SOCIAL STATISTICS OF CITIES.

CITIES OF 10,000 INHABITANTS AND UPWARD IN THE UNITED STATES ON JUNE 1, 1890.

BY JOHN S. BILLINGS, M. D., SURGEON UNITED STATES ARMY, EXPERT SPECIAL AGENT.

In 1880 there were in the United States 219 cities having each a population of 10,000 and upward, and including within their corporate limits a total population of 10,769,116, being 21.47 per cent of the entire population of the United States. In 1890 there were 345 such cities, containing a total population of 17,280,077, being 27.59 per cent of the total population of the country. The increase of the total population of the country from 1880 to 1890 was 24.86 per cent, while for the cities of 10,000 inhabitants and upward it was 60.46 per cent.

Table 1 shows, by geographical divisions and by states, the number of cities of 10,000 population and upward on June 1, 1890, with the increase in the total and in such city population since 1880, and the percentage of the total population living in cities of this class in 1880 and in 1890.

TABLE 1.

STATES AND TERRITORIES.	Number of cities.	POPULATION, 1890.		INCREASE SINCE 1880.					PER CENT OF TOTAL POPULATION LIVING IN CITIES.	
		Total.	For cities.	Number of cities.	Population.		Per cent.			
					Total.	For cities.	Total.	For cities.	1890	1880
The United States	345	62,622,250	17,280,077	126	12,466,467	6,510,961	24.86	60.46	27.59	21.47
North Atlantic division	143	17,401,545	8,470,433	39	2,894,138	2,480,017	19.95	41.40	48.68	41.29
Maine	6	661,086	113,449	2	12,150	31,049	1.87	37.68	17.16	12.70
New Hampshire	4	376,530	93,231	.....	29,530	21,674	8.51	30.29	24.76	20.62
Vermont	2	332,422	26,350	.....	136	2,836	0.04	12.06	7.93	7.08
Massachusetts	37	2,238,943	1,475,086	7	455,858	430,524	25.57	41.22	65.88	58.58
Rhode Island	4	345,506	200,060	.....	68,975	44,436	24.94	28.55	57.91	56.28
Connecticut	10	746,258	312,376	.....	123,558	86,078	19.84	38.04	41.86	36.34
New York	32	5,997,853	3,458,533	9	914,982	954,516	18.00	38.12	57.66	49.26
New Jersey	15	1,444,933	735,619	6	313,817	266,188	27.74	56.70	50.91	41.50
Pennsylvania	33	5,258,014	2,055,723	15	975,123	642,710	22.77	45.49	39.10	32.99
South Atlantic division	29	8,857,920	1,332,980	10	1,260,723	418,407	16.50	45.75	15.05	12.04
Delaware	1	168,493	61,431	.....	21,885	18,953	14.93	44.62	36.46	28.97
Maryland	3	1,042,390	457,286	1	107,447	114,280	11.49	33.32	43.87	36.69
District of Columbia	1	230,392	a202,978	.....	52,708	43,107	29.71	26.96	88.10	90.01
Virginia	8	1,655,980	212,719	2	143,415	64,489	9.48	43.51	12.85	9.80
West Virginia	2	762,794	44,630	1	144,337	13,893	23.34	45.20	5.85	4.97
North Carolina	4	1,617,947	54,526	3	218,197	37,176	15.59	214.27	3.37	1.24
South Carolina	2	1,151,149	70,308	.....	155,572	10,288	15.63	17.14	6.11	6.03
Georgia	5	1,837,353	182,071	.....	295,173	69,190	19.14	61.29	9.91	7.32
Florida	3	391,422	47,031	3	121,929	47,031	45.24	.....	12.02	.....

a Washington city only.

5780 S S——1

TABLE 1—Continued.

STATES AND TERRITORIES.	Number of cities.	POPULATION, 1890.		INCREASE SINCE 1880.					PER CENT OF TOTAL POPULATION LIVING IN CITIES.	
		Total.	For cities.	Number of cities.	Population.		Per cent.		1890	1880
					Total.	For cities.	Total.	For cities.		
North Central division	119	22,302,279	5,499,177	50	4,998,168	2,695,780	28.78	96.16	24.59	16.14
Ohio	23	3,672,316	1,107,156	8	474,254	406,049	14.83	57.92	30.15	21.92
Indiana	14	2,192,404	365,747	5	214,103	130,986	10.82	62.01	16.68	14.41
Illinois	21	3,826,351	1,457,090	9	748,380	779,090	24.32	114.91	38.08	22.03
Michigan	15	2,093,889	500,413	8	456,952	262,519	27.92	110.35	24.00	14.53
Wisconsin	12	1,686,880	378,843	5	371,383	183,435	28.23	93.87	22.46	14.85
Minnesota	5	1,501,826	360,477	2	521,053	261,999	60.74	265.71	27.09	12.62
Iowa	11	1,911,896	260,316	4	287,281	134,089	17.68	106.23	13.62	7.77
Missouri	6	2,679,184	685,585	2	510,804	235,777	23.56	52.42	25.59	20.74
North Dakota	.....	182,719	.....	.....	145,840	.....	305.05	.....	.....	.....
South Dakota	1	328,808	10,177	1	239,540	10,177	231.60	.....	3.10	.....
Nebraska	5	1,058,910	231,520	3	606,508	190,999	134.06	438.87	22.15	9.62
Kansas	6	1,427,096	138,853	3	431,000	91,750	43.27	194.79	9.73	4.73
South Central division	31	10,072,893	1,077,945	14	2,053,522	429,975	23.02	66.36	9.82	7.26
Kentucky	5	1,858,635	257,782	1	269,945	67,215	12.73	35.27	13.87	11.56
Tennessee	5	1,767,518	188,155	2	225,159	98,321	14.60	109.45	10.65	5.82
Alabama	3	1,513,017	79,137	1	250,512	33,292	19.84	72.62	5.23	3.63
Mississippi	3	1,289,600	34,098	2	158,003	22,284	13.96	188.62	2.64	1.04
Louisiana	3	1,118,587	204,696	2	178,641	48,406	19.01	22.46	23.65	22.99
Texas	10	2,235,523	217,092	5	613,774	136,410	40.14	169.07	9.71	5.67
Oklahoma	.....	561,834	.....	.....	61,834	.....	.....	.....	.....	.....
Arkansas	2	1,128,179	37,185	1	325,654	24,047	40.58	183.63	3.30	1.64
Western division	23	3,027,613	899,542	13	1,259,916	486,782	71.27	117.93	29.71	23.35
Montana	2	132,159	24,557	2	93,600	24,557	237.49	.....	18.58	.....
Wyoming	1	60,705	11,690	1	39,916	11,690	192.01	.....	19.26	.....
Colorado	4	412,198	152,795	2	217,871	102,346	112.12	202.87	37.07	25.96
New Mexico	.....	153,593	.....	.....	34,028	.....	28.46	.....	.....	.....
Arizona	.....	59,620	.....	.....	19,180	.....	47.44	.....	.....	.....
Utah	2	207,905	59,732	1	63,942	38,064	44.42	187.62	28.73	14.43
Nevada	.....	45,761	.....	.....	b16,595	.....	b26.51	.....	.....	.....
Idaho	.....	84,385	.....	.....	51,775	.....	158.77	.....	.....	.....
Washington	3	349,390	98,765	3	274,274	98,765	365.13	.....	28.27	.....
Oregon	2	313,767	56,937	1	138,999	39,340	79.53	223.82	18.14	10.06
California	9	1,208,130	195,086	3	343,436	171,120	39.72	52.82	40.98	37.47

a Including 5,338 persons in Greer county (in Indian territory), claimed by Texas.

b Decrease.

It will be seen from this table that the states in the North Atlantic division have the greatest number of cities and the greatest proportion of the total population living therein, 48.68 per cent of the total population of this division, or nearly one-half, being residents in the cities.

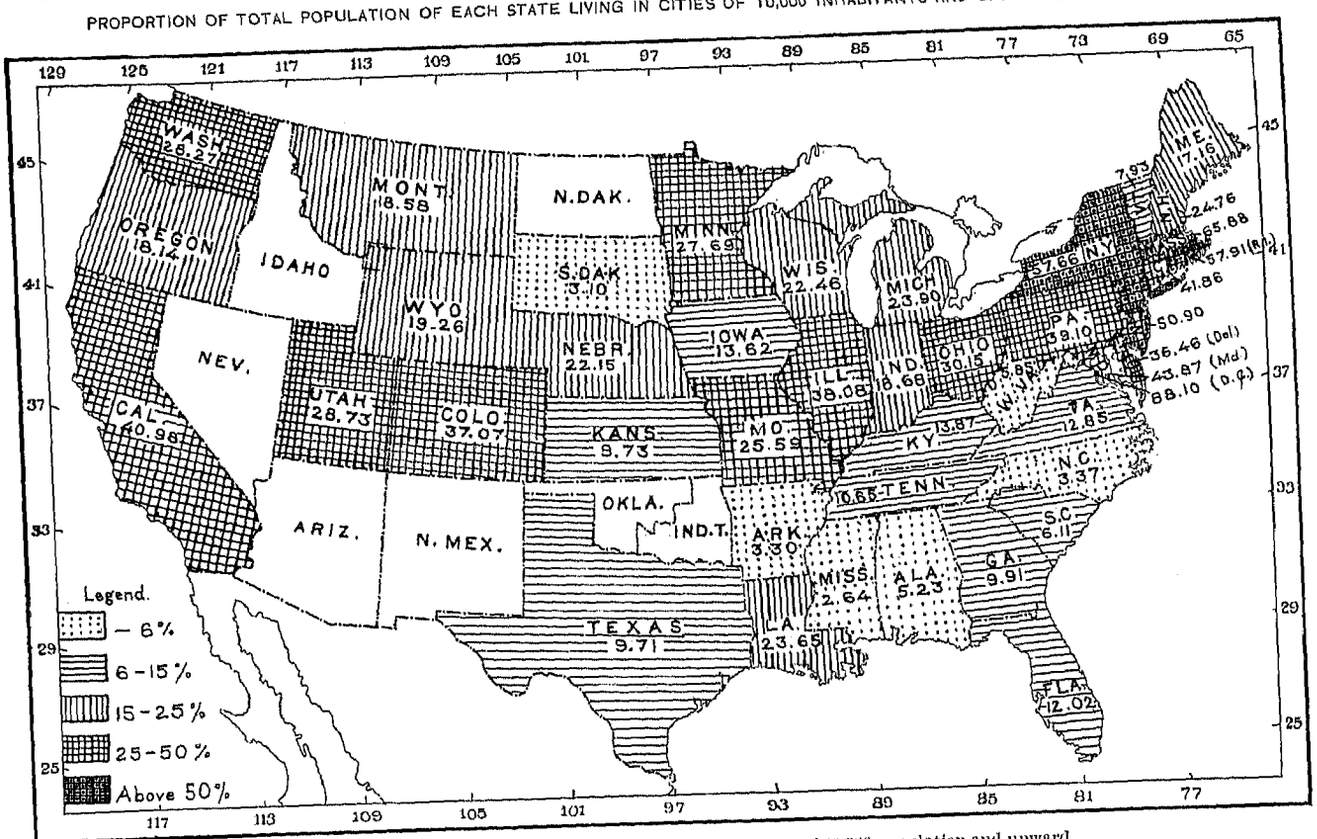
Massachusetts had 37 cities of this class, containing 65.88 per cent; Pennsylvania had 33 cities, containing 39.10, and New York 32 cities, containing 57.66 per cent of the total population. The South Central and the South Atlantic divisions had the least proportion of urban population, and of the states contained in these divisions Mississippi had the lowest, or 2.64 per cent.

The largest proportional gain in the municipal population occurs in the North Central division, in which 24.59 per cent were living in cities in 1890, as against 16.14 per cent in 1880. The largest percentage of increase for cities occurs in the Western division, being 117.93, that is, the population of cities in this division has more than doubled during the 10 years.

The accompanying cartogram shows the relative proportion of the total population of each state living in cities of 10,000 inhabitants and upward on June 1, 1890.

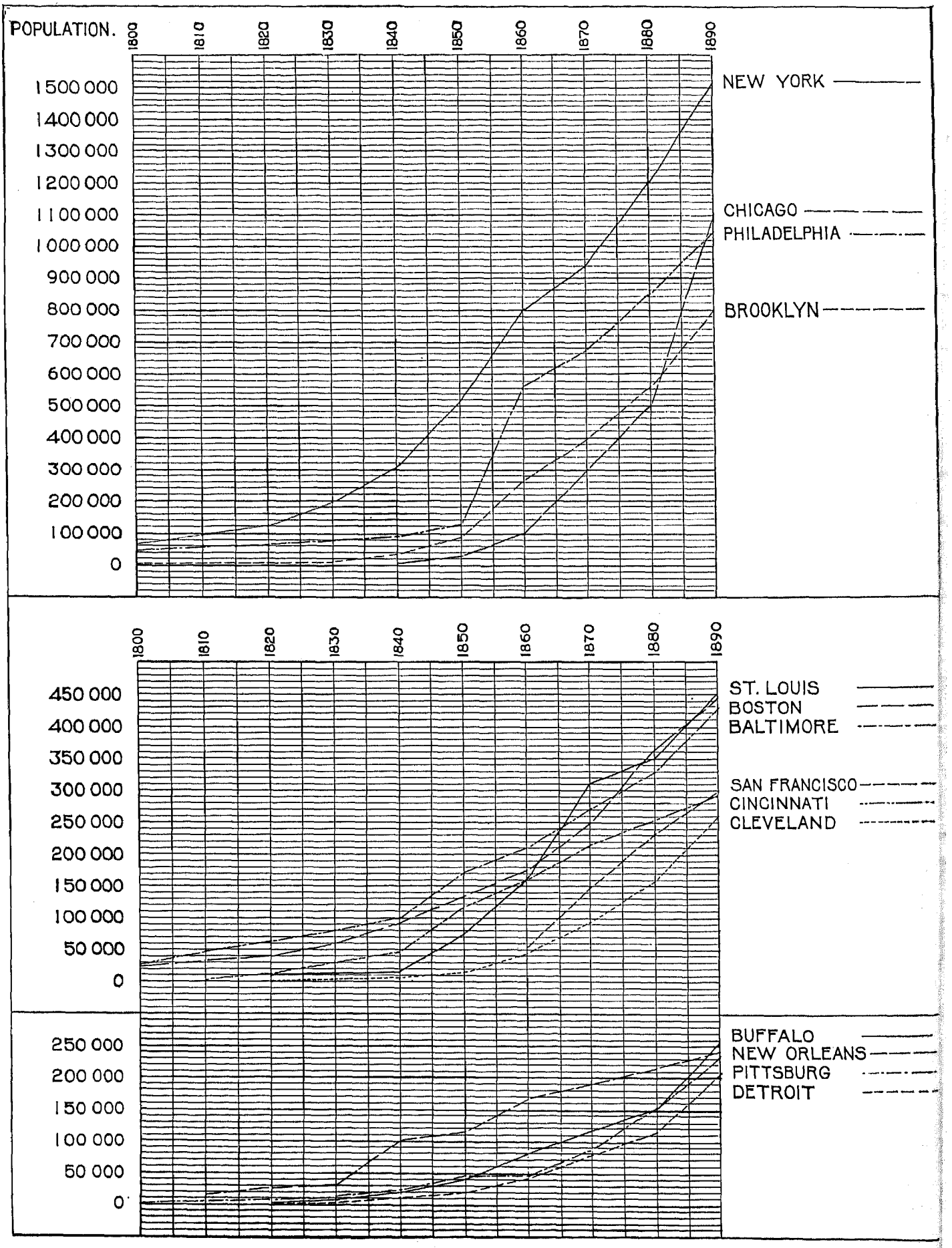
Diagram 1, drawn on 3 scales, and by groups of cities, indicates the rate of increase of the 28 largest cities, as shown by the population at each census, since 1800.

PROPORTION OF TOTAL POPULATION OF EACH STATE LIVING IN CITIES OF 10,000 INHABITANTS AND UPWARD ON JUNE 1, 1890.



Absence of shading indicates that the state contained no city of 10,000 population and upward.

DIAGRAM 1.—GROWTH OF THE 28 CITIES HAVING A POPULATION OF 100,000 OR OVER ON



JUNE 1, 1890, AS SHOWN BY EACH CENSUS FROM 1800 TO 1890, BY GROUPS OF CITIES ON DIFFERENT SCALES.

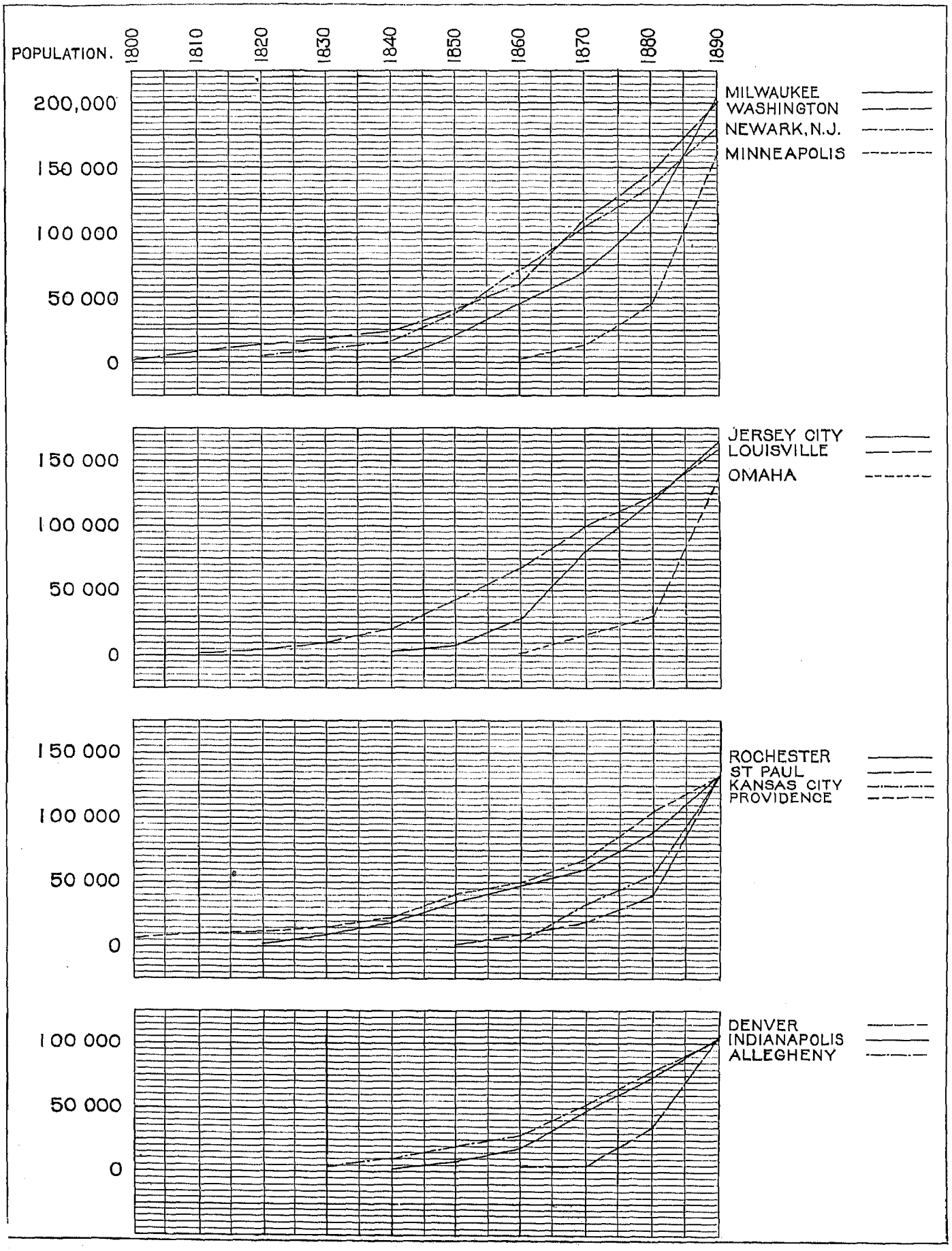
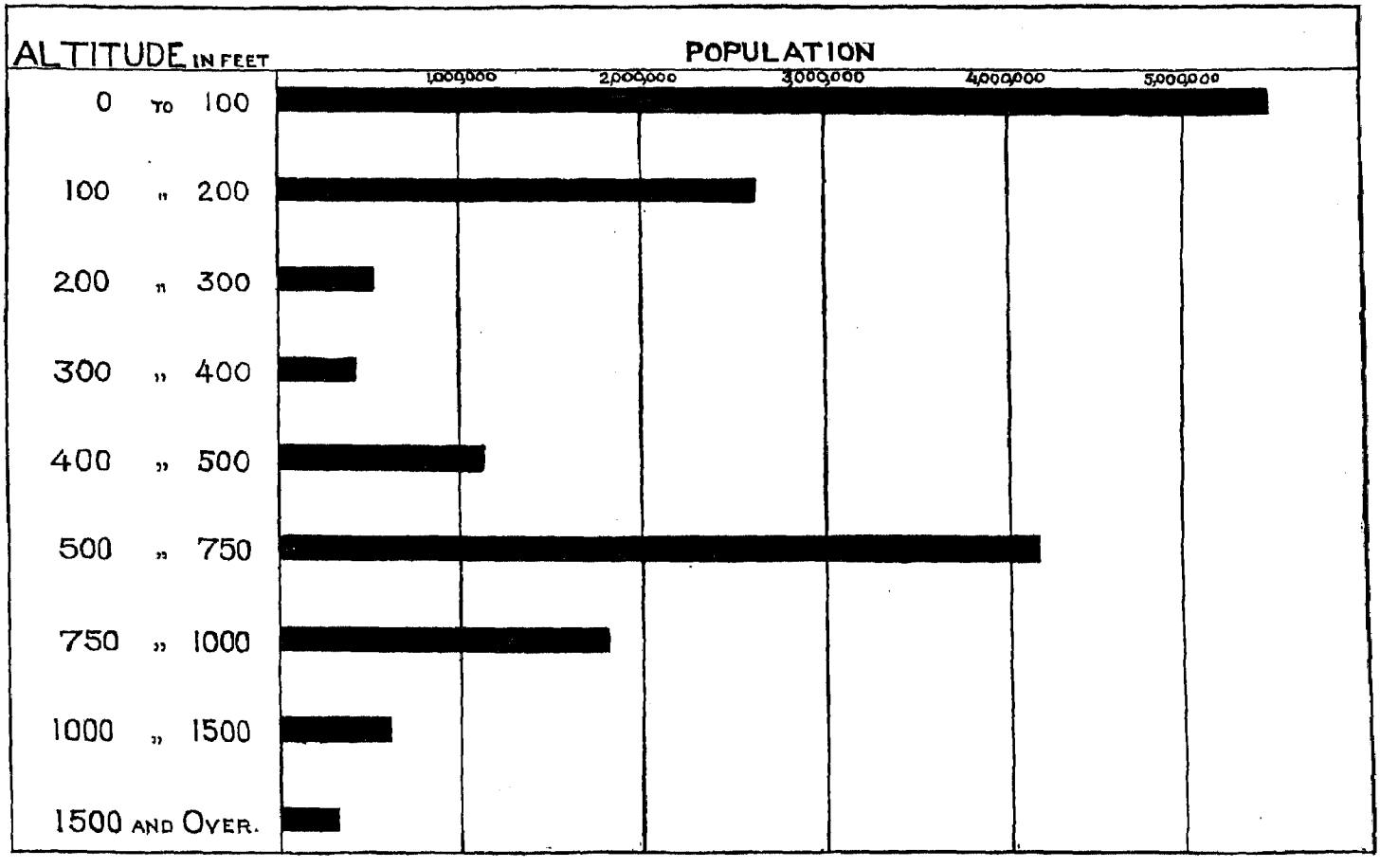


DIAGRAM 2.—PROPORTION OF THE AGGREGATE POPULATION OF 339 CITIES WHICH LIVED IN VARIOUS ALTITUDES JUNE 1, 1890.



ALTITUDE.

Reports as to the highest, lowest, and average altitude in feet above mean sea level have been received from 339 cities with an aggregate population of 17,185,492, and these altitudes are given in Table 63. The average altitude ranges from a few feet to over 10,000 feet. The greatest variation in level within the limits of any one city is found in North Adams, Mass., the difference there being 2,400 feet between the lowest and the highest point. In Galveston, Tex., there is but 6 feet difference between the highest and the lowest point. Of the total municipal population, 31.92 per cent lived at altitudes ranging from sea level to 100 feet above; 15.28 per cent within the next 100 feet of altitude, and 3.04 per cent in the next; so that a little over half the population contained in the cities reported lived at altitudes below 300 feet.

The proportion of this urban population which lived in each altitude, and its distribution by geographical divisions, is shown in Table 2 and Diagram 2.

TABLE 2.

AGGREGATE.			
Altitude. (Feet above mean sea level.)	Number of cities.	Population. Total.	Population. Percentage of total.
Total	339	17,185,492	.....
0 to 99	73	5,484,946	31.92
100 to 199	30	2,625,274	15.28
200 to 299	20	522,303	3.04
300 to 399	20	433,512	2.52
400 to 499	21	1,145,231	6.66
500 to 749	85	4,179,878	24.32
750 to 999	52	1,845,537	10.74
1,000 to 1,499	23	619,707	3.61
1,500 and over	15	329,104	1.91

NORTH CENTRAL DIVISION.			
Altitude. (Feet above mean sea level.)	Number of cities.	Population. Total.	Population. Percentage of total.
Total	119	5,499,177	.....
0 to 99	(a)	.....	.....
100 to 199	(a)	.....	.....
200 to 299	(a)	.....	.....
300 to 399	2	61,080	1.11
400 to 499	6	560,375	10.19
500 to 749	57	3,213,256	58.43
750 to 999	40	1,242,497	22.60
1,000 to 1,499	12	398,208	7.24
1,500 and over	2	23,761	0.43

NORTH ATLANTIC DIVISION.			
Total	139	8,396,427	.....
0 to 99	52	4,547,100	54.15
100 to 199	21	1,630,664	19.42
200 to 299	13	317,331	3.78
300 to 399	12	277,674	3.31
400 to 499	7	244,809	2.91
500 to 749	15	675,587	8.05
750 to 999	8	531,222	6.33
1,000 to 1,499	10	155,966	1.86
1,500 and over	1	16,074	0.19

SOUTH CENTRAL DIVISION.			
Total	29	1,057,366	.....
0 to 99	4	329,756	31.19
100 to 199	1	11,979	1.13
200 to 299	3	85,569	8.09
300 to 399	4	59,334	5.61
400 to 499	6	312,439	29.55
500 to 749	8	203,849	19.28
750 to 999	2	44,102	4.17
1,000 to 1,499	(a)	.....	.....
1,500 and over	1	10,338	0.98

SOUTH ATLANTIC DIVISION.			
Total	29	1,332,980	.....
0 to 99	11	453,367	34.01
100 to 199	4	610,558	45.80
200 to 299	1	15,353	1.15
300 to 399	2	35,424	2.66
400 to 499	2	27,608	2.07
500 to 749	5	87,186	6.54
750 to 999	2	27,716	2.08
1,000 to 1,499	1	65,533	4.92
1,500 and over	1	10,235	0.77

WESTERN DIVISION.			
Total	23	899,542	.....
0 to 99	6	154,723	17.20
100 to 199	4	372,073	41.36
200 to 299	3	104,050	11.57
300 to 399	(a)	.....	.....
400 to 499	(a)	.....	.....
500 to 749	(a)	.....	.....
750 to 999	(a)	.....	.....
1,000 to 1,499	(a)	.....	.....
1,500 and over	10	268,696	29.87

a No cities in this altitude.

The following list shows the distribution of these cities for each altitude group, by population groups and by geographical divisions:

AVERAGE ALTITUDE BELOW 100 FEET.

POPULATION 10,000 TO 14,999.—North Atlantic division: Atlantic city, N. J.; Augusta, Me.; Beverly, Mass.; Biddeford, Me.; Bridgeton, N. J.; Chicopee, Mass.; Dover, N. H.; Hyde Park, Mass.; Lansingburg, N. Y.; Medford, Mass.; Millville, N. J.; Newburyport, Mass.; New London, Conn.; Passaic, N. J.; Peabody, Mass., and West Troy, N. Y. South Atlantic division: Alexandria, Va.; Pensacola, Fla., and Portsmouth, Va. Western division: Alameda, Cal., and Stockton, Cal.

POPULATION 15,000 TO 24,999.—North Atlantic division: Chester, Pa.; Malden, Mass.; New Brunswick, N. J.; Newburg, N. Y.; Newport, R. I.; Norristown, Pa.; Norwich, Conn.; Quincy, Mass.; Stamford, Conn., and Waltham, Mass. South Atlantic division: Jacksonville, Fla.; Key West, Fla.; Petersburg, Va., and Wilmington, N. C. Western division: San Jose, Cal.

POPULATION 25,000 TO 49,999.—North Atlantic division: Bridgeport, Conn.; Chelsea, Mass.; Elizabeth, N. J.; Hoboken, N. J.; Lawrence, Mass.; Long Island city, N. Y.; New Bedford, Mass.; Pawtucket, R. I.; Portland, Me.; Salem, Mass.; Somerville, Mass.; Springfield, Mass., and Taunton, Mass. South Atlantic division: Norfolk, Va., and Savannah, Ga. South Central division: Galveston, Tex.; Houston, Tex., and Mobile, Ala. Western division: Oakland, Cal.; Sacramento, Cal., and Tacoma, Wash.

POPULATION 50,000 TO 99,999.—North Atlantic division: Cambridge, Mass.; Camden, N. J.; Hartford, Conn.; Lynn, Mass.; New Haven, Conn.; Trenton, N. J., and Troy, N. Y. South Atlantic division: Charleston, S. C.

POPULATION OF 100,000 AND OVER.—North Atlantic division: Boston, Mass.; Brooklyn, N. Y.; Jersey city, N. J.; Newark, N. J.; New York, N. Y., and Providence, R. I. South Atlantic division: Washington, D. C. South Central division: New Orleans, La.

AVERAGE ALTITUDE 100 TO 199 FEET.

POPULATION 10,000 TO 14,999.—North Atlantic division: Brookline, Mass.; Northampton, Mass.; Plainfield, N. J.; Pottstown, Pa.; Weymouth, Mass., and Woburn, Mass. South Central division: Shreveport, La. Western division: East Portland, Ore.

POPULATION 15,000 TO 24,999.—North Atlantic division: Bangor, Me.; Cohoes, N. Y.; Gloucester, Mass.; Meriden, Conn.; Nashua, N. H.; New Britain, Conn.; Newton, Mass., and Poughkeepsie, N. Y. Western division: San Diego, Cal.

POPULATION 25,000 TO 49,999.—North Atlantic division: Brockton, Mass.; Haverhill, Mass., and Holyoke, Mass. South Atlantic division: Augusta, Ga. Western division: Portland, Ore.

POPULATION 50,000 TO 99,999.—North Atlantic division: Albany, N. Y.; Fall River, Mass., and Lowell, Mass. South Atlantic division: Richmond, Va., and Wilmington, Del.

POPULATION OF 100,000 AND OVER.—North Atlantic division: Philadelphia, Pa. South Atlantic division: Baltimore, Md. Western division: San Francisco, Cal.

AVERAGE ALTITUDE 200 TO 299 FEET.

POPULATION 10,000 TO 14,999.—North Atlantic division: Burlington, Vt.; Easton, Pa.; Ogdensburg, N. Y., and South Bethlehem, Pa. South Central division: Vicksburg, Miss. Western division: Fresno, Cal.

POPULATION 15,000 TO 24,999.—North Atlantic division: Amsterdam, N. Y.; Concord, N. H.; Kingston, N. Y.; Orange, N. J.; Schenectady, N. Y., and Woonsocket, R. I. South Atlantic division: Columbia, S. C. South Central division: Montgomery, Ala.

POPULATION 25,000 TO 49,999.—North Atlantic division: Manchester, N. H., and Waterbury, Conn. Western division: Seattle, Wash.

POPULATION 50,000 TO 99,999.—North Atlantic division: Paterson, N. J. South Central division: Memphis, Tenn. Western division: Los Angeles, Cal.

AVERAGE ALTITUDE 300 TO 399 FEET.

POPULATION 10,000 TO 14,999.—North Atlantic division: Auburn, Me.; Clinton, Mass.; Columbia, Pa.; Marlboro, Mass., and Saratoga Springs, N. Y. South Atlantic division: Raleigh, N. C. North Central division: Cairo, Ill. South Central division: Jackson, Tenn.; Meridian, Miss., and Paducah, Ky.

POPULATION 15,000 TO 24,999.—North Atlantic division: Lewiston, Me.; Oswego, N. Y., and York, Pa. South Atlantic division: Macon, Ga.

POPULATION 25,000 TO 49,999.—North Atlantic division: Allentown, Pa.; Harrisburg, Pa., and Lancaster, Pa. South Central division: Little Rock, Ark.

POPULATION 50,000 TO 99,999.—North Atlantic division: Reading, Pa. North Central division: Evansville, Ind.

AVERAGE ALTITUDE 400 TO 499 FEET.

POPULATION 10,000 TO 14,999.—North Atlantic division: Ithaca, N. Y.; Lebanon, Pa.; Rome, N. Y., and Watertown, N. Y. South Atlantic division: Danville, Va. North Central division: Jeffersonville, Ind. South Central division: Fort Smith, Ark.; Laredo, Tex., and Waco, Tex.

POPULATION 15,000 TO 24,999.—North Atlantic division: Danbury, Conn. South Atlantic division: Columbus, Ga. North Central division: East St. Louis, Ill., and New Albany, Ind.

POPULATION 25,000 TO 49,999.—North Central division: Quincy, Ill., and Terre Haute, Ind. South Central division: Dallas, Tex.

POPULATION 50,000 TO 99,999.—North Atlantic division: Syracuse, N. Y., and Worcester, Mass. South Central division: Nashville, Tenn.

POPULATION 100,000 AND OVER.—North Central division: St. Louis, Mo. South Central division: Louisville, Ky.

AVERAGE ALTITUDE 500 TO 749 FEET.

POPULATION 10,000 TO 14,999.—North Atlantic division: Middletown, N. Y.; Nanticoke, Pa.; Pittston, Pa.; Pottsville, Pa.; Rutland, Vt., and Shamokin, Pa. South Atlantic division: Cumberland, Md.; Hagerstown, Md., and Huntington, W. Va. North Central division: Alpena, Mich.; Alton, Ill.; Chillicothe, Ohio; Clinton, Iowa; Danville, Ill.; Hannibal, Mo.; Ironton, Ohio; Jacksonville, Ill.; Janesville, Wis.; Keokuk, Iowa; Logansport, Ind.; Manistee, Mich.; Marinette, Wis.; Menominee, Mich.; Michigan city, Ind.; Moline, Ill.; Muscatine, Iowa; Nebraska city, Neb.; Ottumwa, Iowa; Port Huron, Mich.; Portsmouth, Ohio; Rock Island, Ill.; Steubenville, Ohio; Stillwater, Minn.; Streator, Ill.; Superior, Wis., and West Bay city, Mich. South Central division: Austin, Tex., and Denison, Tex.

