sup>3</sup> Ibid., p. 307.<sup>4</sup> Ibid., Ann. Rept. for 1885, pp. 86-91.<sup>5</sup> Ibid., Vol. I<sup>6</sup>, p. 241.<sup>6</sup> Ibid., Ann. Rept. for 1886, part 2, pp. 756-758.<sup>7</sup> Ibid., p. 720.<sup>8</sup> Ibid., Vol. G<sup>4</sup>, pp. 143-146.<sup>9</sup> Ibid., Vol. I<sup>6</sup>, p. 316.<sup>10</sup> Ibid., Ann. Rept. for 1886, part 2, p. 716.<sup>11</sup> Ibid., pp. 755-756.<sup>12</sup> Ibid., Vol. I<sup>4</sup>, p. 236.

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Oil Well Records, selected from the collections of Mr. J. F. Carll, by J. P. Lesley, American Philosophical Society, Proceedings, vol. 16, pp. 346-380, Philadelphia, 1877.

On the First Systematic Collection and Discussion of the Venango County Oil Wells of Western Pennsylvania, by E. S. Nettleton, prepared for publication by J. F. Carll, American Philosophical Society Proceedings, Nos. 97-99, for 1876-1877, vol. 16, pp. 439-495, Philadelphia, 1877.

Pennsylvania Second Geological Survey, Report of Progress, 1876-1877, Oil Well Records and Levels, by J. F. Carll, Vol. II, 398 pages, Harrisburg, 1877.

Pennsylvania Second Geological Survey, Report for 1875-1879, The Geology of the Oil Regions of Warren, Venango, Clarion, and Butler Counties, by J. F. Carll, Vol. III, 482 pages, Harrisburg, 1880.

Pennsylvania Second Geological Survey, Report of Progress, 1879, The Geology of Erie and Crawford Counties, by I. C. White, Vol. QQQQ, 406 pages, Harrisburg, 1881.

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### RHODE ISLAND.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
Providence.....	Providence..	<i>Feet.</i> 400	<i>Inches.</i> 6	<i>Gallons.</i> 85	<i>Feet.</i> No flow.	
Do.....	do.....	460	6	110	No flow.	
Saylesville.....	do.....	1,433	.....	15	No flow.	Abandoned.

### SOUTH CAROLINA.

Abbeville.....	Abbeville.....	504	8	80	-3	
Aiken <sup>1</sup> .....	Aiken.....	558	8-6	50	-170	In granite.
Bamberg <sup>2</sup> .....	Barnwell.....	479-555	14-2	35-40	+12-30	Several wells.
Beaufort <sup>3</sup> .....	Beaufort.....	800	.....	.....	.....	
Camden.....	Kershaw.....	618-625	.....	Many.	-20	Two wells.
Charleston <sup>4</sup> .....	Charleston.....	1,970	.....	250	+4	Temp. 99.5°.
Do. <sup>5</sup> .....	do.....	1,260	.....	30	+25	Saline water; temp. 87°.
Do.....	do.....	1,950	3½	167	.....	Temp. 99°.
Do.....	do.....	1,970	2½	104	.....	Do.
Do.....	do.....	2,050	4	451	.....	Do.
Do.....	do.....	1,945	5	695	.....	Do.
Charleston (vicinity) <sup>6</sup> .....	do.....	425-475	.....	.....	.....	Several wells.
Chester.....	Chester.....	700	.....	.....	.....	In granite; unsuccessful.
Do.....	do.....	500	8	.....	.....	Unsuccessful.
Florence <sup>7</sup> .....	Florence.....	1,335	10-8	100	-20	Lowest water at 1,215 to 1,220.
Do.....	do.....	420	.....	Many.	.....	Fine water.
Georgetown.....	Georgetown.....	400?	.....	Not any	.....	
Green Pond.....	Colleton.....	503	3	1	Flows.	Temp. 70°.
Greenwood.....	Abbeville.....	400	8	40	-4	
Hampton.....	Hampton.....	800	.....	.....	Flows.	
Do.....	do.....	583	6	Many.	-9	Soft, iron water.
Jacksonboro.....	Colleton.....	420	3	4	Flows.	Temp. 72°.
Johns Island.....	.....	500	6	11	Flows.	Temp. 70°.
Marion.....	Marion.....	1,244	8-6	½	Flows.	
Mays River Neck.....	.....	800	.....	.....	-1	Very sulphurous water.
Orangeburg <sup>8</sup> .....	Orangeburg.....	1,160	6-2½	Many.	-52	Pumped at 300 feet.
Peeples.....	Hampton.....	850	6	100	Flows.	Temp. 76°.
Sullivan's Island.....	Laurens.....	1,308	12-3	10	.....	Temp. 87°.
Varnville.....	Hampton.....	983	6	Many.	-12	
Walterboro.....	Colleton.....	490	6	Many.	-30	Soft water.

<sup>1</sup> Record, U. S. Geol. Surv., Bull. No. 138, p. 220.

<sup>2</sup> Ibid., p. 221.

<sup>3</sup> Analysis, Ibid., p. 217.

<sup>4</sup> Record, Municipal Report of City of Charleston, 1881, Artesian Wells, Report of Scientific Committee, pp. 3-4, plate.

<sup>5</sup> Analysis, U. S. Geol. Surv., Bull. No. 138, p. 212.

<sup>6</sup> Ibid., pp. 214-216.

<sup>7</sup> Record and Analysis, Ibid., pp. 218-219.

<sup>8</sup> Record, Ibid., p. 220.

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Artesian Well prospects in the Atlantic Coastal Plain region, by N. H. Barton, U. S. Geological Survey, Bulletin No. 138, 232 pages, plates, Washington, 1896.

## SOUTH DAKOTA.

[Arranged by counties.]

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Plankinton Town-ship.	Aurora	775	4 $\frac{1}{2}$	200	+127	
Plankinton	do	830	4 $\frac{1}{2}$ -3	225	+209	Flows at 540 and 740 feet also.
Do	do	745	4	60		
White Lake	do	863	4	150	+80	Flows at 790 and 850 feet.
Crystal Lake Town-ship, sec. 17.	do	850	4 $\frac{1}{2}$	600	+127	
T. 105, R. 63, sec. —	do	475	2	5		
T. 105, R. 66, sec. 24	do	953	2	115		
T. 104, R. 63, sec. 22 <sup>1</sup>	do	525	4-3	168		
T. 104, R. 66, sec. 2	do	844	2	150		A flow also at 710 feet.
T. 104, R. 63, sec. 21	do	523	4 $\frac{1}{2}$	150	+103	
Do	do	525	4 $\frac{1}{2}$	150		
T. 104, R. 63, sec. 1	do	470	2	4		
T. 104, R. 66, sec. 3	do	922	2	75		
T. 103, R. 63, sec. 26 <sup>1</sup>	do	490	4	10		
Do	do	530	2	10		
T. 103, R. 63, sec. 35	do	484	4-3			
T. 103, R. 63, sec. 32	do	623	3-2	15		A flow also at 520 feet.
T. 103, R. 66, sec. 34	do	842	6			Flows at 650 and 842 feet.
T. 103, R. 63, sec. —	do	705	3	200		
T. 103, R. 63, sec. 28	do	716				Flows at 600 and 675 feet.
T. 103, R. 63, sec. —	do	530	2	30		
T. 103, R. 63, sec. 13	do	420	2	30		
T. 102, R. 66, sec. 17	do	835	4	400		
T. 102, R. 63, sec. 10 <sup>1</sup>	do	613	2	3		
Hitchcock <sup>2</sup>	Beadle	953	4-3	1,260	+345	
Huron <sup>2</sup>	do	906	6	1,500	+276	Flows at 712 and 772 feet also.
Do	do	847	6-4	600	+276	Flows at 776 and 826 feet.
Do	do	1,040	8	350		A flow at 756 feet also.
Huron (1 miles sw.)	do	1,080	5 $\frac{1}{2}$	1,500		A flow at 900 feet also.
Huron <sup>2</sup>	do	960	10-5 $\frac{1}{2}$	2,250	+380	Temp. 70°. Several flows 240 to 960 feet.
Wolsey <sup>2</sup>	do	930	8-5	330		Flows at 490, 808, 858, and 893 feet also.
T. 113, R. 64, sec. 15	do	1,068	4	600	Flows.	
T. 113, R. 64, sec. 29	do	1,118	4	1,435	+403	
T. 112, R. 61, sec. 30 <sup>3</sup>	do	917	6-4		Flows.	Flows at 770 and 800 feet also.
T. 111, R. 61, sec. 19	do	836	3	360	+338	
T. 111, R. 61, sec. 31	do	792	3	200	+292	
T. 110, R. 62, sec. 11	do	1,080	5 $\frac{1}{2}$	1,500	Flows.	Flow at 900 feet also.
T. 110, R. 60, sec. 29	do	930	4	930	+230	
T. 109, R. 62, sec. 30	do	813	3	250	+288	
Scotland	Bonhomme	590	6			
Do <sup>4</sup>	do	587		9		
Springfield <sup>4</sup>	do	592	8	3,292	+198	
Do	do		4			
Tyndall <sup>4</sup>	do	736	4 $\frac{1}{2}$	1,000	+69	
Do	do	752	8			
Choteau Creek	do	862 <sup>5</sup>		1,400	+143	
Do	do	897	6	1,600	+133	
T. 96, R. 59, sec. 15 <sup>5</sup>	do	700	2			
Do <sup>5</sup>	do	590	7	1	+126	
Do <sup>5</sup>	do	645	3		+149	
T. 94, R. 61, sec. 22 <sup>4</sup>	do	1,074 $\frac{1}{2}$	3-2 $\frac{1}{2}$		+6	
T. 94, R. 60, sec. 9	do	768	2	60		
T. 94, R. 58, sec. 32	do	640	2	75		
T. 93, R. 59, sec. 1	do	646	1	30	+143	
T. 93, R. 58, sec. 5 <sup>6</sup>	do	660	3	95	+104	
T. 95, R. 59, sec. 34	do	730	2	97	+82	
T. 60, R. 93, sec. 5 <sup>7</sup>	do	825				
T. 94, R. 58, sec. 19	do	576	3	11		
Aberdeen <sup>8</sup>	Brown	955	8-3	Many.	+230	Flows at 925 and 940 feet.

<sup>1</sup> Record, U. S. Geol. Surv., 18th Ann. Rpt., part 4, Pl. XL.<sup>2</sup> U. S. Geol. Surv., 17th Ann. Rept., part 2, pp. 22-23.<sup>3</sup> Ibid., Pl. 76.<sup>4</sup> Record, U. S. Geol. Surv., 17th Ann. Rept., part 2, p. 58.<sup>5</sup> At Hutterisches Colony. Record, U. S. Geol. Surv., 18th Ann. Rept., part 4, p. 587.<sup>6</sup> Record, U. S. Geol. Surv., 17th Ann. Rept., part 2, p. 50.<sup>7</sup> Record, U. S. Geol. Surv., 18th Ann. Rept., part 4, p. 586.<sup>8</sup> Record, U. S. Geol. Surv., 17th Ann. Rept., part 2, pl. 72.

## SOUTH DAKOTA—Continued.

Location.	County.	Depth.	Dia- meter.	Yield per minute.	Height of water.	Remarks.
Aberdeen <sup>1</sup>	Brown	<i>Feet.</i> 1,050	<i>Inches.</i> 6-5	<i>Gallons.</i> 1,000	<i>Feet.</i> +317	
Do. <sup>1</sup>	do.	918	3 $\frac{3}{8}$	330	+92	Flows at 879 and 905 feet.
Do. <sup>1</sup>	do.	1,004	6-4	825	+143	
Do. <sup>1</sup>	do.	1,066	8-2	Many.	Flows.	Flows at 910, 921, and 1,020 feet also.
Do. <sup>1</sup>	do.	1,300	8-4 $\frac{1}{2}$	1,080	+196	Flows at 920, 995, and 1,077 feet.
Aberdeen, T. 123, R. 63, sec. 17.	do.	1,117	4 $\frac{1}{2}$	Many.	Flows.	Flows at 925 and 1,090 feet.
Aberdeen, T. 123, R. 63, sec. 18.	do.	1,015	4 $\frac{1}{2}$	300	+288	Flows also at 928 feet.
Columbia <sup>1</sup>	do.	964	4 $\frac{1}{2}$	940	+368	Five flows 721-927 feet.
Frederick <sup>1</sup>	do.	1,139	6-4	139	+161	Flows at 985 and 1,045 feet also.
Groton <sup>1</sup>	do.	960	5 $\frac{3}{8}$ -3 $\frac{1}{2}$			
Do.	do.	922	6-3	830	+310	
T. 127, R. 63, sec. 12 <sup>2</sup>	do.	856			Flows.	
T. 127, R. 63, sec. 21 <sup>2</sup>	do.	800			Flows.	
T. 126, R. 60, sec. 32	do.	1,030	6		+80	
T. 126, R. 61, sec. 31 <sup>2</sup>	do.	965			Flows.	
T. 125, R. 61, sec. 3 <sup>2</sup>	do.	716			Flows.	
T. 124, R. 60, sec. 31 <sup>2</sup>	do.	942	4-2	150	+315	
T. 123, R. 60, sec. 8 <sup>2</sup>	do.	977		105	+184	
Chamberlain <sup>3</sup>	Brule	600	8		+219	
Do. <sup>3</sup>	do.	685	10-8	4,350	+253	
Do.	do.	1,026	6	3,000	Flows.	
Do.	do.	815		300	Flows.	Flows at 716, 750, and 780 feet also.
Do.	do.	563	2		Flows.	
Do.	do.	600	2	2	Flows.	
Kimball <sup>3</sup>	do.	1,068	4 $\frac{1}{2}$	185	+46	
T. 105, R. 68, sec. 26 <sup>3</sup>	do.	935	6	815	+173	Flows at 750, 825, and 875 feet also.
T. 105, R. 68, sec. 3	do.	987	6		Flows.	
T. 104, R. 70, sec. 33	do.	900	6		Flows.	
T. 103, R. 71, sec. 12	do.	1,030	6	700	Flows.	
T. 103, R. 68, sec. 1	do.	1,065	6	750	+46	
T. 103, R. 68, sec. 27	do.	980	8		Flows.	
T. 102, R. 70, sec. 21	do.	1,185	6	800	Flows.	
T. 102, R. 67, sec. 18	do.	1,050	6	1,000	Flows.	
T. 102, R. 68, sec. 16	do.		6		Flows.	
T. 102, R. 70, sec. 9	do.	1,165		Many.	Flows.	
T. 102, R. 70, sec. 15	do.	1,100	6	800	Flows.	
T. 102, R. 70, sec. 2	do.	1,027		Many.	Flows.	
T. 102, R. 71, sec. 2	do.	1,227	8	600	Flows.	
T. 102, R. 71, sec. 2	do.	1,230	8	900	Flows.	
T. 101, R. 68, sec. 12	do.	937	6	1,098	Flows.	Flows at 753, 786, and 851 feet also.
T. 101, R. 68, sec. 21	do.	962	8-4	Many.	Flows.	
Crow Creek Agency <sup>4</sup>	Buffalo	780	6		+414	Temp. 72°; flows at 409 feet also.
Belle Fourche	Butte	525	8	60	+70	Two wells; another flows at 410 feet.
Chandler	Charles Mix	900	2			Uncompleted.
Greenwood <sup>5</sup>	do.	651	6	3,000	+274	Temp. 70°; several flows 420-641 feet.
Lake Andes <sup>5</sup>	do.	755 $\frac{1}{2}$	8-6	1,500	+161	Temp. 70°; flows at 623 and 725 feet also.
Do. <sup>5</sup>	do.	802	8-6	1,500	+161	Temp. 70°.
T. 100, R. 69, sec. 9	do.	980	3	125	Flows.	Chalk at 210 feet.
T. 100, R. 71, sec. 29	do.	785	8	500	Flows.	
T. 100, R. 71, sec. 18	do.	868	8	2,352	Flows.	
T. 100, R. 68, sec. 13	do.	720	2-1	Several.	Flows.	
T. 100, R. 68, sec. 9	do.	830	2-1 $\frac{1}{2}$	7	Flows.	
T. 99, R. 69, sec. 19	do.	966	2-1 $\frac{1}{2}$	60	+115	Flows at 779, 803, 838, and 860 feet also.
T. 100, R. 71, sec. 23	do.	688	8	1,700	Flows.	Flows at 500 and 614 feet also.
T. 99, R. 67, sec. 18	do.	769	2-1	7	Flows.	Water at 515 feet.
T. 99, R. 67, sec. 21 <sup>6</sup>	do.	907	8-4 $\frac{1}{2}$	40	Flows.	
T. 98, R. 68, sec. 13	do.	1,006	6-4		No flow.	
T. 98, R. 64, sec. 20	do.	772	2	200	+120	

<sup>1</sup> Record, U. S. Geol. Surv., 17th Ann. Rept., part 2, pp. 16-18, pl. 72.<sup>2</sup> Record, U. S. Geol. Surv., 17th Ann. Rept., part 2, pp. 15-17.<sup>3</sup> Ibid., pp. 42-48.<sup>4</sup> Record, U. S. Geol. Surv., 18th Ann. Rept., part 4, p. 573.<sup>5</sup> Record, U. S. Geol. Surv., 18th Ann. Rept., part 4, p. 570.<sup>6</sup> Record, U. S. Geol. Surv., 17th Ann. Rept., part 2, pp. 44-45.