POPULATION 15,000 TO 24,999.—North Atlantic division: Fitchburg, Mass., and Lockport, N. Y. South Atlantic division: Lynchburg, Va. North Central division: Aurora, Ill.; Belleville, Ill.; Burlington, Iowa; Cedar Rapids, Iowa; Decatur, Ill.; Hamilton, Ohio; Joliet, Ill.; Lafayette, Ind.; Muskegon, Mich.; Racine, Wis.; Sandusky, Ohio; Sheboygan, Wis.; South Bend, Ind.; Springfield, Ill.; Winona, Minn., and Zanesville, Ohio. South Central division: Fort Worth, Tex., and Newport, Ky.

POPULATION 25,000 TO 49,999.—North Atlantic division: Auburn, N. Y.; Erie, Pa.; Utica, N. Y.; Wilkesbarre, Pa., and Williamsport, Pa. South Atlantic division: Wheeling, W. Va. North Central division: Bay city, Mich.; Davenport, Iowa; Lacrosse, Wis.; Peoria, Ill., and Saginaw, Mich. South Central division: Birmingham, Ala.; Chattanooga, Tenn.; Covington, Ky., and San Antonio, Tex.

POPULATION 50,000 TO 99,999.—North Central division: Columbus, Ohio; Grand Rapids, Mich., and Toledo, Ohio.

POPULATION 100,000 AND OVER.—North Atlantic division: Buffalo, N. Y., and Rochester, N. Y. North Central division: Chicago, Ill.; Cincinnati, Ohio; Cleveland, Ohio; Detroit, Mich.; Indianapolis, Ind., and Milwaukee, Wis.

AVERAGE ALTITUDE 750 TO 999 FEET.

POPULATION 10,000 TO 14,999.—North Atlantic division: Gloversville, N. Y., and Newcastle, Pa. South Atlantic division: Charlotte, N. C. North Central division: Anderson, Ind.; Appleton, Wis.; Atchison, Kan.; Battle Creek, Mich.; East Liverpool, Ohio; Elkhart, Ind.; Fond du Lac, Wis.; Fort Scott, Kan.; Lansing, Mich.; Madison, Wis.; Massillon, Ohio; Muncie, Ind.; Newark, Ohio; Sedalia, Mo., and Tiffin, Ohio.

POPULATION 15,000 TO 24,999.—North Atlantic division: McKeesport, Pa. South Atlantic division: Roanoke, Va. North Central division: Bloomington, Ill.; Council Bluffs, Iowa; Eauclaire, Wis.; Elgin, Ill.; Findlay, Ohio; Galesburg, Ill.; Jackson, Mich.; Kalamazoo, Mich.; Leavenworth, Kan.; Lima, Ohio; Oshkosh, Wis., and Rockford, Ill. South Central division: Knoxville, Tenn., and Lexington, Ky.

POPULATION 25,000 TO 49,999.—North Atlantic division: Binghamton, N. Y., and Elmira, N. Y. North Central division: Dubuque, Iowa; Duluth, Minn.; Fort Wayne, Ind.; Kansas city, Kan.; Springfield, Ohio; Topeka, Kan., and Youngstown, Ohio.

POPULATION 50,000 TO 99,999.—North Atlantic division: Scranton, Pa. North Central division: Dayton, Ohio; Des Moines, Iowa, and St. Joseph, Mo.

POPULATION 100,000 AND OVER.—North Atlantic division: Allegheny, Pa., and Pittsburg, Pa. North Central division: Kansas city, Mo.; Minneapolis, Minn., and St. Paul, Minn.

AVERAGE ALTITUDE 1,000 TO 1,499 FEET.

POPULATION 10,000 TO 14,999.—North Atlantic division: Bradford, Pa.; Carbondale, Pa.; Hornellsville, N. Y.; Mahanoy, Pa., and Oil city, Pa. North Central division: Beatrice, Neb.; Freeport, Ill.; Ishpeming, Mich., and Mansfield, Ohio.

POPULATION 15,000 TO 24,999.—North Atlantic division: Jamestown, N. Y.; Johnstown, Pa.; Pittsfield, Mass., and Shenandoah, Pa. North Central division: Richmond, Ind.; Springfield, Mo., and Wichita, Kan.

POPULATION 25,000 TO 49,999.—North Atlantic division: Altoona, Pa. North Central division: Akron, Ohio; Canton, Ohio, and Sioux city, Iowa.

POPULATION 50,000 TO 99,999.—South Atlantic division: Atlanta, Ga. North Central division: Lincoln, Neb.

POPULATION 100,000 AND OVER.—North Central division: Omaha, Neb.

AVERAGE ALTITUDE 1,500 FEET AND OVER.

POPULATION 10,000 TO 14,999.—South Atlantic division: Asheville, N. C. North Central division: Hastings, Neb., and Sioux Falls, S. D. South Central division: El Paso, Tex. Western division: Butte, Mont.; Cheyenne, Wyo.; Colorado Springs, Colo.; Helena, Mont.; Leadville, Colo., and Ogden, Utah.

POPULATION 15,000 TO 24,999.—North Atlantic division: North Adams, Mass. Western division: Pueblo, Colo., and Spokane, Wash.

POPULATION 25,000 TO 49,999.—Western division: Salt Lake, Utah.

POPULATION 100,000 AND OVER.—Western division: Denver, Colo.

Table 3 shows for the cities containing 50,000 inhabitants and upward, arranged in the order of average altitude, the highest, lowest, and average altitudes, the greatest difference in altitude between different parts of the city, and the death rates per 1,000 of the population during the census year.

TABLE 3.

CITIES.	FEET ABOVE MEAN SEA LEVEL.				Death rate per 1,000 of population.	CITIES.	FEET ABOVE MEAN SEA LEVEL.				Death rate per 1,000 of population.
	Highest.	Lowest.	Average.	Difference in level between highest and lowest point.			Highest.	Lowest.	Average.	Difference in level between highest and lowest point.	
New Orleans	15	0	2	15	28.40	Reading	656	183	300	473	15.55
Charleston	20	6	10	14	41.23	Evansville	378	363	370	15	16.65
New Haven	360	0	25	360	19.99	Syracuse	686	360	400	326	19.66
Trenton	45	2	33	43	18.10	Louisville	490	425	457	65	21.81
Cambridge	77	0	39	77	19.89	Nashville	644	387	474	257	18.07
Washington	200	6	45	194	25.20	Worcester	778	410	478	368	19.10
Brooklyn	190	0	50	190	25.54	St. Louis	616	413	488	203	19.14
Lynn	280	0	55	280	18.03	Rochester	620	420	510	200	17.35
New York	285	0	58	285	28.03	Cincinnati	905	440	595	465	22.36
Boston	335	5	60	330	24.79	Chicago	657	592	600	65	21.06
Providence	202	6	80	196	22.36	Toledo	625	577	600	48	20.34
Hartford	156	20	85	136	25.49	Detroit	634	580	601	54	20.42
Jersey city	175	4	90	171	27.51	Buffalo	674	575	624	99	19.90
Newark (N. J.)	230	10	90	220	29.04	Milwaukee	747	587	637	160	19.28
Baltimore	350	4	100	346	24.75	Cleveland	876	573	663	603	21.95
Philadelphia	446	2	110	444	22.67	Indianapolis	753	691	716	62	18.85
Wilmington (Del.)	240	4	110	236	20.79	Dayton	875	740	752	135	16.30
Lowell	297	42	115	255	27.31	Scranton	1,025	675	850	350	22.71
Fall River	355	0	116	355	24.84	Minneapolis	972	691	854	281	14.81
Troy	400	3	130	397	27.02	Kansas city (Mo.)	1,037	737	887	300	19.24
Richmond (Va.)	210	8	150	202	29.02	St. Paul	1,000	690	900	310	16.82
Albany	303	3	153	300	25.50	Pittsburg	1,232	698	965	534	21.82
San Francisco	938	6	183	932	23.61	Allegheny	1,370	716	970	654	20.15
Memphis	280	220	250	60	26.31	Atlanta	1,100	930	1,030	170	24.84
Los Angeles	860	180	267	680	20.00	Omaha	1,205	972	1,032	293	9.95
Paterson	503	34	268	469	23.73	Denver	5,425	5,165	5,300	260	24.21

From this table it will be seen that there is no definite relation between average altitude above sea level and death rates for individual cities, the death rate being much more affected by the average altitude of the local subsoil water level and by the effects of differences in the proportion of different races in the different populations.

If, however, the cities be taken by large groups the death rates diminish as the altitude above sea level increases, as will be seen by Table 4, which shows the population, number of deaths, and death rates per 1,000 population for the aggregate of these cities, subdivided into 5 groups of average altitude.

TABLE 4.

ALTITUDES.	Number of cities.	Population.	Total number of deaths.	Death rate per 1,000 of population.
Total	52	11,329,056	262,654	23.18
Below 100 feet	14	4,064,813	108,578	26.71
100 to 300 feet	12	2,424,429	57,822	23.85
300 to 500 feet	7	971,282	18,642	19.19
500 to 700 feet	8	2,539,449	52,749	20.77
700 feet and over	11	1,329,083	24,863	18.71

If we divide the cities into 2 groups, one including those less than 300 feet above sea level and the other those above this altitude, we find that 6,489,242 of this municipal population lived at an average altitude below 300 feet, and the death rate was 25.64 per 1,000 population, while the remainder of the population, or 4,839,814, lived above 300 feet, and the death rate was but 19.89. The lower death rate for the higher altitudes depends, probably, not upon the altitude itself, but upon the fact that the larger and more densely populated cities are, for the most part, in the lower altitudes. The relations of local altitudes above subsoil water levels to death rates are indicated in the special reports upon "Vital Statistics of Baltimore and the District of Columbia", "Vital Statistics of New York and Brooklyn", and "Vital Statistics of cities of 100,000 inhabitants and upward", published among the reports of the Eleventh Census.

AREA AND DENSITY OF POPULATION.

For 326 cities given in Table 63, the total area has been obtained either from the city records or by careful measurements from the latest obtainable maps, and for each of these cities the table shows the number of dwellings and the number of persons to each acre of the total area.

Table 5 gives a summary as to the density of population and dwellings of these cities by geographical divisions and by 5 population groups. In the cities of from 10,000 to 15,000 inhabitants the density of population was 2.58 per acre of the total area, the density gradually increasing through the various groups, reaching 15.15 in the cities of 100,000 inhabitants and upward. In the geographical divisions the density is greatest in the South Atlantic, being 12.62 persons per acre; the least in the Western, where it is 3.56 per acre.

TABLE 5.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Total area. (Acres.)	POPULATION.		DWELLINGS.		
			Total.	Per acre.	Total number.	Per acre.	Persons to each.
Total	326	2,398,796	16,970,433	7.07	2,535,645	1.06	6.69
10,000 to 14,999	123	573,047	1,480,561	2.58	278,401	0.49	5.32
15,000 to 24,999	81	524,463	1,602,040	3.05	288,874	0.55	5.55
25,000 to 49,999	64	425,815	2,208,646	5.19	374,879	0.88	5.89
50,000 to 99,999	30	237,236	2,008,640	8.47	328,005	1.38	6.12
100,000 and over	28	638,235	9,670,546	15.15	1,265,426	1.98	7.64
Total	326	2,398,796	16,970,433	7.07	2,535,645	1.06	6.69
North Atlantic	132	1,079,668	8,295,652	7.68	1,101,528	1.02	7.53
South Atlantic	27	103,304	1,303,553	12.62	224,001	2.17	5.82
North Central	114	816,384	5,410,812	6.64	870,975	1.07	6.22
South Central	30	146,912	1,054,869	7.18	187,312	1.27	5.63
Western	23	252,528	899,547	3.56	151,829	0.60	5.92

Of these cities, 173 had a system of registration of deaths sufficient to warrant the calculation of death rates, which are shown for the individual cities in Table 63.

Table 6 shows the figures for these cities by groups according to size of population and by geographical divisions.

TABLE 6.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Total area. (Acres.)	POPULATION.		DWELLINGS.			Death rate per 1,000 of population.
			Total.	Per acre.	Total number.	Per acre.	Persons to each.	
Total	173	1,611,661	14,066,046	8.73	1,995,096	1.24	7.05	22.62
10,000 to 14,999	41	207,564	505,070	2.43	92,753	0.45	5.45	17.86
15,000 to 24,999	39	278,698	778,886	2.79	133,205	0.48	5.85	19.45
25,000 to 49,999	40	295,600	1,370,066	4.67	227,051	0.77	6.06	21.81
50,000 to 99,999	25	191,564	1,732,478	9.04	276,061	1.44	6.28	22.43
100,000 and over	28	638,235	9,670,546	15.15	1,265,426	1.98	7.64	23.28
Total	173	1,611,661	14,066,046	8.73	1,995,096	1.24	7.05	22.62
North Atlantic	106	945,338	7,786,962	8.24	1,004,163	1.06	7.75	23.54
South Atlantic	11	62,344	1,032,280	16.56	174,928	2.81	5.90	26.77
North Central	34	438,645	3,894,346	8.88	581,472	1.33	6.70	19.18
South Central	13	89,499	766,818	8.57	134,672	1.50	5.69	25.59
Western	9	75,835	585,640	7.72	99,861	1.32	5.86	22.22

It will be observed that the death rate was lowest in the cities of from 10,000 to 15,000 inhabitants, having an average population of 2.43 per acre and a death rate of 17.86 per 1,000; and that the densities and death rates increase regularly in the succeeding groups, reaching a density of 15.15 per acre and a death rate of 23.28 per 1,000 for the cities of 100,000 inhabitants and upward.

Table 7 and Diagram 3 show the density of population and the death rates for each of the 50 larger cities arranged in the order of density.

TABLE 7.

CITIES.	Population per acre.	Death rate per 1,000 of population.	CITIES.	Population per acre.	Death rate per 1,000 of population.
New York	58.69	28.63	Wilmington (Del.)	13.53	20.79
Brooklyn	44.59	25.54	Rochester	13.40	17.35
Washington	30.99	25.20	Paterson	13.12	23.73
Baltimore	23.03	24.75	Philadelphia	12.64	22.67
Trenton	22.74	18.10	Atlanta	11.57	24.84
Camden	21.00	(a)	St. Louis	11.50	19.14
Richmond (Va.)	20.78	29.62	San Francisco	11.07	23.61
Allegheny	20.66	20.15	Lowell	10.88	27.31
Louisville	20.36	21.81	Chicago	10.70	21.06
Cincinnati	20.02	22.36	Nashville	10.67	18.07
Memphis	19.84	26.31	Dayton	10.50	16.39
Jersey city	19.59	27.51	Grand Rapids	10.46	(a)
Troy	19.00	27.02	Buffalo	10.23	19.40
Milwaukee	18.79	19.28	New Orleans	10.20	28.40
Cambridge	18.77	19.89	Denver	10.09	24.21
Boston	18.51	24.79	Columbus	9.82	15.16
New Haven	16.80	19.99	Omaha	8.96	9.95
Cleveland	16.41	21.95	Syracuse	8.87	19.66
Newark (N.J.)	15.99	29.04	Scranton	8.72	22.71
Detroit	15.63	20.42	Toledo	6.46	20.34
Indianapolis	15.14	18.85	Kansas city (Mo.)	6.39	19.24
Albany	15.02	25.50	Minneapolis	4.98	14.81
Providence	14.24	22.36	St. Paul	4.65	16.82
Reading	14.15	15.55	Worcester	3.89	19.10
Pittsburg	13.75	21.82	Fall River	3.41	24.81

a Nonregistration.

It will be seen from this table and the diagram that the relation between density of population and magnitude of death rate shown by Table 6 is not very apparent for individual cities, being overshadowed by the effects of differences in age groupings and in proportion of races in the different populations, as was remarked in speaking of altitude.

It should also be observed that the statement of the average density of the population of a city by no means indicates the amount of overcrowding which may exist in certain parts of it. For instance, Baltimore had 75 per cent of the total population living in but 24 per cent of the total area; 81 per cent of the population of Boston occupied but 26 per cent of the city area; in Brooklyn 81 per cent of the population covered 48 per cent of the area; in Cincinnati 80 per cent of the population lived within 36 per cent of the total area; in Philadelphia 81 per cent of the population lived in 29 per cent of the area; 83 per cent of the population of Pittsburg lived in but 40 per cent of the total area; in St. Louis 83 per cent of the population occupied 23 per cent of the area; in San Francisco 81 per cent of the population lived in 33 per cent of the area; while in New York 95 per cent of the population was on Manhattan island, which includes only 51 per cent of the total city area. There are 4 contiguous wards in New York, covering a total area of 1.13 square miles, which had an aggregate population larger than either Cleveland, Buffalo, New Orleans, Pittsburg, Washington, or Milwaukee, the average density here for the total area being 390 persons to an acre. Many smaller cities in the table show similar conditions. Auburn, Me., with 81 per cent of its population in 47 per cent of its area; Augusta, Me., with 89 per cent of its population in 66 per cent of its area; Biddeford, Me., with 80 per cent of its population in 14 per cent of its area; San Diego, Cal., with 93 per cent of its population in 21 per cent of its area; Taunton, Mass., with 86 per cent of its population in 34 per cent of its area; and Superior, Wis., with 67 per cent of its population in 12 per cent of its area, are examples. Had figures been obtained for ward areas in all instances, or even in a majority of the cities, it is believed that the result would have been similar in all cases where a large area in comparison to the population has been taken into the city limits.

As the population of San Francisco was taken by assembly districts and not by wards, the 20 assembly districts, numbered from 29 to 48, inclusive, are used in the place of wards. Washington has no municipal divisions, but the city was divided into sanitary districts by the Census Office, which districts were numbered from 1 to 27. The density and death rates are shown for these sanitary districts in lieu of wards. The death rates were not obtained by wards for Denver, Omaha, Providence, Rochester, and San Francisco. For Denver the total city area only was obtained. With the above exceptions, Table 8 shows for the cities having a population of 100,000 and upward the density of population and the death rates by wards.

DIAGRAM 3.—DENSITY OF THE POPULATION TO TOTAL AREA, WITH COMPARISON OF DEATH RATES, FOR THE 50 LARGEST CITIES OF THE COUNTRY.

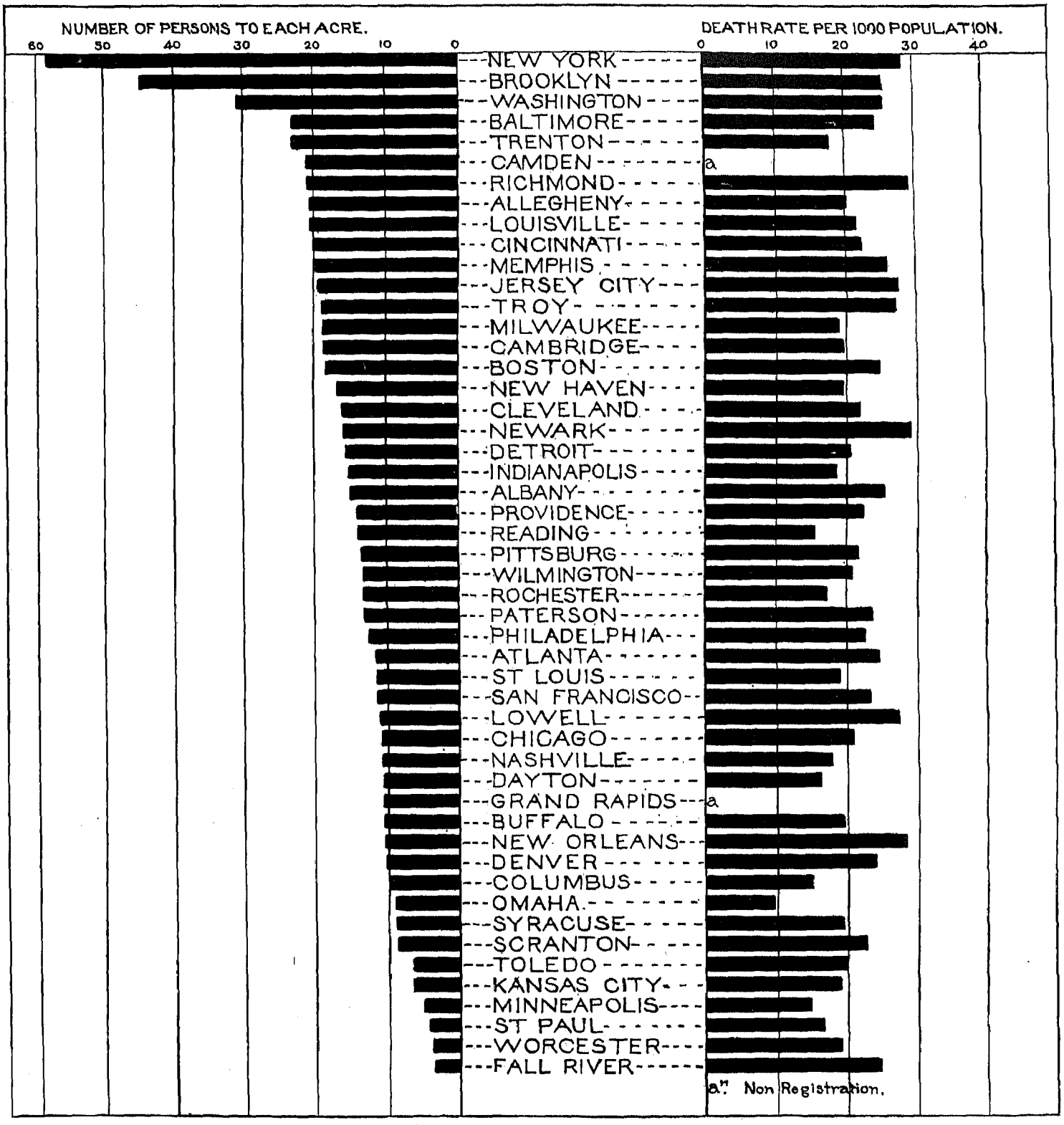


TABLE 8.

CITIES.	Area. (Acres.)	POPULATION. Total.	POPULATION. Per acre.	Death rate per 1,000 of population.
Allegheny, Pa	5,096	105,287	20.66	20.15
Ward 1	243	6,943	28.57	17.43
Ward 2	450	16,511	36.69	17.81
Ward 3	159	14,887	93.63	21.70
Ward 4	211	11,618	55.06	25.74
Ward 5	260	9,920	38.15	16.33
Ward 6	281	11,602	41.29	17.93
Ward 7	181	5,928	32.75	25.81
Ward 8	113	2,941	26.03	27.54
Ward 9	238	4,085	19.68	15.37
Ward 10	1,523	4,381	2.88	15.98
Ward 11	1,064	5,669	5.33	22.93
Ward 12	232	5,370	23.15	18.62
Ward 13	141	4,832	34.27	22.56
Baltimore, Md	18,867	434,439	23.03	24.75
Ward 1	595	22,162	37.25	28.38
Ward 2	250	16,843	67.37	31.05
Ward 3	154	15,762	102.35	26.58
Ward 4	154	15,777	102.45	23.90
Ward 5	141	15,809	112.12	24.54
Ward 6	1,024	26,322	25.71	28.08
Ward 7	326	25,083	76.94	22.60
Ward 8	480	24,688	51.43	22.56
Ward 9	330	15,301	46.37	38.75
Ward 10	109	15,760	144.59	21.51
Ward 11	211	20,310	96.26	27.07
Ward 12	416	23,924	57.51	23.57
Ward 13	173	14,601	84.40	28.22
Ward 14	166	17,485	105.33	22.99
Ward 15	173	14,791	85.50	26.50
Ward 16	134	14,250	106.34	26.32
Ward 17	1,224	25,209	20.60	25.74
Ward 18	1,120	26,452	23.62	23.20
Ward 19	480	24,484	51.01	22.55
Ward 20	330	20,034	60.71	20.16
Ward 21	6,973	16,054	2.30	19.37
Ward 22	3,904	23,398	5.98	19.97
Boston, Mass	24,231	448,477	18.51	24.79
Ward 1	1,256	19,633	15.63	21.49
Ward 2	263	17,207	65.77	27.69
Ward 3	296	13,094	44.24	25.43
Ward 4	291	12,842	44.13	25.23
Ward 5	196	12,412	63.33	26.02
Ward 6	176	18,447	104.81	31.12
Ward 7	105	13,145	125.19	27.01
Ward 8	76	13,026	171.30	33.16
Ward 9	107	12,660	118.32	25.51
Ward 10	215	8,205	38.16	21.08
Ward 11	424	21,660	51.08	17.31
Ward 12	212	12,585	59.36	32.26
Ward 13	495	22,375	45.20	36.96
Ward 14	533	26,307	49.47	25.11
Ward 15	353	18,049	51.13	27.81
Ward 16	98	18,048	184.16	29.31
Ward 17	160	15,638	97.74	21.04
Ward 18	202	16,035	79.38	18.52
Ward 19	220	23,016	104.62	32.24
Ward 20	680	24,335	35.79	22.72
Ward 21	856	22,930	26.79	19.23
Ward 22	1,344	20,011	14.89	23.74
Ward 23	8,079	24,997	3.09	17.96
Ward 24	5,007	29,638	5.92	18.66
Ward 25	2,587	12,032	4.65	19.86
Brooklyn, N. Y	18,084	806,343	44.59	25.54
Ward 1	236	20,040	84.92	21.11
Ward 2	95	8,986	94.59	35.17
Ward 3	160	18,754	117.21	23.14
Ward 4	112	12,324	110.04	29.13
Ward 5	112	20,175	180.13	33.71
Ward 6	296	37,693	127.34	28.23
Ward 7	447	35,726	79.92	22.96
Ward 8	1,749	31,239	17.86	30.15
Ward 9	437	17,696	40.49	28.25
Ward 10	318	34,631	108.73	29.71
Ward 11	253	22,693	89.70	30.10
Ward 12	756	27,368	36.20	33.25
Ward 13	226	21,628	95.70	24.00
Ward 14	280	27,246	97.31	33.47
Ward 15	234	27,630	118.08	27.54
Brooklyn, N. Y.—Continued.				
Ward 16	250	45,720	182.88	27.65
Ward 17	755	41,424	54.87	27.86
Ward 18	2,005	74,060	36.30	24.57
Ward 19	422	36,244	85.89	23.01
Ward 20	410	24,136	58.87	24.40
Ward 21	475	50,118	105.51	23.34
Ward 22	1,355	50,250	37.08	20.40
Ward 23	422	20,348	60.55	17.79
Ward 24	1,181	16,771	14.20	20.93
Ward 25	818	44,638	54.57	20.18
Ward 26	4,225	29,505	6.98	21.66
Buffalo, N. Y	24,982	255,664	10.23	19.90
Ward 1	616	17,125	27.80	21.43
Ward 2	112	6,922	61.80	15.31
Ward 3	294	12,922	43.95	18.96
Ward 4	168	8,501	50.60	18.94
Ward 5	2,520	55,062	21.85	21.45
Ward 6	1,596	31,363	19.61	20.32
Ward 7	2,464	42,112	17.09	19.97
Ward 8	580	9,848	16.98	21.63
Ward 9	224	8,233	36.75	13.12
Ward 10	392	14,340	36.58	18.97
Ward 11	2,296	30,304	13.20	16.20
Ward 12	8,120	10,851	1.34	30.69
Ward 13	5,600	8,141	1.45	16.34
Chicago, Ill	102,765	1,099,850	10.70	21.06
Ward 1	740	24,074	32.53	23.14
Ward 2	642	25,581	39.85	19.00
Ward 3	525	28,040	53.41	17.80
Ward 4	764	27,694	36.25	15.89
Ward 5	693	41,009	59.18	22.75
Ward 6	1,902	43,264	22.75	25.66
Ward 7	508	34,957	68.81	24.12
Ward 8	444	35,583	80.14	23.02
Ward 9	697	41,474	59.50	22.52
Ward 10	4,277	44,551	10.42	20.81
Ward 11	609	35,047	57.55	16.86
Ward 12	2,106	48,795	23.17	15.70
Ward 13	1,436	36,431	25.37	18.28
Ward 14	1,879	40,592	21.60	22.42
Ward 15	2,133	38,429	18.01	22.98
Ward 16	473	55,467	117.27	25.33
Ward 17	400	21,852	54.63	28.74
Ward 18	357	26,456	74.11	21.09
Ward 19	527	44,380	84.21	24.58
Ward 20	678	21,705	32.01	24.88
Ward 21	632	30,225	47.82	20.22
Ward 22	367	31,843	86.77	23.05
Ward 23	443	35,918	81.08	26.20
Ward 24	476	30,942	65.00	16.13
Ward 25	2,942	24,202	8.23	17.44
Ward 26	3,780	28,839	7.63	23.96
Ward 27	18,396	10,734	0.58	12.95
Ward 28	4,513	9,046	2.00	18.08
Ward 29	3,584	31,632	8.83	21.75
Ward 30	7,680	49,134	6.40	20.52
Ward 31	11,560	18,957	1.65	13.29
Ward 32	2,360	26,775	11.20	14.94
Ward 33	13,081	20,039	1.09	21.16
Ward 34	11,191	30,192	2.70	14.97
Cincinnati, Ohio	14,834	296,908	20.02	22.36
Ward 1	2,087	8,441	4.04	18.48
Ward 2	872	12,447	14.27	19.44
Ward 3	102	8,619	84.50	35.04
Ward 4	284	13,938	49.08	22.38
Ward 5	122	7,947	65.14	28.19
Ward 6	94	7,661	81.50	26.11
Ward 7	59	9,198	154.88	25.17
Ward 8	181	4,921	27.19	30.08
Ward 9	105	7,409	70.56	18.90
Ward 10	88	10,949	124.42	37.45
Ward 11	142	12,806	90.18	22.41
Ward 12	755	12,116	16.05	21.87
Ward 13	79	11,438	144.78	26.67
Ward 14	106	9,828	92.72	20.86
Ward 15	72	9,350	129.86	21.07
Ward 16	76	9,930	130.66	22.16
Ward 17	102	10,165	99.66	18.89

TABLE 8—Continued.

CITIES.	Area. (Acres.)	POPULATION. Total.	POPULATION. Per acre.	Death rate per 1,000 of population.
Cincinnati, Ohio—Continued.				
Ward 18	93	8,138	87.51	21.87
Ward 19	145	8,202	56.57	25.36
Ward 20	150	9,347	62.31	20.76
Ward 21	463	10,267	22.17	24.74
Ward 22	360	12,462	34.62	27.92
Ward 23	197	15,090	76.60	19.55
Ward 24	815	10,901	13.38	17.61
Ward 25	1,440	9,974	6.93	18.45
Ward 26	1,145	10,678	9.33	11.43
Ward 27	297	8,627	29.05	19.59
Ward 28	644	9,472	14.71	17.10
Ward 29	1,504	7,279	4.84	16.49
Ward 30	2,255	9,368	4.15	10.11
Cleveland, Ohio	15,923	261,353	16.41	21.95
Ward 1	217	7,008	32.29	36.82
Ward 2	98	3,683	37.58	10.59
Ward 3	342	3,023	8.84	13.89
Ward 4	140	5,906	42.19	22.69
Ward 5	112	5,577	49.79	18.29
Ward 6	266	4,451	16.73	11.23
Ward 7	280	7,758	27.71	24.75
Ward 8	147	6,674	45.40	20.38
Ward 9	616	9,542	15.49	21.80
Ward 10	77	3,874	50.31	20.91
Ward 11	63	3,115	49.44	19.26
Ward 12	126	4,150	32.94	14.70
Ward 13	140	5,159	36.85	36.44
Ward 14	140	4,213	30.09	18.04
Ward 15	140	6,254	44.67	17.27
Ward 16	147	5,685	38.67	21.11
Ward 17	280	8,278	29.56	20.90
Ward 18	644	10,172	15.80	17.99
Ward 19	1,330	4,909	3.69	13.24
Ward 20	406	6,286	15.48	18.93
Ward 21	672	6,739	10.03	18.85
Ward 22	448	9,325	20.81	18.55
Ward 23	896	6,080	6.79	21.88
Ward 24	1,267	14,027	11.07	28.09
Ward 25	1,141	11,610	10.18	24.46
Ward 26	896	4,992	5.57	28.04
Ward 27	980	9,209	9.40	20.41
Ward 28	127	4,402	34.66	32.71
Ward 29	88	4,408	50.09	21.55
Ward 30	224	3,814	17.63	19.40
Ward 31	91	3,699	40.65	20.28
Ward 32	168	4,849	28.81	21.49
Ward 33	112	5,089	45.44	15.52
Ward 34	224	6,327	28.25	20.07
Ward 35	168	6,925	41.22	23.97
Ward 36	294	7,659	26.05	19.98
Ward 37	728	11,012	15.13	20.25
Ward 38	616	8,741	14.19	33.18
Ward 39	392	9,517	24.28	22.59
Ward 40	680	7,221	10.62	21.74
Denver, Colo	a10,576	106,713	10.09	24.21
Detroit, Mich	13,173	205,876	15.63	20.42
Ward 1	738	13,159	17.83	21.51
Ward 2	619	10,943	17.68	12.15
Ward 3	476	14,266	29.97	31.61
Ward 4	619	11,989	19.37	16.10
Ward 5	547	16,320	29.84	19.73
Ward 6	619	13,846	22.37	17.12
Ward 7	571	14,482	25.36	23.75
Ward 8	791	12,591	15.92	19.30
Ward 9	791	21,470	27.14	22.78
Ward 10	983	16,011	16.29	17.24
Ward 11	642	13,974	21.77	19.04
Ward 12	952	14,409	15.14	19.99
Ward 13	1,041	8,809	8.46	20.55
Ward 14	1,166	8,197	7.03	22.94
Ward 15	1,190	5,981	5.03	19.56
Ward 16	1,428	9,429	6.60	20.36
Indianapolis, Ind	6,965	105,436	15.14	18.85
Ward 1	1,066	8,009	7.51	14.98
Ward 2	469	6,810	14.52	11.75
Ward 3	358	5,161	14.42	18.41
Ward 4	209	3,259	15.59	21.48
Indianapolis, Ind.—Continued.				
Ward 5	184	3,424	18.61	17.52
Ward 6	145	3,505	24.17	15.12
Ward 7	214	4,834	22.59	18.29
Ward 8	454	4,661	10.27	16.52
Ward 9	113	3,141	27.80	21.65
Ward 10	112	2,862	25.55	20.61
Ward 11	130	2,391	18.39	24.26
Ward 12	107	3,334	31.16	18.00
Ward 13	131	3,667	27.99	19.01
Ward 14	159	4,069	25.59	46.45
Ward 15	375	4,568	12.18	15.51
Ward 16	214	2,996	14.00	19.03
Ward 17	184	1,680	9.13	14.88
Ward 18	134	2,398	17.90	26.27
Ward 19	231	4,421	19.14	19.23
Ward 20	109	3,643	33.42	13.45
Ward 21	266	6,268	23.56	15.70
Ward 22	681	5,135	7.54	19.67
Ward 23	139	5,173	37.22	14.69
Ward 24	360	3,705	10.29	20.51
Ward 25	421	6,322	15.02	21.35
Jersey city, N. J	8,320	163,003	19.59	27.51
Ward 1	325	17,837	54.88	34.98
Ward 2	849	30,216	35.59	35.71
Ward 3	161	24,312	151.01	27.35
Ward 4	2,375	36,776	15.48	24.01
Ward 5	1,603	20,204	12.66	25.38
Ward 6	3,007	33,568	11.16	21.39
Kansas city, Mo	20,774	132,716	6.39	19.24
Ward 1	440	6,983	15.87	21.05
Ward 2	164	5,403	32.95	14.99
Ward 3	289	10,864	37.59	17.67
Ward 4	418	11,471	27.44	17.17
Ward 5	892	8,337	9.35	21.14
Ward 6	244	9,744	39.93	18.37
Ward 7	1,765	13,692	7.76	20.38
Ward 8	684	16,115	23.56	18.80
Ward 9	888	22,455	25.29	19.37
Ward 10	1,920	14,604	7.61	27.94
Ward 11	2,114	4,613	2.18	14.09
Ward 12	1,850	1,872	1.01	9.62
Ward 13	4,940	3,388	0.78	6.20
Ward 14	4,706	3,175	0.67	8.50
Louisville, Ky	7,913	161,129	20.36	21.81
Ward 1	1,377	14,390	10.45	24.67
Ward 2	608	13,026	21.42	17.58
Ward 3	339	13,572	40.04	20.63
Ward 4	341	12,611	36.98	25.77
Ward 5	500	13,816	27.63	20.40
Ward 6	282	8,251	29.26	16.12
Ward 7	260	6,599	24.53	19.40
Ward 8	302	9,309	30.82	20.03
Ward 9	343	10,364	30.22	21.81
Ward 10	469	14,780	31.51	27.37
Ward 11	947	25,555	26.99	20.58
Ward 12	2,136	18,856	8.83	16.71
Milwaukee, Wis	10,880	204,468	18.79	19.28
Ward 1	289	9,341	32.32	18.95
Ward 2	248	10,548	42.53	20.10
Ward 3	227	6,823	30.06	20.52
Ward 4	440	10,291	23.39	19.53
Ward 5	495	10,168	20.54	16.23
Ward 6	440	13,020	29.59	18.13
Ward 7	220	6,645	30.20	20.92
Ward 8	1,013	14,236	14.05	16.79
Ward 9	715	22,469	31.43	21.99
Ward 10	1,073	19,879	18.53	18.66
Ward 11	481	13,538	28.15	23.05
Ward 12	770	11,791	15.31	16.79
Ward 13	880	14,658	16.66	17.67
Ward 14	529	11,337	21.43	23.29
Ward 15	440	9,584	21.78	18.47
Ward 16	715	6,521	9.12	17.02
Ward 17	825	5,696	6.90	15.98
Ward 18	1,080	7,923	7.34	10.69

a Area by wards not obtained.

TABLE 8—Continued.

CITIES.	Area. (Acres.)	POPULATION. Total.	POPULATION. Per acre.	Death rate per 1,000 of population.
Minneapolis, Minn	33,079	164,738	4.98	14.81
Ward 1	1,540	10,376	6.74	16.00
Ward 2	2,108	9,458	4.49	11.31
Ward 3	2,172	23,647	10.89	14.25
Ward 4	2,461	22,649	9.20	9.05
Ward 5	904	20,528	22.71	13.20
Ward 6	415	15,827	38.14	18.51
Ward 7	2,147	13,265	6.18	15.68
Ward 8	2,742	13,391	4.88	13.22
Ward 9	3,874	12,539	3.24	15.23
Ward 10	3,750	4,514	1.20	18.83
Ward 11	661	14,333	21.68	19.95
Ward 12	4,799	1,901	0.40	29.46
Ward 13	5,506	2,319	0.42	24.68
Newark, N. J	11,375	181,830	15.99	29.04
Ward 1	181	7,595	41.96	28.57
Ward 2	122	7,151	58.61	38.88
Ward 3	126	6,404	50.83	26.55
Ward 4	129	5,946	46.09	35.99
Ward 5	110	5,403	49.12	32.76
Ward 6	632	25,830	40.87	29.62
Ward 7	148	9,288	62.76	32.10
Ward 8	1,909	19,575	10.25	25.34
Ward 9	155	7,084	45.70	22.16
Ward 10	3,728	13,897	3.73	30.94
Ward 11	890	11,784	13.24	21.55
Ward 12	1,961	19,616	10.00	34.10
Ward 13	568	27,600	48.59	28.04
Ward 14	574	5,700	9.93	17.54
Ward 15	142	8,957	63.08	31.26
New Orleans, La	23,739	242,039	10.20	28.40
Ward 1	308	13,993	45.43	28.80
Ward 2	530	16,406	30.95	24.26
Ward 3	989	28,241	28.56	57.04
Ward 4	1,081	12,890	11.92	25.29
Ward 5	2,534	21,474	8.47	27.48
Ward 6	258	14,516	56.26	24.04
Ward 7	2,635	22,361	8.49	25.89
Ward 8	1,430	11,087	7.75	28.14
Ward 9	7,049	17,143	2.43	23.39
Ward 10	374	20,789	55.59	26.97
Ward 11	449	21,011	46.80	26.32
Ward 12	815	12,265	15.05	23.40
Ward 13	615	7,485	12.17	24.32
Ward 14	1,089	4,927	4.52	28.21
Ward 15	1,796	10,334	5.75	23.51
Ward 16	374	3,530	9.44	32.01
Ward 17	1,413	3,587	2.54	22.02
New York, N. Y	25,818	1,515,301	58.69	28.63
Ward 1	264	11,122	42.13	52.60
Ward 2	76	929	12.22	55.97
Ward 3	102	3,765	36.91	29.75
Ward 4	82	17,809	217.18	44.53
Ward 5	162	12,385	76.45	41.50
Ward 6	100	23,119	231.19	41.61
Ward 7	202	57,366	283.99	32.68
Ward 8	170	31,220	183.65	37.83
Ward 9	316	54,425	172.23	30.28
Ward 10	106	57,596	543.36	25.61
Ward 11	218	75,426	345.99	26.85
Ward 12	5,879	245,046	41.68	24.99
Ward 13	109	45,884	420.95	26.81
Ward 14	102	28,094	275.43	45.24
Ward 15	229	25,399	110.91	33.82
Ward 16	332	49,134	147.99	30.90
Ward 17	290	103,158	355.72	27.76
Ward 18	431	63,270	146.80	31.37
Ward 19	1,600	234,846	146.78	23.68
Ward 20	443	84,327	190.35	33.93
Ward 21	410	63,019	153.70	29.01
Ward 22	1,480	153,877	103.97	27.08
Ward 23	4,241	53,948	12.72	25.82
Ward 24	8,474	20,137	2.38	24.58
Omaha, Neb	15,680	140,452	8.96	a9.95
Ward 1	1,472	11,907	8.09	.....
Ward 2	1,024	17,531	17.12	.....
Ward 3	384	21,901	57.03	.....
Ward 4	384	19,901	51.83	.....
Ward 5	2,112	15,517	7.35	.....
Ward 6	4,800	18,956	3.95	.....
Ward 7	3,584	8,730	2.44	.....
Ward 8	384	17,278	44.99	.....
Ward 9	1,536	8,731	5.68	.....
Philadelphia, Pa	82,807	1,046,964	12.64	22.67
Ward 1	3,526	53,882	15.28	24.72
Ward 2	283	31,563	111.53	23.76
Ward 3	122	19,925	163.32	23.69
Ward 4	147	20,384	138.67	30.96
Ward 5	205	16,987	82.86	28.08
Ward 6	205	8,712	42.50	27.55
Ward 7	281	30,179	107.40	27.60
Ward 8	278	16,971	61.05	23.81
Ward 9	256	9,791	38.25	31.97
Ward 10	230	21,514	93.54	21.57
Ward 11	135	12,953	95.95	29.41
Ward 12	124	14,170	114.27	23.71
Ward 13	163	17,923	109.96	20.81
Ward 14	152	20,737	136.43	24.06
Ward 15	671	52,705	78.55	23.91
Ward 16	180	17,087	94.93	31.08
Ward 17	161	19,546	121.40	27.68
Ward 18	416	29,164	70.11	22.25
Ward 19	447	55,545	124.26	22.65
Ward 20	469	44,480	94.84	21.06
Ward 21	4,563	26,900	5.90	19.37
Ward 22	12,738	45,329	3.56	18.07
Ward 23	27,330	35,204	1.29	20.23
Ward 24 (b)	6,224	66,277	10.65	19.06
Ward 25	2,641	35,945	13.61	24.26
Ward 26	4,788	62,138	12.98	21.34
Ward 27	7,475	32,905	4.40	42.00
Ward 28	3,542	46,390	13.10	18.39
Ward 29	896	54,759	61.11	20.96
Ward 30	332	30,614	92.21	23.13
Ward 31	456	32,974	72.31	19.59
Ward 32	518	30,050	58.01	12.08
Ward 33	2,844	33,171	11.66	13.42
Ward 34	.....	.....	.....	.....
Pittsburg, Pa	17,350	238,617	13.75	21.82
Ward 1	75	3,732	49.76	21.97
Ward 2	69	3,695	53.55	38.97
Ward 3	52	2,090	40.19	14.35
Ward 4	86	3,144	36.56	17.18
Ward 5	40	5,131	128.28	19.10
Ward 6	143	9,129	63.84	32.64
Ward 7	43	5,902	137.26	20.50
Ward 8	70	7,022	100.31	20.08
Ward 9	63	4,277	67.89	21.51
Ward 10	63	3,602	57.17	21.38
Ward 11	126	9,884	78.44	14.87
Ward 12	242	10,335	42.71	42.10
Ward 13	823	11,109	13.50	18.45
Ward 14	952	15,521	16.30	23.26
Ward 15	172	5,758	33.48	22.40
Ward 16	241	10,810	44.85	23.87
Ward 17	429	12,335	28.75	21.97
Ward 18	1,131	6,995	6.18	24.45
Ward 19	1,349	7,996	5.93	16.26
Ward 20	1,099	11,012	10.02	15.26
Ward 21	1,766	11,276	6.39	17.83
Ward 22	3,488	3,259	0.93	12.89
Ward 23	1,802	7,020	3.71	18.52
Ward 24	260	5,809	20.05	23.76
Ward 25	138	7,379	53.47	21.68
Ward 26	92	7,762	84.37	23.06
Ward 27	423	10,898	25.76	25.33
Ward 28	63	5,120	81.27	20.12
Ward 29	65	4,836	74.40	20.06

a Deaths not returned by wards.

b Includes Thirty-fourth ward.

TABLE 8—Continued.

CITIES.	Area. (Acres.)	POPULATION. Total.	POPULATION. Per acre.	Death rate per 1,000 of population.
Pittsburg, Pa.—Continued.				
Ward 30	80	3,402	42.53	23.52
Ward 31	161	4,823	29.96	17.62
Ward 32	627	6,791	10.83	15.76
Ward 33	74	1,079	14.58	21.32
Ward 34	87	2,422	27.84	18.58
Ward 35	788	3,630	4.61	13.77
Ward 36	138	3,632	26.32	21.20
Providence, R. I	9,277	132,146	14.24	a22.36
Ward 1	504	13,709	27.20	.....
Ward 2	1,961	13,501	7.10	.....
Ward 3	1,237	17,152	13.87	.....
Ward 4	344	8,573	24.92	.....
Ward 5	321	12,428	38.72	.....
Ward 6	939	12,517	13.33	.....
Ward 7	1,145	11,007	9.61	.....
Ward 8	378	12,015	31.79	.....
Ward 9	332	13,603	40.97	.....
Ward 10	2,176	17,641	8.11	.....
Rochester, N. Y	9,993	133,896	13.40	a17.35
Ward 1	91	2,102	24.09	.....
Ward 2	149	3,468	23.28	.....
Ward 3	264	6,532	24.74	.....
Ward 4	93	3,946	39.86	.....
Ward 5	586	9,978	17.03	.....
Ward 6	107	4,936	46.13	.....
Ward 7	314	7,224	23.01	.....
Ward 8	891	15,191	17.05	.....
Ward 9	652	9,602	14.73	.....
Ward 10	264	5,665	21.46	.....
Ward 11	338	8,955	26.49	.....
Ward 12	479	8,720	18.22	.....
Ward 13	264	12,878	48.78	.....
Ward 14	182	7,067	38.83	.....
Ward 15	1,848	6,654	3.60	.....
Ward 16	3,465	20,879	6.03	.....
St. Louis, Mo	39,276	451,770	11.50	19.14
Ward 1	211	11,293	53.52	29.13
Ward 2	274	10,891	39.75	32.96
Ward 3	237	13,489	56.92	22.83
Ward 4	262	12,792	48.82	24.94
Ward 5	215	16,731	77.82	19.96
Ward 6	846	18,366	21.71	19.87
Ward 7	292	20,501	70.21	19.22
Ward 8	93	13,322	143.25	24.85
Ward 9	577	20,701	35.88	17.20
Ward 10	154	17,756	115.30	22.98
Ward 11	2,584	18,367	7.11	15.41
Ward 12	191	15,234	79.76	19.36
Ward 13	1,100	11,837	10.76	20.02
Ward 14	191	15,369	80.47	18.02
Ward 15	119	11,913	100.11	28.46
Ward 16	271	13,804	50.94	18.98
Ward 17	212	15,201	71.70	16.71
Ward 18	646	17,462	27.03	15.81
Ward 19	305	16,363	53.65	20.05
Ward 20	343	14,783	43.10	12.51
Ward 21	358	16,713	46.68	17.71
Ward 22	349	15,678	44.92	16.71
Ward 23	490	19,815	40.44	16.91
Ward 24	325	16,777	51.62	17.46
Ward 25	842	18,256	21.68	17.36
Ward 26	11,368	18,093	1.59	15.86
Ward 27	13,229	17,871	1.35	15.67
Ward 28	3,192	22,392	7.02	15.01
St. Paul, Minn	32,908	133,156	4.05	16.82
Ward 1	2,614	17,080	6.53	19.85
Ward 2	9,570	13,667	1.43	15.22
Ward 3	264	7,514	28.46	12.91
Ward 4	297	12,642	42.57	17.88
Ward 5	2,442	15,119	6.19	22.03
Ward 6	2,673	14,767	5.52	15.03
Ward 7	1,353	10,134	7.49	16.08
Ward 8	3,465	23,337	6.74	17.05
Ward 9	1,353	13,257	9.80	13.50
Ward 10	3,333	3,019	0.91	11.26
Ward 11	5,544	2,620	0.47	15.65
San Francisco, Cal	27,000	298,997	11.07	b23.61
Assembly district 29	215	7,211	33.54	.....
Assembly district 30	114	9,932	87.12	.....
Assembly district 31	128	26,838	209.67	.....
Assembly district 32	151	16,588	109.85	.....
Assembly district 33	183	13,448	73.49	.....
Assembly district 34	352	12,229	34.74	.....
Assembly district 35	87	9,748	112.05	.....
Assembly district 36	100	9,081	90.81	.....
Assembly district 37	91	11,890	130.66	.....
Assembly district 38	123	12,424	101.01	.....
Assembly district 39	137	13,149	95.98	.....
Assembly district 40	204	14,967	73.37	.....
Assembly district 41	2,858	18,253	6.39	.....
Assembly district 42	1,763	20,975	11.90	.....
Assembly district 43	1,020	15,882	15.57	.....
Assembly district 44	2,586	22,046	8.53	.....
Assembly district 45	723	14,200	19.64	.....
Assembly district 46	691	11,593	16.78	.....
Assembly district 47	6,745	18,386	2.73	.....
Assembly district 48	8,729	20,157	2.31	.....
Washington, D. C	6,550	202,978	30.99	25.20
Sanitary district 1	211	3,638	17.24	25.56
Sanitary district 2	97	2,609	26.90	31.11
Sanitary district 3	127	3,079	24.24	18.84
Sanitary district 4	53	2,800	52.83	25.71
Sanitary district 5	103	1,920	18.64	43.23
Sanitary district 6	40	2,031	50.78	32.09
Sanitary district 7	180	2,102	11.68	42.34
Sanitary district 8	336	9,649	28.72	22.30
Sanitary district 9	148	6,337	42.82	26.35
Sanitary district 10	156	8,451	54.17	13.96
Sanitary district 11	246	5,410	21.99	25.88
Sanitary district 12	243	11,151	45.89	25.74
Sanitary district 13	40	2,701	67.53	24.81
Sanitary district 14	251	13,704	54.60	25.32
Sanitary district 15	242	16,715	69.07	24.59
Sanitary district 16	104	5,087	48.91	20.44
Sanitary district 17	196	10,274	52.42	18.88
Sanitary district 18	68	1,550	22.79	35.48
Sanitary district 19	458	9,263	20.22	27.74
Sanitary district 20	149	7,099	47.64	25.07
Sanitary district 21	305	19,038	62.42	29.05
Sanitary district 22	279	2,952	10.58	39.30
Sanitary district 23	689	13,179	19.13	22.84
Sanitary district 24	539	16,412	30.45	22.36
Sanitary district 25	532	4,039	7.59	29.22
Sanitary district 26	159	7,696	48.40	31.83
Sanitary district 27	599	14,092	23.53	22.02

a Deaths not returned by wards.

b Deaths not returned by assembly districts.

From the preceding table it will be seen that ward 10 of New York had 543.36 persons to each acre of its area, while ward 24 of the same city had but 2.38; San Francisco ranges from 209.67 to 2.31; Brooklyn, from 182.88 to 6.98; Philadelphia, from 163.32 to 1.29; Boston, from 184.16 to 3.09; Cincinnati, from 154.88 to 4.04. On the other hand, the range in Detroit is from 29.97 to 5.03; in Indianapolis, from 37.22 to 7.51; in Minneapolis, from 38.14 to less than 1; in Providence, from 40.97 to 7.10; in Louisville, from 40.04 to 8.83, and in Kansas city, from 39.93 to less than 1.

The 12 squares of San Francisco, known as "Chinatown", had a less density of population than ward 10 in New York; the number of persons to an acre being 538 in Chinatown and 543 in ward 10, New York. The area of Chinatown is 41.33 acres, and with the exception of 2 squares is included in assembly district 31. In New York 52 acres of ward 10 had a density of 586 persons to an acre, while 32 acres in ward 11 had 763 persons to an acre.

Table 9 gives the data for a comparison of the area, population, and density of population of the principal cities of the United States, England, France, Germany, and Belgium, arranged in the descending order of population. The data for the foreign cities are taken from the census reports for 1891. It will be seen that Chicago and Philadelphia had each a greater area than London; that there were 11 cities in the United States which exceeded Paris in total area and 16 cities of this country which had a greater area than Berlin.

TABLE 9.

Cities.	Countries.	Area. (Acres.)		Population.			Dwellings.			
		Total.	Actual building.	Total.	To each acre— Of total area.	To each acre— Of building area.	Total number.	To each acre— Of total area.	To each acre— Of building area.	Persons to each.
London	England	74,692	(a)	4,211,056	56.38	.....	553,704	7.41	.....	7.60
Paris	France	19,295	.....	2,447,957	126.87	.....	.....	.....	.....	.....
New York	United States	25,818	16,114	1,515,301	58.69	94.03	81,828	3.17	5.08	18.52
Berlin	Germany	15,661	5,312	1,578,794	100.81	297.21	28,700	1.84	5.42	54.84
Chicago	United States	102,705	(a)	1,099,850	10.70	.....	127,871	1.24	.....	8.60
Philadelphia	do	82,807	(a)	1,046,964	12.64	.....	187,052	2.26	.....	5.60
Brooklyn	do	18,084	(a)	806,343	44.59	.....	82,282	4.55	.....	9.80
Liverpool	England	5,210	(a)	517,951	99.41	.....	91,484	17.56	.....	5.66
Manchester	do	12,788	(a)	505,343	39.52	.....	100,249	7.84	.....	5.04
Hamburg	Germany	18,544	4,799	569,269	30.70	121.12	28,444	1.53	6.05	20.01
St. Louis	United States	39,276	29,887	451,770	11.50	15.12	60,937	1.55	2.04	7.41
Boston	do	24,231	20,076	448,477	18.51	22.34	52,669	2.17	2.62	8.52
Baltimore	do	18,867	(a)	434,439	23.03	.....	72,112	3.82	.....	6.02
Birmingham	England	8,406	(a)	429,171	51.09	.....	85,624	10.19	.....	5.01
Leeds	do	21,572	(a)	367,506	17.04	.....	78,686	3.62	.....	4.71
Sheffield	do	19,651	(a)	324,243	16.50	.....	66,708	3.40	.....	4.85
Breslau	Germany	7,499	1,930	335,186	44.70	173.67	9,562	1.28	4.95	35.05
San Francisco	United States	27,000	(a)	298,997	11.07	.....	47,183	1.75	.....	6.34
Cincinnati	do	14,834	11,341	296,908	20.02	26.18	33,487	2.26	2.95	8.87
Munich	Germany	15,811	.....	349,024	22.07	.....	15,537	0.98	.....	22.46
Cleveland	United States	15,923	(a)	261,353	16.41	.....	43,835	2.75	.....	5.96
Buffalo	do	24,982	(a)	255,664	10.23	.....	37,290	1.49	.....	6.86
Dresden	Germany	7,064	2,276	276,522	39.15	121.49	10,160	1.44	4.46	27.22
New Orleans	United States	23,739	18,559	242,039	10.20	13.05	43,000	1.81	2.32	5.63
Pittsburg	do	17,350	14,200	238,617	13.75	16.80	37,725	2.17	2.66	6.33
Bristol	England	3,595	(a)	221,605	61.66	.....	35,347	9.83	.....	6.27
Bradford	do	10,775	(a)	216,361	20.08	.....	45,887	4.26	.....	4.72
Antwerp	Belgium	4,780	1,119	224,012	46.86	200.19	(a) *	.....	.....	.....
Nottingham	England	9,960	(a)	211,984	21.28	.....	45,629	4.58	.....	4.65
Detroit	United States	13,173	9,491	205,876	15.63	22.95	36,992	2.81	3.90	5.57
Milwaukee	do	10,880	7,559	204,468	18.79	27.05	32,888	3.02	4.35	6.22
Washington	do	6,550	(a)	202,978	30.99	.....	34,543	5.27	.....	5.88
Kingston upon Hull	England	7,916	(a)	199,991	25.26	.....	42,466	5.36	.....	4.71
Salford	do	5,170	(a)	198,136	38.32	.....	39,163	7.58	.....	5.06
Newcastle on Tyne	do	5,371	(a)	186,345	34.69	.....	26,227	4.88	.....	7.11
Newark	United States	11,375	9,748	181,830	15.99	18.65	23,296	2.05	2.39	7.81
Brussels	Belgium	2,208	928	176,138	79.77	189.80	(a)	.....	.....	.....
Leipsic	Germany	14,075	.....	357,122	25.37	.....	11,686	0.83	.....	30.56
Minneapolis	United States	33,679	23,497	164,738	4.98	7.18	25,281	0.76	1.08	6.52
Jersey city	do	8,320	.....	163,003	19.59	.....	18,562	2.23	.....	8.78
Cologne	Germany	27,442	2,293	281,681	10.26	122.84	20,737	0.76	9.04	13.58
Louisville	United States	7,913	5,434	161,129	20.36	29.65	24,999	3.16	4.60	6.45
Portsmouth	England	4,320	(a)	159,255	36.86	.....	29,376	6.80	.....	5.42
Frankfort on the Main	Germany	18,411	1,977	179,985	9.78	91.04	10,834	0.59	5.48	16.61
Königsberg	do	4,954	1,072	161,666	32.63	150.81	5,520	1.11	5.15	29.29
Ghent	Belgium	5,767	1,203	148,729	25.79	123.63	(a)	.....	.....	.....
Liege	do	4,646	822	147,660	31.78	179.64	(a)	.....	.....	.....
Leicester	England	3,200	(a)	142,051	44.39	.....	29,288	9.15	.....	4.85
Omaha	United States	15,080	(a)	140,452	8.96	.....	20,194	1.29	.....	6.96
Hanover	Germany	6,120	1,231	163,593	26.73	132.89	8,945	1.46	7.27	18.29
Rochester	United States	9,993	7,850	133,896	13.40	17.20	23,954	2.40	3.05	5.59
St. Paul	do	32,908	26,445	133,156	4.05	5.04	20,976	0.64	0.79	6.35
Kansas city	do	20,774	(a)	132,716	6.39	.....	23,140	1.11	.....	5.74
Providence	do	9,277	(a)	132,146	14.24	.....	17,639	1.90	.....	7.49
Oldham	England	4,730	(a)	131,463	27.79	.....	27,489	5.81	.....	4.78
Sunderland	do	3,032	(a)	130,921	43.18	.....	18,523	6.11	.....	7.07
Cardiff	do	7,374	(a)	128,849	17.47	.....	20,476	2.78	.....	6.29
Stuttgart	Germany	7,361	751	139,817	18.99	186.17	6,108	0.83	8.13	22.89
Blackburn	England	6,974	(a)	120,064	17.22	.....	24,493	3.51	.....	4.90
Brighton	do	2,514	(a)	115,402	45.90	.....	19,619	7.80	.....	5.88
Dusseldorf	Germany	12,019	1,515	144,642	12.03	95.47	8,563	0.71	5.65	16.89
Bolton	England	2,404	(a)	115,002	47.84	.....	23,523	9.78	.....	4.89
Magdeburg	Germany	13,597	1,829	202,234	14.87	110.57	7,554	0.56	4.13	26.77
Strasburg	do	19,345	1,606	123,500	6.38	76.90	6,967	0.36	4.34	17.73
Preston	England	4,030	(a)	107,573	26.69	.....	22,346	5.54	.....	4.81
Denver	United States	10,576	4,827	106,713	10.09	22.11	18,010	1.70	3.73	5.93
Indianapolis	do	6,965	3,751	105,436	15.14	28.11	21,138	3.03	5.64	4.99
Allegheny	do	5,096	(a)	105,287	20.66	.....	16,543	3.25	.....	6.36
Altona	Germany	5,387	791	143,249	26.59	181.10	7,476	1.39	9.45	19.16
Norwich	England	7,472	(a)	100,064	13.51	.....	22,273	2.98	.....	4.53

a No data.

Tables 10 and 11 show in the aggregate, for the cities named in Table 9, for which the necessary data were obtained, the density of population and dwellings per acre of total and actual building area.

TABLE 10.

COUNTRIES.	Number of cities.	Building area. (Acres.)	POPULATION.		DWELLINGS.	
			Total.	Per acre of building area.	Number.	Per acre of building area.
United States	15	208,785	4,590,354	21.99	537,180	2.57
Germany	13	27,283	4,300,129	157.61	159,660	5.85
Belgium	4	4,072	696,539	171.06	(a)	.....

a No data.

TABLE 11.

COUNTRIES.	Number of cities.	Total area. (Acres.)	POPULATION.		DWELLINGS.		
			Total.	Per acre of total area.	Total number.	Number per acre of total area.	Number of persons to each.
United States	28	638,235	9,670,546	15.15	1,265,426	1.98	7.64
England	22	231,150	8,841,296	38.25	1,448,130	6.26	6.11
Germany	15	193,290	5,006,275	25.90	186,883	0.97	26.79
Belgium	4	17,401	696,539	40.03	(a)	.....	.....
France	1	19,295	2,447,957	126.87	(a)	.....	.....

a No data.

There is a wide range, even in the totals, in the several countries, as shown in the density of the population per acre of both the total and the actual building area, the population per acre of the total area being 40.03 for the 4 Belgian cities and 15.15 for the 28 cities of the United States. The density per acre of actual building area ranges from 171.06 in Belgium to 21.99 for the 15 cities in the United States for which the actual building area is reported, while Paris has 126.87 persons per acre of total area.

BOARDS OF HEALTH.

Of the 345 cities in Table 63, 292 reported regarding their several boards of health. Of these 14 reported "no board" and 2 reported that the functions of a health board were performed by the county medical society, while the remaining 276 have regular boards, with a total membership of 1,403, and of this number 348 were physicians, being 24.80 per cent of the total number. Of these 276 cities, 217, with an aggregate population of 14,026,360, reported an annual expense of their health boards amounting to $2,075,536.

Table 12 shows for these 217 cities, grouped by population and by geographical divisions, the population, number of members constituting the boards, number of physicians, and percentage of physicians to the membership; also the average annual expenditures for the 10 years 1880–1889, inclusive.

TABLE 12.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	BOARD OF HEALTH.			
			Membership.		Percentage of physicians of total membership.	Average annual expenditures. (For 10 years.)
			Total.	Physicians.		
Total	217	14,026,360	1,085	261	24.06	$2,075,536
10,000 to 14,999	73	883,576	341	69	20.23	94,746
15,000 to 24,999	50	983,932	234	69	29.49	57,939
25,000 to 49,999	46	1,537,628	240	44	18.33	197,857
50,000 to 99,999	23	1,560,856	125	44	35.20	167,472
100,000 and over	25	9,060,368	145	35	24.14	1,557,522
Total	217	14,026,360	1,085	261	24.06	2,075,536
North Atlantic	93	7,433,890	439	98	22.32	962,283
South Atlantic	17	1,104,810	101	31	30.69	215,162
North Central	85	4,575,845	435	96	22.07	803,984
South Central	14	769,061	77	22	28.57	81,469
Western	8	142,754	33	14	42.42	12,638

DIAGRAM 4.—TOTAL LENGTH OF STREETS AND ALLEYS AND THE PROPORTION PAVED; ALSO, THE PERCENTAGE OF PAVING IN EACH GROUP, BY POPULATION AND BY GEOGRAPHICAL DIVISIONS.

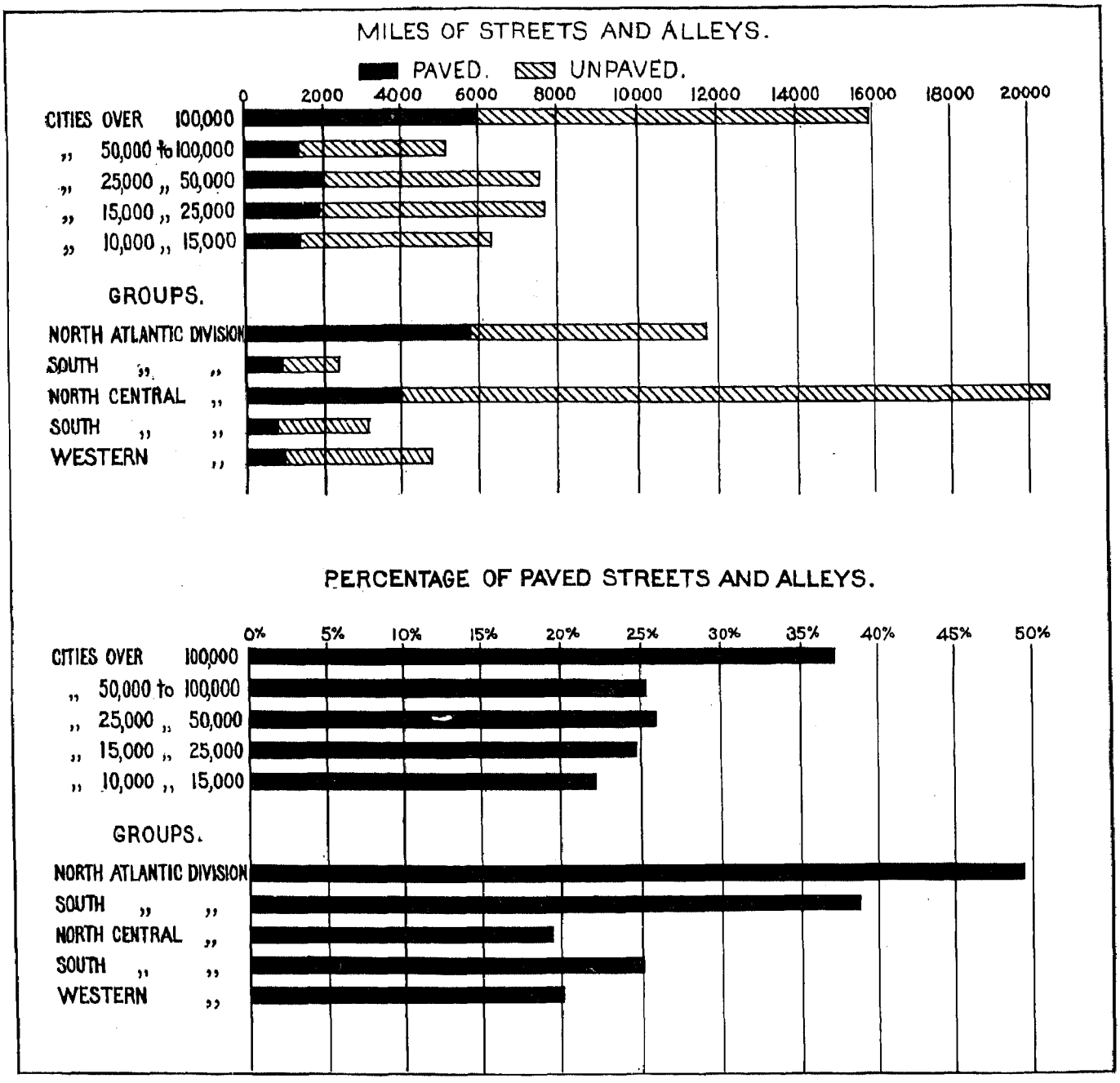
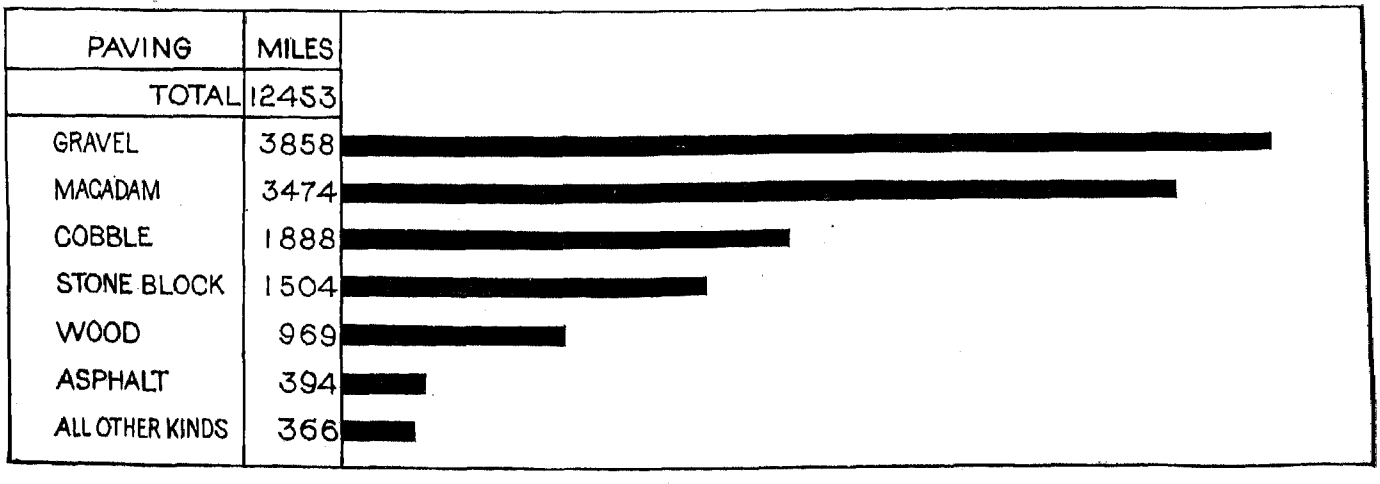


DIAGRAM 5.—TOTAL NUMBER OF MILES OF PAVING IN THE 262 CITIES, BY CLASSES.