## SOUTH DAKOTA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Clark	Clark	1,200				Two wells; unsuccessful.
T. 117, R. 59, sec. 22 <sup>1</sup>	do	1,200	6			
T. 95, R. 52, sec. 9	Clay	500	3-2	3		Flows.
T. 94, R. 52, sec. 11	do	402	2	5		Flows.
T. 94, R. 52, sec. 15	do	400	1½	Many.		Flows.
T. 94, R. 53, sec. 33	do	500	2	Few.		Flows.
T. 93, R. 51, sec. 29	do	400	1½	3		Flows.
T. 93, R. 51, sec. 31	do	410	1	1		Flows.
T. 92, R. 51, sec. 33	do	400	3-2	Few.		Flows.
Vermilion	do	507	3	Few.		Flows.
Buffalo Gap	Custer	800				Two borings; no water.
Mitchell <sup>2</sup>	Davison	548			+16	
Do	do	586	8	600	+64	Flows at 285, 445, and 560 feet.
Mitchell (12 miles southwest). <sup>2</sup>	do	433	2	20		Flows.
Mitchell (6 miles northeast). <sup>2</sup>	do	472	2	40		Flows.
Mitchell	do	550	2	60	+30	
Mount Vernon	do	442	2	8		Flows.
Mount Vernon (14 miles southeast).	do	515	4½-3½	50		Flows.
T. 104, R. 60, sec. 17 <sup>2</sup>	do	400		100		Flows.
T. 104, R. 62, sec. 9 <sup>3</sup>	do	550	2-1	130		Flows.
T. 104, R. 60, sec. 17 <sup>3</sup>	do	456	3	10		Flows.
T. 103, R. 62, sec. 4	do	495	4	30		Flows.
T. 103, R. 62, sec. 3 <sup>3</sup>	do	646	4½	700		Flows.
T. 104, R. 61, sec. —	do	415		30		Flows.
T. 104, R. 61, sec. 12	do	410	2	40		Flows.
T. 104, R. 62, sec. 18	do	408	2	20		Flows.
T. 104, R. 62, sec. 21	do	424	3	156 <sup>4</sup>		Flows.
T. 104, R. 62, sec. 12	do	416	2	5		Flows.
T. 104, R. 62, sec. 3	do	601	4-3	130		Flows.
T. 104, R. 62, sec. 7	do	444	2	15		Flows.
T. 104, R. 62, sec. 35	do	479	5-4	Many.		Flows.
T. 104, R. 60, sec. 35	do	507	4½-3	40		Flows.
T. 104, R. 62, sec. 6	do	458	1	3		Flows.
T. 104, R. 61, sec. 29	do	419	2	50		Flows.
T. 104, R. 61, sec. 8	do	577	2	50		Flows.
T. 104, R. 61, sec. 18	do	653	2-1	90		Flows.
T. 104, R. 61, sec. 33	do	425	3	210		Flows.
T. 104, R. 61, sec. 20	do	420	2	22		Flows.
T. 103, R. 61, sec. 19	do	411	2	120		Flows.
T. 103, R. 62, sec. 2	do	420	2	60		Flows.
T. 103, R. 62, sec. 14	do	450	2	60		Flows.
T. 103, R. 62, sec. 10	do	495	3	35		Flows.
T. 103, R. 62, sec. 11	do	408	2	45		Flows.
T. 103, R. 62, sec. 15	do	406	2	60		Flows.
T. 103, R. 61, sec. 19	do	410	2	110		Flows.
T. 102, R. 62, sec. 9	do	460	2	90		Flows.
T. 102, R. 62, sec. 31	do	642	2-1½	20		Flows.
T. 102, R. 62, sec. 29	do	485	2-1½	30		Flows.
T. 102, R. 62, sec. 6	do	460	2	25		Flows.
T. 101, R. 61, sec. 25	do	520	2	27		Flows.
T. 101, R. 61, sec. 28	do	530	2	15		Flows.
T. 101, R. 61, sec. 21	do	535	1½	35		Flows.
T. 101, R. 61, sec. 2	do	425	2	30		Flows.
T. 101, R. 60, sec. 32	do	435	2	25		Flows.
T. 101, R. 60, sec. 9	do	477	2			Flows.
T. 101, R. 60, sec. 29	do	413	2	35		Flows.
S. S. Slade's well	do	440	2	10		Flows.
Andover <sup>4</sup>	Day	1,075	6-4½	300	+ 207	
Webster	do	1,400				Small flow only at 1,100 feet.
Cheyenne Agency <sup>5</sup>	Dewey	1,337	4	500	+ 472	Temperature 80°.
Armour	Douglas	800	8	1,500		Flows.
Do. <sup>6</sup>	do	737	6	1,500	+ 126	
Delmont <sup>6</sup>	do	821	2	60		Flows.
Flensburg <sup>6</sup>	do	611	2	60		Flows.
Do	do	651	2			Flows.
Do	do	775	2	65-70		Flows.
T. 100, R. 64, sec. 26 <sup>6</sup>	do	937	6	900	+ 72	

<sup>1</sup> Record, U. S. Geol. Surv., 18th Ann. Rept., 1897, part 4, pp. 18, 21.<sup>2</sup> Record, U. S. Geol. Surv., 17th Ann. Rept., part 2, pp. 39-40, 44.<sup>3</sup> Record, U. S. Geol. Surv., 18th Ann. Rept., part 4, p. 575.<sup>4</sup> Record, U. S. Geol. Surv., 17th Ann. Rept., part 2, p. 19.<sup>5</sup> Record, U. S. Geol. Surv., 18th Ann. Rept., part 4, p. 588.<sup>6</sup> Record, U. S. Geol. Surv., 17th Ann. Rept., part 2, pp. 46-50.

## SOUTH DAKOTA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
T. 100, R. 64, sec. 26	Douglas	975	4	1,000	Flows.	
T. 100, R. 62, sec. 18	do	1,025		1,025	Flows.	
T. 100, R. 63, sec. 15	do	750	4	600-700	Flows.	
T. 100, R. 62, sec. 16	do	600		Many.	Flows.	
T. 98, R. 65, sec. 2 <sup>1</sup>	do	880	6	900	Flows.	
T. 99, R. 63, sec. 35	do	703½	8-6	2,100	+172	
T. 99, R. 65, sec. 14	do	925	4	600-700	Flows.	
T. 99, R. 65, sec. —	do	1,010	6	1,000	Flows.	
T. 98, R. 65, sec. 2	do	901	8-6	650	Flows.	
Ipswich	Edmunds	1,265	4½-3½	Many.	+244	
Ardmore	Fall River	1,500				Unsuccessful.
Argentine <sup>2</sup>	do	550			Flows.	
Edgemont <sup>3</sup>	do	1,125		Several.	— 60	Plugged at 700 feet; water from 509 feet.
Edgemont (near)	do	960		Several.	— 30	Water from 578 feet.
Minnekahta <sup>4</sup>	do	1,348		None.		
Faulton	Faulk	1,032		100	Flows.	
Orient (4 miles NE.) <sup>5</sup>	do	1,215	6-5½	950	Flows.	
T. 113, R. 69, sec. —	Hand	1,200			Flows.	Flows at 1,087 and 1,127 feet also.
T. 113, R. 67, sec. 25	do	1,137	6-3	480	Flows.	
T. 112, R. 68, sec. 7	do	1,200	4	50	Flows.	
St. Lawrence	do	1,272		Few.	+ 92	First flow at 1,070 feet.
Miller <sup>6</sup>	do	1,139	6½-4½	360	+276	
T. 112, R. 68, sec. 10	do	1,140	3½		Flows.	
T. 112, R. 67, sec. 33	do	1,375	3	1,000	+273	
T. 112, R. 67, sec. 18	do	1,343	3	350	+287	
T. 104, R. 57, sec. 8 <sup>7</sup>	Hanson	589	2-1½	50	Flows.	
T. 104, R. 58, sec. 14 <sup>7</sup>	do	528	2-1½	30	Flows.	
T. 104, R. 58, sec. 13 <sup>7</sup>	do	550	2	150	Flows.	
T. 104, R. 57, sec. 22	do	543	2	50	Flows.	
T. 104, R. 58, sec. 9	do	535	2	5	Flows.	
T. 104, R. 58, sec. 17	do	440	1	Few.	Flows.	
T. 104, R. 57, sec. 8	do	600	1½	20	Flows.	
T. 104, R. 58, sec. 12 <sup>8</sup>	do	483	4	35	+46	
T. 104, R. 57, sec. 27	do	508	2	4	Flows.	
T. 104, R. 57, sec. 7	do	510	3-2	16	Flows.	
East Pierre <sup>9</sup>	Hughes	1,192		900	+380	
Harrold <sup>9</sup>	do	1,453	4	84	+62	Temp. 95°.
Pierre	do	1,160		600	Flows.	Temp. 92°.
Menno	Hutchinson	417	6			Small flow.
Northwest corner of county. <sup>10</sup>	do	560		10		
Parkson <sup>10</sup>	do	542	3	30	+46	
Parkson (1 mile southwest). <sup>10</sup>	do	515		50	Flows.	
Tripp (4 miles north) <sup>10</sup>	do	580-540	2	9	Flow.	Three wells.
Tripp	do	815	6	700	+21	
T. 97, R. 57, sec. 21	do	747	2	6	Flows.	
T. 98, R. 61, sec. —	do	482		60	Flows.	
T. 98, R. 60, sec. 21	do	559	2	50	Flows.	
T. 99, R. 60, sec. 7	do	527	3	150	Flows.	
T. 100, R. 61	do	419-585	3-1½	90-1	Flow.	Fourteen wells.
T. 100, R. 60	do	420-462	2	10-3	Flow.	Three wells.
T. 100, R. 61, sec. 25 <sup>11</sup>	do	458	2		Flows.	
T. 99, R. 61	do	490-572	2-1½	50-8	Flow.	Fourteen wells.
T. 99, R. 60 <sup>11</sup>	do	485	2	25	Flows.	
T. 99, R. 60 <sup>11</sup>	do	485	1½	90	Flows.	
T. 99, R. 60	do	400-540	6-1½	25-1	Flow.	Twelve wells.
T. 98, R. 60 <sup>11</sup>	do	559	2	50	Flows.	
T. 98, R. 59	do	400-450	2-1½	15-1	Flows.	Six wells.
T. 99, R. 59	do	490	2		Flows.	
T. 98, R. 60	do	475-580	5-2	120-10	Flow.	Fifteen wells.
T. 98, R. 61	do	500-798	3-1½	40-13	Flow.	Nine wells.
T. 97, R. 60	do	550-614	4½-1½	50-40	Flow.	Three wells, not including town well at Tripp.
T. 97, R. 61	do	945			Flows.	
T. 97, R. 59	do	517-550	2-1½	30	Flow.	Two wells.

<sup>1</sup> Record, U. S. Geol. Surv., 17th Ann. Rept., part 2, pp. 46-50.<sup>2</sup> Analysis, U. S. Geol. Surv., 21st Ann. Rept., 1899-1900, part 4, p. 570.<sup>3</sup> Ibid., pp. 568, 571.<sup>4</sup> Ibid., p. 573.<sup>5</sup> Record, U. S. Geol. Surv., 17th Ann. Rept., part 2, p. 22.<sup>6</sup> Ibid., p. 26.<sup>7</sup> Ibid., p. 84.<sup>8</sup> Record, U. S. Geol. Surv., 18th Ann. Rept., part 4, p. 579.<sup>9</sup> Record, U. S. Geol. Surv., 17th Ann. Rept., part 2, pl. 76.<sup>10</sup> Ibid., pp. 47-48.<sup>11</sup> Record, U. S. Geol. Surv., 18th Ann. Rept., 1897, part 4, pp. 580-585.

## SOUTH DAKOTA—Continued.

Location.	County.	Depth.	Dia- me- ter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
T. 97, R. 57, sec. ....	Hutchinson.	500-406	2-1 1/2	2	Flow.	Two wells.
T. 97, R. 57	do	747-485	2-1 1/2	4-3	Flow.	Do.
T. 97, R. 56	do	445	2		Flows.	
Highmore <sup>1</sup>	Hyde	1,552	6	9	+ 35	Temp. 72°.
T. 108, R. 64, sec. 11	Jerauld	799	2-1 1/2	2	Flows.	
T. 108, R. 65, sec. 5 <sup>2</sup>	do	1,057	2 1/2	200	+207	
T. 106, R. 63, sec. 2	do	715	2	200	+304	
T. 106, R. 63, sec. 6	do	760	3-2	280	+253	
T. 106, R. 64, sec. 9 <sup>2</sup>	do	880	2 1/2	280	+262	
T. 106, R. 64, sec. 17	do	810	2 1/2	5	Flows.	
T. 106, R. 64, sec. 15	do	816	3	10	Flows.	
Desmet	Kingsbury	1,610				
Arlington	do	800			No flow.	
Iroquois <sup>3</sup>	do	1,115	4 1/2	1,000	+154	
T. 109, R. 58, sec. 30	do	600	2		Flows.	
Britton <sup>4</sup>	Marshall	1,004	8-3 1/2	600	+365	Temp. 64°.
Langford	do	1,050	6	400-500	+138	
Newark	do	940	8-6	600	+288	Water at 420, 480, and 900 feet.
Rosebud Agency (26 miles northeast).	Meyer	2,500	8-6		-600	
Gettysburg	Potter	2,140			-100	
Artesian (1 mile southwest). <sup>5</sup>	Sanborn	+630	3		+ 81	
Letcher <sup>6</sup>	do	577	3-2	90	+207	Water at 300, 400, and 570 feet.
T. 105, R. 61, sec. 23 <sup>6</sup>	do	561		125	Flows.	
T. 105, R. 61, sec. 15 <sup>6</sup>	do	578	2	70	Flows.	
T. 107, R. 62, sec. 29	do	742	3	425	+299	
T. 105, R. 62, sec. 26	do	445	2-1	3	Flows.	
T. 105, R. 60, sec. 10	do	625	2	30	Flows.	
T. 105, R. 60, sec. 20	do	497	2	165	Flows.	
T. 105, R. 62, sec. 19	do	485	2	4	Flows.	
T. 105, R. 62, sec. 17	do	463	2	6	Flows.	
T. 105, R. 62, sec. 30	do	500	1 1/2	15	Flows.	
T. 105, R. 60, sec. 14	do	511	2	100	Flows.	
T. 105, R. 61, sec. 15	do	584	2	80	Flows.	
T. 105, R. 60, sec. 27	do	445	2	30	Flows.	
Woonsocket <sup>6</sup>	do	725	6	1,150	+299	
Do	do	775		Many.	+288	
Ashton	Spink	1,003	8	2,000	+345	
Do. <sup>7</sup>	do	925	6-4 1/2	100	+138	Flows at 650, 795, and 900 feet.
Conde	do	960	4 1/2	Many.	Flows.	
Doland <sup>7</sup>	do	897	4 1/2	370	+281	
Do	do	957		600	+258	
Frankfort <sup>7</sup>	do	1,008	8-4 1/2	Many.	Flows.	Flows at 803, 864, 945 and 1,000 feet.
Mellette	do	1,065	8-6	1,200	Flows.	
Do. <sup>7</sup>	do	920	6-4 1/2	1,320	+380	
Northville	do	980	9-6	1,900	+359	Flows at 875 and 956 feet.
Redfield <sup>7</sup>	do	964	6 1/2-4 1/2	1,260	+407	
Do	do	1,025	6	1,900	Flows.	
Turton	do	920	4 1/2	1,300	Flows.	
T. 119, R. 63, sec. 22 <sup>7</sup>	do	958		60	+324	
T. 119, R. 63, sec. 19 <sup>7</sup>	do	930	6-4 1/2	670	+352	
T. 119, R. 64, sec. 23 <sup>7</sup>	do	993	6-4 1/2	1,300	+311	
T. 119, R. 63, sec. 32 <sup>7</sup>	do	920	4 1/2-3	2,894	Flows.	
T. 117, R. 64, sec. — <sup>7</sup>	do	987		Many.	Flows.	
T. 117, R. 62, sec. 32	do	950	4 1/2	350	Flows.	
T. 116, R. 62, sec. 4	do	895	4 1/2	600	Flows.	
T. 115, R. 61, sec. 7	do	1,050	8-4 1/2	75	+200	
T. 114, R. 63, sec. 26 <sup>7</sup>	do	909		1,200	Flows.	
T. 114, R. 62, sec. 18 <sup>7</sup>	do	1,000	6-4 1/2	150	+288	
T. 114, R. 63, sec. 32 <sup>7</sup>	do	1,150	6-4 1/2	550	+115	
T. 114, R. 62, sec. 30	do	909	4 1/2	1,000	+345	
Fort Randall <sup>8</sup>	Todd	610	4	600	Flows.	
Yankton (Excelsior Mill).	Yankton	493	8	3,060	+120	
Yankton (Fountain Mill). <sup>9</sup>	do	600	6	1,500	+110	
Yankton (Asylum). <sup>9</sup>	do	672	4 1/2	165	+23	
Yankton (city well). <sup>9</sup>	do	942	6	880	+41	

<sup>1</sup> Record, U. S. Geol. Survey, 17th Annual Report, part 2, p. 24.<sup>2</sup> Ibid., pp. 29-30.<sup>3</sup> Ibid., pp. 22-23.<sup>4</sup> Ibid., p. 181.<sup>5</sup> Record, U. S. Geol. Surv., 18th Annual Report, 1897, part 4, p. 575.<sup>6</sup> Records, U. S. Geol. Surv., 17th Annual Report, 1896, part 2, pp. 31-33.<sup>7</sup> Ibid., pp. 19-20.<sup>8</sup> Ibid., p. 58.<sup>9</sup> Record, U. S. Geol. Surv., 17th Annual Report, 1896, part 2, pp. 53, 58.



## SOUTH DAKOTA—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Yankton (College Hill).	do	524	2	2,600	+62	
Yankton (Wilcox well).	Yankton	455	3	330	+127	
Yankton (Donaldson well).	do	525	4½		Flow.	
T. 93, R. 56, sec. 12	do	475	2	6	Flow.	
T. 93, R. 56, sec. 17	do	400	2	500	Flow.	
T. 93, R. 56, sec. 16 <sup>1</sup>	do	500	6-5	1,300	+115	
T. 93, R. 55, sec. 8	do	521	3	350	+113	
T. 93, R. 54, sec. 18 <sup>1</sup>	do	422	3½-3	120	Flow.	
T. 94, R. 55, sec. 19 <sup>1</sup>	do	648	2	4	Flow.	
T. 93, R. 54, sec. 11	do	450	2	80	Flow.	
T. 94, R. 55, sec. 18	do	480	2	55	+23	
T. 94, R. 55, sec. 22	do	522	2	30	Flow.	
T. 94, R. 55, sec. 21	do	435	2	100	Flow.	
T. 94, R. 54, sec. 36	do	495	2	75	Flow.	
T. 95, R. 55, sec. 8	do	535	2	50	Flow.	

## PUBLICATIONS RELATING TO DEEP BORINGS IN SOUTH DAKOTA.

Report on Irrigation, 52d Congress, 1st session, Senate Ex. Doc. No. 41, part 2, pp. 40-65, Washington, 1893.

Preliminary Report on the Artesian Waters of a Portion of the Dakotas, by N. H. Darton, United States Geological Survey, Seventeenth Annual Report, 1895-96, part 2, pp. 609-694, Washington, 1896.

New Development in Well Boring and Irrigation in South Dakota, by N. H. Darton, United States Geological Survey, Eighteenth Annual Reports, 1896-97, part 4, pp. 567-615, Washington, 1897.

Geology and Water Resources of a portion of Eastern South Dakota, by J. E. Todd, United States Geological Survey, Water-Supply and Irrigation Papers, No. 34, 34 pages, plates and maps, Washington, 1900.

## TENNESSEE.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Bells	Crockett	1,100				Prospect well; unsuccessful.
Chattanooga	Hamilton	600	10-8	50	-45	Abandoned.
Crockett Mills	Crockett	+900	3		No flow.	Three oil wells.
Dull (2 miles from)	Dickson	565	4½			Oil well.
Do	do	2,000	4½			Do.
Dyersburg <sup>2</sup>	Dyer	600		140	Flows.	Do.
Do	do	600		130		Do.
Glen Mary (2 miles west). <sup>3</sup>	Scott	1,236-1,340				Oil wells; several others in Scott County.
Do	do	600				For oil; unsuccessful.
Helenwood(?)	do	1,500				Oil well.
Hurricane Creek <sup>2</sup>	Union(?)	530				For oil or gas.
Iron City	Lawrence	400	12			For gas; not in use.
Do	do	480				Unsuccessful.
Kingston Springs	Cheatham	1,000				Temp. 57°.
Knoxville	Knox	2,100				Several wells.
Memphis	Shelby	450-400	8-6	200-100		
Do. <sup>4</sup>	do	+1,156				Several wells for oil; abandoned.
Do	do	3,000-2,000				Several wells for oil. Sulphur; temp. 45°; bored in 1830.
Rugby	Morgan					Oil well.
Saltillo	Hardin	950	36-6	Many.	Flows.	
Tullahoma	Coffee	700				

<sup>1</sup> Record, U. S. Geol. Surv., 17th Annual Report, 1896, part 2, pp. 53, 58.

<sup>2</sup> Tennessee, Comm'r Ag. Rept., Oil Region, 1877, pp. 54, 73.

<sup>3</sup> U. S. Geol. Surv., 17th Ann. Rept., 1895-96, part 3, pp. 699-700.

<sup>4</sup> Tennessee, State Board of Health, Bulletin, vol. 5, 1890, pp. 98-106.

## TEXAS.

Location.	County.	Depth.	Diam-eter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Abbott (1½ miles N.).	Hill	446	-----	20	—160	
Do	do	486	-----	Several	—186	
Abilene	Taylor	2,500	-----	-----	-----	
Albany	Shackelford	400	-----	Few.	-----	
Alta Loma	Galveston	875-950	9	310	22	Numerous wells. Temp. 75°-78°.
Alvarado	Johnson	1,500	-----	-----	Flows.	
Alvin (4 miles north).	Brazoria	502	2	70	-----	
Aquilla	Hills	600	-----	Few.	Flows.	
Do	do	800	-----	Several	Flows.	
Archer City	Archer	550	6	Few.	— 50	Alkali water.
Do. <sup>1</sup>	do	736	-----	-----	No flow.	
Do	do	500	-----	-----	-----	Salt water only.
Arcola	Fort Bend	+910	-----	300	Flows.	
Argyle (1½ miles east)	Denton	900	-----	-----	Flows.	Soft water.
Arlington	Tarrant	1,480	-----	21	-----	Strong mineral water.
Aul <sup>2</sup>	Bexar	673	-----	-----	— 4	
Austin (Fifth and Jacinto streets). <sup>3</sup>	Travis	2,020	-----	175	Flows.	
Austin (asylum).	do	1,280	-----	-----	-----	
Austin (poorhouse)	do	1,300	-----	5	No flow.	
Austin	do	471	-----	5	-----	
Do	do	1,450	-----	5	-----	
Austin (East Fifth street).	do	700	-----	14	Flows.	In progress 1897; sulphur water.
Austin (Natatorium). <sup>4</sup>	Travis	2,025	10-8-7-6	175	Flows.	Main flow at 1,875 feet; temp. 100°.
Austin (Asylum). <sup>4</sup>	do	1,975	-----	+104	+40	
Austin <sup>4</sup>	do	2,053	-----	-----	— 5	
Do	do	1,280	-----	-----	-----	
Austin (near)	Kinney	400	-----	-----	-----	Several wells.
Baileyville	Milan	800	-----	-----	-----	Failure.
Baileyville (3 miles west).	do	831	-----	-----	No flow.	Water very salty.
Baird	Callahan	415	8	-----	-----	Abandoned.
Bastrop	Bastrop	+900	-----	-----	-----	No water.
Barstow	Ward	+500	-----	-----	No flow.	
Batesville	Zavalla	700	-----	-----	—300	
Bedford (2 miles S.).	Tarrant	602½	-----	-----	Flows.	Soft water.
Belcherville	Montague	900-1,200	-----	70	Flow.	Three wells; soft water.
Belton (9 miles W.).	Bell	700	-----	-----	Flows.	
Belton (10 miles SE.).	do	1,800	-----	Many.	Flows.	
Belton (2 miles NE.).	do	1,000	-----	-----	Flows.	
Belton (19 miles W.).	do	530	-----	-----	Flows.	
Belton (9 miles SW.).	do	772	-----	70	Flows.	
Belton <sup>5</sup>	do	975	4	173.6	Flows.	Soft water.
Belton (1 mile SW.).	do	1,060	-----	347	Flows.	Do.
Belton (1 mile S.).	do	1,000	-----	-----	Flows.	
Big Spring	Howard	603	7	-----	-----	Salt water at 300 feet; abandoned.
Birdville	Tarrant	406	-----	-----	No flow.	Soft water.
Birdville (1 mile N.).	do	486	-----	-----	— 20	Do.
Birdville (one-half mile from).	do	420	-----	Many.	Flowed once.	
Blum (4½ miles E.).	Hill	532	-----	-----	—200	
Bolivar	Denton	1,176	-----	-----	Flows.	
Bonham	Fannin	+400	-----	-----	-----	
Do	do	+400	-----	-----	-----	
Do	do	1,500	-----	-----	-----	No water.
Bowie	Montague	700	-----	-----	—160	
Bowie (one-half mile west).	do	600	-----	-----	-----	
Boyce (1½ miles west)	Ellis	981	-----	1½	Flows.	Soft water.
Do	do	975	-----	-----	Flows.	Do.
Brackettville (7 miles from). <sup>6</sup>	Kinney	404	-----	Several.	-----	
Brambleton	Tarrant	485	-----	-----	—130	Do.
Branchville (4 miles east).	Milan	-----	-----	-----	Flows.	
Do	do	700	-----	-----	— 6	
Breckenridge	Stephens	1,400	-----	-----	-----	Failure.

<sup>1</sup> Record, 51st Congress, 1st session, Senate Ex. Doc. No. 222, p. 262, Washington, 1890.<sup>2</sup> Record, U. S. Geol. Surv., 18th Ann. Rept., 1896-97, Part II, p. 272, Washington, 1898.<sup>3</sup> Ibid., pp. 280-283.<sup>4</sup> U. S. Geol. Surv., 18th Ann. Rept., 1896-97, Part II, pp. 280, 284, Washington, 1898.<sup>5</sup> Record, Artesian waters of Texas west of the 97th meridian, by R. T. Hill, 52d Congress, 1st session, Senate Ex. Doc. No. 41, part 3, p. 116, Washington, 1893.<sup>6</sup> Record, U. S. Geol. Surv., 18th Ann. Rept., 1896-97, part 2, p. 278, Washington, 1898.