From this it will be seen that but 24.06 per cent of all the members of the several boards for the 217 cities were physicians, and the range in the population groups is from 35.20 to 18.33 per cent, and in the geographical groups from 42.42 to 22.07. The expenditures being the average annual for the 10 years, 1880–1889, and the population that for 1890, only an approximate per capita cost can be estimated, and no fair comparisons on this point can be made, but it would seem that the average annual expenditure on boards of health and their work was between 15 and 20 cents per head of population.

The expenditures by the boards of health are not at all uniform in character in the several cities. In Philadelphia, for instance, the board of health does not pay for the removal of garbage, while for Baltimore and Washington such work is included in the expenditures of the boards of health.

STREETS AND ALLEYS.

Table 64 gives certain data with regard to the streets and alleys that were opened and accepted by the municipal authorities at the date of the report in each city making returns on this subject.

Of the 345 cities of 10,000 inhabitants and upward, 277 returned the street schedules, many of them complete, but some lacking in one or more details, which makes it impossible to give complete totals and averages on all the points for the whole number of cities. Table 64 gives for the individual cities the number of miles of streets and alleys, the number of miles paved, with distinction of the different materials used for paving, the average width of streets between the building lines, average width of sidewalks, number of miles of streets lined with shade trees, and the length and width of grassed places, not including parks. The financial portion of the table shows the average annual cost of construction, repairs, and cleaning for the 10 years preceding the date of the report, or for the years to which the reports pertained, as indicated by the footnotes.

The 277 cities, with an aggregate population of 15,979,809, reported as the total length of their streets and alleys 43,855 miles, which gives 1 mile for each 364.37 persons. Of these cities, 262, with a total population of 15,745,770, and with 42,551 miles of streets and alleys, reported as the total length of their paving 12,453 miles, or 29.27 per cent of the total length, being 1 mile of paving to each 1,264.41 of the population. Some of the cities made no distinction between streets and alleys, while others have probably failed to include the length of the alleys, and the same is also true as to the paving.

Table 13 shows for these 262 cities in the aggregate, and as grouped by number of population and by geographical divisions, the population, the length of streets and alleys, the percentage paved, and the number of persons per mile of such highways.

TABLE 13.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	STREETS AND ALLEYS.			
			Total length. (Miles.)	Paved. (Miles.)	Percentage paved.	Population to each mile.
Total	262	15,745,770	42,551	12,453	29.27	370.04
10,000 to 14,999	83	1,002,307	6,320	1,395	22.07	158.61
15,000 to 24,999	67	1,339,088	7,651	1,891	24.72	175.10
25,000 to 49,999	57	1,961,748	7,513	1,940	25.82	261.11
50,000 to 99,999	27	1,771,391	5,185	1,308	25.23	341.64
100,000 and over	28	9,670,546	15,882	5,919	37.27	608.90
Total	262	15,745,770	42,551	12,453	29.27	370.04
North Atlantic	103	7,732,540	11,721	5,800	49.48	659.72
South Atlantic	20	1,180,839	2,343	905	38.63	503.99
North Central	103	5,183,615	20,527	3,996	19.47	252.53
South Central	19	872,802	3,134	785	25.05	278.51
Western	17	775,914	4,826	967	20.04	160.78

It will be seen that the percentage of paving is smallest in the lesser cities and greatest in the cities of 100,000 and over, and that the population per mile of streets increases regularly as the cities grow larger. In the geographical divisions the North Atlantic cities had the largest percentage of paving, nearly 50 per cent being paved, and also the greatest number of persons to each mile of streets and alleys, while the smallest percentages of paving and the least number of persons per mile of streets were in the North Central and Western.

Diagram 4 shows by population groups and geographical divisions the total length of streets and alleys and the proportion paved, the black portion of the bar indicating the paving; also the percentage of the total length which is paved.

In sending out the schedules 6 materials were named for street paving: cobblestones, stone blocks, asphalt, wood, macadam, and gravel. All other materials were classed together, including artificial stone, iron, vitrified brick, and oyster shells, as well as the 6 above named, when these did not exceed half a mile in length in any one city. It will be noted in Table 64 that 38 miles of "coal tar concrete" were included under the head of "Asphalt" in Washington. This city is the only one that reported paving over a mile of the material named, and, as it so closely resembles asphalt, the consolidation was deemed best. Diagram 5 shows the distribution of the total paving in these 262 cities by materials used.

Owing to differences in opinion as to the purpose of the inquiry regarding paving, it is probable that some cities reported graveling, which was not in its character paving, and that others failed to include such paving.

Table 14 shows by population groups and by geographical divisions the total number of miles of paving, the number of miles of each kind, and the percentage of the total for the 262 cities which reported.

TABLE 14.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Total length of paving. (Miles.)	STONE.					ASPHALT.		WOOD.		MACADAM.		GRAVEL.		ALL OTHER KINDS.	
		Cobble.		Block.		All stone. (Per cent.)										
		Length. (Miles.)	Per cent.	Length. (Miles.)	Per cent.		Length. (Miles.)	Per cent.	Length. (Miles.)	Per cent.	Length. (Miles.)	Per cent.	Length. (Miles.)	Per cent.	Length. (Miles.)	Per cent.
Total	12,453	1,888	15.16	1,504	12.08	27.24	394	3.16	969	7.78	3,474	27.90	3,858	30.98	366	2.94
10,000 to 14,999	1,395	29	2.08	28	2.01	4.09	2	0.14	50	3.59	327	23.44	927	66.45	32	2.29
15,000 to 24,999	1,891	106	5.61	76	4.02	9.63	8	0.42	73	3.86	564	29.83	1,017	53.78	47	2.48
25,000 to 49,999	1,940	79	4.07	86	4.43	8.50	56	2.89	135	6.96	711	36.65	811	41.80	62	3.20
50,000 to 99,999	1,308	164	12.54	117	8.94	21.48	25	1.91	54	4.13	443	33.87	464	35.47	41	3.14
100,000 and over	5,919	1,510	25.51	1,197	20.22	45.73	303	5.12	657	11.10	1,429	24.14	639	10.80	184	3.11
Total	12,453	1,888	15.16	1,504	12.08	27.24	394	3.16	969	7.78	3,474	27.90	3,858	30.98	366	2.94
North Atlantic	5,800	1,035	17.84	971	16.74	34.58	189	3.26	34	0.59	1,348	23.24	2,057	35.47	166	2.86
South Atlantic	905	532	58.78	78	8.62	67.40	98	10.83	6	0.66	77	8.51	81	8.95	33	3.65
North Central	3,996	245	6.13	306	7.66	13.79	65	1.62	877	21.95	1,289	32.26	1,114	27.88	100	2.50
South Central	785	69	8.79	80	10.19	18.98	11	1.40	36	4.59	405	51.59	130	16.56	54	6.88
Western	967	7	0.72	69	7.14	7.86	31	3.21	16	1.66	355	36.71	476	49.22	13	1.34

It will be seen that gravel and macadam comprise 58.88 per cent of all the material used. Stone pavement, cobble and block, formed 27.24 per cent and wood 7.78 per cent of the total number of miles paved, while asphalt covers 3.16 per cent, and all other kinds 2.94 per cent. Taking the geographical divisions, 54.82 per cent of the cobblestone pavement was used in the North Atlantic and 28.18 per cent in the South Atlantic; 64.56 per cent of stone block paving was used in the North Atlantic and 20.35 per cent in the North Central; 72.84 per cent of all the asphalt paving was laid in the North Atlantic and South Atlantic; the North Central used nearly 91 per cent of all the wood paving; nearly 76 per cent of the macadam paving goes to the North Atlantic and North Central, while about 82 per cent of the gravel was used by the same divisions. In the population groups it will be observed that 89.88 per cent of all the paving used in the cities of from 10,000 to 15,000 inhabitants was macadam and gravel, and that this class of roadway is gradually displaced by a more permanent pavement as the population increases. Stone paving comprises 45.73 per cent of the total paving in the larger cities.

Diagram 6 shows the distribution of the paving by materials used in each of the geographical divisions and population groups.

A large number of cities did not separate their street cleaning account from the cost of construction and repairs.

There were 173 cities with a population of 13,450,167, and with 30,884 miles of streets and alleys, of which 9,904 miles were paved, which made returns showing the average annual cost of construction and repairs for 10 years. This amounted in the aggregate to $20,806,402.

Table 15 shows for the total of these 173 cities, and by population groups and geographical divisions, the population, miles of streets and alleys, and number of miles paved, with the average annual cost of construction and repairs.

It should be borne in mind that the cost of construction and repairs is the average annual cost for the past 10 years, and that the cost per mile of street can not be based on it, for the reason that it would not cover the cost of streets existing prior to the 10-year period.

DIAGRAM 6.—CLASSES OF PAVING BY PERCENTAGE OF TOTAL LENGTH PAVED FOR 262 CITIES, BY POPULATION AND GEOGRAPHICAL GROUPS.

PAVING	PER CENT
POPULATION	
CITIES 10,000 TO 15,000	
GRAVEL	66.45
MACADAM	23.44
COBBLE	02.08
STONE BLOCK	02.01
WOOD	03.59
ASPHALT	00.14
ALL OTHER	02.29
CITIES 15,000 TO 25,000	
GRAVEL	53.78
MACADAM	29.83
COBBLE	05.61
STONE BLOCK	04.02
WOOD	03.86
ASPHALT	00.42
ALL OTHER	02.48
CITIES 25,000 TO 50,000	
GRAVEL	41.80
MACADAM	36.65
COBBLE	04.07
STONE BLOCK	04.43
WOOD	06.96
ASPHALT	02.89
ALL OTHER	03.20
CITIES 50,000 TO 100,000	
GRAVEL	35.47
MACADAM	33.87
COBBLE	12.54
STONE BLOCK	08.94
WOOD	04.13
ASPHALT	01.91
ALL OTHER	03.14
CITIES OF 100,000 AND ABOVE.	
GRAVEL	10.80
MACADAM	24.14
COBBLE	25.51
STONE BLOCK	20.22
WOOD	11.10
ASPHALT	05.12
ALL OTHER	03.11
GEOGRAPHICAL GROUPS.	
NORTH ATLANTIC DIVISION.	
GRAVEL	35.47
MACADAM	23.24
COBBLE	17.84
STONE BLOCK	16.74
WOOD	00.59
ASPHALT	03.26
ALL OTHER	02.86
SOUTH ATLANTIC DIVISION.	
GRAVEL	08.95
MACADAM	08.51
COBBLE	58.78
STONE BLOCK	08.62
WOOD	00.66
ASPHALT	10.83
ALL OTHER	03.65
NORTH CENTRAL DIVISION.	
GRAVEL	27.88
MACADAM	32.26
COBBLE	06.13
STONE BLOCK	07.66
WOOD	21.95
ASPHALT	01.62
ALL OTHER	02.50
SOUTH CENTRAL DIVISION.	
GRAVEL	16.56
MACADAM	51.59
COBBLE	08.79
STONE BLOCK	10.19
WOOD	04.59
ASPHALT	01.40
ALL OTHER	06.88
WESTERN DIVISION.	
GRAVEL	49.22
MACADAM	36.71
COBBLE	00.72
STONE BLOCK	07.14
WOOD	01.66
ASPHALT	03.21
ALL OTHER	01.34

TABLE 15.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	STREETS AND ALLEYS.		
			Total length. (Miles.)	Paved. (Miles.)	Average annual cost of construction and repairs. (For 10 years.)
Total	173	13,450,167	30,884	9,904	20,806,402
10,000 to 14,999	52	628,454	3,841	1,012	811,869
15,000 to 24,999	40	818,360	5,037	1,070	1,758,559
25,000 to 49,999	34	1,168,273	4,376	957	2,276,206
50,000 to 99,999	21	1,403,963	2,887	988	1,965,593
100,000 and over	26	9,431,117	14,743	5,868	13,994,175
Total	173	13,450,167	30,884	9,904	20,806,402
North Atlantic	69	6,881,212	9,166	4,671	6,324,242
South Atlantic	15	1,115,995	2,015	873	1,214,894
North Central	65	4,241,361	15,104	3,277	10,506,591
South Central	14	705,511	2,081	543	845,432
Western	10	506,088	2,518	540	1,915,243

The average annual cost of construction and repairs and of street cleaning, as shown in Tables 15 and 16, is a summary of the average for each city represented in the respective groups, and is not therefore strictly correct, but it is believed that the figures are fairly comparative.

Of the cities, 157 with a total population of 12,844,450, made separate returns showing both the average annual cost of construction and repairs and of street cleaning. These cities had a total length of 27,644 miles of streets and alleys, of which 9,315 miles were paved. The aggregate annual amount expended for construction and repairs was $19,383,596, and for cleaning $3,531,858, which makes the total average annual amount expended for street work $22,915,454, of which 15.41 per cent was for the cleaning.

Table 16 shows the distribution of these figures by groups and by geographical divisions.

TABLE 16.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	STREETS AND ALLEYS.					
			Total length. (Miles.)	Paved. (Miles.)	Average annual cost of all street work. (For 10 years.)			
					Total.	Construction and repairs.	Cleaning.	Percentage of total for cleaning.
Total	157	12,844,450	27,644	9,315	$22,915,454	$19,383,596	$3,531,858	15.41
10,000 to 14,999	44	534,638	3,320	797	700,038	617,718	82,320	11.76
15,000 to 24,999	36	743,592	3,952	1,005	1,644,509	1,518,359	126,150	7.67
25,000 to 49,999	32	1,100,346	4,186	933	2,218,691	1,955,828	262,863	11.85
50,000 to 99,999	21	1,403,963	2,887	988	2,173,890	1,905,593	208,297	9.58
100,000 and over	24	9,061,911	13,299	5,592	16,178,326	13,326,098	2,852,228	17.63
Total	157	12,844,450	27,644	9,315	22,915,454	19,383,596	3,531,858	15.41
North Atlantic	65	6,834,550	8,950	4,493	8,427,772	6,257,441	2,170,331	25.75
South Atlantic	15	1,115,995	2,015	873	1,[illegible]38,313	1,214,894	323,419	21.02
North Central	57	3,763,579	13,087	2,890	10,4[illegible]2,328	9,668,586	773,742	7.41
South Central	12	683,234	1,929	530	988,632	830,432	158,200	16.00
Western	8	447,092	1,663	529	1,518,409	1,412,243	106,166	6.99

Table 17 shows for each of the 45 cities of largest population which made reports the average annual cost of construction and repairs of streets and alleys, and the average annual cost for cleaning.

TABLE 17.

CITIES.	AVERAGE ANNUAL COST OF ALL STREET WORK. (FOR 10 YEARS.)			CITIES.	AVERAGE ANNUAL COST OF ALL STREET WORK. (FOR 10 YEARS.)		
	Construction and repairs.	Cleaning.	Percentage of total for cleaning.		Construction and repairs.	Cleaning.	Percentage of total for cleaning.
New York	$1,024,161	a$1,075,200	51.22	Denver	c$48,250	.....	.....
Chicago	3,500,000	88,128	2.46	Indianapolis	275,000	$50,000	15.38
Philadelphia	637,550	283,979	30.82	Allegheny	105,000	25,000	19.23
Brooklyn	393,945	165,165	29.54	Albany	168,000	8,000	4.55
St. Louis	837,304	126,804	13.15	Columbus	(b)	(b)	.....
Boston	825,000	136,673	14.21	Syracuse	(b)	(b)	.....
Baltimore	120,000	110,000	47.83	Worcester	140,011	7,000	4.76
San Francisco	958,743	58,437	5.75	Toledo	237,902	8,137	3.31
Cincinnati	855,000	185,000	17.79	Richmond (Va.)	104,043	1,660	1.51
Cleveland	350,550	49,807	12.44	New Haven	136,416	4,500	3.19
Buffalo	573,244	85,500	12.98	Paterson	55,000	10,000	15.38
New Orleans	35,000	25,000	41.67	Lowell	81,712	17,000	17.22
Pittsburg	498,561	40,661	7.54	Nashville	c130,000	.....	.....
Washington	507,320	62,450	10.96	Scranton	d38,925	10,000	20.44
Detroit	334,617	58,589	14.90	Fall River	c66,500	.....	.....
Milwaukee	468,077	(b)	.....	Cambridge	45,000	25,000	35.71
Newark (N. J.)	20,000	30,000	60.00	Atlanta	165,941	14,369	7.97
Minneapolis	200,000	(b)	.....	Memphis	259,000	3,000	1.10
Jersey city	80,000	30,000	27.27	Wilmington (Del.)	25,000	5,000	16.67
Louisville	259,032	70,000	21.27	Dayton	(b)	(b)	.....
Omaha	83,366	11,000	11.66	Troy	(b)	(b)	.....
Rochester	141,803	20,611	12.69	Grand Rapids	64,989	14,330	18.07
St. Paul	750,902	37,584	4.77	Reading	26,000	3,000	10.34
Kansas city (Mo.)	(b)	(b)	.....	Camden	22,000	11,000	33.33
Providence	160,000	26,640	14.27	Trenton	10,000	1,000	9.09

a Including removal of garbage, ashes, ice, and snow. b No data. c Includes cleaning. d For past year only.

Diagram 7 shows for each of the 40 cities of greatest population which made reports the percentage of the average annual total cost of all street work which was paid for cleaning.

STREETS EXCLUSIVE OF ALLEYS.

Of the 277 cities reporting as to streets and alleys, 48 made returns separating the streets from the alleys. Table 18 shows for each of these 48 cities the total length of streets, and for 43 of them the number of miles of paved streets, with distinction between graveling and all other kinds of paving.

As was stated in relation to streets and alleys, it is possible that some of these cities did not report the number of miles graveled under the head of "Paving", and that others included graveling, which was not in its character paving, so the percentage of total length paved will be affected accordingly. The table also shows the population, water mains, hydrants, sewers, and public street lamps to each mile of street, and the actual building area, with population and number of dwellings to each acre.

DIAGRAM 7.—COST OF STREET WORK FOR CLEANING.

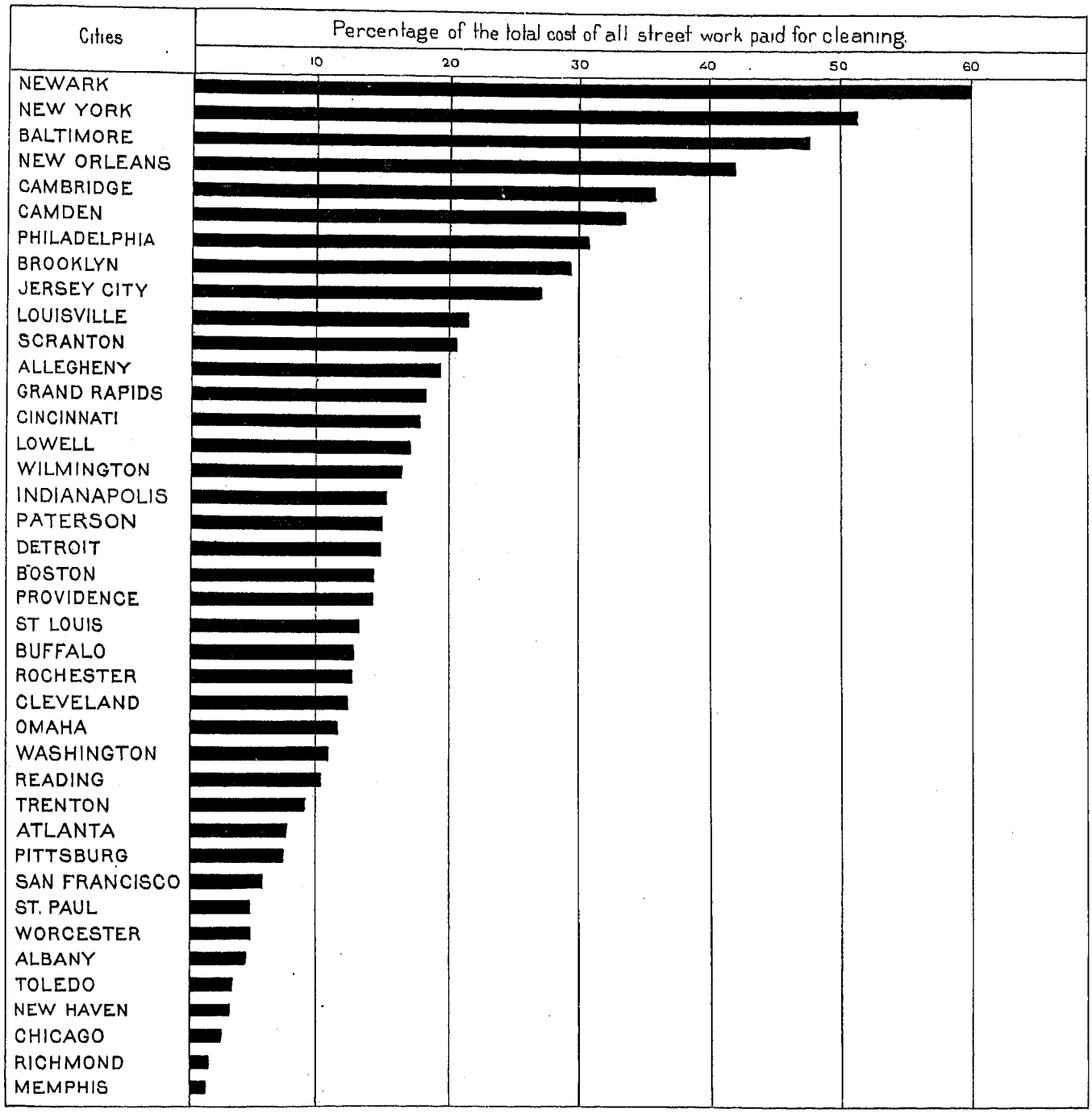


DIAGRAM 8.—PERCENTAGE OF THE TOTAL LENGTH OF ALL STREETS PAVED IN EACH OF THE 43 CITIES.

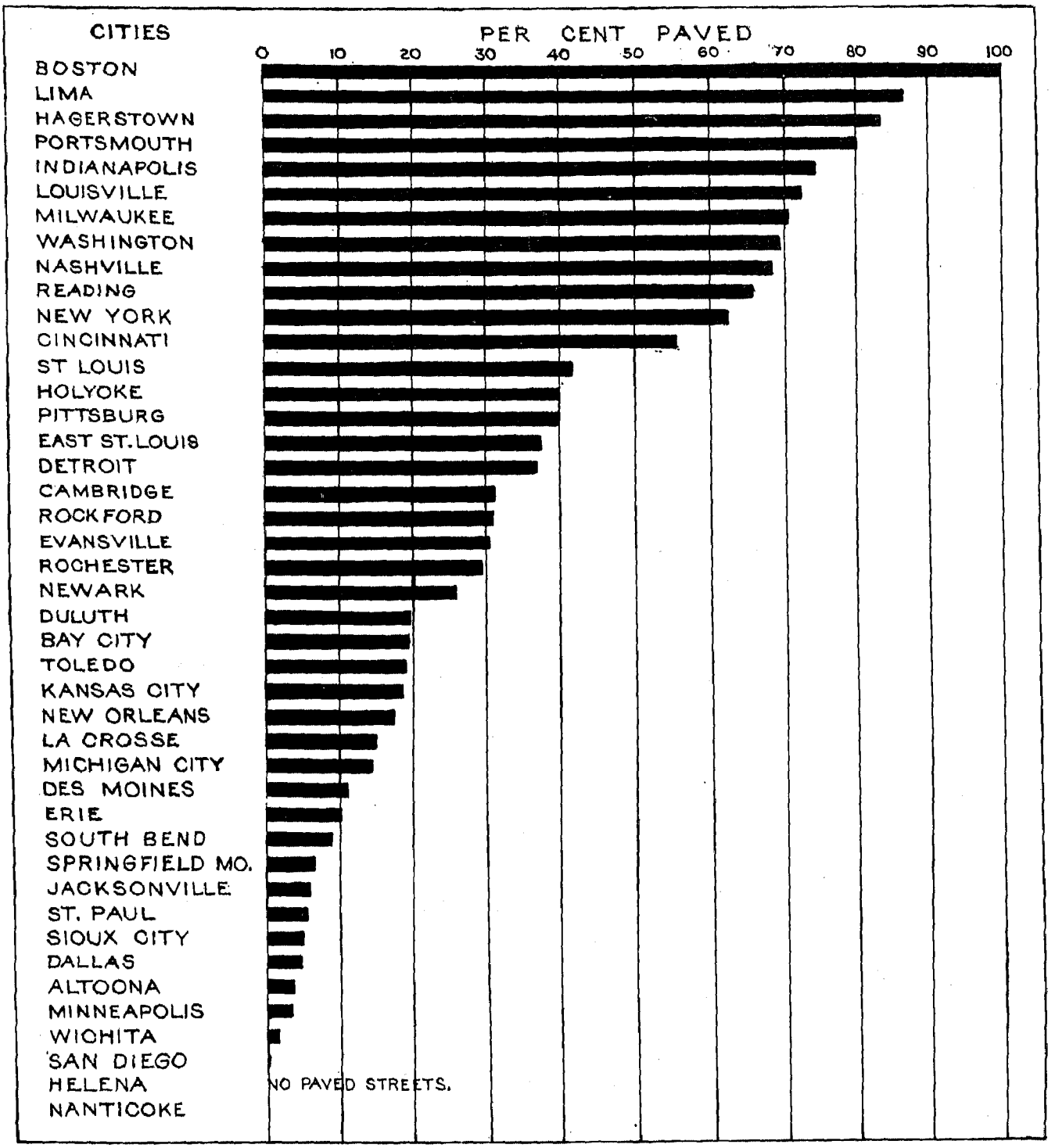


DIAGRAM 9.—DISTRIBUTION OF THE DWELLINGS IN 44 CITIES, IN ACCORDANCE WITH TOTAL AND ACTUAL BUILDING AREA.

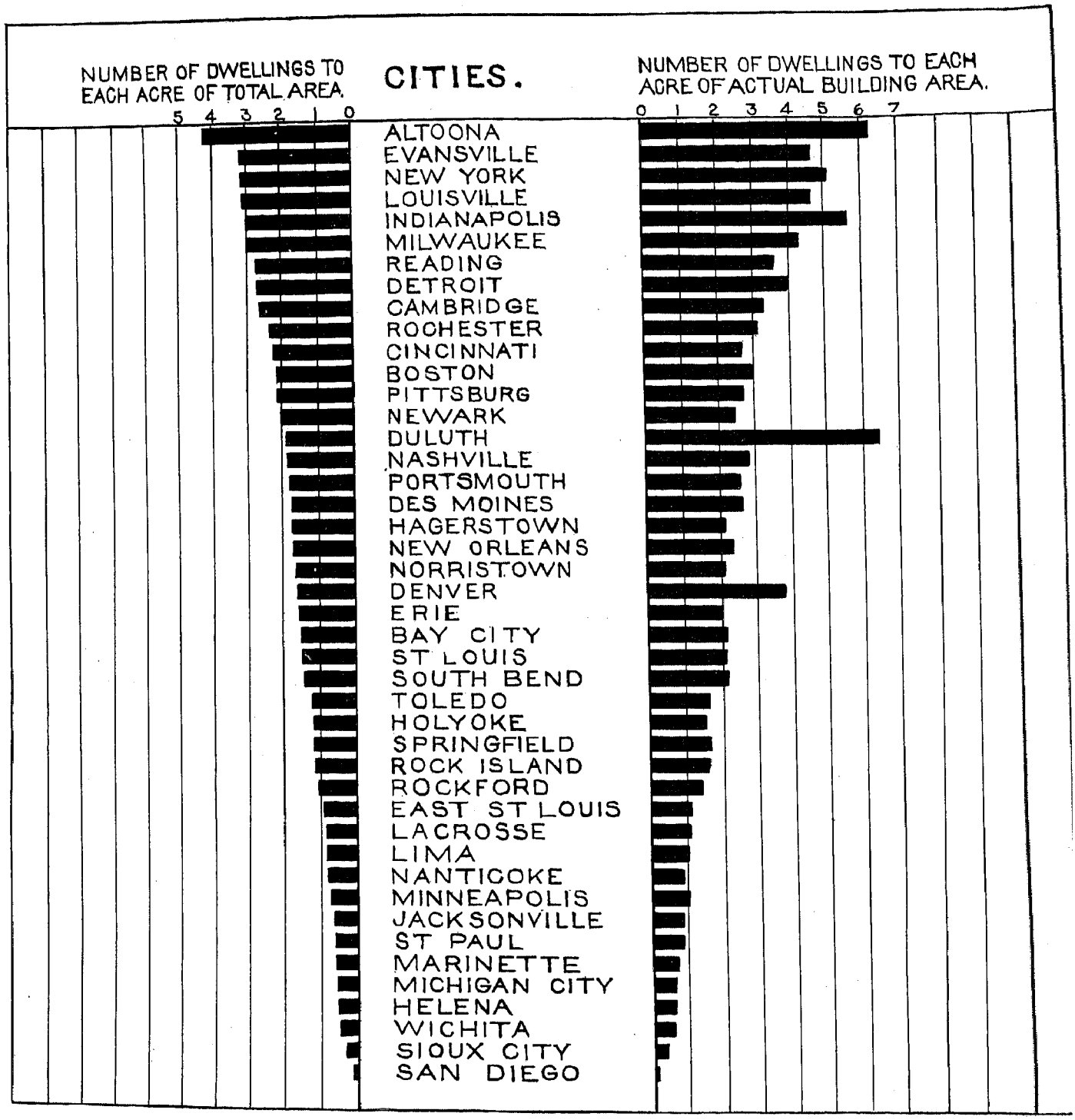
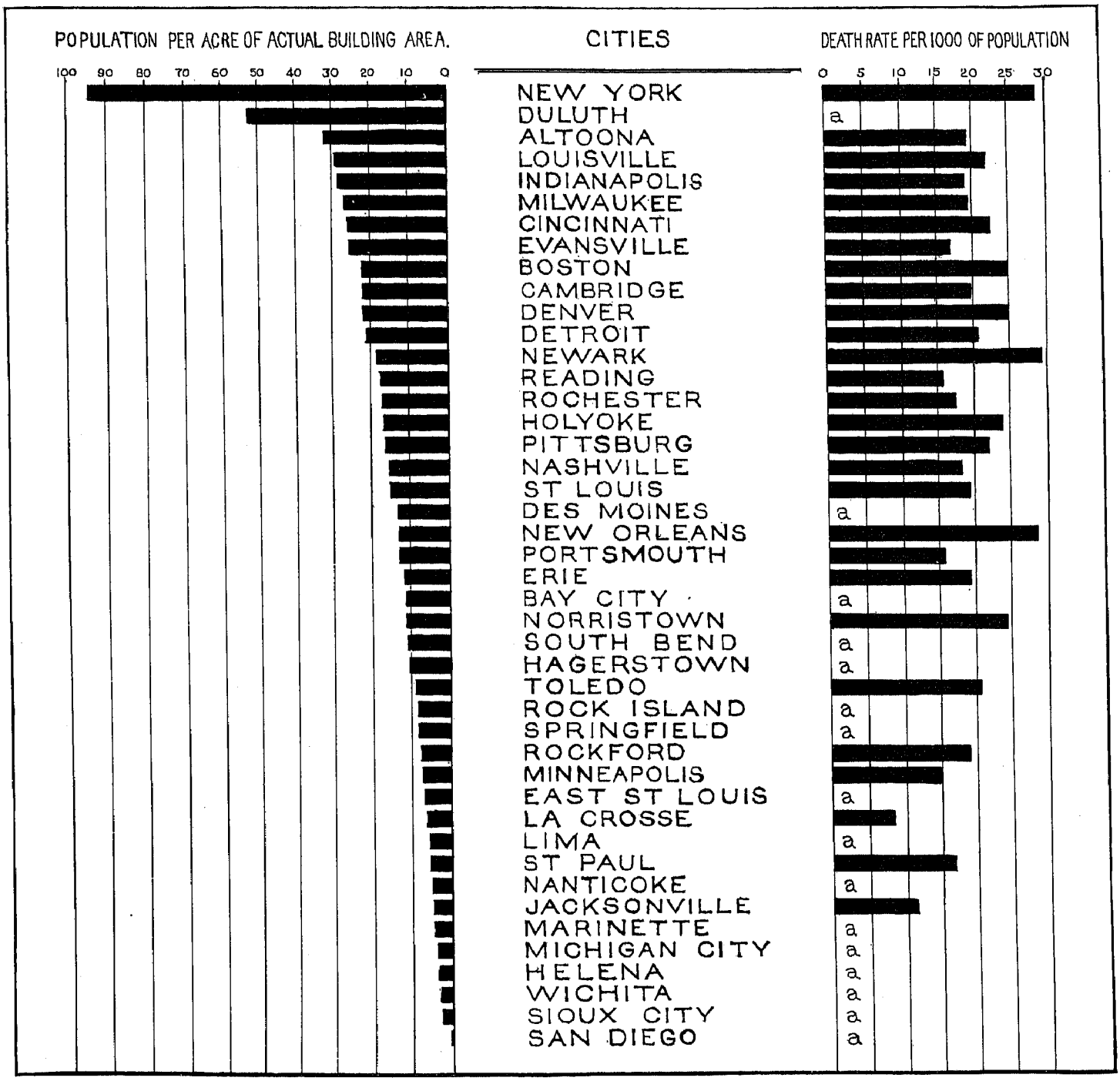


DIAGRAM 10.—DENSITY OF POPULATION PER ACRE OF ACTUAL BUILDING AREA FOR 44 CITIES, WITH COMPARISON OF DEATH RATES FOR THOSE HAVING A REGISTRATION SYSTEM.



a.—No system of registration.