## TEXAS—Continued.

Location.	County.	Depth.	Dia- me- ter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Bremond .....	Robertson .....	1,500	-----	-----	No flow.	Some water.
Brenham .....	Washington .....	600	-----	-----	-----	Failure.
Brownville (50 miles northwest).	Hidalgo .....	70	-----	-----	No flow.	-----
Brownwood (north- east of).	Brown .....	1,900	-----	-----	-----	Oil borings; some gas.
Brownwood .....	do .....	1,938	10-6	32	+74	-----
Do .....	do .....	1,558	-----	-----	-----	Failure.
Do .....	do .....	1,803	-----	-----	-----	Do.
Bruceville .....	McLennan .....	1,560	6	-----	+125	-----
Do .....	do .....	1,565	-----	139	Flows.	Soft water; temp. 95°.
Bryan (16 miles south).	Burleson .....	870	2	22	Flows.	-----
Bryan (12 miles from)	do .....	835	2	35	+30	Temp. 85°.
Do .....	do .....	635	2	22	+25	Temp. 76°.
Do .....	do .....	550	7	15	+20	Do.
Burke .....	Angelina .....	500	-----	-----	-----	Salt water; aban- doned.
Burleson (1 mile west).	Johnson .....	500	-----	-----	No flow.	Soft water.
Burleson (2½ miles west).	do .....	465	-----	Many.	No flow.	Do.
Call .....	Newton .....	700	-----	Several.	Flows.	-----
Calvert <sup>1</sup> .....	Robertson .....	460	-----	-----	-30	-----
Do. <sup>2</sup> .....	do .....	585-620	4	Many.	Flow.	Several wells.
Calvert (5 miles southwest).	do .....	510	1	Many.	Flow.	Several wells in vi- cinity.
Do .....	do .....	900	1	-----	-20	-----
Calvert (5 miles west)	do .....	400	-----	-----	-20	-----
Do .....	do .....	800	-----	-----	-100	-----
Cayote (3 miles northeast).	Bosque .....	439	-----	-----	No flow.	-----
Cedar Bayou .....	Harris .....	558	3	-----	-----	-----
Do .....	do .....	600	3	-----	Flows.	-----
Do .....	do .....	727	3	5	Flows.	Temp. 76°.
Do .....	do .....	610	3	30	-----	Do.
Cedar Hill (19 miles southwest).	Dallas .....	750	-----	Many.	-300	Soft water.
Celina .....	Collin .....	470	-----	7.7	-145	Do.
Celina (1 mile west)	do .....	400	-----	-----	-100	Do.
China Springs .....	McLennan .....	1,380	-----	-----	Flows.	Another flow at 800 feet; temp. 102°.
Do .....	do .....	1,100	-----	40	Flow.	Two (?) wells.
Cisco .....	Eastland .....	1,680	8	-----	-25	Salt water.
Clarksville .....	Red River .....	1,060	-----	-----	Flows.	Brackish water; abandoned.
Do .....	do .....	+1,050	-----	-----	-10	Salty water.
Do .....	do .....	+1,200	-----	-----	to -12	-----
Cleburne .....	Johnson .....	970-1,003	-----	70	-40 to -70	Abandoned. Many wells.
Cleburne (6 miles south).	do .....	520	-----	Many.	No flow.	Soft water.
Cleburne (5 miles southeast).	do .....	568	-----	-----	-168	Do.
Cleburne (3 miles southwest).	do .....	420	-----	Many.	-160	Do.
Cleburne (3 miles northwest).	do .....	424	-----	Many.	-274	-----
Clifton .....	Bosque .....	640	-----	170	Flows.	-----
Do .....	do .....	700	-----	Many.	-----	Temp. 70°.
Clifton (3 miles N.)	do .....	662	-----	220	Flows.	Temp. 84°; soft water.
Clifton (1 mile west)	do .....	715	-----	60	Flows.	Soft water.
Clifton (3½ miles N.)	do .....	670	-----	170	Flows.	-----
Clifton (8 miles S.E.)	do .....	840	-----	170	Flows.	-----
Clifton (3 miles W.)	do .....	612	-----	-----	Flows.	Do.
Clifton (1 mile W.)	do .....	687	-----	-----	Flows.	Do.
Clifton .....	do .....	700	-----	Many.	-----	Temp. 70°.
Clifton (three- fourths mile west).	do .....	700	-----	11	Flows.	Soft water.
Colorado <sup>3</sup> .....	Mitchell .....	1,120	-----	-----	-----	Several deep salt wells.
Commerce .....	Hunt .....	2,300	-----	-----	-----	-----
Comstock (20 miles from). <sup>4</sup>	Valverde .....	569	-----	-----	-----	-----

<sup>1</sup> Record, 51st Congress, 1st session, Senate Ex. Doc. No. 222, p. 266, Washington, 1890.<sup>2</sup> Record, Texas Geol. Surv., 4th Ann. Rept., 1892, p. 169.<sup>3</sup> Record, U. S. Geol. Surv., 18th Ann. Rept., 1896-97, Part II, p. 265, Washington, 1898.<sup>4</sup> Record, 51st Congress, 1st session, Senate Ex. Doc. No. 222, p. 264, Washington, 1890.

## TEXAS—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Coperas Cove	Coryell	1,865			—100	Brackish water.
Coperas Cove (4 miles north).	do	500		Many.	No flow.	Salty water.
Coperas Cove	do	1,875			—475	
Cornhill	Williamson	404			—282	
Corpus Christi	Nueces					
Do	do	1,765		50		Mineral water at about 600 feet only.
Do	do	525		300		
Do	do	560		100		
Corsicana	Navarro					
Corsicana (3 miles west).	do	2,500				
Corsicana	do	2,477				Several wells.
Do	do	1,000-1,200				Many oil wells.
Do	do	2,483		208	+150	Water, gas, and oil; temp. 126°.
Do	do	2,150		208		Oil at 1,100 feet.
Do	do	2,487		Many.		
Do	do	2,500		+194.4	+85	Temp. 126° F.
Do	do	1,035				Oil well.
Corsicana (3 miles west).	do	2,300				
Coryell (3 miles east)	Coryell	940		Many.	—50	Soft water.
Cotulla <sup>1</sup>	Lasalle	825			Flows.	Bad water.
Do	do	1,010		55.5		
Do	do	852				
Do	do	800		2	Flows.	Do.
Do	do	1,008		Many.	+6	Temp. 86° F.; alkaline-saline water.
Cotulla (8 miles S.)	do	600			—100	Bad water.
Crawford (4 miles west).	McLennan	1,000		31		Soft water.
Do	do	1,040		31		Do.
Do	do	945		140		Temp. 72° F.; two wells.
Do	do	1,060		50		Soft water.
Crockett	Houston	630	5-3	Many.	—190	
Crowley	Tarrant	486		3	No flow.	Soft water.
Crowley (3 miles northwest).	do	446			—150	Do.
Crowley (7 miles southwest).	do	430			No flow.	Do.
Crowley (2 miles from).	do	484	2		—134	Do.
Cyrus (1 mile east)	Bosque	1,000		Many.	Flows.	
Dallas (1 mile east)	Dallas	850		70	Flow.	Two wells.
Dallas (6 miles west-northwest).	do	+400		Many.	Flows.	
Dallas	do	790-1,000		Many.	Flows.	Numerous wells.
Do	do	718			Flows.	Much soda in water.
Do	do	700		12	Flows.	
Dallas (City Park)	do	672		15	Flows.	
Dallas	do	±2,500				
Dallas (1 mile south)	do	850		70	Flow.	Two wells.
Dallas (6 miles west-northwest).	do	±400		Many.	Flows.	
Davenport	Guadalupe	810			—180	Good water.
Del Rio <sup>2</sup>	Valverde	760			—60	Mineral waters.
Del Rio (30 miles N.)	do	475			—300	
Del Rio (3 miles S.)	do	460			Flows.	Sulphur water.
Denison (1 mile S.) <sup>3</sup>	Grayson	1,800	2½			Abandoned.
Denton	Denton	460			+15	
Do	do	550	6	6	+20	
Do	do	600		Few.		
Do	do	620		8	Flows.	
Do	do	600			Flows.	
Do	do	606			Flows.	
Derby	Frio	540		Many.	—35	
Dickinson <sup>4</sup>	Galveston	600	3		14	Flows.
Do	do	624	3		40	Flows.
Dickinson (3 miles W.)	do	700	3	34.7	Flows.	
Dickinson (one-fourth mile west).	do	588	1		Flows.	
Dryden	Pecos	1,797	7½-4	18	—600	

<sup>1</sup> Texas, Geol. Surv., 2d Ann. Rept., 1891, p. 71; Analysis, 51st Congress, 1st session, Senate Ex. Doc. No. 222, p. 272, Washington, 1890.

<sup>2</sup> U. S. Geol. Surv., 18th Ann. Rept., 1896-97, Part II, pp. 265, 299, Washington, 1898.

<sup>3</sup> Record, *ibid.*, 21st Annual Report, 1899-1900, part 7, p. 197, Washington, 1901.

<sup>4</sup> Analysis, Texas Geol. Surv., 4th Ann. Rept., 1892, p. 104.

## TEXAS—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Dryden .....	Pecos .....	590		Many.	-539	
Dublin .....	Erath .....	400			-8	
Eagleflat .....	El Paso .....	680				No water.
Eagleford .....	Dallas .....	417		800	+35	Soft water.
Eagle Pass <sup>1</sup> .....	Maverick .....	1,508				Salty water.
Do .....	do .....	400				Abandoned.
Eastland <sup>2</sup> .....	Eastland .....	500				Abandoned.
Do .....	do .....	1,300	6		No flow.	Salt water.
Do .....	do .....	400			Flows.	Mineral water.
Eden .....	Concho .....	987		7	Flows.	Salty water.
Do .....	do .....	800				Oily water; abandoned.
Eddy .....	McLennan .....	1,565		208	Flows.	Soft water.
El Paso (N.W. of) .....	El Paso .....	800				In granite; no water.
El Paso (10 miles N.E.) <sup>3</sup> .....	do .....	621			-215	
Encinal .....	Webb .....	900			-200	Good water.
Enon .....	Tarrant .....	442			-142	
Enon (1 mile west) .....	do .....	430		5	-60	
Enon (3 miles N.E.) .....	do .....	460		Many.	-90	Soft water.
Estelle .....	Dallas .....	970			Flow.	Soft water.
Eulogy .....	Bosque .....	780			34	Flows.
Do .....	do .....	529			30	Flows.
Eulogy (1 mile north) .....	do .....	475			Flows.	Do.
Eulogy (three-fourth mile north) .....	do .....	460		10	Flows.	
Eulogy (one-fourth mile west) .....	do .....	430		68	Flows.	Do.
Fairwood <sup>4</sup> .....	Galveston .....	575	3	50	Flows.	Temp. 78½°.
Farr (2 miles south) .....	McLennan .....	1,065		10	Flows.	
Ferris .....	Ellis .....	1,360		89	Flows.	
Finlay <sup>5</sup> .....	El Paso .....	1,080	8			Bad water at 396 feet; abandoned.
Forreston .....	Ellis .....	400				No water.
Fort Bliss Station .....		403	4½	Many.	-130	
Fort Worth <sup>6</sup> .....	Tarrant .....				-50	
Do .....	do .....	484				
Do .....	do .....	450				
Do .....	do .....	465		30	Flows.	
Do .....	do .....	950-1,400	10 to 4	140	Flow.	Several wells.
Do .....	do .....	4,000				No flow below 1,200 feet; temp. 140° at 3,250 feet.
Do .....	do .....	760				
Fort Worth (3 miles north) .....	do .....	1,200				
Fort Worth (10 miles east) .....	do .....	480	4½	+208		
Fort Worth (12 miles southeast) .....	do .....	534			-450	
Fort Worth (7 miles south) <sup>7</sup> .....	do .....	+400				
Fowler (1½ miles N.) .....	Bosque .....	735		123	Flows.	Soft water.
Frankfort (2 miles southwest) .....	Collin .....	442			-50	Salty water.
Franklin .....	Robertson .....	1,200			No flow.	
Freeland (2 miles S.) .....	Johnson .....	500		15	Flows.	Soft water.
Freeland (2½ miles S.) .....	do .....	618		18	Flows.	
Freeland (1½ miles S.) .....	do .....	585		65	Flows.	Good water.
Freeland (1½ miles W.) .....	do .....	548		12	Flows.	Soft water.
Gainesville .....	Cooke .....	+1,250			-40	In progress.
Do .....	do .....	850		243	-10	
Do .....	do .....	480			-40	
Do .....	do .....	405		69	No flow.	
Do .....	do .....	632		Many.	-7	
Do .....	do .....	700			-30	
Do .....	do .....	850		6		
Galveston <sup>8</sup> .....	Galveston .....	3,070	22-6	Many.	Flows.	Brackish water at various depths to bottom.
Do .....	do .....	1,346		400	Flows.	Salty water.

<sup>1</sup> Record, 51st Congress, 1st session, Senate Ex. Doc. No. 222, p. 266, Washington, 1890.<sup>2</sup> Ibid., pp. 268, 269.<sup>3</sup> Record, 51st Congress, 1st session, Senate Ex. Doc. No. 222, p. 297, Washington, 1890.<sup>4</sup> Analysis, Texas Geol. Surv., 4th Ann. Rept., 1892, p. 102.<sup>5</sup> Analysis, 51st Congress, 1st session, Senate Ex. Doc. No. 222, p. 272, Washington, 1890.<sup>6</sup> Record, Artesian Waters of Texas west of 97th meridian, by R. T. Hill, 52d Congress, 1st session, Senate Ex. Doc. No. 41, Part 3, pp. 105-106, Washington, 1893.<sup>7</sup> Fifty-first Congress, 1st session, Senate Ex. Doc. No. 222, p. 270, Washington, 1890.<sup>8</sup> Records, analysis, etc., Texas Geol. Surv., 4th Ann. Rept., 1892, pp. 87-101; U. S. Geol. Survey, 21st Annual Report, 1899-1900, part 7, pp. 402-406, Washington, 1901.

## TEXAS—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
Galveston .....	Galveston	<i>Feet</i> 810-973	<i>Inches.</i>	<i>Gallons.</i> Many.	<i>Feet.</i> Flow.	Several wells; water too salty.
Galveston (2½ miles west).	do	1,365		250	Flows.	Temperature 84°.
Gatesville .....	Coryell	500-550	6	2-20	Flow.	Several wells.
Do .....	do	700		175		
Do .....	do	475			No flow.	Soft water.
Gatesville (8 miles W.)	do	612				Do.
Gatesville (6 miles southeast).	do	558		4	Flows.	
Georgetown (2 miles east).	Williamson	520		15		
Godley (5 miles S.)	Johnson	420		Many.	No flow.	Do.
Goldthwaite .....	Mills	563	10-7		-20	
Do .....	do	600				
Do .....	do	563	10-7		-20	
Gonzales .....	Wilson	1,400		15	+60	Flows at 650, 950, 1,300, and 1,400 feet.
Do .....	do	625	10-8	30	Flows.	
Gonzales (1 mile N.)	do	1,135		Many.	-60	
Gordon .....	Palo Pinto	485		1	+23	Salt water.
Do .....	do	498	1	1	+23	Salt water and gas.
Grapevine .....	Tarrant	423			No flow.	Soft water.
Gravis (1½ miles S.)	Williamson	412		3	-96	Sulphur water.
Greenway (one half mile west).	Johnson	590		45		Soft water.
Greenway (one-half mile northwest).	do	602		22	Flows.	Do.
Hamilton .....	Hamilton	425				Water only at 350 feet to -8 feet.
Handley .....	Tarrant	509			-25	Soft water.
Hallettsville .....	Lavaca	300-560			Flow.	
Harmosa .....	McLennan	1,730		139		Soft water; temp. 103°.
Hartley .....	Hartley	410	5	17		
Haskell .....	El Paso	2,029	12-7½	Few.	No flow.	
Haslett (1 mile S.)	Tarrant	430			-255	Soft water.
Haslett (3 miles SE.)	do	480		3	-258	
Hearne .....	Robertson	740			Flows.	Many wells in vicinity.
Do .....	do	400-450	4		Flow.	Several wells.
Do .....	do					
Do .....	do	450-700	2	3 to 10	+10-+40	Do.
Hearne (8 miles S.)	do	300-700		3	Flows.	
Hearne (12 miles northwest).	do	300-700		3	Flows.	
Heffron .....	Galveston	480	3	52	+16	Temp. 60° ±
Hemming .....	Cooke	426		100	Flows.	Soft water.
Hico .....	Hamilton	1,365	12		-125	Water at 210, 300, 600, and 900 feet.
Do .....	do	1,200			No flow.	
Hidalgo .....	Hidalgo	700			-100	
Hillsboro .....	Hill	1,800			Flows.	
Do .....	do	1,762		34.7	Flows.	
Do .....	do	500				Failure.
Hitchcock¹ .....	Galveston	726		66	Flows.	Temp. 77°; many wells in vicinity.
Hitchcock (1½ miles northwest).	do	710		100	Flows.	Temp. 77°.
Do .....	do	768		48	Flows.	Temp. 78°.
Holland (10 miles S.)	Bell	1,800		10	Flows.	Salt water.
Honeygrove .....	Fannin	1,700		Many.		Strong mineral water.
Do .....	do	1,650		Many.	-50	Do.
Do .....	do	1,500				
Do .....	do	1,000			-300	Salty water; not in use.
Do .....	do	1,200			No flow.	
Hondo .....	Medina	1,000				No water.
Do .....	do	1,500		Many.	-175	
Houston .....	Harris	493	8	120	Flows.	
Do .....	do	564	8	130	Flows.	
Do .....	do	850	5	200	Flows.	
Do .....	do	500 or less.			Flows.	Fine water.
Do .....	do	700				
Houston (3 miles from).	do	600		42		Temp. 70°.
Hubbard .....	Hills	3,166			Flows.	

¹ Analyses, etc., Texas Geol. Surv., 4th Ann. Rpt., 1892, pp. 102-103.

## TEXAS—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Hueco	El Paso	431				Bad water; abandoned.
Hueco (20 miles NNE.)	do	572		Many.		Bad water.
Humble	Harris	606	3½	50	Flows.	Fresh water.
Huntsville	Walker	2,210	9-3	Many.	-100	
Hurst Lake	Coryell	500				
Italy	Ellis	1,400			-10	Soft water.
Itasca	Hills	1,800			Flows.	
Do	do	1,680		160	+35	
Jefferson	Marion	1,802		Few.	Flows.	Sulphur water.
Joshua (3 miles west)	Johnson	525			No flow.	Soft water.
Joshua (6 miles NW.)	do	454			-189	
Kaufman	Kaufman	600				Failure.
Kaufman (1 mile NW.)	do	600				Do.
Kearnes	Kearnes	1,800				Do.
Keechi	Jack	400		20	-400	Soft water.
Keene	Johnson	750			-300	Do.
Keller	Tarrant	400				
Do	do	457		50	-50	
Do.	do	430				
Keno	Liberty	700				No water below 90 feet; abandoned.
Kerrville	Kerr	1,325			-75	Good water at 750 feet.
Kerrville (9½ miles northeast). <sup>2</sup>	do	1,100		Several.	-55	Granite below 180 feet.
Killeen	Bell	606			-60	
Kimball	Bosque	550-630			Flow.	Several wells.
Kimball (6 miles west)	do	554		60	+20	Soft water.
Kopperl	do	400			Flows.	
Kopperl (1 mile east)	do	600		800	Flows.	
Kopperl	do	625		150	Flows.	Do.
Kopperl (3¼ miles W.)	do	609		200	Flows.	Slightly brackish.
Kopperl	do	525			Flows.	
Krum (2½ miles south)	Denton	450			No flow.	
Ladonia	Fannin					
Do	do	1,033				Never completed.
Lancaster	Dallas	1,057			Flows.	Soft water.
Lanham	Hamilton	470				Abandoned.
Do	do	500				Do.
Do	do	600				
Lanoria <sup>3</sup>	Mesa	621			-215	
Laporte	Harris	454		41	Flows.	
Do	do	440	3	80	Flows.	
Laredo	Webb	1,200			No flow.	
Lebanon	Collin	400		Many.	-100	
Llano (9 miles SE.)	Llano	500			+2	Coal prospect; abandoned.
Longfellow	Pecos	683	8	20	No flow.	
Lorena	McLennan	1,495		Many.	Flows.	Soft water.
Lorena (5 miles west)	do	760		Few.	Flows.	Salt water.
Lorena	do	1,495		Many.	Flows.	Soft water.
Lozier	Pecos	770	7½	Few.	No flow.	
Lufkin	Angelina	1,300				No water; abandoned.
Manor <sup>4</sup>	Travis	2,220	6	69	+30	Temp. 93°.
Marine (½ mile NE.)	Tarrant	1,200		545	Flows.	Temp. 78°; soft water.
Marlin	Falls	3,350		140	+322	Temp. 147°.
Marshall	Harrison	1,000			No flow.	
Maxon Springs	Buchel	1,004	9½-4½	Several.		Not in use.
Maysfield	Milan	1,356	4	Many.	-34	
McGregor	McLennan	1,030		139	-10	Soft water.
Do	do	470			Flows.	
Do	do	991		348		
McGregor (5 miles west.)	do	490		Many.	-11	Do.
McKinney	Collin	1,860		21	-70	Soft water.
Menardville (near)	Brown	1,100				Found water, etc., but well now caved in.
Menardville	Menard	1,175				Oil boring unsuccessful.
Meridian	Bosque	450-580		25-45	Flow.	Several wells; soft water.
Meridian (10 miles E.)	do	850		16	Flows.	
Meridian (12 miles E.)	do	875			-42	Soft water.

<sup>1</sup> Record, Artesian waters of Texas west of 97th meridian, by R. T. Hill, 52d Congress, 1st session, Senate Ex. Doc. No. 41, Part 3, p. 104, Washington, 1893.<sup>2</sup> U. S. Geol. Surv., 18th Ann. Rept., 1896-97, Part II, p. 271, Washington, 1898.<sup>3</sup> Record, 51st Congress, 1st session, Senate Ex. Doc. 222, p. 297.<sup>4</sup> Record, U. S. Geol. Surv., 18th Ann. Rept., 1896-97, Part 2, pp. 285-286, Washington, 1898.

## TEXAS—Continued.

Location.	County.	Depth.	Diam-eter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Merkel .....	Taylor	+2,000				
Miami .....	Roberts	—500				Several wells in county.
Midlothian .....	Ellis	464			—200	
Milford .....	do	2,018			Flows.	Mineral water?
Mineola <sup>1</sup> .....	Wood	1,200	6-3		—40	
Moody .....	McLennan	1,508		69	No flow.	Soft water.
Do .....	do	1,300			No flow now.	
Do .....	do	1,450			—15	
Morgan <sup>2</sup> .....	Bosque	600		100	Flows.	Soft water.
Do .....	do	580-620		20-150	Flow.	Several wells; soft water.
Morgan (1 mile SE.) .....	do	575		170	Flows.	
Morgan .....	do	800		50	Flows.	
Morgan (5 miles east) .....	do	780		40	Flows.	
Morgan (12 miles E.) .....	do	501		100	Flows.	
Morris Ranch <sup>3</sup> .....	Gillespie	1,100			—55	
Mound (2 miles NE.) .....	Coryell	697			—5	Mineral water.
Mountain Peak (½ mile southwest) .....	Ellis	435		Many.	No flow.	Soft water.
Mumford .....	Robertson	300-1,000		2-12		Several wells.
Myers .....	Burleson	440	1-2	2		Temp. 60°.
Do .....	do	860	4-2	30	+20	Temp. 90°.
Myrtle Springs .....	Van Zandt	650				Unsuccessful.
Navasota <sup>4</sup> .....	Grimes	830			To surface.	
Navasota (16 miles N.) .....	do	999		Many.	Flows.	
Newlin Station .....	Hall	550	6			Four layers of salt water; abandoned.
Neri (2 miles south) .....	Hood	415			No flow.	Soft water.
Newark .....	Wise	410	5	1	+14	Temp., 65°.
New Boston .....	Bowie	1,200			—75	
Norse (4 miles SW.) .....	Bosque	622			No flow.	Soft water.
North Galveston .....	Galveston	575-1,590	3	70 each.	Flow.	Several wells.
Oak Grove (1 mile S.) .....	Tarrant	500		3½	—72	Soft water.
Ocece (1 mile east) .....	McLennan	1,098	6	160	Flows.	Do.
Odessa .....	Ector	830	8			Abandoned.
Oglesby (2½ miles northwest-west). <sup>5</sup> .....	Coryell	500			No flow.	Soft water.
Orphans' Home Station (2 miles SE.) .....	Dallas	685			No flow.	Very salty water.
Orphans' Home Station .....	do	1,230			—40	Mineral water.
Palestine .....	Anderson	650	6	Few.	—200	
Palestine (1½ miles) .....	do	444	8-6	121	No flow.	Several wells.
Palmer .....	Ellis	1,154		+ 9	Flows.	Soft water.
Do .....	do	1,154			Flows.	Do.
Do .....	do	1,178		83	Flows.	Do.
Panhandle City .....	Carson	600				Unsuccessful.
Paris .....	Lamar	444				Abandoned.
Do .....	do	1,350		Many.	—5	
Park Springs .....	Wise	400	6	Many.	—60	
Pearsall .....	Frio	600		15	Flows.	
Do .....	do	400		30	Flows.	
Do .....	do	650		30	Flows.	
Do .....	do	620			—20	
Pearsall (15 miles E.) .....	do				Flow.	Several wells.
Pearsall (20 miles SE.) .....	do	(?)				
Pecangrove .....	Coryell	590			Flows.	
Pecos <sup>6</sup> .....	Pecos	683		20		
Do .....	do	987		28		Good water.
Do .....	do	1,797		16		Do.
Do .....	do	770		16		
Pecos (4 miles W.) .....	Reeves	400			No flow.	
Pierce Station .....	Wharton	850 or 900				
Pilotpoint .....	Denton	937		17	—25	Soft water.
Pilotpoint (8 miles northwest) .....	Cooke	426		1		Do.
Port Arthur .....	Jefferson	±800	5		Flows.	Mineral water; temp. 80°.
Pottsboro (7 miles west) .....	Grayson	±500		Many.	Flows.	Pure water.
Prosper .....	Collin	470		Many.	No flow.	Soft water.

<sup>1</sup> Geol. Surv. of Texas (Report on the Brown coal and lignite of Texas), pp. 132-135, 1892.<sup>2</sup> Record, 51st Congress, 1st session, Senate Ex. Doc. No. 222, p. 269, Washington, 1890.<sup>3</sup> Record, U. S. Geol. Surv., 18th Ann. Rept., 1896-97, Part II, p. 272, Washington, 1898.<sup>4</sup> Record, 51st Congress, 1st session, Senate Ex. Doc. No. 222, p. 235, Washington, 1890.<sup>5</sup> Record, 51st Congress, 1st session, Senate Ex. Doc. No. 222, p. 283, Washington, 1890.<sup>6</sup> Record, etc., U. S. Geol. Surv., 18th Ann. Rept., 1896-97, Part II, p. 267, Washington, 1898.



## TEXAS—Continued.

Location.	County.	Depth.	Diam-eter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Prosper ( $\frac{1}{2}$ mile east).	Collin	660		4	-244	Soft water.
Quintana	Brazoria	650				
Kandol (1 mile N.E.)	Tarrant	546			-10	Sulphur water.
Randol (one-half mile southwest.)	do	525		156	Flows.	
Randol (3 miles SW.)	do	420			Flows.	Soft water.
Randol (one-half mile north).	do	505	4		Flows.	Do.
Refugio <sup>1</sup>	Refugio	853		104	Flows.	
Refugio	do	956		104	Flows.	
Do	do	1,000		347	Flows.	
Rendon (2 miles N.)	Johnson	535		Many.	No flow.	Do.
Riovista (1 mile N.E.)	do	460		Many.	No flow.	Do.
Riovista (3 miles E.)	do	540			-176	Do.
Roanoke (west.)	Denton	476			-33	
Roanoke	do	400-600		40-50	Flows.	Several wells.
Roanoke (one-half mile south).	do	505			-16	
Rocksprings	Edwards	400		Many.	No flow.	Two wells.
Do	do	450		Many.	No flow.	Do.
Rogers	Bell	+1,600			Flow.	
Roundrock	Travis	400		1	No flow.	
Roundrock	Williamson	1,400			-4	
Rusk	Cherokee	620				Abandoned.
Sabinal	Walde	529				
Salado (5 miles SE.)	Bell	412			-397	
San Angelo	Tom Green	960				
San Antonio <sup>2</sup>	Bexar	822-1,200		55-200		Numerous wells.
Do	do	1,250				
Do	do	465		55		
San Antonio (1 mile west).	do	835		55		
San Antonio	do					
Do	do	870		861		
San Antonio (3 miles southeast).	do	1,100				Hot sulphur water.
San Antonio (3 miles south).	do	1,900		555		
San Antonio (6 miles southeast).	do	2,215				Water at 1,800 feet.
San Antonio (2 miles south).	do	1,900		555	-84	
San Antonio	do	500				Several wells.
Do	do	650-715		500-700		Do.
San Antonio ( $2\frac{1}{2}$ miles northwest).	do	540				
San Antonio	do	630				
Do	do	750-780		1,000		Do.
Do	do	450				
Do	do	657		250		Do.
San Antonio (3 miles north).	do	583			-50	
Sanderson <sup>3</sup>	Pecos	987	7 $\frac{1}{2}$	30	No flow.	
Sanderson	do	2,000				No water.
San Marcos <sup>4</sup>	Hays	1,490		6	Flows.	Waters at 128, 191, 652, 1,178, 1,291, 1,345, and 1,475 feet.
Santa Tomas						
Sherman	Grayson	632				Fine water.
Do	do	915				
Do	do	2,500		Many.	-40	
Do	do	660				Several wells.
Sherman (18 miles N.)	do	480			No flow.	
Sierra Blanco <sup>5</sup>	El Paso	943	5 $\frac{1}{2}$	Many.	No flow.	Bad water.
Sonora	Sutton	480				Several wells.
Do	do	800				Oil.
South Bosque (3 miles west).	McLennan	450		1		
Spofford Junction	Kenney	1,700				Failure.
Stony ( $\frac{1}{2}$ mile south)	Denton	447		3	Flows.	Soft water.
Strong Junction	Harris	450	3	48	+9	
Sugarland	Fort Bend	600-1,550	3-4		Flow.	Several wells
Do	do	1,550	8-4	104	+9	
Surfside	Brazoria	1,070	4	215	Flows.	
Taylor	Williamson	1,400		104	Flows.	

<sup>1</sup> Records, 51st Congress, 1st session, Senate Ex. Doc. No. 222, pp. 266-267, Washington, 1890.<sup>2</sup> Records, etc., U. S. Geol. Surv., 18th Ann. Rept., 1896-97, Part II, pp. 290-297, Washington, 1898.<sup>3</sup> Record, U. S. Geol. Surv., 18th Ann. Rept., 1896-97, Part II, p. 274, Washington, 1898.<sup>4</sup> Ibid., pp. 287-290.<sup>5</sup> Record, 51st Congress, 1st session, Senate Ex. Doc. No. 222, p. 296, Washington, 1900.