TABLE 18.

CITIES.	STREETS.											ACTUAL BUILDING AREA.		
	Total length. (Miles.)	Paved.			Percentage of total length paved.	To each mile of street.						Total. (Acres.)	To each acre.	
		Length. (Miles.)	Materials.			Persons. (Number.)	Water mains. (Miles.)	Hydrants. (Number.)	Sewers. (Miles.)	Public street lamps. (Number.)			Dwellings. (Number.)	Persons. (Number.)
			Gravel. (Miles.)	All other paving. (Miles.)										
New York	575	358	.....	358	62.26	2,635.31	1.15	14.78	0.81	46.92		16,114	5.08	94.03
St. Louis	818	342	.....	342	41.81	552.29	0.41	4.16	0.49	5.00		29,887	2.04	15.12
Boston	408	408	163	245	100.00	1,099.21	1.55	14.82	0.71	33.85		20,076	2.62	22.34
Cincinnati	460	254	.....	254	55.22	645.45	0.59	6.81	0.21	21.48		11,341	2.95	26.18
New Orleans	625	109	8	101	17.44	387.26	0.12	1.84	(a)	2.89		18,559	2.32	13.04
Pittsburg	285	114	.....	114	40.00	837.25	0.67	5.38	0.31	14.42		14,206	2.66	16.80
Washington	235	163	29	134	69.36	863.74	0.91	4.62	1.13	25.12		(b)	.....	.....
Detroit	400	147	.....	147	36.75	514.69	0.90	4.55	0.73	2.07		9,401	3.90	21.69
Milwaukee	298	210	173	37	70.47	686.13	0.59	4.81	0.61	12.36		7,559	4.35	27.05
Newark (N. J.)	186	48	.....	48	25.81	977.58	0.95	7.85	0.47	20.27		9,748	2.39	18.65
Minneapolis	800	25	.....	25	3.13	205.92	0.18	2.24	0.08	7.28		23,497	1.08	7.01
Louisville	205	148	3	145	72.20	786.00	0.74	0.72	0.25	23.20		5,434	4.00	29.65
Rochester	240	71	18	53	29.58	557.90	0.90	8.51	0.58	11.33		7,850	3.05	17.06
St. Paul	741	40	.....	40	5.40	179.70	0.22	1.99	0.14	7.96		26,445	0.79	5.04
Kansas city (Mo.)	267	50	.....	50	18.73	497.06	0.47	4.63	0.43	10.86		(b)	.....	.....
Denver	481	(b)	.....	.....	.....	221.86	0.42	4.10	0.13	3.64		4,827	3.73	22.11
Indianapolis	288	214	200	14	74.31	366.10	0.28	2.52	0.10	9.38		3,751	5.64	28.11
Toledo	316	60	.....	60	18.99	257.70	0.22	1.46	0.19	1.69		9,638	1.64	8.45
Nashville	163	111	.....	111	68.10	467.29	0.28	3.07	0.15	5.94		4,915	2.80	15.50
Cambridge	77	24	.....	24	31.17	909.45	1.38	8.42	1.09	13.96		3,161	3.26	22.15
Reading	72	47	.....	47	65.28	814.74	0.76	5.83	(c)	9.57		3,352	3.49	17.50
Evansville	92	28	22	6	30.43	551.70	0.47	3.33	0.18	2.52		1,957	4.65	25.04
Des Moines	166	18	.....	18	10.84	301.77	(b)	(b)	0.13	7.80		3,830	2.59	13.08
Erie	100	10	.....	10	10.00	406.34	0.65	3.50	0.22	7.12		3,614	1.98	11.24
Dallas	528	25	.....	25	4.73	72.10	0.07	0.37	0.03	0.38		(b)	.....	.....
Sioux city	227	11	.....	11	4.85	166.55	0.11	0.57	0.16	2.00		17,233	0.33	2.10
Holyoke	50	20	18	2	40.00	712.74	0.94	6.02	0.40	5.02		2,107	1.49	16.91
Duluth	172	34	26	8	19.77	192.53	0.17	1.16	d0.09	1.05		630	6.43	52.56
Lancaster	55	(b)	.....	.....	.....	582.02	(b)	(b)	0.09	8.93		(b)	.....	.....
Altoona	56	2	.....	2	3.57	541.73	0.68	2.54	0.20	5.52		937	0.26	32.38
Bay city	107	21	.....	21	19.63	260.18	0.28	2.14	0.28	1.26		2,505	2.10	11.11
Lacrosse	100	15	.....	15	15.00	250.90	0.20	1.84	0.04	1.28		4,209	1.09	5.96
Wichita	249	3	.....	3	1.20	95.80	0.12	0.84	0.16	2.79		8,735	0.58	2.73
Rockford	100	31	20	11	31.00	235.84	0.42	2.84	0.08	5.20		3,130	1.40	7.51
Springfield	98	6	.....	6	6.12	222.96	0.41	2.10	(c)	1.30		2,684	1.60	8.14
South Bend	80	7	3	4	8.75	272.74	0.34	1.31	0.08	1.53		1,986	2.10	10.09
Morristown	48	(b)	.....	.....	.....	412.31	0.77	3.13	(b)	5.21		1,796	2.04	11.02
San Diego	790	2	.....	2	0.25	20.45	0.12	0.37	d0.05	0.11		42,679	0.09	0.38
Lima	52	45	.....	45	86.54	307.44	0.48	3.33	0.27	2.35		3,007	1.01	5.31
East St. Louis	32	12	.....	12	37.50	474.03	0.78	7.09	0.31	9.09		2,391	1.09	6.34
Helena	120	(c)	.....	.....	.....	115.28	(b)	(b)	0.22	0.67		4,161	0.61	3.32
Rock Island	65	(b)	.....	.....	.....	209.75	0.20	1.86	0.17	1.31		1,673	1.60	8.15
Portsmouth	30	24	9	15	80.00	413.13	(b)	(b)	0.13	(b)		952	2.53	13.02
Jacksonville	70	4	.....	4	5.71	184.79	0.20	1.50	0.11	1.04		2,987	0.78	4.33
Marinette	50	(b)	.....	.....	.....	230.46	0.36	2.96	0.02	0.72		2,735	0.69	4.21
Michigan city	42	6	1	5	14.29	256.57	0.31	2.45	0.31	1.19		3,232	0.61	3.33
Hagerstown	18	15	.....	15	83.33	562.11	1.06	3.11	(c)	3.33		973	2.07	10.40
Nanticoke	14	(c)	.....	.....	.....	717.43	1.07	3.36	(a)	11.14		2,095	0.87	4.79

a No sewers. b No data. c Construction just begun. d For house sewage only. e No paved streets.

The aggregate population of these 48 cities was 5,867,188 and the total length of their streets 11,451 miles, which gives an average of 1 mile of street to each 512.37 persons. The number of persons to each mile of street varies from 2,635.31 in New York, 1,099.21 in Boston, and 863.74 in Washington to 20.45 in San Diego, 72.10 in Dallas, Tex., and 95.80 in Wichita, Kan. The 43 cities reporting as to their paving had 10,802 miles of streets, of which 3,282 miles were paved, being 30.39 per cent of the total length.

Diagram 8 shows the percentage of paving to the total length of streets in each of the cities.

Of these cities, those reporting the number of miles of water mains, number of hydrants, miles of sewers, and number of public street lamps had an average to each mile of street of 0.47 mile of water mains, 4.08 hydrants, 0.28 mile of sewers, and 9.80 street lamps.

The actual building area for 44 of the cities was 76.36 per cent of their total area, and was obtained by eliminating from the total area the space taken up by streets and alleys, parks, cemeteries, and government reservations, the aggregate building area being 352,098 acres, with a population of 5,461,416 and 692,144 dwellings, which is an average of 15.51 persons and 1.97 dwellings per acre.

It will be seen that the density of population ranges from 94.03 in New York to 0.38 in San Diego.

Diagrams 9 and 10 show the distribution of dwellings in accordance with total and actual building area, and the density of population per acre of the actual building area, with comparison of death rates for those cities which had a registration system. It will be seen from Diagram 10 that while in a general way those cities having the greatest density of population per acre of actual building area have the higher death rates, yet to this rule there are numerous exceptions, the influence of density being overcome by influences connected with race and age.

STREET LIGHTING.

Table 65 shows, for 323 cities out of the 345 included in the report, the manner in which the streets were lighted by the civil authorities and the cost of the same for 1890, or equivalent parts of the years 1889 and 1890, where annual contracts were in existence at the time this census was taken. It must be borne in mind that the lights shown in the table are only those that are provided by the city government for the purpose of lighting the streets, no account having been taken of lamps or other devices for street lighting placed in or over the public streets by private parties at their own expense. The table gives the total number of street lamps, divided as gas, electric (both arc and incandescent), vapor, and oil, the annual cost of street lighting, and distribution of lamps as to area and population. In some cases a city reported its street lighting but gave no data regarding streets, while another city furnished information as to streets and street lighting, but failed to give any information as to area, hence, for the totals, comparison between lamps, cost, and population furnishes the larger range.

The cities reporting their street lighting had an aggregate population of 16,904,800, being 98 per cent of the total of all cities named in the report, and they were lighted by 305,684 lamps.

The number of street lamps by classes, with the population per lamp and the annual cost of street lighting to each head of population, by population groups and geographical divisions, is shown in Table 19.

TABLE 19.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	LAMPS. (NUMBER.)					Population to each lamp.	ANNUAL COST.	
			Total.	Gas.	Electric.		All other.		Total.	Per capita.
					Arc.	Incandescent.				
Total	323	16,904,800	305,684	186,359	42,927	14,256	62,142	55.30	$10,788,099	$0.64
10,000 to 14,999	122	1,465,283	16,981	5,151	6,049	2,997	2,784	86.29	797,295	0.54
15,000 to 24,999	80	1,581,502	21,685	8,512	6,651	1,592	4,930	72.93	941,464	0.60
25,000 to 49,999	63	2,178,829	27,951	9,988	8,314	3,312	6,337	77.95	1,332,910	0.61
50,000 to 99,999	30	2,008,640	28,445	12,232	6,399	2,534	7,280	70.61	1,240,436	0.62
100,000 and over	28	9,670,546	210,622	150,476	15,514	3,821	40,811	45.91	6,475,994	0.67
Total	323	16,904,800	305,684	186,359	42,927	14,256	62,142	55.30	10,788,099	0.64
North Atlantic	130	8,269,266	152,616	95,181	21,053	8,027	28,355	54.18	5,498,482	0.66
South Atlantic	25	1,252,712	20,881	15,530	2,727	546	2,078	59.99	760,785	0.61
North Central	117	5,473,971	106,950	60,817	14,154	2,343	29,636	51.18	3,222,699	0.59
South Central	28	1,009,309	13,529	8,504	2,676	276	2,073	74.60	549,681	0.54
Western	23	899,542	11,708	6,327	2,317	3,064	.....	76.83	756,452	0.84

From the above table it is seen that the average for all the cities was 55.30 persons to each lamp, and that the streets were lighted at an annual cost of $0.64 to each head of population. In the geographical divisions the range of persons to the lamp was from 51.18 to 76.83, and the cost per capita from $0.54 to $0.84. The range is a wide one, however, when the individual cities are considered, varying in persons to the lamp from 17.58 in Newton, Mass., 20.97 in Saratoga Springs, N. Y., and 22.57 in St. Paul, Minn., to 467.60 in Cheyenne, Wyo., 494.14 in Beatrice, Neb., and 512.86 in Alpena, Mich. The cost per capita ranges from $0.04 in Ogden, Utah, $0.11 in Anderson, Ind., and $0.15 in both Michigan city and Nebraska city to $2.80 in Brookline, Mass., $1.64 in Superior, Wis., and $1.61 in Providence, R. I.

Gas lamps are more used than any other form, comprising 60.96 per cent of all public lamps. The electric lights, including both arc and incandescent, form 18.71 per cent of the total number of lamps, while oil, vapor, gasoline, etc., classified as "All others", are 20.33 per cent. Of the total number of gas lamps in these cities, 83.71 per cent were in the North Atlantic and North Central divisions and 87.31 per cent in those cities that had a population of 50,000 and upward. The electric lights are found chiefly in the North Atlantic and North Central divisions, which include 79.70 per cent of the total; the largest two population groups had 49.42 per cent of the total.

Diagram 11 shows the proportion of each class divided between gas, electric, and all others for the total number reported by the 323 cities, and then subdivided and shown by population groups and geographical divisions.

The cities of 100,000 and upward had the largest percentage of gas lamps and the smallest percentage of electric lights, while the reverse was true of the smaller cities. In the cities of the Western division the proportion of electric lights was larger than in any other division, while it was the smallest in the North Central division, where other than gas or electric lighting amounted to 27.71 per cent of the total lights used.

Of the 323 cities reporting their street lighting, only 15 used gas exclusively, while 134 used electric lights to the exclusion of all others. The distribution of these cities by geographical divisions, with the cost of street lighting, and the distribution of lamps in reference to population, is shown by Table 20.

DIAGRAM 11.—PROPORTION OF EACH CLASS OF PUBLIC STREET LAMPS FOR THE GRAND TOTAL AND FOR POPULATION AND GEOGRAPHICAL GROUPS.

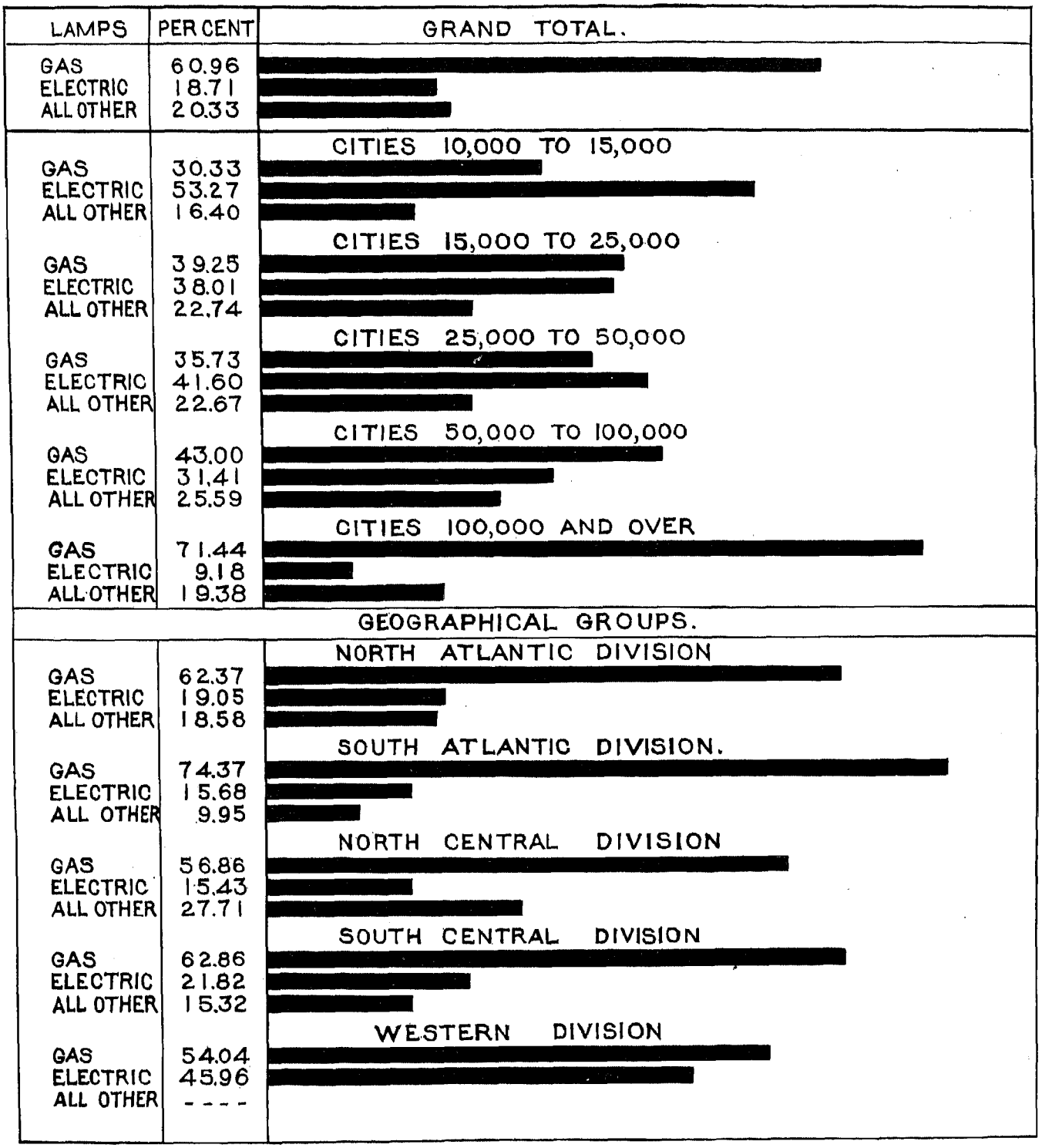


TABLE 20.

GEOGRAPHICAL DIVISIONS.	GAS.						ELECTRIC.					
	Number of cities.	Population.	Lamps. (Number.)	Population to each lamp.	Annual cost.		Number of cities.	Population.	Lamps. (Number.)	Population to each lamp.	Annual cost.	
					Total.	Per capita.					Total.	Per capita.
Total	15	253,312	4,147	61.08	$94,119	$0.37	134	3,190,628	25,410	125.57	$1,907,582	$0.60
North Atlantic	4	49,459	1,068	46.31	27,902	0.56	40	975,124	9,801	99.49	600,957	0.62
South Atlantic	2	73,181	1,005	72.82	17,481	0.24	14	299,944	1,938	154.77	153,378	0.51
North Central	6	83,488	1,428	58.46	30,584	0.37	53	1,236,214	7,435	166.27	663,581	0.54
South Central	3	47,184	646	73.04	18,152	0.38	11	215,833	1,322	163.26	103,227	0.48
Western	.....	.....	.....	.....	.....	.....	16	463,513	4,914	94.32	386,439	0.83

One city, Muncie, Ind., having a population of 11,345, lighted its streets without cost to the municipality. It has 203 natural gas lamps.

The report on cities for the Tenth Census, while treating of cost of gas and the amount manufactured annually, did not give details as to street lighting, but many of the larger cities reported their street lamps in connection with their gas works, and enough data were obtained to found a comparison. The reports of foreign cities do not go very extensively into the subject, and it is almost impossible to make comparisons between their manner of street lighting and that pursued here. Germany gives some figures in its statistical reports, but they relate entirely to gas.

Table 21 shows the manner and cost of lighting the larger cities of this country in 1880 and 1890.

TABLE 21.

CITIES.	1890								1880					
	Public street lamps.					Population to each lamp.	Annual cost.		Public street lamps.			Population to each lamp.	Annual cost.	
	Total.	Gas.	Electric.		All other.		Total.	Per capita.	Total.	Gas.	All other.		Total.	Per capita.
			Arc.	Incandescent.										
New York	26,978	25,483	1,369	.....	126	56.17	$649,159	$0.43	23,231	23,231	.....	51.93	$325,244	$0.27
Chicago	32,793	24,878	422	.....	7,493	33.54	640,784	0.58	11,080	11,080	.....	45.41	191,905	0.38
Brooklyn	10,890	9,381	1,509	.....	.....	74.04	474,082	0.59	14,866	14,866	.....	38.12	341,918	0.60
St. Louis	4,091	691	1,782	1,449	169	110.43	266,382	0.44	7,278	7,278	.....	48.16	196,506	0.50
Baltimore	7,772	5,790	607	.....	1,375	55.90	304,442	0.70	6,147	5,032	1,115	66.04	.....	.....
San Francisco	5,323	5,200	123	.....	.....	56.17	281,962	0.94	3,500	3,500	.....	66.85	150,225	0.64
Cincinnati	9,883	8,168	.....	.....	1,715	30.04	217,541	0.73	6,180	6,180	.....	41.28	179,220	0.70
Cleveland	8,267	4,839	106	.....	3,322	31.61	160,673	0.61	2,595	2,595	.....	61.71	41,520	0.26
Buffalo	5,600	4,377	1,223	.....	.....	45.65	287,655	1.12	5,030	5,030	.....	30.84	130,780	0.84
New Orleans	1,808	858	950	.....	.....	133.87	171,321	0.71	3,600	3,600	.....	60.03	49,968	0.23
Pittsburg	4,109	.....	920	282	2,907	58.07	131,396	0.55	2,559	2,559	.....	61.11	47,199	0.30
Detroit	827	.....	827	.....	.....	248.94	115,821	0.56	2,742	1,802	940	42.43	.....	.....
Milwaukee	3,682	2,350	312	.....	1,020	55.53	120,620	0.59	1,368	1,368	.....	84.49	47,880	0.41
Washington	5,904	5,349	195	.....	360	34.38	156,705	0.77	4,163	4,163	.....	38.40	.....	.....
Newark (N.J.)	3,770	3,382	388	.....	.....	48.23	122,056	0.67	3,000	3,000	.....	45.50	86,100	0.63
Minneapolis	5,821	2,854	475	.....	2,492	28.30	166,517	1.01	300	300	.....	156.29	9,000	0.19
Louisville	4,756	3,656	.....	.....	1,100	33.88	89,620	0.56	2,500	2,500	.....	49.50	47,575	0.38
Omaha	1,341	793	8	.....	540	104.74	36,448	0.26	160	160	.....	190.74	4,400	0.14
Rochester	2,719	846	1,083	790	.....	49.24	141,803	1.06	3,750	2,489	1,261	23.83	.....	.....
St. Paul	5,900	2,750	50	.....	3,100	22.57	151,230	1.14	250	250	.....	165.89	7,500	0.18
Kansas city (Mo.)	2,809	1,588	123	.....	1,188	45.78	88,436	0.67	605	605	.....	92.21	13,310	0.24
Providence	4,983	2,176	550	.....	2,257	26.52	213,075	1.61	2,647	2,647	.....	39.61	.....	.....
Denver	1,750	.....	450	1,300	.....	60.98	101,300	0.95	343	343	.....	103.87	13,720	0.39
Indianapolis	2,700	2,300	100	.....	300	39.05	45,900	0.44	2,400	2,400	.....	31.27	60,000	0.80
Allegheny	2,140	1,739	16	.....	385	49.20	29,359	0.28	1,105	1,105	.....	71.21	16,575	0.21
Albany	531	.....	531	.....	.....	178.76	76,560	0.81	2,056	1,108	948	44.14	.....	.....
Syracuse	698	398	300	.....	.....	126.28	48,573	0.55	1,020	1,020	.....	50.78	20,808	0.40
Worcester	2,365	514	201	.....	1,650	35.79	79,354	0.94	1,446	690	756	40.31	28,980	0.50
Toledo	535	.....	535	.....	.....	152.21	53,500	0.66	1,026	1,026	.....	48.87	38,330	0.76
Nashville	968	818	150	.....	.....	78.69	28,735	0.38	697	697	.....	62.20	13,940	0.32
Fall River	1,071	416	69	.....	586	69.47	27,754	0.37	883	415	468	55.45	16,688	0.34
Cambridge	1,075	681	113	187	94	65.14	48,597	0.69	769	769	.....	68.49	.....	.....
Atlanta	624	.....	178	446	.....	105.02	42,768	0.65	300	300	.....	124.70	9,000	0.24
Wilmington (Del.)	806	806	.....	.....	.....	76.22	13,501	0.22	500	500	.....	48.96	10,475	0.25
Dayton	1,121	986	135	.....	.....	54.61	38,984	0.64	884	884	.....	43.75	21,481	0.56
Troy	550	268	282	.....	.....	110.83	48,975	0.80	687	687	.....	82.60	23,358	0.41
Grand Rapids	2,356	600	120	16	1,620	25.58	39,263	0.65	176	176	.....	181.91	1,980	0.06
Reading	689	.....	190	499	.....	85.14	32,780	0.56	367	367	.....	117.92	8,074	0.19
Charleston	910	810	100	.....	.....	60.36	23,462	0.43	1,136	1,136	.....	44.00	22,152	0.44
Memphis	706	406	100	.....	200	63.21	26,662	0.53	580	580	.....	57.92	15,660	0.47

Diagram 12 shows for principal cities the population per lamp in 1880 and in 1890.

Table 23 and Diagram 13 show for principal cities using electric lights only the population per lamp and the annual cost per capita.

TABLE 23.

CITIES.	Population per lamp.	Cost per capita.	CITIES.	Population per lamp.	Cost per capita.
Davenport	268.72	$0.61	Topeka	168.52	$0.53
St. Joseph	255.24	0.19	Galveston	166.19	0.53
Detroit	248.94	0.56	Williamsport	159.60	0.50
Fort Wayne	245.78	0.61	Harrisburg	155.06	0.58
Los Angeles	244.64	1.15	Toledo	152.21	0.66
Scranton	233.50	0.39	Terre Haute	128.58	0.54
Little Rock	233.10	0.21	Tacoma	124.16	1.16
Saginaw	220.58	0.58	Utica	119.91	1.07
Bay city	206.21	0.29	Hartford	113.98	0.80
Norfolk	202.74	0.44	Atlanta	105.02	0.65
Lacrosse	196.02	0.51	Chelsea	93.03	0.58
Sacramento	195.45	0.92	Reading	85.14	0.56
Dallas	190.34	0.50	Portland	82.97	0.84
Duluth	182.96	0.68	Lawrence	62.45	0.49
Peoria	179.93	0.81	Denver	60.98	0.95
Albany	178.76	0.81	Seattle	57.12	0.47
Quincy	174.97	0.57	Brockton	51.99	0.40
Youngstown	174.84	0.40	Portland	51.54	0.66
Savannah	172.76	0.58	Lynn	49.06	0.69
Mobile	171.69	0.53			

Table 24 and Diagram 14 show for 15 cities using gas only the population per lamp and the annual cost for their use per capita.

TABLE 24.

CITIES.	Population per lamp.	Cost per capita.	CITIES.	Population per lamp.	Cost per capita.
Bradford	159.20	$0.16	Muncie	55.89	$0.23
Fort Worth	127.49	0.28	Fort Smith	55.72	0.51
Appleton	118.69	0.15	East St. Louis	52.13	0.43
Ishpeming	98.22	0.31	Cairo	51.62	0.41
Wilmington (Del.)	76.22	0.22	Paducah	48.84	0.46
Jamestown	67.96	0.26	Rockford	45.35	0.51
Pensacola	59.05	0.34	Saratoga Springs	20.97	1.53
Oil city	57.24	0.35			

WATERWORKS.

Table 66 shows for the cities that made returns the conditions of their waterworks as follows: ownership, capacity of the supply, number of reservoirs and their capacity, average daily consumption of water, the distribution system, total cost of works, with average annual cost of maintenance for the past 10 years and the average annual receipts from water rents, the total cost of the works per capita of the population, and the number of miles of water mains to each mile of sewer. Key West, Fla., is the only city that reported "no waterworks".

Of the 345 cities in the list, 288, with an aggregate population of 16,020,612, reported the character of the supply and the average daily consumption. The supply has been grouped under four heads: "Rivers and lakes", "Surface water", "Driven wells", and "Artesian wells". As the names imply, the first includes large bodies of water, the second all small streams, springs, etc., where the water is impounded in reservoirs, while the third and fourth are self explanatory. The source of water supply for each of the 288 cities was as follows:

RIVERS AND LAKES.

There were 146 cities having an aggregate population of 11,614,909, or near 73 per cent of the total population, which obtained their water supply from rivers and lakes. These were as follows: Alpena, Mich.; Alton, Ill.; Anderson, Ind.; Atchison, Kan.; Auburn, Me.; Auburn, N. Y.; Augusta, Ga.; Aurora, Ill.; Austin, Tex.; Baltimore, Md.; Bangor, Me.; Bay city, Mich.; Beatrice, Neb.; Beverly, Mass.; Biddeford, Me.; Boston, Mass.; Buffalo, N. Y.; Burlington, Iowa; Burlington, Vt.; Cairo, Ill.; Camden, N. J.; Chattanooga, Tenn.; Chelsea, Mass.; Chicago, Ill.; Chillicothe, Ohio; Cincinnati, Ohio; Cleveland, Ohio; Cohoes, N. Y.; Council Bluffs, Iowa; Covington, Ky.; Dallas, Tex.; Danville, Ill.; Danville, Va.; Davenport, Iowa; Decatur, Ill.; Denver, Colo.; Detroit, Mich.; Duluth, Minn.; East St. Louis, Ill.; Easton, Pa.; Eauclaire, Wis.; Elgin, Ill.; El Paso, Tex.; Erie, Pa.; Evansville, Ind.; Fall River, Mass.; Findlay, Ohio; Fort Scott, Kan.; Fort Smith, Ark.; Grand Rapids, Mich.; Hannibal, Mo.; Harrisburg, Pa.; Hoboken, N. J.; Indianapolis, Ind.; Ironton, Ohio; Ishpeming, Mich.; Jeffersonville, Ind.; Jersey city, N. J.; Kansas city, Kan.; Kansas city, Mo.; Keokuk, Iowa; Knoxville, Tenn.; Lacrosse, Wis.; Lafayette, Ind.; Laredo, Tex.; Lawrence, Mass.; Leavenworth, Kan.; Lewiston, Me.; Little Rock, Ark.; Lockport, N. Y.; Logansport, Ind.; Los Angeles, Cal.; Louisville, Ky.; Lowell, Mass.; Lynchburg, Va.; Manchester, N. H.; Marinette, Wis.; McKeesport, Pa.; Menominee, Mich.; Milwaukee, Wis.; Minneapolis, Minn.; Moline, Ill.; Muscatine, Iowa; Nashville, Tenn.; Nebraska city, Neb.; Newark, N. J.; New Haven, Conn.; New Orleans, La.; Newport, Ky.; New York, N. Y.; Norristown, Pa.; Ogdensburg, N. Y.; Oil city, Pa.; Omaha, Neb.; Oshkosh, Wis.; Oswego, N. Y.; Paducah, Ky.; Passaic, N. J.; Paterson, N. J.; Philadelphia, Pa.; Pittsburg, Pa.; Port Huron, Mich.; Portland, Me.; Portland, Ore.; Poughkeepsie, N. Y.; Providence, R. I.; Pueblo, Colo.; Quincy, Ill.; Racine, Wis.; Raleigh, N. C.; Richmond, Va.; Rochester, N. Y.; Rock Island, Ill.; Sacramento, Cal.; Saginaw, Mich.; San Diego, Cal.; Sandusky, Ohio; Schenectady, N. Y.; Seattle, Wash.; Shreveport, La.; Sheboygan, Wis.; Sioux Falls, S. D.; Spokane Falls, Wash.; Springfield, Ill.; St. Louis, Mo.; St. Joseph, Mo.; St. Paul, Minn.; Steubenville,

DIAGRAM 12.—STREET LIGHTING IN THE PRINCIPAL CITIES.

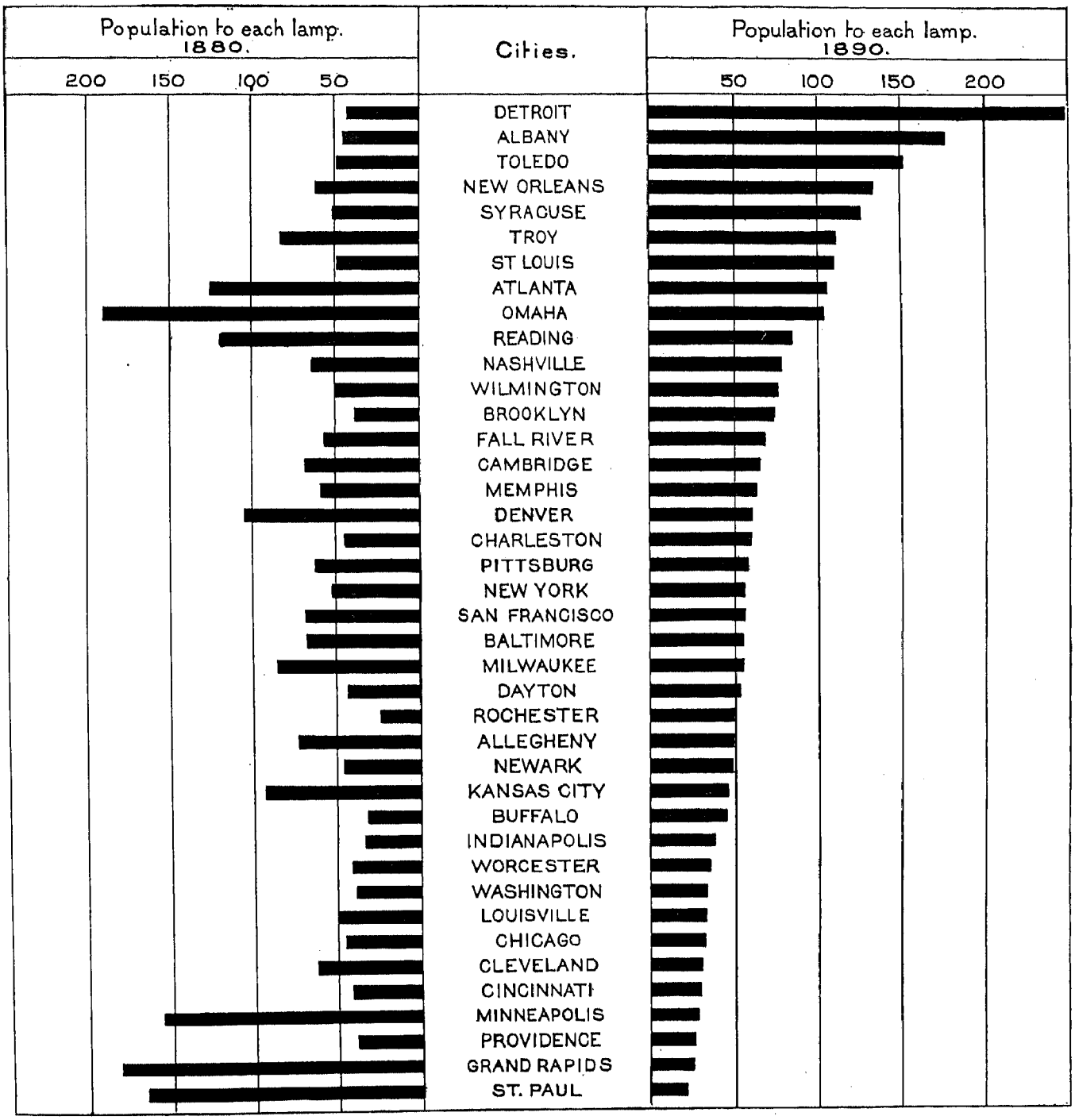


DIAGRAM 13.—COST PER CAPITA AND POPULATION PER LAMP FOR CITIES USING ELECTRIC LIGHTS ONLY.