## TEXAS—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Taylor.....	Williamsom	2,800	-----	27	Flow.	Two wells; poor water.
Do .....	do .....	1,500	-----	15	+40	Several wells
Temple (1 mile west).	Bell	1,850	-----	Many.	Flow.	Temp. 91°.
Do .....	do .....	1,800	-----	Few.	Flows.	
Terrell <sup>1</sup> .....	Kaufman	2,200	8	70	-50	Good water.
Texas City .....	Galveston	725	-----	+104	+16	
Do .....	do .....	900	-----	+104	+16	
The Grove .....	Coryell	900	-----	680	-13	
Thorndale .....	Milan	1,790	-----	-----	-----	No water.
Do .....	do .....	3,200	-----	-----	-----	Do.
Thurber <sup>2</sup> .....	Erath	3,050	-----	8	No flow.	
Tilden .....	McMullen	475	4½	8	Flows.	Salty water.
Timber .....	Tarrant	576	-----	2½	-----	Do.
Tobey .....	Atascosa	1,200-1,300	-----	-----	-----	
Torbert .....	El Paso	1,100	8-5½	-----	-----	Abandoned. Small amount of fair water at 696 feet.
Toyah .....	Reeves	834	9-3	300	Flows.	Sulphur water.
Do .....	do .....	514	12	9	Flows.	
Trinity .....	Trinity	+900	-----	Few.	-----	Salty, sulphur water
Trinity Mills (4 miles east).	Dallas	+468	-----	-----	-25	
Do .....	do .....	415	-----	-----	-25	
Troy .....	Bell	1,472	8	-----	Flows.	Soft water.
Do .....	do .....	1,474	-----	14	Flows.	
Do .....	do .....	1,464	-----	243	Flows.	Do.
Turtle Bayou .....	Chambers	850	4	139	Flows.	
Do .....	do .....	900	4	-----	-----	
Tyler .....	Smith	1,150	.6	-----	-----	In progress, 1901.
Uvalde .....	Uvalde	512	-----	Few.	-85	
Do .....	do .....	1,000	-----	-----	No flow.	
Valda .....	Polk	420	4	45	Flows.	
Valentine .....	Presidio	1,280	-----	-----	-----	No water.
Do .....	Jeff Davis	1,245	5½-3	Many.	No flow.	
Valeo .....	Hidalgo	1,004	8	-----	-----	No water below.
Valley Mills .....	Bosque	805	-----	-----	Flows.	
Valley Mills (5 miles north).	do .....	870	-----	-----	Flows.	Soft water.
Valley Mills (1 mile north).	do .....	706	-----	-----	Flows.	
Valley Mills (5 miles north).	do .....	877	-----	-----	Flows.	Do.
Van Horn .....	El Paso	600	5½	-----	-500	Several wells.
Velasco .....	Brazoria	1,100	8	694	Flows.	
Vernon <sup>3</sup> .....	Wilbarger	(?)	-----	-----	-----	
Do .....	do .....	(?)	-----	-----	-----	
Victoria .....	Victoria	815-956	-----	70-200	Flow.	Three wells.
Waco <sup>4</sup> .....	McLennan	1,812-1,862	8-4	51-400	Flow.	Numerous wells. Temperature, 103°.
Waco (5 miles west) ..	do .....	1,470	4½	347	Flows.	Pure water. Temperature, 90°.
Waldo (2 miles south)	Coryell	423	-----	-----	-85	Saline water.
Wallisville .....	Chambers	400	-----	70	-----	
Walters .....	Travis	700	-----	-----	-----	
Waxahachie .....	Ellis	990	-----	-----	Flows?	
Do .....	do .....	1,700	-----	-----	-15	Soft water.
Waxahachie (6 miles southwest).	do .....	700	-----	-----	-125	
Weatherford <sup>5</sup> .....	Parker	500	-----	-----	-50	
Do .....	do .....	402	-----	69	-250	Good water.
Do .....	do .....	440	-----	-----	-----	
Do .....	do .....	488	-----	-----	-250	
Webb .....	Tarrant	800	-----	-----	-160	Poor water.
West .....	McLennan	1,690	-----	208	Flows.	
Wexia .....	Limestone	1,333	4½	-----	-----	Oil or gas prospect; abandoned; some water at 512 feet.
Whitesboro .....	Grayson	+800	-----	-----	No flow.	
Whitney .....	Hill	1,575	-----	-----	+40	
Do .....	do .....	1,000	-----	139	Flows.	
Do .....	do .....	438	-----	-----	430	
Wichita Falls (1½ miles south).	Wichita	800	-----	-----	-----	Salt water.

<sup>1</sup> Record, Artesian waters in Texas west of 97th meridian, by R. T. Hill, 52d Congress, 1st session, Senate Ex. Doc. No. 41, part 3, p. 99. Another authority gives 2,700 feet as depth.

<sup>2</sup> Record, 51st Congress, 1st session, Senate Ex. Doc. No. 222, p. 270, Washington, 1890.

<sup>3</sup> Analysis, Texas Geol. Surv., 4th Ann. Rept., 1892, p. 105.

<sup>4</sup> Record, 51st Congress, 1st session, Senate Ex. Doc. No. 222, pp. 265, 269, Washington, 1890, Analysis, *ibid.*, p. 271.

<sup>5</sup> Record, 51st Congress, 1st session, Senate Ex. Doc. No. 222, p. 266, Washington, 1890.

## TEXAS—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Wills Point.....	Van Zandt....	1,100	6	-----	To surface.	
Youngsfort.....	Bell.....	404	-----	1	Flows.	
Do.....	do.....	417	-----	-----	Flows.	
Youngsfort (1½ miles east).	do.....	433	-----	-----	Flows.	
Youngsfort (one-half mile north).	do.....	444	-----	1	Flows.	
Zimbi.....	Harris.....	480	-----	-----	-----	No water; abandoned.
Do.....	do.....	520	-----	-----	-----	Do.

## PRINCIPAL PUBLICATIONS RELATING TO THE UNDERGROUND WATERS OF TEXAS.

Report of F. E. Roesler, Division Field Agent for Texas, letter from the Secretary of Agriculture transmitting a report on the preliminary investigations to determine the proper location of artesian wells within the area of the 97th meridian and east of the foothills of the Rocky Mountains, 51st Congress, 1st session, Senate Ex. Doc. No. 222, pp. 243-319, Washington, 1890.

Report of E. T. Dumble on the existence of artesian waters west of the 97th meridian, etc., 51st Congress, 1st session, Senate Ex. Doc. No. 222, pp. 99-102, Washington, 1890.

Preliminary reports on the artesian wells of the Gulf Coastal Slope, by J. A. Singley, Texas Geological Survey, 4th Annual Report, 1892, pp. 85-113, Austin, 1893.

On the occurrence of artesian and other underground waters in Texas, etc., west of the 97th meridian, by R. T. Hill, Report on Irrigation, 52d Congress, 1st session, Senate Ex. Doc. No. 41, part 3 (Final Geological Reports), pp. 41-166, plates, Washington, 1893.

Geology of the Edwards Plateau and Rio Grande Plain adjacent to Austin and San Antonio, Tex., with reference to the occurrence of underground waters, by Robert T. Hill and T. Wayland Vaughan, United States Geological Survey, Eighteenth Annual Report, 1896-1897, part 2, pp. 193-321 and plates, Washington, 1898.

Geography and geology of the Black and Grand prairies, Texas, with detailed descriptions of the Cretaceous formations and special reference to artesian waters, by Robert T. Hill, United States Geological Survey, Twenty-first Annual Report, 1899-1900, part 7, pp. 1-649, Washington, 1901.

## UTAH.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Bountiful.....	Davis.....	400	-----	4-60	-----	
Bountiful (2 miles north of west).	do.....	580	-----	-----	-----	No water.
Layton.....	do.....	500	4½-1½	Few.	-----	
Paragonah.....	Iron.....	412	2	-----	-----	Cool water.
Salt Lake City.....	Salt Lake.....	550	8	500	-----	
Do.....	do.....	1,105	8	350	-----	
Salt Lake City (12 miles north).	do.....	500-750	-----	-----	-----	Several wells.
Smithfield.....	Cache.....	410	-----	3	-----	

<sup>1</sup> Record, etc., Texas Geol. Surv., 4th Ann. Rpt., 1892, p. 107.

## UTAH—Continued.

Location.	County.	Depth.	Diam-eter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Spanish Fork .....	Utah .....	420	2	60	.....	
Do .....	do .....	400	2	5	.....	
Do .....	do .....	400	2	70	.....	
Do .....	do .....	410	2	40	.....	
Sulphur Springs .....	.....	650	.....	.....	No flow.	
Vernal .....	Uinta .....	975	.....	.....	.....	Abandoned.
Do .....	do .....	900	8	.....	.....	Surface water only.

## VIRGINIA.

Alexandria (brew-ery).	Alexandria ..	430	8	90	.....	
Alexandria (ice works).	do .....	401	8	20	.....	
Allisonia .....	Pulaski .....	400-1,200	.....	.....	.....	Several wells.
Blueridge Springs .....	Botetourt .....	500	6	75	.....	
Buckroe Beach .....	.....	+400	.....	.....	.....	
Claybank .....	Gloucester .....	538	1	Several	Flows.	
Cotman .....	Henrico .....	730	.....	40	No flow.	In granite.
Covington .....	Alleghany .....	1,138	.....	400	.....	
Crewe .....	Nottoway .....	500	.....	Few.	Flow.	
Delton .....	Pulaski .....	+400	.....	Not any	.....	Abandoned.
Ditchley .....	.....	620	1	2	Flows.	
Dublin .....	Pulaski .....	475	6	25	-80	
Dymer Creek <sup>1</sup> .....	Northum-berland.	507	.....	.....	.....	
Fairport <sup>2</sup> .....	do .....	662	8-6	75	Flows.	
Fort Monroe <sup>3</sup> .....	Elizabeth City.	907	.....	.....	.....	Drilled in 1864; saline water flowed at 591 feet.
Do. <sup>4</sup> .....	do .....	945	.....	.....	Flows.	Saline water.
Foster Falls .....	Wythe .....	808	.....	100	-2	
Harrisonburg .....	Rockingham .....	420	8	.....	-10	
Gloucester .....	Gloucester .....	600	.....	Not any	.....	
Lamberts Point <sup>5</sup> .....	Norfolk .....	616	.....	65	+7	
Lancaster .....	Lancaster .....	+400	.....	.....	No flow.	
Middlebrook .....	Augusta .....	460	5	10	-50	
Newport News .....	Warwick .....	600	.....	Few.	No flow.	
Norfolk (Money Point).	Norfolk .....	562	.....	Many.	Flows.	Ferruginous water.
Norfolk (water works). <sup>6</sup>	do .....	1,760	12-4½	150	Flows.	Saline waters at several horizons.
Northend Point <sup>7</sup> .....	Elizabeth City.	1,172	.....	Not any	.....	
Oak Springs .....	.....	400	1	Several	Flows.	
Pulaski .....	Pulaski .....	400-600	6	100	-10	Several wells.
Do .....	do .....	1,200	.....	.....	.....	
Reedville .....	Northum-berland.	680	8-6	85	+3	Temp. 78°.
Richmond (paper mill).	Henrico .....	400	.....	Several.	.....	
Richmond (Sherwood Park).	do .....	900	.....	Not any	.....	
Richmond (Ginter Farm).	do .....	400	.....	Many.	.....	
Roanoke .....	Roanoke .....	1,200	6	.....	-4	Not in use.
Roanes <sup>8</sup> .....	Gloucester .....	716	6	50	+23+	
Stannardsville .....	Greene .....	1,150	.....	.....	.....	For oil. No success.
Staunton (asylum) .....	Augusta .....	696	5	60	-60	
Staunton (mile east).	do .....	490	5	9	-30	
Sandy Point <sup>9</sup> .....	Fairfax .....	560	.....	Many.	No flow.	Water at 270 feet; rock below.
Stonega .....	Wise .....	503	8	55	-16	
Toms Creek .....	.....	.....	6	100	No flow.	
Williamsburg .....	James City .....	876	.....	Not any	do .....	
Windmill Point .....	Lancaster .....	450	.....	.....	.....	Abandoned.

<sup>1</sup> Record, U. S. Geol. Surv., Bull. No. 138, p. 176.<sup>2</sup> New Jersey Geol. Surv., Report for 1898, pp. 121-122.<sup>3</sup> Record, Geology of the Virginias, by W. B. Rogers, New York, 1884, pp. 731-736; Am. Inst. Mining Engineers Trans., vol. 24, pp. 380-384; U. S. Geol. Surv., Bull. No. 138, p. 167.<sup>4</sup> Record, etc., New Jersey Geol. Surv., Report for 1898, pp. 122-126.<sup>5</sup> Record, U. S. Geol. Surv., Bull. No. 138, p. 172; New Jersey Geol. Surv., Report for 1899, pp. 87-92.<sup>6</sup> Record, etc., New Jersey Geol. Surv., Report for 1899, pp. 92-102.<sup>7</sup> Record, Am. Inst. Mining Eng., Trans., vol. 24, pp. 384-386.<sup>8</sup> New Jersey Geol. Surv., Report for 1899, pp. 86-87.<sup>9</sup> Record, U. S. Geol. Surv., Bull. No. 138, p. 178.

# PRINCIPAL PUBLICATION RELATING TO DEEP WELLS IN VIRGINIA.

Artesian Well Prospects in the Atlantic Coastal Plain Region, by N. H. Darton, United States Geological Survey, Bulletin No. 138, 232 pages, 19 plates, Washington, 1896.

## WASHINGTON.

Location.	County.	Depth.	Diam-eter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Junction City .....	Jefferson .....	800	1½	½	Flows.	Abandoned.
North Yakima <sup>1</sup> .....	Yakima .....	404	6	Many.	Flows.	
Do .....	do .....	534-835	8, 6 and 3.	Many.	Flow.	Several wells.
Do .....	do .....	650		Many.	Flows.	Temp. 71°.
Do .....	do .....	1,050	5-3½		+110	
Do .....	do .....	940	6-4		Flows.	
Pasco <sup>2</sup> .....	Franklin .....	527	6	Many.	Flows.	
Do .....	do .....	404				
Do .....	do .....	400		Not any		
Port Blakely .....	Kitsap .....	410	4½	500	-6	
Prosser .....	Yakima .....	500		Many?	No flow.	
Port Discovery .....	Jefferson .....	+800				Abandoned.
Roslyn .....	Kittitas .....	700		Many.	Flows.	
Port Discovery (4 miles northeast).		1,230				
Port Townsend .....	Jefferson .....	1,060				For coal; unsuccessful.
Port Townsend (3 miles from).	do .....	1,500				Do.
Port Townsend (9 miles from).	do .....	1,100				Do.
Port Townsend (15 miles from).	do .....	700				Do.
Port Townsend (18 miles from).	do .....	900				Do.

## WEST VIRGINIA.

Alva <sup>3</sup> .....	Tyler .....	2,700				For oil or gas.
Beaver Creek, (1 mile north).		417				
Big Flint Creek (2 miles southeast from mouth). <sup>4</sup>	Doddridge .....	2,520				Oil well.
Big Otter .....	Clay .....	1,100				Do.
Booher <sup>5</sup> .....	Tyler .....	1,859				Several gas wells.
Bridgeport .....	Harrison .....	±2,500				Two oil wells.
Brink (near) <sup>6</sup> .....	Wetzel .....	2,753				For oil or gas.
Browns Mills (near) <sup>7</sup>	Harrison .....	1,867				For oil; unproductive.
Buckhannon .....	Upshur .....	2,530				For oil.
Buffalo (near) .....	Putnam .....	400				
Bulltown .....	Braxton .....	1,000				Salt well.
Burning Springs (near). <sup>8</sup>	Wirt .....	2,010				Oil well.
Burnsville .....	Braxton .....	2,750				Small flow of oil.
Cairo <sup>9</sup> .....	Ritchie .....	2,060				For oil or gas.
Cairo (1½ miles north-west). <sup>10</sup>	do .....	1,735				Do.
Cairo (4 miles north-east). <sup>11</sup>	do .....	2,142				Do.
Cairo (8 miles south). <sup>12</sup>	do .....	1,652				Small supply of oil.
Cameron (near). <sup>13</sup>	Marshall .....	3,249				For oil or gas.
Center Point (near). <sup>14</sup>	Doddridge .....	1,910-2,880				Several oil wells.
Central .....	do .....	460	5		-20	Sulphur water.