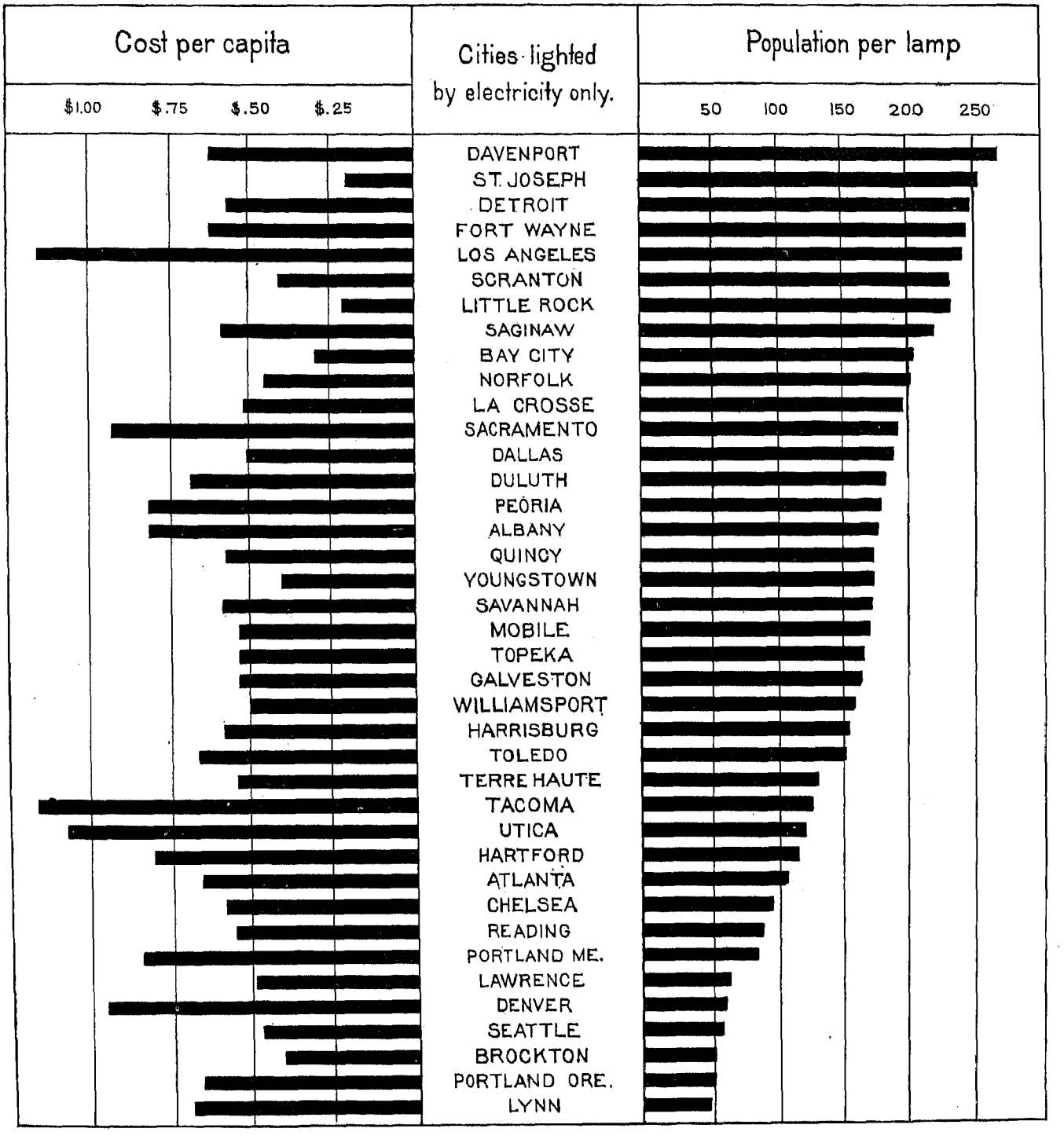
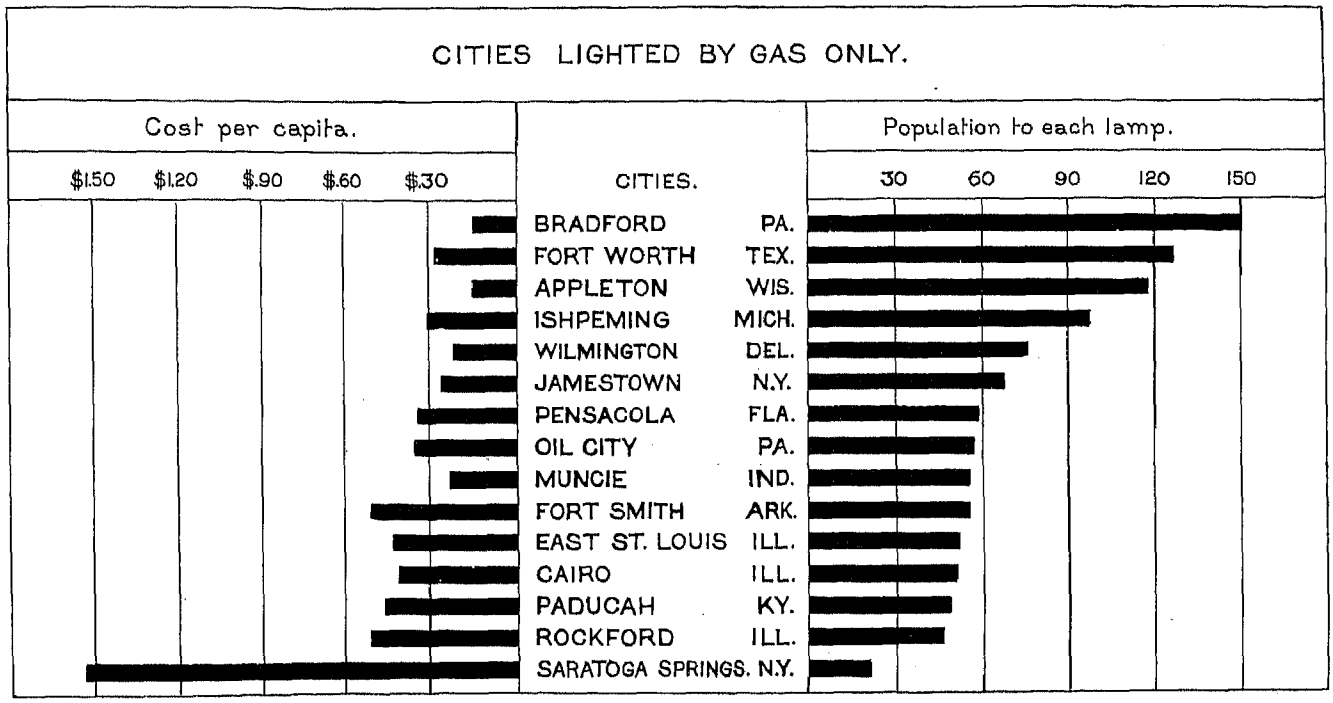


DIAGRAM 14.—COST PER CAPITA AND POPULATION PER LAMP FOR CITIES USING GAS LAMPS ONLY.



BUREAU OF ... LIBRARY

Ohio; Superior, Wis.; Terre Haute, Ind.; Tiffin, Ohio; Toledo, Ohio; Trenton, N. J.; Troy, N. Y.; Vicksburg, Miss.; Washington, D. C.; Watertown, N. Y.; West Bay city, Mich,; West Troy, N. Y.; Wheeling, W. Va.; Wichita, Kan.; Wilmington, Del.; Wilmington, N. C.; Winona, Minn.; Youngstown, Ohio, and Zanesville, Ohio.

SURFACE WATER.

There were 96 cities having an aggregate population of 3,409,063, or about 21 per cent of the total population, which obtained their water supply from surface waters. These were as follows: Akron, Ohio; Albany, N. Y.; Allentown, Pa.; Altoona, Pa.; Amsterdam, N. Y.; Asheville, N. C.; Atlanta, Ga.; Battle Creek, Mich.; Belleville, Ill.; Bradford, Pa.; Bridgeport, Conn.; Bridgeton, N. J.; Brockton, Mass.; Brookline, Mass.; Brooklyn, N. Y.; Butte, Mont.; Cambridge, Mass.; Canton, Ohio; Cheyenne, Wyo.; Chicopee, Mass.; Clinton, Mass.; Colorado Springs, Colo.; Columbus, Ga.; Concord, N. H.; Dover, N. H.; East Portland, Ore.; Elmira, N.Y.; Fitchburg, Mass.; Gloversville, N.Y.; Hagerstown, Md.; Hartford, Conn.; Holyoke, Mass.; Hornellsville, N.Y.; Ithaca, N.Y.; Jacksonville, Ill.; Kingston, N.Y.; Leadville, Colo.; Lexington, Ky.; Lima, Ohio; Lynn, Mass.; Mahanoy, Pa.; Malden, Mass.; Marlboro, Mass.; Medford, Mass.; Meriden, Conn.; Meridian, Miss.; Michigan city, Ind.; Middletown, N. Y.; Mobile, Ala.; Muskegon, Mich.; Nanticoke, Pa.; Nashua, N. H.; New Bedford, Mass.; New Brunswick, N. J.; Newburg, N. Y.; Newburyport, Mass.; New London, Conn.; Newton, Mass.; Northampton, Mass.; Norfolk, Va.; Norwich, Conn.; Oakland, Cal.; Ogden, Utah; Pawtucket, R. I.; Peabody, Mass.; Petersburg, Va.; Pittsfield, Mass.; Pittston, Pa.; Portsmouth, Va.; Quincy, Mass.; Reading, Pa.; Richmond, Ind.; Salem, Mass.; Salt Lake, Utah; San Antonio, Tex.; San Francisco, Cal.; San Jose, Cal.; Saratoga Springs, N. Y.; Sedalia, Mo.; Shenandoah, Pa.; Springfield, Mass.; Springfield, Mo.; Stillwater, Minn.; Syracuse, N. Y.; Tacoma, Wash.; Taunton, Mass.; Utica, N. Y.; Waltham, Mass.; Waterbury, Conn.; Weymouth, Mass.; Williamsport, Pa.; Woburn, Mass.; Woonsocket, R. I.; Worcester, Mass.; Yonkers, N. Y., and York, Pa.

DRIVEN WELLS.

There were 19 cities having an aggregate population of 466,115, or near 3 per cent of the total population, which obtained their water supply from driven wells. These were as follows: Binghamton, N. Y.; Bloomington, Ill.; Dayton, Ohio; Denison, Tex.; Elkhart, Ind.; Fort Wayne, Ind.; Fort Worth, Tex.; Hamilton, Ohio; Hastings, Neb.; Jackson, Tenn.; Joliet, Ill.; Lincoln, Neb.; Long Island city, N. Y.; Manistee, Mich.; Muncie, Ind.; Newark, Ohio; Plainfield, N. J.; Sioux city, Iowa, and Topeka, Kan.

ARTESIAN WELLS.

There were 27 cities having an aggregate population of 530,525, or near 3 per cent of the total population, which obtained their water supply from artesian wells. These were as follows: Alameda, Cal.; Appleton, Wis.; Cedar Rapids, Iowa; Charleston, S. C.; Clinton, Iowa; Fond du Lac, Wis.; Freeport, Ill.; Fresno, Cal.; Galveston, Tex.; Houston, Tex.; Jackson, Mich.; Jacksonville, Fla.; Jamestown, N. Y.; Janesville, Wis.; Kalamazoo, Mich.; Madison, Wis.; Mansfield, Ohio; Massillon, Ohio; Memphis, Tenn.; Montgomery, Ala.; Natchez, Miss.; Pensacola, Fla.; Rockford, Ill.; Savannah, Ga.; South Bend, Ind.; Stockton Cal., and Waco, Tex.

Table 25 shows for these cities the distribution of the population in relation to the source of supply; also the average daily consumption of water, both by the total and by geographical divisions.

TABLE 25.

GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	AVERAGE DAILY CONSUMPTION OF WATER.	
			Total. (In 1,000 gallons.)	Per capita. (Gallons.)
Aggregate	288	16,020,612	1,443,564	90.11
Rivers and lakes	146	11,614,909	1,112,080	95.75
North Atlantic	43	5,219,735	513,686	98.41
South Atlantic	10	910,806	105,181	115.48
North Central	69	4,408,120	389,969	88.47
South Central	16	742,893	53,850	72.49
Western	8	333,355	49,394	148.17
Surface waters	96	3,409,063	250,429	73.46
North Atlantic	62	2,409,641	175,105	72.67
South Atlantic	7	174,008	8,050	46.26
North Central	12	208,528	11,124	53.35
South Central	4	100,940	5,250	52.01
Western	11	515,946	50,900	98.65
Artesian wells	27	530,525	50,830	95.81
North Atlantic	1	16,038	1,500	93.53
South Atlantic	4	127,095	9,000	70.81
North Central	13	197,602	14,810	74.95
South Central	6	153,383	22,300	145.39
Western	3	36,407	3,220	88.44
Driven wells	19	466,115	30,225	64.84
North Atlantic	3	76,778	5,098	66.40
South Atlantic (a)				
North Central	13	345,264	20,127	58.29
South Central	3	44,073	5,000	113.45
Western (a)				

a No driven wells.

The greater portion of the population included in these cities depended on rivers and lakes and surface water, about 94 per cent receiving their water from these sources. There were 146 cities on rivers and lakes, and of these 43 were in the North Atlantic and 69 in the North Central division. There were 96 cities which depended on surface water, and of these 62 were in the North Atlantic and 12 in the North Central division. Of the 19 cities which depended on driven wells, 13 were in the North Central division, while for the artesian wells, 13 of the 27 cities were in the same division.

The number of gallons of water daily supplied for each person was, for the 288 cities in round numbers, 90.11; 95.75 gallons daily to each one of the population is used in the supply taken from rivers and lakes, 73.46 gallons in the surface water supply, 64.84 gallons in that from driven wells, and 95.81 in that from artesian wells. By geographical divisions, the total average consumption per capita is, in the North Atlantic, 88.91 gallons, ranging from 2 gallons in Chicopee, 14 in Woonsocket, and 23 in Ithaca and Marlboro each to 251 in Saratoga Springs, 199 in Nanticoke, and 196 in Buffalo. In the South Atlantic division the average daily number of gallons to each person is 101.56, ranging from 18 in Charleston and 19 in Portsmouth to 177 in Washington and 152 in Lynchburg. In the North Central division the average daily consumption to each head of population is 85.40 gallons, ranging from 6 gallons in Findlay and 19 in Anderson to 198 in East St. Louis and 171 in Detroit. The South Central division ranges from 19 in Vicksburg and 31 in New Orleans to 519 in Waco and 179 in Memphis, the average being 80.22 gallons daily to each head of population. The Western division has the highest average daily consumption, it being 120.44 gallons per capita, with a range from 9 gallons in East Portland to 288 in Oakland. The largest per capita consumption from the river and lake supply, 148.17 gallons, was in the Western division and the smallest, 72.49 gallons, in the South Central division. From the surface water supply, the largest per capita consumption, 98.65 gallons, was in the Western division and the smallest, 46.26 gallons, in the South Atlantic. Driven wells and artesian wells furnished the largest per capita supply for the South Central division, reaching 113.45 and 145.39 gallons, respectively. The number of gallons daily to each head of population must be based on the total population of each city irrespective of the number living on the lines of the water mains. In Washington the population was enumerated by blocks, and therefore the population living along the lines of the water mains could be determined, and a calculation on this basis develops the fact that the average daily consumption per capita for the population living on the lines of the water mains was 196 gallons instead of 177 gallons. In Saratoga Springs the average daily consumption was given at 251 gallons, but it must be borne in mind that during the summer months, when the consumption of water is at its highest, the population of the city is, probably, increased fourfold. The larger consumption of water in some of the southwestern cities is largely due to irrigation, but it has not been possible to determine what portion was used for this purpose.

Diagram 15, for the largest cities of the country, shows the proportion of water used daily to each head of population.

As an indication of the lavish use of water in nearly all of the cities of this country, Diagram 16 is given, showing the average number of gallons used daily for each head of population in the German cities that have over 100,000 inhabitants each.

There were 266 cities, with an aggregate population of 15,416,689, which reported the total cost of their waterworks and the number of miles of mains. The average cost per capita of the population for construction in these cities was $22.27, the consumption of water per capita was 89.93 gallons, and the cost of the works to each mile of main was $21,440.

Table 26 shows the distribution of these figures by population groups and by geographical divisions.

TABLE 26.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	AVERAGE DAILY CONSUMPTION.		Mains. (Miles.)	COST OF WORKS.		
			Total. (In 1,000 gallons.)	Per capita. (Gallons.)		Total.	Per capita.	To each mile of main.
Total	266	15,416,689	1,386,356	89.93	16,015	$343,363,566	$22.27	$21,440
10,000 to 14,999	98	1,186,629	91,103	76.77	1,977	23,154,532	19.51	11,712
15,000 to 24,999	64	1,269,603	112,106	88.30	1,906	26,081,290	20.54	13,684
25,000 to 49,999	53	1,823,431	175,130	96.04	2,368	43,537,199	23.88	18,386
50,000 to 99,999	24	1,571,767	130,348	82.93	1,776	32,400,772	20.61	18,244
100,000 and over	27	9,565,259	877,669	91.76	7,988	218,189,773	22.81	27,315
Total	266	15,416,689	1,386,356	89.93	16,015	343,363,566	22.27	21,440
North Atlantic	104	7,559,105	672,069	88.91	7,751	188,449,689	24.93	24,313
South Atlantic	18	1,144,402	116,231	101.56	1,069	21,326,090	18.64	19,950
North Central	96	4,942,863	422,142	85.40	4,709	80,556,568	16.30	17,107
South Central	27	927,448	74,400	80.22	908	18,429,724	19.87	20,297
Western	21	842,871	101,514	120.44	1,578	34,601,495	41.05	21,927

DIAGRAM 15.—AMOUNT OF WATER USED IN THE LARGER CITIES IN ACCORDANCE WITH THE POPULATION.

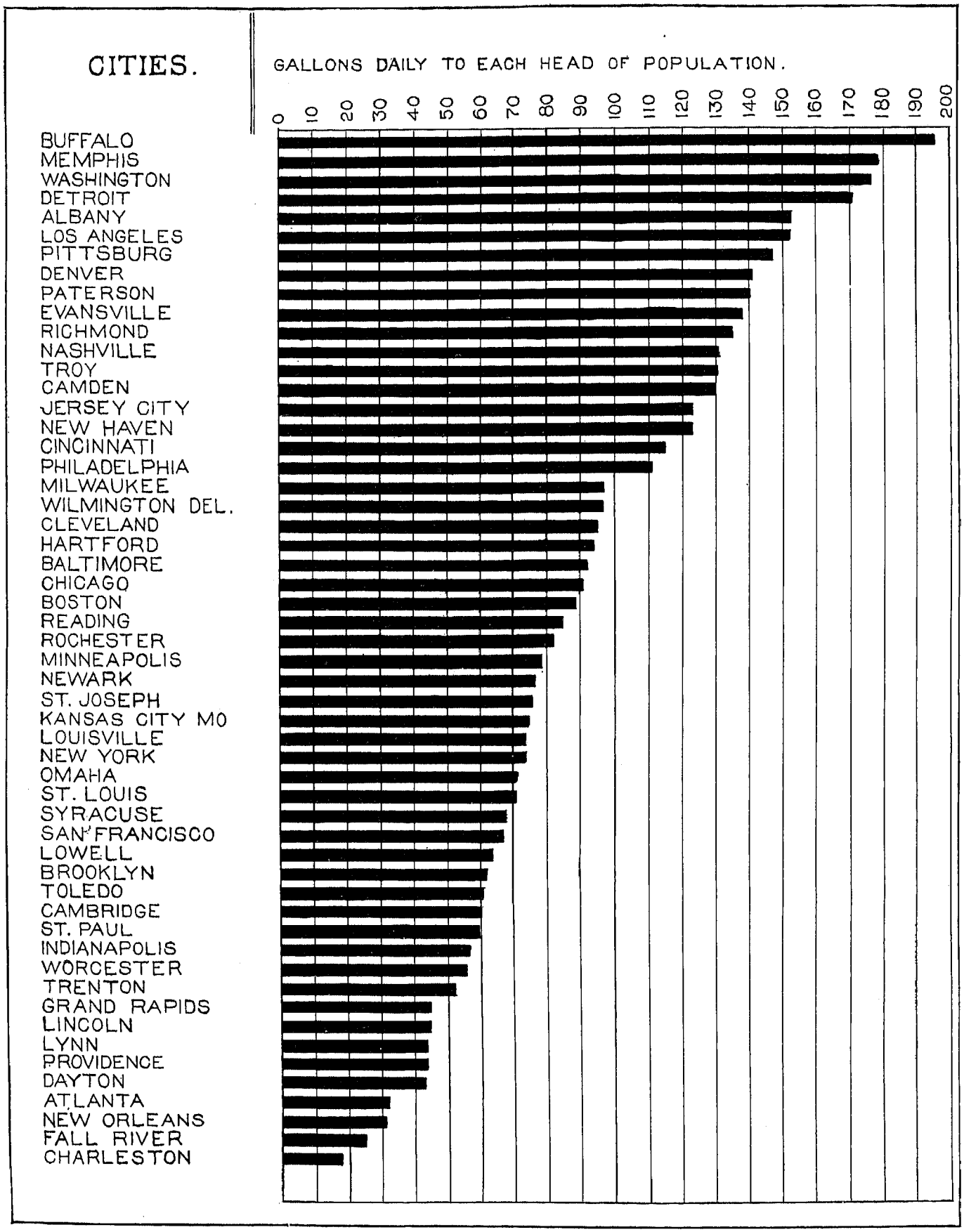


DIAGRAM 16.—CONSUMPTION OF WATER IN GERMAN CITIES.

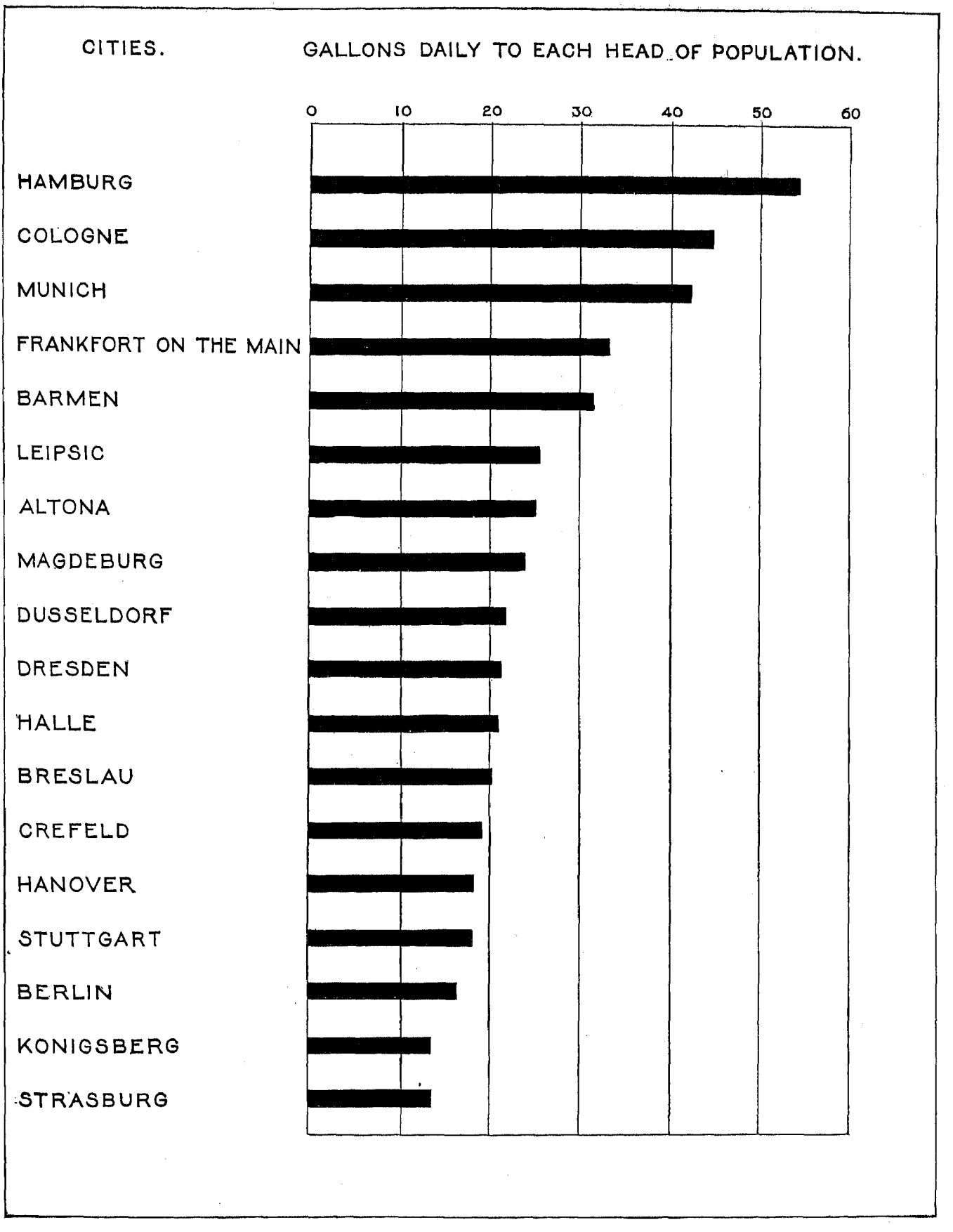
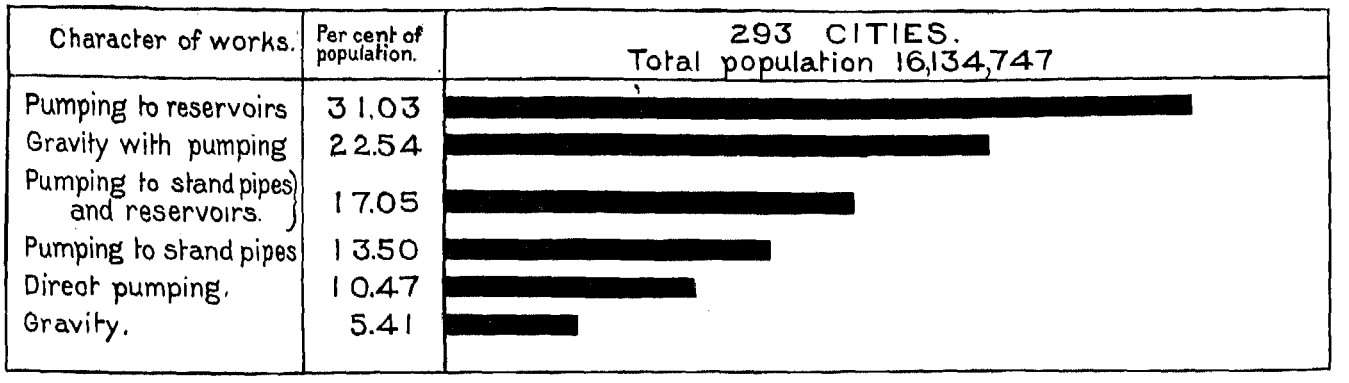


DIAGRAM 17.—DISTRIBUTION OF POPULATION ACCORDING TO CHARACTER OF WATERWORKS.



The character of the works that distribute the water from the source of supply to the consumers has been divided into 6 groups, comprising: "Gravity", where the whole supply is sent to every part of the city by the natural pressure, "Gravity with pumping to high service", "Pumping direct", "Pumping to reservoirs", "Pumping to standpipes", and "Pumping to both standpipes and reservoirs, combined". In many cities where the last three conditions prevail water can be pumped directly into the mains in cases of emergency or when so desired, the reservoirs being in some cases secondary.

Diagram 17 shows the proportion of the population of 293 cities distributed to each class of waterworks.

From this it will be seen that all the gravity works, either alone or with pumping, did not supply as large a population as those that pumped to reservoir.

GRAVITY.

There are 36 cities, with 5.41 per cent of the total population treated, that had their entire water supply distributed by gravity. Of these, 28 are in the North Atlantic, 1 in the South Central, 1 in the North Central, and 6 in the Western division.

Of these cities, 16 had a population of between 10,000 and 15,000, 8 between 15,000 and 25,000, 9 between 25,000 and 50,000, and 3 had between 50,000 and 100,000 inhabitants. The 36 cities are as follows: Altoona, Pa.; Amsterdam, N. Y.; Bradford, Pa.; Brockton, Mass.; Clinton, Mass.; Colorado Springs, Colo.; Concord, N. H.; Fitchburg, Mass.; Gloversville, N. Y.; Hartford, Conn.; Holyoke, Mass.; Hornellsville, N. Y.; Ishpeming, Mich.; Ithaca, N. Y.; Jackson, Tenn.; Kingston, N. Y.; Leadville, Colo.; Los Angeles, Cal., Mahanoy, Pa.; Medford, Mass.; Meriden, Conn.; New Bedford, Mass.; New London, Conn.; Northampton, Mass.; Norwich, Conn.; Oakland, Cal.; Ogden, Utah; Passaic, N. J.; Pittsfield, Mass.; Pittston, Pa.; Portland, Me.; Salt Lake, Utah; Shenandoah, Pa.; Springfield, Mass.; Utica, N. Y., and Worcester, Mass.

GRAVITY WITH PUMPING TO HIGH SERVICE.

The cities that depended on gravity for the main portion of their supply, pumping only for the high service, numbered 22, but the population was 22.54 per cent of the total discussed. Of these, 12 are in the North Atlantic, 3 in the South Atlantic, 3 in the North Central, and 4 in the Western division.

PUMPING WORKS.

Pumping works were largely in excess throughout the country, the population dependent upon them being 72.05 per cent of the total under consideration. There are 235 cities represented, with an average population of 49,600 each, and located in geographical divisions as follows: North Atlantic, 67; North Central, 105; South Central, 30; South Atlantic, 21, and Western, 12. Taking the 4 classes of pumping works: "Pumping direct to main", "Pumping to reservoir", "Pumping to standpipe", and "Pumping to standpipe and reservoir", the following conditions prevail:

DIRECT PUMPING.

There are 68 cities, with 10.47 per cent of the population, that have an average number of 24,840 inhabitants where pumping directly into the mains was used, and 45 of these cities are located in the North Central, 9 in the North Atlantic, 7 in the South Central, 4 in the South Atlantic, and 3 in the Western division. Minneapolis and Indianapolis, having a population of over 100,000 each, used this class of works.

PUMPING TO RESERVOIR.

There are 89 cities, with an average population each of 56,245, that pump their water to reservoirs, the supply passing from there to the mains. These cities, representing 31.03 per cent of the population discussed, are distributed geographically as follows: 35 in the North Atlantic, 25 in the North Central, 12 in the South Central, 11 in the South Atlantic, and 6 in the Western division. Of the larger cities, Brooklyn, Buffalo, Cincinnati, Denver, Kansas city (Mo.), Newark (N. J.), Omaha, Providence, and St. Louis are in this class.

PUMPING TO STANDPIPE.

There were 44 cities, with 13.50 per cent of the population, averaging 49,532 each, for which the water was pumped to standpipe, and, as was the case in pumping direct, a majority of the works was located in the North Central division, where 25 cities used this class of works; of the remainder, 9 are in the North Atlantic, 6 in the South Central, and 4 in the South Atlantic division. Of the larger cities, Chicago and Detroit were supplied by this class of works, as were also Charleston, Fall River, Lincoln, and Toledo.

PUMPING TO STANDPIPE AND RESERVOIR.

There were 34 cities, with 17.05 per cent of the population discussed, that used the standpipe and reservoir in connection with their pumping works, and of these 14 are in the North Atlantic, 10 in the North Central, 5 in the South Central, 3 in the Western, and 2 in the South Atlantic division. The average population of each city was 80,915; the cities of Cleveland, Jersey city, Louisville, Milwaukee, New Orleans, and Philadelphia are included.

Many of the cities reported the character of their works but failed to give the cost of the same, and these can not be used in showing the relative cost of each class of works.

Table 27 shows for 269 cities, with an aggregate population of 15,460,938, the total cost of works, daily consumption, capacity of reservoirs, the distribution of population on mains, cost of works per capita of the population and to each mile of main, and the daily consumption to each person for each class of works.

TABLE 27.

CHARACTER OF WORKS.	Number of cities.	POPULATION.		COST OF WORKS.			AVERAGE DAILY CONSUMPTION.		Capacity of reservoirs. (In 1,000,000 gallons.)
		Total.	To each mile of main.	Total.	Per capita.	Per mile of main.	Total. (In 1,000,000 gallons.)	Per capita. (Gallons.)	
Total	269	15,460,938	954.97	$354,635,373	$22.94	$21,905	1,411.5	91	33,430.7
Gravity	36	873,233	521.33	26,607,690	30.47	15,885	81.7	94	14,142.0
Gravity with pumping	19	3,496,262	1,118.09	114,489,299	32.75	36,613	306.7	88	7,469.0
Pumping direct	62	1,580,044	941.27	24,200,204	15.26	14,362	139.0	88	.....
Pumping to reservoirs	78	4,608,042	940.95	104,723,250	22.43	21,109	436.0	93	4,988.2
Pumping to standpipes	41	2,126,393	1,069.08	29,826,740	14.02	14,996	193.5	91	.....
Pumping to standpipes and reservoirs	33	2,710,964	984.73	54,788,190	20.21	19,901	254.6	94	6,831.5

From this it will be seen that the cost of works to each head of population and each mile of main is the largest in those cities having gravity works with pumping to high service. In the pumping works the cost is higher in those cities where reservoirs are used, the least expensive to build appearing to be the pumping direct and the pumping to standpipe. It will also be noted in the consumption daily to each head of population that gravity with pumping and pumping direct to mains used the same proportionate consumption, while gravity alone and pumping to reservoir and standpipe were the same and the highest.

Table 66 shows the ownership of the waterworks, whether by the municipalities or by private parties, for the individual cities. Of the 292 cities reporting, 168, having a population of 12,650,460, owned and operated their own waterworks, while 124, with a total population of 3,473,020, depended on private parties for their water supply. Of the population, 78.46 per cent was in the cities owning the works.

The average population of each of the cities owning the waterworks was 75,300. The waterworks owned by private parties existed mostly in the smaller cities, as the 124 cities thus supplied had an average population of but 28,008 each. Of the cities having a population of 100,000 and upward, San Francisco, New Orleans, Omaha, Kansas city (Mo.), Denver, and Indianapolis have their waterworks operated by private parties.

Though the ownership of the works was reported for 292 cities, but 215, with an aggregate population of 13,422,223, made complete returns on all points desired for Table 28, which gives for these cities the cost of works, average annual cost of maintenance, average annual receipts from water rents, cost of works to each mile of main and to each tap, and the population to each mile for the city, and the private ownership, by population groups and geographical divisions.

TABLE 28.

OWNED BY THE CITIES.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	POPULATION.		COST OF WORKS.			Taps. (Number.)	Mains. (Miles.)	AVERAGE ANNUAL—(FOR 10 YEARS)	
		Total.	To each mile of main.	Total.	Per capita.	To each mile of main.			Cost of maintenance.	Receipts from water rents.
Total	149	11,599,966	1,040.73	$244,328,379	$21.06	$21,921	1,293,456	11,146	$5,883,619	$16,818,287
10,000 to 14,999	40	494,142	537.11	9,198,653	18.62	9,999	54,017	920	269,800	564,895
15,000 to 24,999	38	759,608	680.65	15,484,242	20.38	13,875	73,040	1,116	452,533	868,292
25,000 to 49,999	36	1,259,343	846.90	24,462,742	19.43	16,451	134,773	1,487	562,655	1,469,127
50,000 to 99,999	15	982,406	976.55	19,419,969	19.77	19,364	105,119	1,006	429,400	1,230,477
100,000 and over	20	8,104,467	1,224.70	175,762,773	21.69	26,562	926,507	6,617	4,169,141	12,685,496
Total	149	11,599,966	1,040.73	244,328,379	21.06	21,921	1,293,456	11,146	5,883,619	16,818,287
North Atlantic	76	6,747,605	1,023.46	167,797,509	24.87	25,451	797,675	6,593	4,069,340	11,526,743
South Atlantic	10	565,835	1,045.57	9,612,000	16.87	17,637	65,930	545	169,125	484,202
North Central	51	3,826,525	1,089.87	56,856,820	14.86	16,194	389,993	3,511	1,267,652	4,280,065
South Central	6	300,608	992.11	7,658,170	25.48	25,274	22,156	303	304,595	363,460
Western	6	155,333	800.69	2,403,760	15.48	12,391	17,702	194	81,907	163,817

PRIVATE OWNERSHIP.

Total	66	1,822,257	710.99	48,142,161	26.42	18,784	139,961	2,563	1,403,973	4,653,384
10,000 to 14,999	36	428,822	627.85	8,290,337	19.33	12,138	33,892	683	307,836	516,050
15,000 to 24,999	10	188,756	734.46	3,736,614	19.80	14,539	12,206	257	102,978	224,848
25,000 to 49,999	14	482,051	621.20	17,663,210	36.64	22,762	40,155	776	318,858	765,273
50,000 to 99,999	2	109,708	330.19	3,325,000	33.02	10,002	15,950	305	128,442	209,372
100,000 and over	4	621,920	1,147.45	15,127,000	24.32	27,910	37,758	542	545,859	2,937,835
Total	66	1,822,257	710.99	48,142,161	26.42	18,784	139,961	2,563	1,403,973	4,653,384
North Atlantic	15	316,351	578.34	9,471,220	29.94	17,315	31,508	547	138,831	467,444
South Atlantic	6	85,173	925.79	1,114,000	13.08	12,109	3,682	92	61,008	83,016
North Central	27	699,462	909.57	16,882,748	24.14	21,954	30,632	769	722,196	2,916,903
South Central	13	493,784	1,132.53	8,412,000	17.04	19,294	31,729	436	284,496	554,049
Western	5	227,487	316.39	12,262,193	53.90	17,055	33,410	719	197,442	631,372

It will be seen from the above table that the cost of works to each head of population was lower in the total for the city ownership, while the cost to each mile of main was lower for the private corporations. In the North Central division the cost of the city works to each head of population was largely below the cost of private works, as was also the case in the Western. This is probably due to the fact that the returns from private corporations generally gave the total capital stock instead of the actual cost of the works.

In connection with the above, Tables 29 and 30 give in detail the receipts and expenditures connected with the water supply in their relations to population, mains, and taps for 49 of the largest cities in this country, and for 18 German cities, so far as such details can be obtained from their reports. In the cities of the United States the cost of maintenance and the annual receipts from water rents are the average annual for the past 10 years, and as the ratios per capita and to the mains and taps can not therefore be accurately ascertained, they are omitted from the tables.

TABLE 29.

CITIES.	POPULATION.		Number of meters to each 100 taps.	COST OF WATERWORKS.			Average annual cost of maintenance. (For 10 years.)	Average annual receipts from water rents. (For 10 years.)	Annual charge for water for an average dwelling.
	To each mile of main.	To each tap.		Per capita.	To each mile of main.	To each tap.			
New York	2,295.91	15.95	20.53	$26.40	$60,606	$421.05	$530,000	$2,300,000	$6.00
Chicago	1,622.20	7.33	2.18	12.48	20,243	91.50	80,000	1,261,396	14.00
Philadelphia	1,125.77	6.13	0.18	17.67	19,892	108.24	545,667	1,088,508	9.00
Brooklyn	1,938.32	9.38	2.04	19.20	37,224	180.14	430,084	1,197,222	8.00
St. Louis	1,344.55	12.52	8.00	18.04	24,258	225.89	241,783	807,554	14.00
Boston	710.74	5.80	4.99	49.34	35,070	286.14	401,700	1,504,790	12.00
Baltimore	1,067.42	(a)	.....	23.25	24,816	(a)	100,000	600,000	7.00
San Francisco	874.26	8.03	31.65	50.17	43,860	402.75	(a)	.....	20.00
Cincinnati	1,095.60	7.94	3.80	11.79	12,915	93.59	229,100	530,931	12.50
Cleveland	868.28	8.51	5.62	21.75	18,885	185.07	83,946	316,975	11.25
Buffalo	909.84	7.09	0.33	23.47	21,352	166.38	90,000	402,978	12.00
New Orleans	3,227.19	23.47	0.29	10.00	32,267	234.70	44,365	132,854	25.00
Pittsburg	1,242.80	13.45	0.24	14.67	18,229	197.25	92,392	406,476	16.00
Washington	944.08	7.52	0.26	17.61	16,628	132.46	26,556	133,704	4.50
Detroit	573.47	5.46	2.02	21.39	12,269	116.75	70,610	298,477	10.00
Milwaukee	1,161.75	12.04	28.14	15.34	17,823	184.68	89,694	207,724	11.00
Newark (N. J.)	1,033.13	8.44	2.58	17.12	17,692	144.61	87,369	264,470	13.75
Minneapolis	1,160.13	19.44	4.39	13.78	15,986	267.91	45,000	88,529	9.00
Jersey city	1,630.03	9.27	1.39	32.36	52,753	299.94	b500,000	466,000	12.85
Louisville	1,007.08	13.01	6.82	26.33	28,100	342.66	195,303	236,409	14.60
Omaha	989.10	23.41	16.67	42.72	42,254	1,000.00	50,000	150,000	12.00
Rochester	622.77	5.78	8.90	31.01	19,312	179.39	51,845	166,967	7.00
St. Paul	802.14	14.71	3.91	21.47	17,219	315.78	20,000	100,000	8.60
Kansas city (Mo.)	1,061.73	12.70	17.35	22.60	24,000	287.16	401,494	2,354,981	16.75
Providence	597.95	8.57	58.00	45.85	27,418	392.85	b358,092	306,395	16.00
Denver	533.57	9.70	0.77	34.74	18,535	337.00	50,000	300,000	17.00
Albany	999.19	6.27	0.35	(a)	(a)	(a)	93,873	178,698	14.00
Syracuse	2,098.64	29.38	17.33	9.08	19,048	266.67	(a)	.....	19.00
Worcester	742.59	9.41	88.03	22.36	16,601	210.28	50,000	124,000	15.00
Toledo	1,163.34	23.27	10.71	15.35	17,857	357.14	20,000	48,600	11.00
Richmond (Va.)	1,114.90	7.68	1.08	24.57	27,307	188.68	30,000	95,000	11.50
New Haven	640.14	(a)	(a)	21.43	13,717	(a)	170,279	186,721	12.00
Paterson	1,119.24	11.80	0.05	40.18	44,971	474.17	(a)	.....	14.00
Fall River	1,180.92	15.50	72.92	25.02	29,547	387.80	25,754	70,500	15.00
Cambridge	660.64	6.89	2.27	36.60	24,182	252.34	31,843	182,708	17.00
Atlanta	1,820.36	21.84	88.33	10.63	19,357	232.28	20,000	30,000	(c)
Memphis	838.55	9.49	6.60	29.81	25,000	283.02	100,000	175,000	17.00
Wilmington (Del.)	830.15	5.26	0.15	16.28	13,514	85.68	34,000	90,577	10.00
Dayton	1,155.09	24.14	4.02	10.49	12,113	253.15	28,150	46,509	10.00
Troy	1,088.50	10.76	3.94	19.63	21,362	211.09	48,400	63,130	10.00
Grand Rapids	972.23	19.22	12.56	13.62	13,246	261.87	22,084	41,839	15.00
Reading	1,066.56	4.19	0.04	21.31	22,727	89.29	40,000	90,000	10.00
Camden	1,023.04	5.32	0.14	11.15	11,404	59.31	16,000	86,434	11.00
Trenton	820.83	(a)	(a)	10.14	8,320	(a)	12,000	57,978	10.00
Lynn	640.54	6.48	3.76	29.78	19,072	192.81	20,000	110,000	11.00
Lincoln	2,757.70	36.77	3.60	3.52	9,700	129.33	10,614	14,421	11.50
Hartford	665.38	8.90	5.77	32.75	21,790	291.30	32,555	136,699	9.00
Evansville	1,180.37	(a)	(a)	9.85	11,628	(a)	26,000	35,000	15.00
Los Angeles	205.69	4.73	3.00	36.21	7,449	171.36	28,442	34,372	24.60

a No data. b Includes interest on debt. c Meter measurement only.

TABLE 30.

CITIES.	POPULATION.		Miles of main.	RECEIPTS AND EXPENDITURES FOR YEAR 1891.						
				Receipts.				Expenditures.		
	Total, 1890.	To each mile of main.		Total.	Above expenditures.	Per capita of population.	To each mile of main.	Total.	Per capita of population.	To each mile of main.
Total	5,329,196	2,579	2,066	$4,565,384	$3,224,977	$0.86	$2,210	$1,340,407	$0.25	$649
Berlin	1,578,794	3,613	437	1,488,975	1,138,069	0.94	3,407	350,906	0.22	803
Hamburg	569,260	2,124	268	560,809	332,155	0.99	2,093	228,654	0.40	853
Leipsic	357,122	3,160	113	142,530	87,924	0.40	1,261	54,606	0.15	483
Munich	349,024	2,585	135	190,913	92,448	0.55	1,414	98,465	0.28	729
Breslau	335,186	3,162	106	314,030	261,605	0.94	2,963	52,425	0.16	495
Cologne	281,681	3,095	91	245,379	183,915	0.87	2,696	61,464	0.22	675
Dresden	276,522	2,609	106	233,514	186,695	0.84	2,203	46,819	0.17	442
Magdeburg	202,234	2,466	82	132,730	90,639	0.66	1,619	42,091	0.21	513
Frankfort on the Main.	179,985	1,353	133	372,811	271,704	2.07	2,803	101,107	0.56	760
Hanover	163,593	2,045	80	102,751	27,290	0.63	1,284	75,461	0.46	943
Königsberg	161,666	3,299	49	105,280	84,502	0.65	2,149	20,778	0.13	424
Dusseldorf	144,642	1,854	78	101,956	79,968	0.79	1,307	21,988	0.15	282
Altona	143,249	1,685	85	156,985	111,447	1.10	1,847	45,538	0.32	536
Stuttgart	139,817	1,554	90	127,570	88,092	0.91	1,417	39,478	0.28	439
Strasburg	123,500	2,628	47	53,827	40,128	0.44	1,145	13,699	0.11	291
Barmen	116,144	1,873	62	91,118	47,472	0.78	1,470	43,646	0.38	704
Crefeld	105,376	2,151	49	57,173	34,634	0.54	1,167	22,539	0.21	460
Halle	101,401	1,844	55	87,033	66,290	0.86	1,582	20,743	0.20	377

From Table 29 it will be seen that the average cost to each head of population for the American cities was $22.47, the range per capita being from $50.17 in San Francisco to $3.52 in Lincoln. The annual charge for water for an average dwelling ranged from $4.50 in Washington, $6.00 in New York, and $7.00 each in Baltimore and Rochester to $20.00 in San Francisco, $24.60 in Los Angeles, $25.00 in New Orleans, $30.00 each in Fresno and Stockton, $31.00 in Dallas, and $48.00 in East Portland, Ore. The average dwelling in this case means a house of 7 rooms, with hot and cold water in the kitchen sink, a bath tub with hot and cold water, and a water closet.

There were 258 cities, with an aggregate population of 15,413,618, which reported as to the annual charge for water for an average dwelling. For 11 of these cities, with 15.84 per cent of the population, the charge was below $8.00 per dwelling; for 30 cities, with 17.94 per cent of the population, it was from $8.00 to $10.00; in 45 cities, with 12.68 per cent of the population, it was from $10.00 to $12.00; in 55 cities, with 17.29 per cent of the population, it was from $12.00 to $14.00; in 36 cities, with 17.19 per cent of the population, it was from $14.00 to $16.00; in 36 cities, with 8.14 per cent of the population, it was from $16.00 to $18.00; in 20 cities, with 3.13 per cent of the population, it was from $18.00 to $20.00; in 18 cities, with 5.32 per cent of the population, it was from $20.00 to $25.00; in 7 cities, with 2.47 per cent of the population, it was $25.00 and over per dwelling.

SEWERS.

Table 67 shows the total length of sewers, divided between pipe and brick or stone, with the diameters of each class, and the largest and smallest diameter, the number of outlets, the several parts of the system, the total cost of sewers, the cost per capita, and the average annual cost of maintenance, repairs, and cleaning for the 10 years ending December 31, 1889, with the cost of cleaning separately shown.

Of the 345 cities, 281 made returns on this subject. Of these, 57 cities, with an aggregate population of 1,107,262, reported "no sewers", and are as follows:

NORTH ATLANTIC DIVISION.

POPULATION 10,000 TO 14,999.—Bridgeton, N. J.; Clinton, Mass.; Columbia, Pa.; Dover, N. H.; Easton, Pa.; Hornellsville, N. Y.; Ithaca, N. Y.; Medford, Mass.; Nanticoke, Pa.; Peabody, Mass.; Plainfield, N. J.; Weymouth, Mass., and Woburn, Mass.

POPULATION 15,000 TO 24,999.—Gloucester, Mass.; Jamestown, N. Y.; Malden, Mass.; Meriden, Conn.; Newton, Mass.; North Adams, Mass.; Orange, N. J.; Quincy, Mass.; Shenandoah, Pa.; Waltham, Mass., and Woonsocket, R. I.

POPULATION 25,000 TO 49,999.—Brockton and Taunton, Mass.

SOUTH ATLANTIC DIVISION.

POPULATION 10,000 TO 14,999.—Alexandria and Portsmouth, Va.

POPULATION 15,000 TO 24,999.—Columbia, S. C.; Key West, Fla., and Wilmington, N. C.

NORTH CENTRAL DIVISION.

POPULATION 10,000 TO 14,999.—Battle Creek, Mich.; Chillicothe, Ohio; Hastings, Neb.; Ironton, Ohio; Ishpeming, Mich.; Janesville, Wis.; Jeffersonville, Ind.; Menominee, Mich.; Sedalia, Mo., and Sioux Falls, S. D.

POPULATION 15,000 TO 24,999.—Aurora, Ill.; Elgin, Ill.; Hamilton, Ohio; Joliet, Ill.; New Albany, Ind., and Winona, Minn.

SOUTH CENTRAL DIVISION.

POPULATION 10,000 TO 14,999.—Austin, Tex.; Laredo, Tex.; Meridian, Miss.; Paducah, Ky., and Vicksburg, Miss.

POPULATION 29,084.—Galveston, Tex.

POPULATION 242,039.—New Orleans, La.

WESTERN DIVISION.

POPULATION 10,532.—East Portland, Ore.

POPULATION 14,889.—Ogden, Utah.

POPULATION 14,424.—Stockton, Cal.

There were 5 cities, with an aggregate population of 122,575, which reported "sewer system under construction", and 2 cities reported less than 1 mile of sewer each. Of the cities reporting "no sewers", 33 are in the population group between 10,000 and 14,999, 20 in the group between 15,000 and 24,999, 3 in the group between 25,000 and 49,999, and 1 in the group of over 100,000; the last is New Orleans, in which a system of sewers has now been commenced. By geographical divisions, 26 of the cities are in the North Atlantic, and range in population from 27,294 to 10,158. In the South Atlantic, 5 cities were without sewer facilities, the range in population being from 20,056 to 13,268. The 16 cities in the North Central which reported "no sewers" are mostly small, the largest having a population of 23,264.

Of the 7 cities in the South Central division, New Orleans was the largest, while in the Western division the 3 cities without sewers have an aggregate population of but 39,845.

The 217 cities that made complete or partially complete returns as to their sewers had an aggregate population of 14,721,217 and 8,199 miles of sewers, or 1,795.49 persons to each mile.

Diagram 18 shows the number of persons to each mile of sewer in the aggregate, and by population groups and geographical divisions.

It will be noted that in the population groups the number of persons to each mile of sewer steadily decreases as the cities grow smaller. This is in part due to the fact that, as a rule, when a city at the present day adopts a sewerage system it is apt to lay more miles of sewers than are needed at the time, thus providing for the future population. It will be seen by Table 67 that the range in the number of persons to each mile of sewer is from 18,837 in San Antonio, 15,516 in Baltimore, and 14,365 in Trenton to 403 in Brookline, 404 in San Diego, and 435 in Fort Smith, Ark.

Diagrams 19 and 20 show for the larger cities of this country which made returns and for 17 of the larger German cities the number of persons to each mile of sewer in each city.

In Table 67 the sewers are divided into "pipe" and "brick or stone", the former being small and the latter running up to great diameters, as 20 feet in Philadelphia and St. Louis, and 22 feet in Washington. In pipe sewers none are under 6 inches in diameter and but few over 24 inches, as above that size brick is usually used for the construction of sewers. The largest pipe sewer reported is 30 inches in diameter, at San Diego.

Table 31 shows, by geographical divisions and population groups, the total number of miles and the proportion of each kind of sewers for the 200 cities from which the data were obtained.

TABLE 31.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Total sewers. (Miles.)	BRICK AND STONE.		PIPE.	
			Total. (Miles.)	Percentage.	Total. (Miles.)	Percentage.
Total	200	7,428	3,334	44.88	4,094	55.12
10,000 to 14,999	59	520	54	10.38	466	89.62
15,000 to 24,999	47	675	146	21.63	529	78.37
25,000 to 49,999	46	964	323	33.51	641	66.49
50,000 to 99,999	24	884	447	50.57	437	49.43
100,000 and over	24	4,385	2,364	53.91	2,021	46.09
Total	200	7,428	3,334	44.88	4,094	55.12
North Atlantic	70	3,585	1,818	50.71	1,767	49.29
South Atlantic	16	530	175	33.02	355	66.98
North Central	84	2,720	1,240	45.59	1,480	54.41
South Central	14	260	68	26.15	192	73.85
Western	16	333	33	9.91	300	90.09

DIAGRAM 18.—DISTRIBUTION OF POPULATION IN RELATION TO TOTAL LENGTH OF ALL SEWERS FOR 217 CITIES.

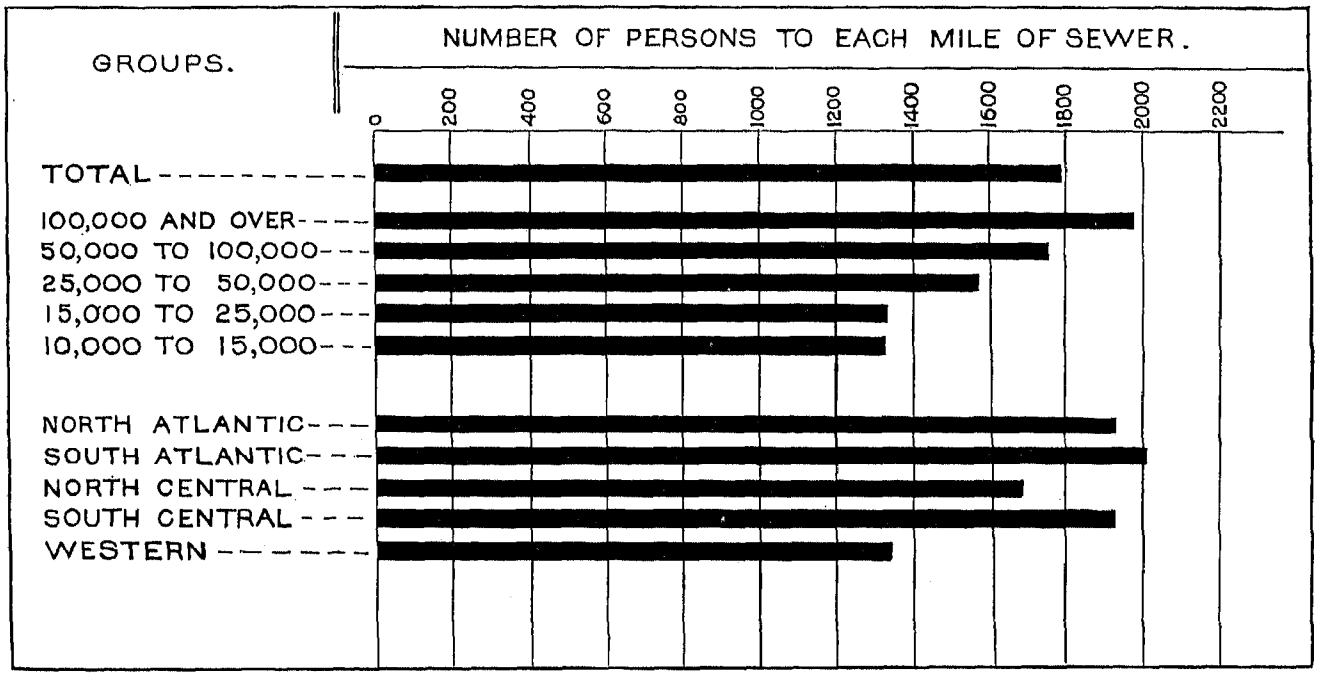


DIAGRAM 19.—DISTRIBUTION OF THE POPULATION IN RELATION TO SEWERS IN EACH OF THE 50 LARGER CITIES.

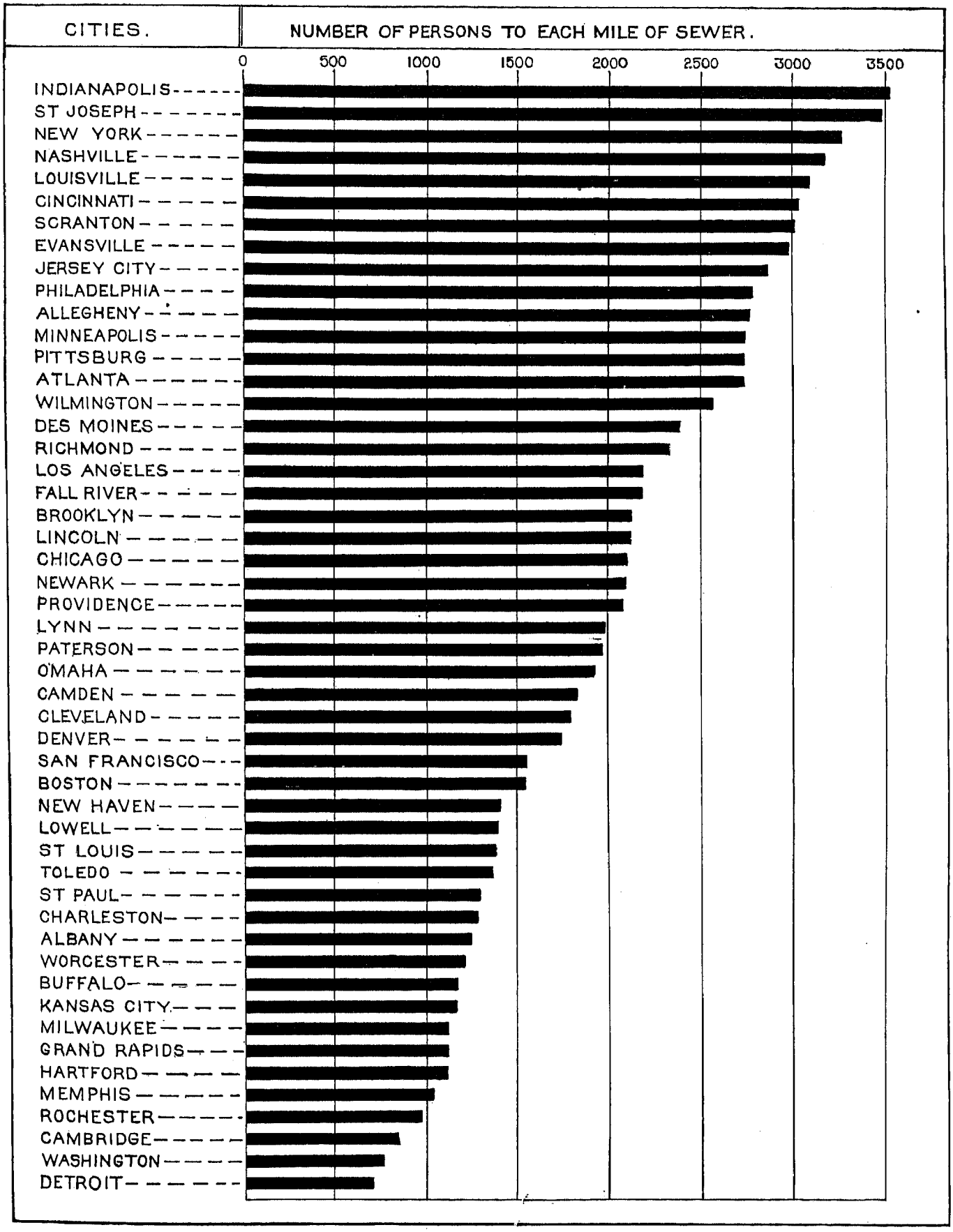


DIAGRAM 20.—DISTRIBUTION OF POPULATION IN RELATION TO SEWERS IN 17 GERMAN CITIES.

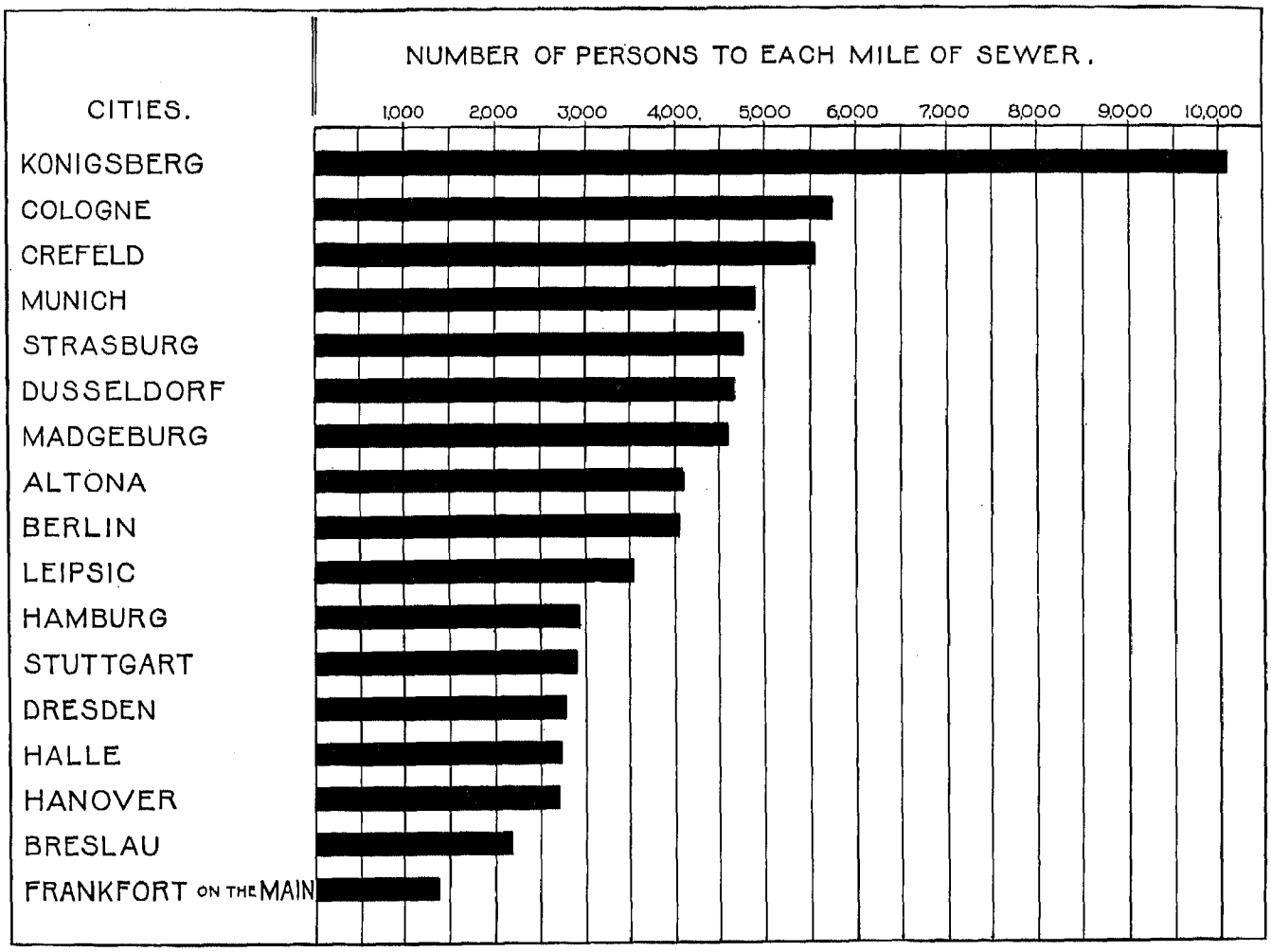


DIAGRAM 21.—PERCENTAGE OF PIPE AND BRICK AND STONE SEWERS FOR 200 CITIES, BY MAGNITUDE OF POPULATION AND FOR TOTAL SEWERS.

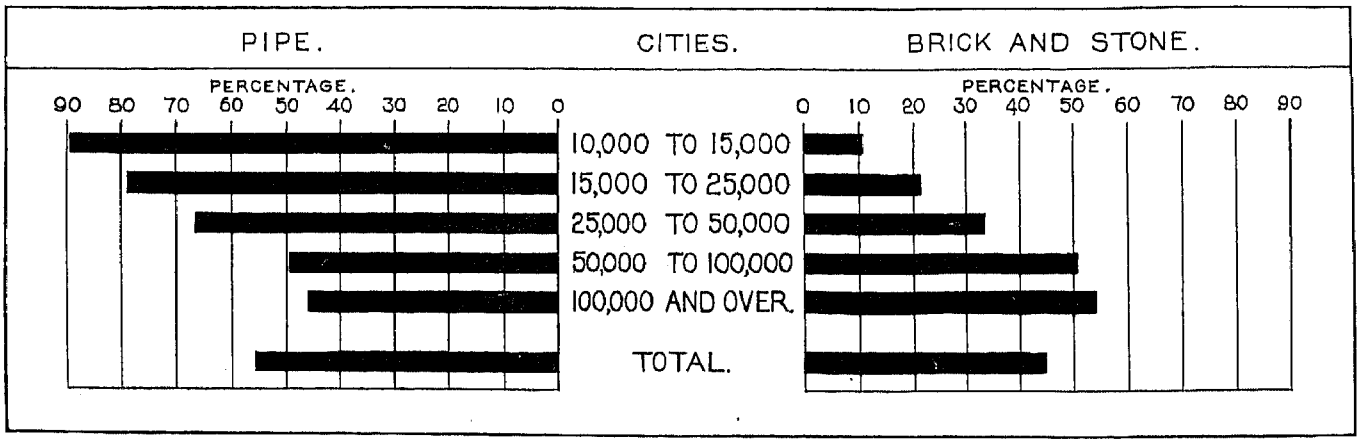
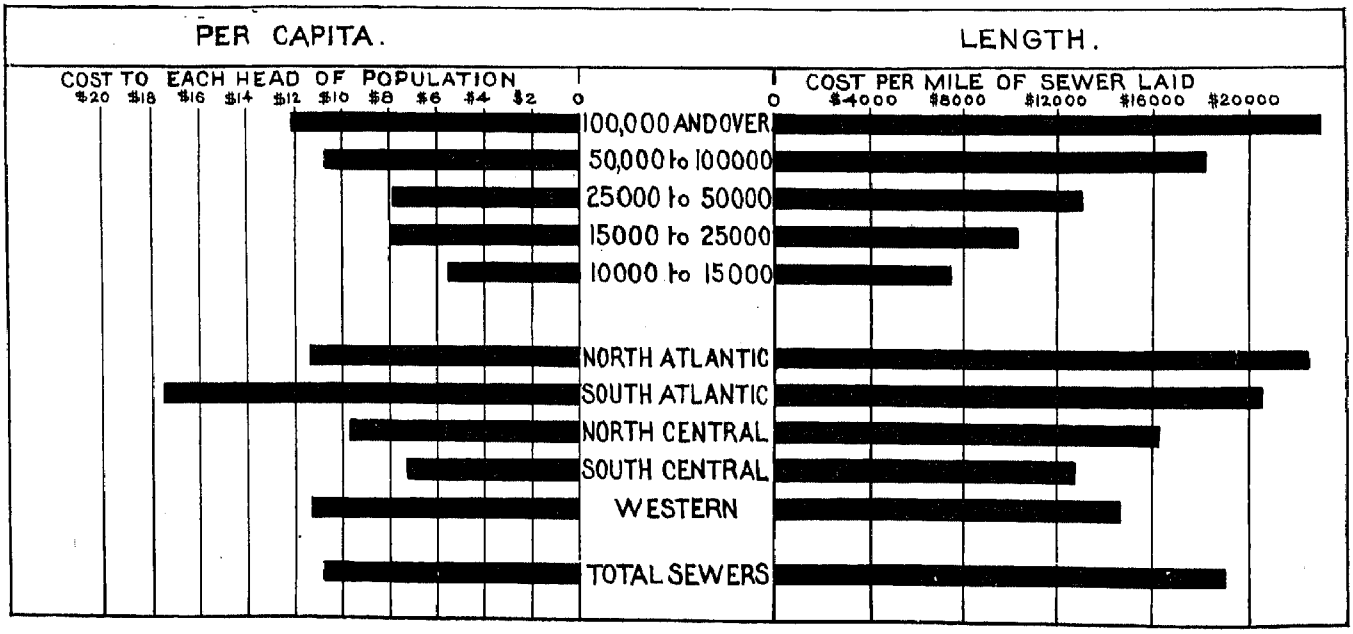


DIAGRAM 22.—TOTAL COST OF SEWERS BY POPULATION AND GEOGRAPHICAL GROUPS FOR 182 CITIES.