<sup>1</sup> Records, U. S. Geol. Surv., Bull. No. 108, pp. 56-58, Washington, 1893.

<sup>2</sup> Record, *ibid.*, p. 39.

<sup>3</sup> Record, W. Va. Geol. Surv., Report, vol. 1, p. 336.

<sup>4</sup> *Ibid.*, pp. 332-334.

<sup>5</sup> *Ibid.*, p. 358.

<sup>6</sup> *Ibid.*, p. 345.

<sup>7</sup> *Ibid.*, pp. 249-250.

<sup>8</sup> *Ibid.*, pp. 232-233.

<sup>9</sup> *Ibid.*, p. 302.

<sup>10</sup> *Ibid.*, pp. 303-304.

<sup>11</sup> *Ibid.*, pp. 305-307.

<sup>12</sup> *Ibid.*, pp. 308-309.

<sup>13</sup> *Ibid.*, p. 350.

<sup>14</sup> *Ibid.*, pp. 328-332.

## WEST VIRGINIA—Continued.

Location.	County.	Depth.	Diam-eter.	Yield per minute.	Height of water.	Remarks.
Central City.....	Cabell.....	<i>Feet.</i> 2,900	<i>Inches.</i> 8½-6½	<i>Gallons.</i> Many.	<i>Feet.</i> Flows.	Some oil.
Do. <sup>1</sup> .....	do.....	2,770				Small flow of gas.
Central City (vicinity). <sup>2</sup>	Boyd.....	1,675-1,775				Two oil wells.
Charleston (water-works). <sup>2</sup>	Kanawha.....	1,840				For oil or gas; unproductive.
Charleston (8 miles above). <sup>3</sup>	do.....	2,450				Moderate flow of gas.
Charleston (9 miles above). <sup>4</sup>	do.....	2,542				Small flow of gas.
Charleston (13 miles southwest). <sup>5</sup>	do.....	2,000				For oil or gas; unproductive.
Cherry Camp (vicinity). <sup>6</sup>	Harrison.....	2,556-2,839				Several oil and gas wells.
Clarksburg.....	do.....	1,700		Many.	Flows.	Some gas.
Clarksburg (5 miles east).	do.....	2,000				
Clarksburg (4 miles south).	do.....	750		Many.	Flows.	Salt water.
Clifton.....	Mason.....	1,800			-100	
Cross Creek district. <sup>7</sup>	Brooke.....	765				For oil; unproductive.
Dingess Station (near). <sup>8</sup>	Mingo.....	2,126				For oil or gas.
Eagle Mills (?) (near). <sup>9</sup>	Tyler.....	2,922				Do.
Ellenboro (¾ miles from). <sup>10</sup>	Ritchie.....	1,782-1,828				Several oil and gas wells.
Eureka (near). <sup>11</sup>	Pleasants.....	{ 1,348+ }				Two oil wells.
Fairfax (northwest of). <sup>12</sup>	Mingo.....	{ 1,602 }				For oil or gas.
Fairview (southwest of). <sup>13</sup>	Marion.....	1,889				Oil well.
Fairview (2 miles northeast). <sup>14</sup>	do.....	1,997				For oil; unproductive.
Fallsmill.....	Braxton.....	1,000				Salt well.
Farmington Station (2 miles east). <sup>15</sup>	Marion.....	2,811				For oil or gas; abandoned.
Friendly (near). <sup>16</sup>	Tyler.....					Deep well for oil or gas.
Glenville. <sup>16</sup>	Gilmer.....	2,412	7½			Oil and gas well.
Do.....	do.....	800	2½			For oil or gas; abandoned.
Grant district. <sup>17</sup>	Hancock.....	1,470				For oil; unproductive.
Do. <sup>18</sup>	Wetzel.....	3,044				Gas well.
Harpers Ferry.....	Jefferson.....	412		Few.	No flow.	
Harrisville.....	Ritchie.....	1,600-2,000				Several oil wells.
Harrisville (near). <sup>19</sup>	do.....	2,500				Oil well.
Hart (near). <sup>20</sup>	Lincoln.....	3,260				For oil or gas.
Hebron (near). <sup>21</sup>	Pleasants.....	2,080				Do.
Henry.....	Preston.....	703	4½			
Highland Church (near). <sup>22</sup>	Monongalia.....	3,484	10-5			Oil well.
Holbrook (near). <sup>23</sup>	Marion line.	2,670				Oil well.
Hundred (near). <sup>24</sup>	Ritchie.....	3,249				Gas well.
Huntington.....	Wetzel.....	2,975	8½-6½			Oil prospect; unsuccessful; much water at bottom.
Do.....	Cabell.....	2,975				
Iuka (near). <sup>25</sup>	do.....	1,200	8-6			
Jarvisville.....	Tyler.....					Several oil wells.
	Harrison.....	2,500-2,800				Numerous oil wells.

<sup>1</sup> Record, W. Va. Geol. Surv., Report, vol. 1, pp. 275-276.<sup>2</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I, pp. 331-332.<sup>3</sup> Ibid., p. 330.<sup>4</sup> Record, W. Va. Geol. Surv., Report, vol. 1, pp. 271-272.<sup>5</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I, pp. 332-333.<sup>6</sup> Records, W. Va. Geol. Surv., Report, vol. 1, pp. 252-255.<sup>7</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I, pp. 327-328.<sup>8</sup> Record, W. Va. Geol. Surv., Report, vol. 1, pp. 278-280.<sup>9</sup> Ibid., pp. 334-335.<sup>10</sup> Ibid., pp. 311-315.<sup>11</sup> Ibid., pp. 351-352.<sup>12</sup> Ibid., pp. 276-277.<sup>13</sup> Ibid., pp. 239-241.<sup>14</sup> Ibid., pp. 238-239.<sup>15</sup> Record, Pa. 2d Geol. Surv., Ann. Report for 1886, part 2, pp. 782-783.<sup>16</sup> Record, W. Va. Geol. Surv., Report, vol. 1, pp. 259-260.<sup>17</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I, p. 328.<sup>18</sup> Record, W. Va. Geol. Surv., Report, vol. 1, pp. 340-342.<sup>19</sup> Ibid., p. 319.<sup>20</sup> Ibid., pp. 280-281.<sup>21</sup> Ibid., p. 360.<sup>22</sup> Ibid., pp. 231-232.<sup>23</sup> Record, W. Va. Geol. Surv., Report, vol. 1, p. 320.<sup>24</sup> Ibid., p. 349.

## WEST VIRGINIA—Continued.

Location.	County.	Depth.	Diam-eter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Joetown (1 mile W.) <sup>1</sup>	Marion .....	3,014	.....	.....	.....	For oil or gas.
Kanawha (and vicinity). <sup>2</sup>	Kanawha .....	1,000-2,450	.....	.....	.....	Numerous salt and gas wells.
Kenton (?) (vicinity). <sup>3</sup>	Doddridge .....	2,115	.....	.....	.....	For oil or gas.
Letart (near) <sup>4</sup>	Mason .....	2,139	.....	.....	.....	Do.
Liberty Township <sup>5</sup>	Marshall .....	2,934	.....	.....	.....	For oil or gas, unproductive.
Long Run Station (near). <sup>6</sup>	Doddridge .....	2,701	.....	.....	.....	For oil or gas.
Lot (near) <sup>7</sup>	Wetzel .....	2,588	.....	.....	.....	Do.
Loudensville (5 miles north). <sup>8</sup>	Marshall .....	1,935	.....	.....	.....	Do.
Lightburn (vicinity)	Lewis .....	2,700	.....	.....	.....	For oil or gas; abandoned.
Little Mills (near) <sup>9</sup>	Tyler .....	2,690	.....	.....	.....	For oil or gas.
Macksburg (near) <sup>10</sup>	Noble .....	1,695	.....	.....	.....	Do.
Malden <sup>11</sup>	Kanawha .....	1,800	.....	.....	.....	Gas well.
Mannington (near) <sup>12</sup>	Marion .....	1,928	.....	.....	.....	For oil or gas.
Mannington (1 mile above). <sup>13</sup>	.....do .....	3,144	.....	.....	.....	Do.
Mannington (3 miles southwest). <sup>14</sup>	.....do .....	3,042	.....	.....	.....	Do.
Mannington (3 miles north). <sup>15</sup>	.....do .....	2,895	.....	.....	.....	Oil well
Mannington (6 miles northwest). <sup>16</sup>	.....do .....	3,010	.....	.....	.....	Do.
McKim (near) <sup>17</sup>	Tyler .....	1,942	.....	.....	.....	For oil or gas.
Martinsburg .....	Berkeley .....	485	.....	.....	.....	Abandoned.
Do .....	.....do .....	450	.....	.....	.....	
Metz (near) <sup>18</sup>	Marion .....	2,992	.....	.....	.....	For oil or gas.
Middlebourne (few miles below). <sup>19</sup>	Tyler .....	1,562	.....	.....	.....	Small supply of oil.
Middlebourne (4 miles north). <sup>20</sup>	.....do .....	1,638	.....	.....	.....	Oil well.
Miletus (near) <sup>21</sup>	Doddridge .....	2,930	.....	.....	.....	For oil or gas.
Do .....	.....do .....	2,670	.....	.....	.....	Gas well.
Morgantown <sup>22</sup>	Monongalia .....	2,267	.....	.....	.....	For oil or gas.
Moundsville (near) <sup>23</sup>	Marshall .....	1,470	.....	.....	.....	Do.
Moundsville (vicinity).	.....do .....	1,400-1,413	.....	.....	.....	Several oil wells.
Moundsville (3 miles northeast). <sup>24</sup>	.....do .....	578	.....	.....	.....	Numerous oil wells.
Murphytown (vicinity). <sup>25</sup>	Wood .....	2,177	.....	.....	.....	For oil or gas.
Newburg .....	Preston .....	3,009	.....	.....	.....	For gas; unsuccessful.
Do .....	.....do .....	865	.....	.....	— 18	
New Cumberland .....	Hancock .....	1,600	.....	.....	.....	Gas well.
New Cumberland (2 miles east). <sup>26</sup>	.....do .....	1,198	.....	.....	.....	Oil well.
Oxford <sup>27</sup>	Ritchie .....	2,106	.....	.....	.....	Do.
Oxford (7 miles above). <sup>28</sup>	Doddridge .....	2,484	.....	.....	.....	Do.
Parkersburg (near) <sup>29</sup>	Wood .....	2,035	.....	.....	.....	For oil or gas.
Parkersburg (5 miles northeast). <sup>30</sup>	.....do .....	3,016	.....	.....	.....	Do.
Peoria .....	Harrison .....	2,300	.....	.....	.....	Do.

<sup>1</sup> Record, W. Va. Geol. Surv., Report, vol. 1, pp. 345-347.<sup>2</sup> Records, Pa. 2d Geol. Surv., Reports, Vol. I<sup>5</sup>, pp. 329-333; W. Va. Board of Centennial Managers, Resources, Report by Maury and Fontaine, pp. 287-290.<sup>3</sup> Record, W. Va. Geol. Surv., Report, vol. 1, p. 335.<sup>4</sup> Ibid., pp. 281-282.<sup>5</sup> Record, Pa. 2d Geol. Surv., Report, Vol. I<sup>5</sup>, pp. 328-329.<sup>6</sup> Record, W. Va. Geol. Surv., Report, vol. 1, pp. 325-326.<sup>7</sup> Ibid., p. 339.<sup>8</sup> Ibid., 351-352.<sup>9</sup> Ibid., p. 355.<sup>10</sup> Ibid., pp. 298-299.<sup>11</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I<sup>5</sup>, p. 331.<sup>12</sup> Record, W. Va. Geol. Surv., Report, vol. 1, pp. 241-242.<sup>13</sup> Ibid., pp. 242-243.<sup>14</sup> Ibid., pp. 243-244.<sup>15</sup> Ibid., pp. 244-246.<sup>16</sup> Ibid., pp. 246-247.<sup>17</sup> Ibid., p. 359.<sup>18</sup> Record, W. Va. Geol. Surv., Report, vol. 1, p. 348.<sup>19</sup> Ibid., p. 361.<sup>20</sup> Ibid., p. 360.<sup>21</sup> Ibid., pp. 323-324.<sup>22</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I<sup>5</sup>, p. 329.<sup>23</sup> Record, W. Va. Geol. Surv., Report, vol. 1, pp. 362-363.<sup>24</sup> Ibid., p. 364.<sup>25</sup> Ibid., pp. 292-294.<sup>26</sup> Ibid., p. 369.<sup>27</sup> Ibid., pp. 321-322.<sup>28</sup> Ibid., pp. 322-323.<sup>29</sup> Ibid., p. 285.<sup>30</sup> Ibid., pp. 296-298.

## WEST VIRGINIA—Continued.

Location.	County.	Depth.	Diam-eter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Petroleum Station (1½ miles north). <sup>1</sup>	Ritchie .....	1,800				Oil well.
Piney Fork. <sup>2</sup>	Wetzel .....	2,640				For oil or gas.
Poe District. <sup>3</sup>	Hancock .....	1,700				For oil; unproduc- tive
Point Pleasant (6 miles below). <sup>4</sup>	Mason .....	2,942				For oil or gas.
Ravenswood (near). <sup>5</sup>	Jackson .....	2,232				Do.
Ritchie Court- House. <sup>6</sup>	Ritchie .....	1,724-1,918				Several oil and gas wells.
Ronceverte .....	Greenbrier .....	800				For oil; abandoned.
Salem .....	Harrison .....	2,100-2,800				Oil wells.
Sardis (vicinity). <sup>7</sup>	do .....	3,081				For oil; abandoned.
Sedalia (near). <sup>8</sup>	Doddridge .....	2,800				Large gas well.
Shanghai .....	Berkeley .....	714	7	Few.		Sulphur water at 188 feet; abandoned.
Sisterville (near) .....	Tyler .....					Large oil well.
Sisterville (2½ miles southwest). <sup>9</sup>	do .....	1,865				For oil or gas.
Smithfield (near). <sup>10</sup>	Wetzel .....	3,282				Oil well.
Smithfield (2 miles northeast). <sup>11</sup>	do .....	3,106				Do.
Spencer (asylum farm). <sup>12</sup>	Roane .....	2,750				For oil or gas.
Spencer (about 10 miles southwest). <sup>13</sup>	do .....	1,623-2,362				Several oil and gas wells.
Sutton (1½ miles below). <sup>14</sup>	Braxton .....	2,725				Oil well.
Ten Mile District. <sup>15</sup>	Harrison .....	2,750				For oil or gas; unpro- ductive.
Vadis (near). <sup>16</sup>	Lewis .....	2,703				Oil well.
Do. <sup>17</sup>	Doddridge .....	2,207				For oil; unsuccessful on account of water.
Wadestown (near). <sup>18</sup>	Monongalia .....	3,090				Oil well.
Do. <sup>19</sup>	do .....	3,112				Do.
Do. <sup>20</sup>	do .....	3,300	6½			Gas well.
Waverly (6 miles south). <sup>21</sup>	Wood .....	2,261-2,208				Two oil wells.
Wellsburg. <sup>22</sup>	Brooke .....	1,217				Numerous deep gas wells; now run out.
Do. <sup>23</sup>	do .....	1,310				Gas well.
Weston .....	Lewis .....	2,700				For oil; unsuccessful
Do .....	do .....	1,450				Small flow of oil.
Weston (2 miles below). <sup>24</sup>	do .....	2,165?				Gas well.
Weston (10 miles southeast). <sup>25</sup>	do .....	2,401				Oil well.
Wick (near). <sup>26</sup>	Tyler .....	1,915				For oil or gas.
Williamstown (1½ miles below). <sup>27</sup>	Wood .....	1,504-1,673				Do.
Williamstown (4 miles below). <sup>28</sup>	do .....	710-1,138				Two oil wells.
Winfield (?). <sup>29</sup>	Putnam .....	500				Two wells.
Wheeling. <sup>30</sup>	Ohio .....	2,095				For oil or gas.
Wheeling (near). <sup>31</sup>	do .....	4,500	4½			Do.
Wheeling (3 miles east-northeast). <sup>32</sup>	do .....	2,000				For oil or gas; un- successful.
Wordley (near). <sup>33</sup>	Monongalia .....	2,830-2,960				Gas well.

<sup>1</sup> Record, W. Va. Geol. Surv., Report, p. 301.<sup>2</sup> Ibid., p. 337.<sup>3</sup> Record, Pa. 2d Geol. Surv., Reports, Vol. I, p. 327.<sup>4</sup> Record, W. Va. Geol. Surv., Reports, vol. 1, pp. 273-274.<sup>5</sup> Ibid., pp. 283-284.<sup>6</sup> Ibid., pp. 317-318.<sup>7</sup> Ibid., pp. 248-249.<sup>8</sup> Ibid., pp. 326-327.<sup>9</sup> Record, W. Va. Geol. Surv., Report, vol. 1, p. 357.<sup>10</sup> Ibid., p. 343.<sup>11</sup> Ibid., pp. 343-344.<sup>12</sup> Ibid., pp. 264-266.<sup>13</sup> Ibid., pp. 267-269.<sup>14</sup> Ibid., pp. 269-270.<sup>15</sup> Ibid., p. 251.<sup>16</sup> Ibid., pp. 257-258.<sup>17</sup> Ibid., pp. 258-259.<sup>18</sup> Ibid., pp. 232-234.<sup>19</sup> Ibid., pp. 232-233.<sup>20</sup> Ibid., pp. 230-231.<sup>21</sup> Ibid., pp. 292-294.<sup>22</sup> Record, Ohio Geol. Surv., Report, 1888, Vol. VI, pp. 337-339.<sup>23</sup> Record, Pa. 2d Geol. Surv., Ann. Report for 1886, part 2, pp. 783-784; W. Va. Geol. Surv., Report, vol. 1, p. 367.<sup>24</sup> Record, W. Va. Geol. Surv., Report, vol. 1, pp. 255-256.<sup>25</sup> Ibid., p. 359.<sup>26</sup> Ibid., pp. 290-291.<sup>27</sup> Ibid., p. 289.<sup>28</sup> Ibid., p. 366.<sup>29</sup> Ibid., pp. 364-365.<sup>30</sup> Record, Pa. 2d Geol. Surv., Ann. Report, 1886, part 2, pp. 781-782.<sup>31</sup> Record, W. Va. Geol. Surv., Report, vol. 1, pp. 234-237.



## PRINCIPAL PUBLICATIONS RELATING TO DEEP BORINGS IN WEST VIRGINIA.

West Virginia Geological Survey, Reports, vol. 1, by I. C. White, 392 pages, Morgantown, 1899.

Seventh Report on the Oil and Gas Fields of Western Pennsylvania for 1887-1888, Pennsylvania Second Geological Survey, Vol. I<sup>3</sup>, by J. F. Carll, 356 pages, Harrisburg, 1890.

## WISCONSIN.

Location.	County.	Depth.	Diam-eter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Berlin .....	Green Lake..	425	6	40	+3	Temp. 52°.
Do .....	do .....	450	-----	40	+3	
Bristol .....	Kenosha .....	815	5	-----	-32	
Brodhead .....	Green .....	1,000	4-8	Each 150	+12	Two wells. Water from 250-300 feet mainly. Granite, 700-1,000 feet. Temp. 52°.
Burlington .....	Racine .....	1,000	9	Many.	Flows.	
Do .....	do .....	800	9	Many.	-8	
Cassville .....	Grant .....	1,100	6	Many.	Flows.	
Clinton .....	Rock .....	650	-----	Many.	-30	
Dale .....	Outagamie..	490	-----	Many.	-15	
De Soto .....	Vernon .....	466	6	126	+26	Temp. 52°.
Durand .....	Pepin .....	550	6	180	+35	Good water.
Durand (5 miles southeast).	do .....	402	10-6	2	-232	Do.
East Troy .....	Walworth ..	2,200	-----	-----	No flow.	
Elkhorn .....	do .....	1,050	8-6	Many.	-155	
Elroy .....	Juneau .....	500 or 600	-----	-----	No flow.	Not in use.
Fond du Lac .....	Fond du Lac.	750	10	Many.	-10	Two wells.
Do .....	do .....	600	10	Many.	-10	Do.
Do .....	do .....	480	10	Many.	-10	
Do. <sup>1</sup> .....	do .....	425	-----	-----	-----	
Genoa .....	Vernon .....	460	6	200	-30	
Greenbay .....	Brown .....	950	-----	70	+14	Temp. 53°. Several wells.
Hartford .....	Washington.	920	-----	40	-----	To be deepened.
Haven .....	Sheboygan ..	600	-----	-----	-40	
Do .....	do .....	420	-----	-----	-11	
Hudson .....	St. Croix ..	400-500	-----	-----	-----	
Independence .....	Trempealeau	438	-----	-----	-12	Well in bad order; abandoned.
Jamesville <sup>2</sup> .....	Rock .....	1,100-1,033	8	500	+35	Two wells and magnesia; water to +48 at 683 feet.
Jamesville (fair ground).	do .....	+1,100	-----	Not any	No flow.	Abandoned.
Kilbourn .....	Columbia ..	1,320	-----	-----	-----	
La Crosse <sup>3</sup> .....	La Crosse ..	573	6	100	-16	Some lime and iron; city supply.
Madison .....	Dane .....	736-821	10	Many.	+5½	Several wells. Temp. 51°.
Marinette .....	Marinette ..	716	4	Many.	+21	Water at 405 and 415 feet only; granite at 716 feet. Temp. 49°.
Menomonee Falls .....	do .....	1,700	8	Many.	Nearly to top.	
Millville .....	Grant .....	487	7	Several	-369	
Milwaukee <sup>4</sup> .....	Milwaukee ..	1,048	4	Many.	+60	
Milwaukee (near) <sup>5</sup> ..	do .....	1,200	-----	300	+50	
Monroe .....	Green .....	+400	-----	-----	-----	
Oconto .....	Oconto .....	+400	-----	450	+24	Temp. 50°.
Oil City <sup>6</sup> .....	Monroe .....	510	-----	Many.	+25	Main body of water at 300 feet.
Onalaska .....	La Crosse ..	450	-----	284	To surface.	
Oshkosh <sup>7</sup> .....	Winnebago ..	961	6	Many.	-4	Granite below 700 feet.

<sup>1</sup> Record, Wis. Geol. Surv., Reports, 1873-1877, vol. 2, p. 153.

<sup>2</sup> Ibid., pp. 166-197.

<sup>3</sup> Record, Wis. Geol. Surv., Reports, 1873-1879, vol. 4, pp. 60-61.

<sup>4</sup> Record, Wis. Geol. Surv., Reports, 1873-1877, vol. 2, p. 164.

<sup>5</sup> Analysis, Ibid., p. 164.

<sup>6</sup> Record, Wis. Geol. Surv., Reports, 1873-1879, vol. 4, pp. 59-60.

<sup>7</sup> Record, Wis. Geol. Surv., Reports, 1873-1877, vol. 2, p. 156.

## WISCONSIN—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Oshkosh <sup>1</sup> .....	Winnebago.....	695	6	Many.	-1	Granite below 665 feet.
Do.....	do.....	537	5	Many.	-1	
Oshkosh (normal school). Oshkosh.....	do.....	613	5	Many.	-4	
Palmyra <sup>2</sup> .....	Jefferson.....	750			-14	Several other similar wells.
Patch Grove.....	Grant.....	487	9-6	Several	-440	Water at 263 feet; oil at 257 feet.
Platteville.....	do.....	1,000				Good water; two other similar wells in vicinity.
Prairie du Chien <sup>3</sup> .....	Crawford.....	960	8-5½	600	+60	
Racine <sup>4</sup> .....	Racine.....	1,240		Many.	+65	Temp. 56°. Water slightly salty; brine at 514 feet; several wells.
Do.....	do.....	1,350	4	Many.	+92	Several wells.
Richland Center.....	do.....	750	6	2,400	-11	
Riverfalls.....	Pierce.....	500	8-6	200	-6	No water below 400 feet.
Do.....	do.....	400	8-6	200	-6	
Rock Elm.....	do.....	520	8		-120	Abandoned.
Sheboygan <sup>5</sup> .....	Sheboygan.....	1,475	4	225	+104	Temp. 59°. Flow at 1,340 feet.
Sherwood.....	Calumet.....	1,035				
Superior.....	Douglas.....	927	6			Water brackish.
Tornado.....	Door.....	1,040	8-6	Many.	-122	
Tomar <sup>6</sup> .....	Monroe.....	492			No flow.	
Two Rivers.....	Manitowoc.....	1,700	8	Many.	No flow.	Abandoned; granite in bottom.
Urne.....	Buffalo.....	471	6			
Watertown.....	Jefferson.....	1,145	9	600	+11	Temp. 47°.
Waukesha.....	Waukesha.....	1,000-1,500			-35	Several wells.
Westbend.....	Washington.....	1,500		Many.	-4	
West Depere.....	Brown.....	810	5	250	+26	Temp. 65°
Western Union Junction. <sup>7</sup>	Racine.....	1,263		Few.	+40	
Whitewater.....	Walworth.....	950		200	+20	

## PUBLICATIONS RELATING TO DEEP BORINGS IN WISCONSIN.

Wisconsin Geological Survey, Reports, 1873-1877, vol. 2, part 2, pp. 97-405.

Wisconsin Geological Survey, Reports, 1873-1879, vol. 4, part 1, 98 pages.

## WYOMING.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Aladdin.....	Crook.....	± 1,000				No water.
Almond.....	Sweetwater.....	1,000				Strong sulphur water.
Cambria <sup>8</sup> .....	Weston.....	1,300				In progress.
Cheyenne.....	Laramie.....	1,145				
Clifton (north of) <sup>9</sup> .....	Weston.....	1,002		Few.	Flows.	Mineral water.
Dallas.....	Fremont.....	800-1,200			Flow.	Oil wells.
Douglas.....	Converse.....	500			+20	Some oil; much water.
Gillette.....	Crook.....	865			-485	
Hilliard.....	Uinta.....	454				For oil; unsuccessful.

<sup>1</sup> Ibid. p. 156.

<sup>2</sup> Ibid. pp. 161-162.

<sup>3</sup> Record, Wis. Geol. Surv., Reports, 1873-1879, vol. 4, pp. 61-62.

<sup>4</sup> Record, Wis. Geol. Surv., Rpts., 1873-1877, vol. 2, p. 163.

<sup>5</sup> Record and analysis, *ibid.*, p. 164.

<sup>6</sup> Record, Wis. Geol. Surv., Rpts., 1873-1879, vol. 4, p. 60.

<sup>7</sup> Record, Wis. Geol. Surv., Rpts., 1873-1877, vol. 2, pp. 162-163.

<sup>8</sup> Record, U. S. Geol. Survey, 21st Ann. Rept., 1889-1900, part 4, p. 572.

<sup>9</sup> Ibid., p. 571.

## WYOMING—Continued.

Location.	County.	Depth.	Diameter.	Yield per minute.	Height of water.	Remarks.
		<i>Feet.</i>	<i>Inches.</i>	<i>Gallons.</i>	<i>Feet.</i>	
Jerome <sup>1</sup> .....		520 .....				
Judson .....	Albany .....	540 .....		Few. .....	Flows. .....	Sulphur water.
Laramie .....	do .....	1,015 .....		30 .....	Flows. .....	Good water.
Do .....	do .....	1,470 .....				
Leach .....	do .....	510 .....	5 .....		No flow. .....	
Moorecroft (8 miles northwest). .....	Crook .....	1,300 .....				For oil; unsuccessful.
Moorecroft (10 miles northwest). .....	do .....	800 .....				Two small oil wells.
Mullen .....	Fremont .....	1,200 .....		Several. ....		Oil and sulphur water.
Newcastle .....	Weston .....	1,950 .....		Several. ....	Flows. ....	For oil; unsuccessful.
Do .....	do .....	1,340 .....				Some oil at about 400 feet.
Do .....	do .....	420 .....				Some oil.
Newcastle (3½ miles southwest). .....	do .....	720 .....				No product.
Oil City <sup>2</sup> .....	Natrona .....	1,130 .....				Oil and gas.
Oxford Ranch .....	Albany .....	540 .....		Few. ....	Flows. ....	For oil; unsuccessful.
Rawlins .....	Carbon .....	450 .....	4½ .....	200 .....		Several wells.
Do .....	do .....	487 .....		400 .....	Flowed originally. ....	
Do .....	do .....	928 .....		350 .....	Flowed originally. ....	Water from 466 feet.
Salt Creek oil field <sup>3</sup> .....	Natrona .....	800-1,200 .....				Oil wells.
Sheridan .....	Sheridan .....	500 .....	2½ .....			
Sussex .....	Johnson .....	1,300 .....		Few. ....		Water at 358 and 1,120 feet.

## PUBLICATIONS RELATING TO DEEP BORINGS IN WYOMING.

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Petroleum of the Shoshone Anticlinal, by W. C. Knight, University of Wyoming, petroleum series, Bulletin No. 2, 34 pages, January, 1897.

Oil Fields of Crook and Uinta Counties, Wyoming, by W. C. Knight, University of Wyoming, Petroleum series, Bulletin No. 3, 31 pages, November, 1899.

A Preliminary Report on the Artesian Basins of Wyoming, by W. C. Knight, University of Wyoming, Wyoming Experiment Station, Bulletin No. 45, 251 pages, plates, map, June, 1900.

Preliminary Description of the Geology and Resources of the Southern Half of the Black Hills and Adjoining Regions in South Dakota and Wyoming, by N. H. Darton, United States Geological Survey, Twenty-first Annual Report, 1899-1900, pp. 489-599, plates, maps, Washington, 1901.

<sup>1</sup> Analysis, *ibid.*, p. 571.

<sup>2</sup> Record, etc., Wyo., Ann. Rept. Geologist, Jan., 1888, p. 32.

<sup>3</sup> Record, Wyoming University, Bull. No. 1 (Petroleum series), 1896, pp. 18-19.