From this it will be seen that pipe sewers comprised 55.12 per cent of the total mileage, but that this class of sewers gradually decreases, while those of brick or stone increase as the cities grow larger. Of the sewers in the cities with from 10,000 to 15,000 inhabitants, 89.62 per cent were of pipe and 10.38 per cent brick or stone, while the cities of 100,000 and over had 53.91 per cent of brick or stone sewers.

It will also be noted in Table 67 that the sewer system in Atlantic city, Leadville, and Muskegon are owned by private companies and are all pipe. In the former city, the company charges a stated sum per annum for each house connection, but no detailed information was obtained from it or from the other two cities. Of the cities using pipe sewers, 8 report "for house sewage only".

Diagram 21 shows the percentage of both pipe and brick or stone sewers for 200 cities grouped according to magnitude of population.

The cost of sewers was reported for 182 cities, with a total population of 12,455,688 and 7,128 miles of sewers, and it amounted in the aggregate to $135,288,355, or $10.86 per capita, and $18,980 for each mile of sewer laid.

Table 32 shows the distribution of these figures by groups, arranged in the order of the magnitude of the population of the cities and by geographical divisions.

TABLE 32.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Sewers. (Miles.)	POPULATION.		COST.		
			Total.	To each mile of sewer.	Total.	To each mile of sewer.	Per capita.
Total	182	7,128	12,455,688	1,747	$135,288,355	$18,980	$10.86
10,000 to 14,999	54	490	644,593	1,315	3,646,181	7,441	5.66
15,000 to 24,999	41	633	811,833	1,283	6,463,338	10,211	7.96
25,000 to 49,999	45	960	1,569,277	1,635	12,465,901	12,985	7.94
50,000 to 99,999	20	781	1,334,663	1,709	14,279,962	18,284	10.70
100,000 and over	22	4,264	8,095,322	1,899	98,432,973	23,085	12.16
Total	182	7,128	12,455,688	1,747	135,288,355	18,980	10.86
North Atlantic	65	3,158	6,232,249	1,973	70,848,285	22,435	11.37
South Atlantic	11	429	503,471	1,174	8,837,566	20,600	17.55
North Central	76	2,735	4,535,388	1,658	44,309,448	16,201	9.77
South Central	15	272	488,756	1,797	3,499,271	12,865	7.16
Western	15	534	695,824	1,303	7,793,785	14,595	11.20

From this it will be seen that in the population groups the largest cities have gone to the most expense per mile of sewer, while the cities between 10,000 and 15,000 are the lowest, the cost per mile being less than one-third and the cost per capita less than one-half. This is due to the fact that in the smaller cities pipe sewers of smaller dimensions are mostly used. In the geographical divisions, the South Atlantic leads in the cost per capita, while the North Atlantic leads in the cost per mile. The South Central division shows the lowest cost both by mileage and per capita. A reference to Table 67 will show that in many of the newer cities of this division the small pipe system is in vogue.

Diagram 22 illustrates the cost of sewers per mile and per capita by these divisions.

Of the cities giving data, only 103 furnish the average annual cost of maintenance with average annual cost of cleaning, due partly to the fact that the financial part is more or less incomplete in many cases, as a large number of cities keep their "sewer" and "street" accounts together, so far as cleaning and repairing is concerned.

The figures for the individual cities as reported will be found in Table 67.

There were 31 cities which made no reports as to either waterworks or sewers, 21 made no reports as to waterworks while reporting as to sewers, and 33 made no reports as to sewers while reporting as to waterworks. One city reported no waterworks, 2 that construction of waterworks had just begun, 57 reported no sewers, 5 reported sewer system just begun, and 2 reported less than 1 mile of sewer each.

For 97 cities, Table 33 shows by groups according to the magnitude of population and according to geographical position some of the relations between the waterworks and sewerage.

TABLE 33.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	CITIES.		WATERWORKS.			SEWERS.		Miles of water main to each mile of sewer.	Number of water taps to each 1,000 house connections with sewers.	TO EACH MILE OF PAVED STREETS AND ALLEYS—	
	Number.	Population.	Average daily consumption of water per capita. (Gallons.)	Number of taps.	Cost per capita.	Number of house connections.	Cost per capita.			Water mains. (Miles.)	Sewers. (Miles.)
Total	97	8,283,526	92.00	812,243	$21.56	649,292	$11.86	1.69	1,250.97	1.35	0.8[illegible]
10,000 to 14,999	27	327,623	84.60	26,361	16.66	12,910	4.56	2.23	2,041.91	1.20	0.54
15,000 to 24,999	24	483,714	107.08	45,479	22.99	38,582	8.32	2.08	1,178.76	1.40	0.6[illegible]
25,000 to 49,999	21	703,049	98.20	61,262	20.33	47,222	7.92	1.90	1,297.32	1.28	0.6[illegible]
50,000 to 99,999	9	623,257	70.00	50,816	23.40	47,923	12.88	1.57	1,060.37	1.37	0.8[illegible]
100,000 and over	16	6,145,883	92.73	628,325	21.66	502,655	12.87	1.59	1,250.01	1.37	0.8[illegible]
Total	97	8,283,526	92.00	812,243	21.56	649,292	11.86	1.69	1,250.97	1.35	0.8[illegible]
North Atlantic	31	4,935,372	90.68	534,150	23.71	425,262	11.70	1.78	1,256.05	1.47	0.8[illegible]
South Atlantic	7	408,822	128.42	42,257	15.18	52,110	20.85	1.05	810.92	1.49	1.4
North Central	46	2,512,825	83.87	195,482	17.67	141,907	11.05	1.64	1,377.54	1.28	0.7[illegible]
South Central	7	318,836	101.46	23,683	22.63	24,707	8.57	1.87	958.55	1.04	0.5[illegible]
Western	6	107,671	175.94	16,671	34.85	5,306	13.41	2.19	3,141.91	0.98	0.45

The 97 cities are divided as follows:

POPULATION 10,000 TO 15,000.

NORTH ATLANTIC DIVISION.—Atlantic city, Auburn (Me.), Bradford, Gloversville, New London, Saratoga.
SOUTH ATLANTIC DIVISION.—Pensacola (Fla.).
NORTH CENTRAL DIVISION.—Anderson, Beatrice, Clinton (Iowa), Fond du Lac, Fort Scott, Hannibal, Jacksonville (Ill.), Mansfield, Michigan city, Moline, Muscatine, Nebraska city, Port Huron, Rock Island, Stillwater, West Bay.
SOUTH CENTRAL DIVISION.—El Paso, Jackson (Tenn.).
WESTERN DIVISION.—Cheyenne, Fresno.

POPULATION 15,000 TO 25,000.

NORTH ATLANTIC DIVISION.—Cohoes, Concord, Fitchburg, Lewiston, Newburg, Poughkeepsie, Schenectady.
SOUTH ATLANTIC DIVISION.—Jacksonville (Fla.).
NORTH CENTRAL DIVISION.—Bloomington, Burlington (Iowa), Cedar Rapids, East St. Louis, Kalamazoo, Lafayette, Leavenworth, Lima, Muskegon, Oshkosh, Rockford, Zanesville.
SOUTH CENTRAL DIVISION.—Fort Worth.
WESTERN DIVISION.—Pueblo, San Diego, San Jose.

POPULATION 25,000 TO 50,000.

NORTH ATLANTIC DIVISION.—Elmira, Erie, Manchester, Portland (Me.), Waterbury, Yonkers.
SOUTH ATLANTIC DIVISION.—Augusta (Ga.), Norfolk, Savannah.
NORTH CENTRAL DIVISION.—Akron, Canton, Davenport, Duluth, Fort Wayne, Lacrosse, Saginaw, Sioux city, Terre Haute.
SOUTH CENTRAL DIVISION.—Dallas (Tex.), Little Rock.
WESTERN DIVISION.—Sacramento (Cal.).

POPULATION 50,000 TO 100,000.

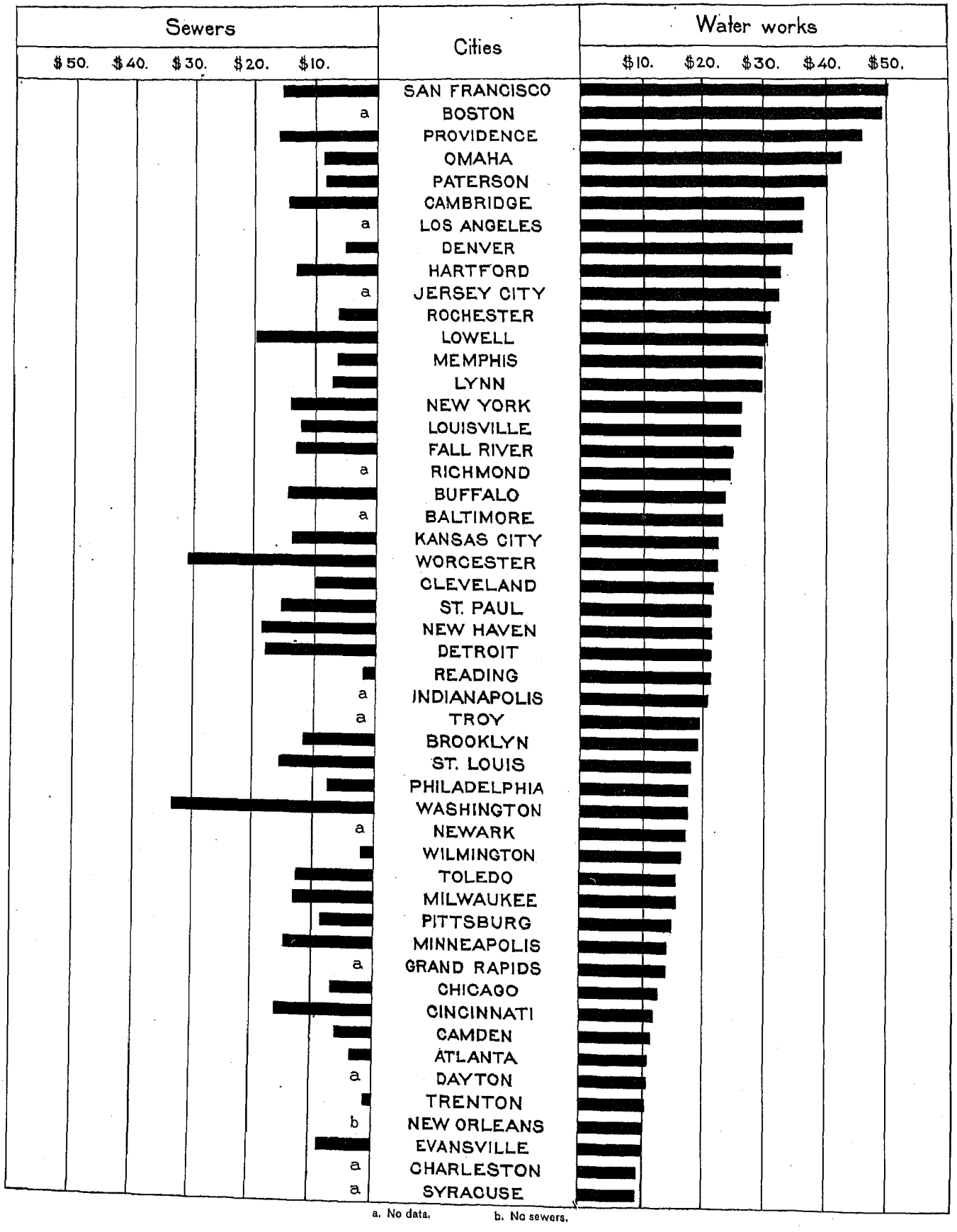
NORTH ATLANTIC DIVISION.—Fall River, Lowell, Lynn, Paterson, Worcester.
SOUTH ATLANTIC DIVISION.—Atlanta (Ga.).
NORTH CENTRAL DIVISION.—Lincoln, Toledo.
SOUTH CENTRAL DIVISION.—Memphis (Tenn.).

POPULATION 100,000 AND OVER.

NORTH ATLANTIC DIVISION.—Brooklyn, Buffalo, New York, Philadelphia, Pittsburg, Providence, Rochester.
SOUTH ATLANTIC DIVISION.—Washington.
NORTH CENTRAL DIVISION.—Cincinnati, Cleveland, Milwaukee, Minneapolis, Omaha, St. Louis, St. Paul.
SOUTH CENTRAL DIVISION.—Louisville.

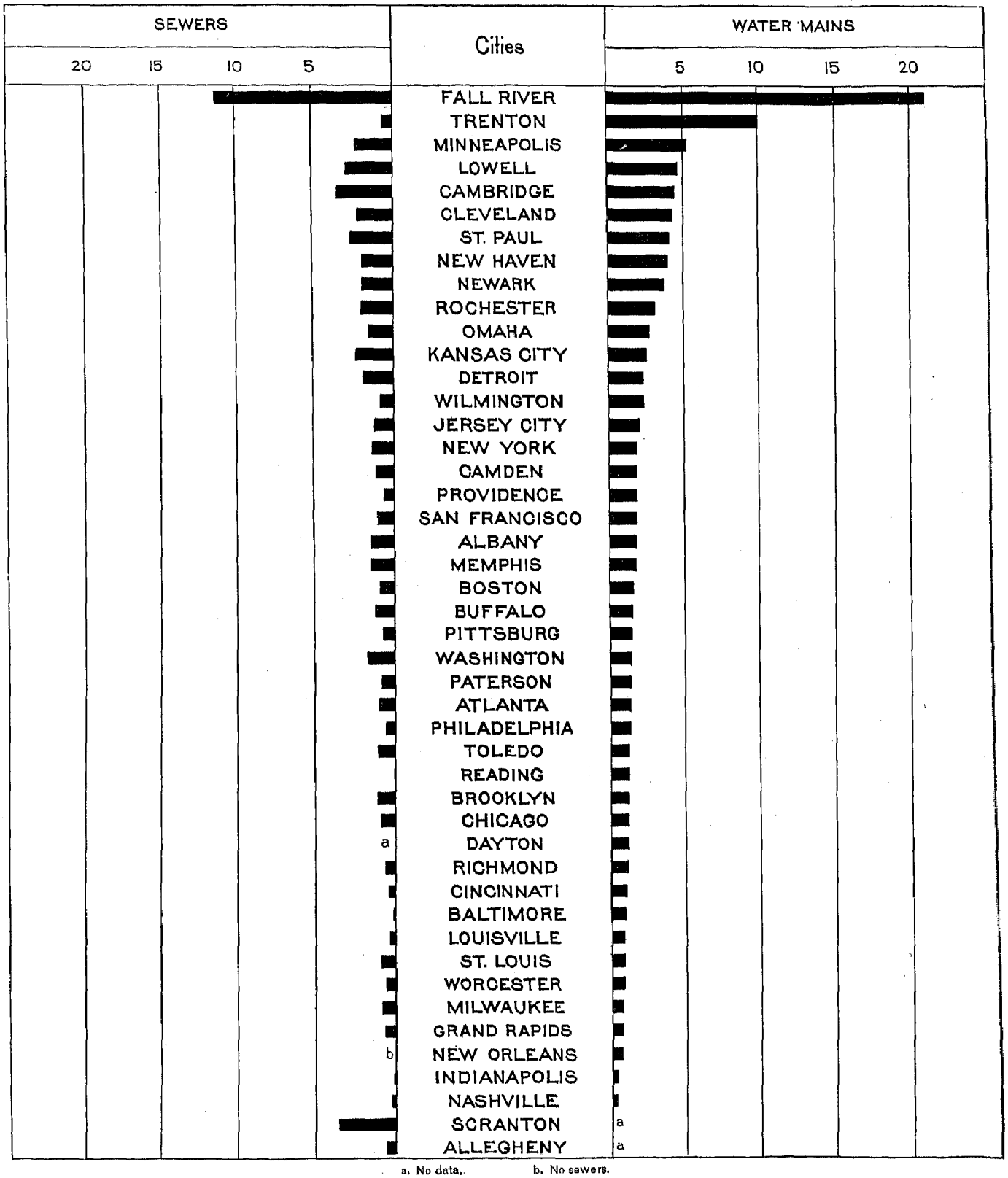
Table 34 shows, so far as the data were supplied, the relation between waterworks and sewerage for the 50 larger cities.

DIAGRAM 23.—PER CAPITA COST OF WATERWORKS AND SEWERS.



a. No data. b. No sewers.

DIAGRAM 24.—MILES OF WATER MAINS AND SEWERS TO EACH MILE OF PAVED STREETS AND ALLEYS.



a. No data. b. No sewers.

TABLE 34.

CITIES.	Population.	WATERWORKS.			SEWERS.		Miles of water mains to each mile of sewer.	TO EACH MILE OF PAVED STREETS AND ALLEYS—	
		Average daily consumption of water per capita. (Gallons.)	Number of taps.	Cost per capita.	Number of house connections.	Cost per capita.		Water mains. (Miles.)	Sewers. (Miles.)
New York	1,515,301	74	95,000	$26.40	123,000	$14.04	1.42	1.84	1.30
Chicago	1,099,850	91	150,000	12.48	(a)	6.84	1.29	1.08	0.83
Philadelphia	1,046,964	111	170,911	17.67	100,000	7.70	2.47	1.24	0.50
Brooklyn	806,343	62	85,961	19.20	83,512	11.53	1.09	1.11	1.01
St. Louis	451,770	71	36,082	18.04	28,756	15.95	1.02	0.80	0.78
Boston	448,477	89	77,337	49.34	52,000	(a)	2.17	1.55	0.71
Baltimore	434,439	92	(a)	23.25	(a)	(a)	.....	0.89	0.06
San Francisco	298,997	67	37,244	50.17	(a)	15.47	1.77	1.78	1.01
Cincinnati	296,908	115	37,397	11.79	7,447	16.00	2.77	0.95	0.35
Cleveland	261,353	95	30,715	21.75	14,000	9.57	2.06	4.36	2.12
Buffalo	255,664	196	36,001	23.47	32,000	14.08	1.28	1.45	1.13
New Orleans	242,039	31	10,311	10.00	(b)	.....	.....	0.69	.....
Pittsburg	238,617	147	17,744	14.67	6,748	8.59	2.21	1.34	0.61
Washington	202,978	177	26,990	17.61	34,000	33.48	0.81	1.32	1.03
Detroit	205,876	171	37,725	21.39	(a)	18.05	1.23	2.24	1.83
Milwaukee	204,468	97	16,986	15.34	17,070	13.02	0.96	0.71	0.73
Newark (N. J.)	181,830	77	21,532	17.12	(a)	(a)	2.02	3.67	1.81
Minneapolis	164,738	79	8,473	13.78	21,122	14.85	2.37	5.26	2.22
Jersey city	163,003	123	17,588	32.36	21,440	(a)	1.75	1.92	1.10
Louisville	161,129	74	12,383	26.33	10,000	12.28	2.90	0.83	0.28
Omaha	140,452	71	6,000	42.72	3,100	8.67	1.95	2.73	1.40
Rochester	133,896	82	23,140	31.01	12,000	6.52	1.56	2.99	1.92
St. Paul	133,156	60	9,052	21.47	4,200	15.06	1.01	4.05	2.51
Kansas city (Mo.)	132,716	75	10,447	22.60	(a)	13.90	1.10	2.45	2.24
Providence	132,146	44	15,424	45.85	5,700	16.16	3.45	1.81	0.52
Denver	106,713	141	11,000	34.74	(a)	5.39	3.28	.....	.....
Indianapolis	105,436	57	2,549	20.87	(a)	(a)	2.67	0.34	0.13
Allegheny	105,287	(a)	(a)	(a)	7,000	10.10	(a)	.....	0.52
Albany	94,923	153	15,137	(a)	7,000	12.04	1.25	1.73	1.38
Columbus	88,150	(a)	(a)	(a)	(a)	(a)	(a)	.....	.....
Syracuse	88,143	68	3,000	9.08	(a)	(a)	(a)	.....	.....
Worcester	84,655	56	9,000	22.36	6,468	30.91	1.63	0.79	0.48
Toledo	81,434	61	3,500	15.35	3,740	12.76	1.15	1.17	1.02
Richmond (Va.)	81,388	135	10,000	24.57	(a)	(a)	2.00	1.06	0.51
New Haven	81,298	123	(a)	21.43	(a)	18.51	2.10	3.97	1.81
Paterson	78,347	140	6,039	40.18	11,000	8.30	1.75	1.27	0.73
Lowell	77,696	64	8,471	30.68	9,000	19.95	1.57	4.63	2.95
Nashville	76,168	131	6,000	(a)	(a)	(a)	1.88	0.31	0.16
Scranton	75,215	(a)	(a)	(a)	(a)	3.93	(a)	.....	3.57
Fall River	74,398	25	4,800	25.02	2,243	13.07	1.85	21.00	11.33
Cambridge	70,028	60	10,158	36.60	(a)	14.87	1.26	4.42	3.50
Atlanta	65,533	32	3,000	10.03	2,900	3.81	1.50	1.24	0.83
Memphis	50,313	170	5,300	29.81	8,782	6.76	1.22	1.71	1.40
Wilmington (Del.)	61,431	97	11,672	16.28	(a)	2.23	3.08	2.24	0.73
Dayton	61,220	43	2,536	10.49	(a)	(a)	(a)	1.08	.....
Troy	60,956	131	5,667	19.63	(a)	(a)	(a)	.....	.....
Grand Rapids	60,278	45	3,136	13.62	(a)	(a)	1.15	0.70	0.01
Reading	58,661	85	14,000	21.31	(a)	2.05	13.75	1.17	0.09
Camden	58,313	130	10,900	11.15	(a)	6.34	1.78	1.84	1.03
Trenton	57,458	52	(a)	10.14	832	1.42	17.50	10.00	0.57

a No data.

b No sewers.

Diagram 23 shows the cost of waterworks and of sewers per capita of the population for 50 principal cities, arranged in order of the magnitude of the cost of the waterworks.

Diagram 24 shows the number of miles of water mains and of sewers to each mile of paved streets and alleys.

PARKS.

Table 68 shows for the cities of the country that have a population of 10,000 and upward the number, area in acres, and water surface of all public parks owned by the city inside the corporate limits, also the miles of driveways, bridleways, and footways, total cost of land, cost of all improvements, and average annual cost for maintenance for 10 years and cost per capita.

There were 297 cities which made returns, and of these 220, with an aggregate population of 14,767,832, reported parks, while 77, with a population of 1,615,900, reported no parks, 48 cities making no returns. Of these 220 cities, 212 reported city area, park area, and area in improved parks.

Table 35 shows, by population and geographical divisions, the population and areas, with the percentage of park area to the city area, number of acres of park area to each 1,000 of the population, and the percentage of improved to total park area.

TABLE 35.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	CITY AREA.		PARK AREA.			
			Total. (Acres.)	Percentage in parks.	Total. (Acres.)	Improved. (Acres.)	Percentage improved.	To each 1,000 population.
Total	212	14,594,167	1,838,897	2.07	38,028	24,379	64.11	2.61
10,000 to 14,999	68	823,323	322,672	0.70	2,246	1,096	48.80	2.73
15,000 to 24,999	46	886,304	358,482	1.09	3,911	2,183	55.82	4.41
25,000 to 49,999	46	1,670,797	334,448	0.75	2,493	1,630	65.38	1.49
50,000 to 99,999	25	1,675,913	208,248	2.51	5,233	3,037	58.04	3.12
100,000 and over	27	9,537,830	615,047	3.93	24,145	16,433	68.06	2.53
Total	212	14,594,167	1,838,897	2.07	38,028	24,379	64.11	2.61
North Atlantic	81	7,274,886	774,483	2.22	17,203	11,003	63.96	2.36
South Atlantic	15	1,086,889	75,743	3.38	2,558	2,276	88.98	2.35
North Central	81	4,635,055	634,938	1.74	11,053	8,131	73.56	2.38
South Central	16	766,073	110,955	1.44	1,603	1,118	69.74	2.09
Western	19	831,264	242,778	2.31	5,611	1,851	32.99	6.75

It will be seen from this that the park area includes an average of 2.07 per cent of the city area, ranging from 3.93 per cent in the largest to 0.70 per cent in the smallest cities.

In the geographical divisions, the range is from 3.38 per cent in the South Atlantic to 1.44 in the South Central. In the cities having a population of 100,000 and over, the range is from 19.76 per cent in New York to 0.06 per cent in Jersey city.

The total park area was 38,028 acres, of which 64.11 per cent was improved, the percentage ranging from 48.80 in the smaller cities to 68.06 in the cities having a population of 100,000 and upward. In the geographical divisions, the largest percentage of improved area (88.98) was in the South Atlantic and the smallest (32.99) in the Western division. The average number of acres of total park area to each 1,000 of the population was 2.61. The range, as shown by Table 68 for the individual cities, is a very wide one, running in the cities from 50,000 to 100,000, from 11.92 acres in New Haven and 10.95 in Los Angeles to 0.16 in Dayton, 0.13 in Nashville, and 0.12 in Memphis. In the cities of 100,000 and over, Minneapolis had 9.04 acres of parks to each 1,000 of the population, while Jersey city has but 0.03 of an acre. The extreme range for all the cities in Table 68 is from 92.83 acres in San Diego and 58.35 in Colorado Springs to 0.04 in Brockton and 0.03 in Jersey city.

Diagram 25 shows the relative proportion of acres of park area to each 1,000 of the population in the aggregate for certain groups of cities.

All the parks in Philadelphia, Boston, Cincinnati, Cleveland, Buffalo, Pittsburg, Washington, Jersey city, Louisville, Denver, and Allegheny have been improved, and practically all in St. Louis, while of the park area only 23.41 per cent in New York, 16.50 in Milwaukee, and 16.00 in Rochester have been improved. Of the cities between 50,000 and 100,000, 11 have all their park area improved, and the per cent declines from this to 6.15 in Grand Rapids and 1.96 in Trenton.

Diagram 26 shows the proportion of the total park area in these 212 cities which was improved and the proportion by groupings of population.

Of the cities discussed above, but 98, with a total population of 10,788,123, reported the total cost of land in their parks; for these the total number of acres purchased was 21,640 and the total cost $60,052,756, or an average of $2,068.67 per acre and $5.92 per capita of the population.

Table 36 shows the distribution of these figures grouped by cities according to magnitude of population.

TABLE 36.

POPULATION GROUPS.	Number of cities.	Population.	Park area. (Acres.)	COST OF LAND IN PARKS.		
				Total.	Per acre.	Cost per capita.
Total	98	10,788,123	30,897	$63,915,617	$2,068.67	$5.92
10,000 to 14,999	27	331,402	1,636	278,473	170.22	0.84
15,000 to 24,999	17	340,224	1,400	442,470	316.05	1.30
25,000 to 49,999	18	663,504	1,425	612,616	429.91	0.92
50,000 to 99,999	16	1,113,146	4,796	2,529,302	527.38	2.27
100,000 and over	20	8,339,847	21,640	60,052,756	2,775.08	7.20

DIAGRAM 25.—DISTRIBUTION OF POPULATION IN RELATION TO TOTAL PARK AREA (212 CITIES).

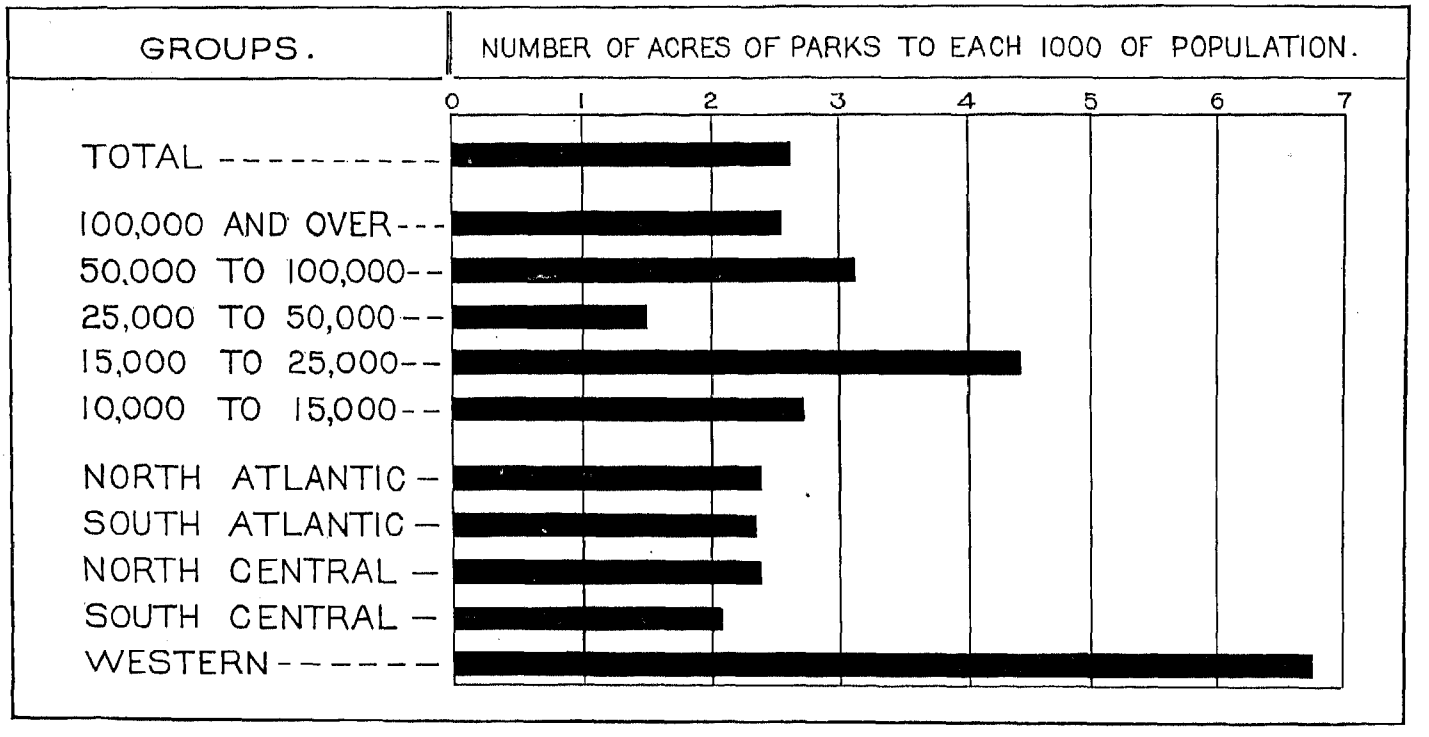
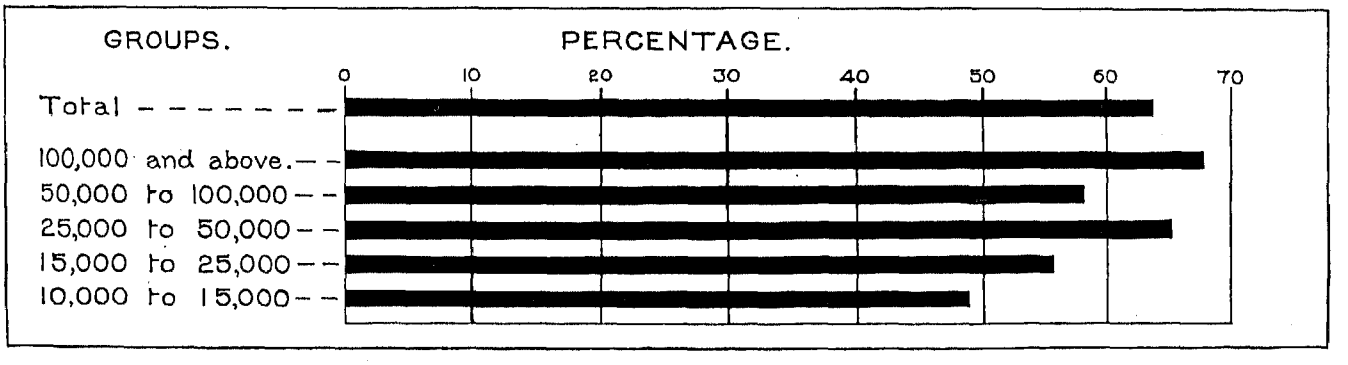


DIAGRAM 26.—PERCENTAGE OF IMPROVED PARK AREA (212 CITIES).



From this table it will be seen that reports were made for 20 of the 28 cities which had a population on June 1, 1890, of 100,000 and upward, and that the cost per acre in these cities was $2,775.08, while but a small proportion of the remainder of the cities made reports as to cost, which averaged, for those reporting, from $170.22 per acre in the smaller cities to $527.38 in the cities of from 50,000 to 100,000; therefore the general average shown in the table is probably much too large in indicating the average cost. Taking each group of cities according to size, the cost of land increases as the cities grow larger.

While but 98 cities reported the cost of land in parks, 157, with a total population of 11,159,777 and 30,593 acres of parks, of which 21,899 acres were improved, reported the total cost of improvements amounting to $33,091,658, which gives $1,081.67 per acre of total area, $1,511.10 for each acre improved, and $2.97 per capita of the population.

In Table 37 these figures are subdivided among the cities grouped according to size of population.

TABLE 37.

POPULATION GROUPS.	Number of cities.	Population.	PARK AREA.		COST OF IMPROVEMENTS.			
			Total. (Acres.)	Improved. (Acres.)	Total.	Per acre of— Total area.	Per acre of— Improved area.	Per capita.
Total	157	11,159,777	30,593	21,899	$33,091,658	$1,081.67	$1,511.10	$2.97
10,000 to 14,999	54	656,901	1,856	931	332,520	179.16	357.16	0.51
15,000 to 24,999	29	564,318	3,260	1,600	283,380	86.93	177.11	0.50
25,000 to 49,999	33	1,180,237	1,904	1,396	699,594	367.43	501.14	0.59
50,000 to 99,999	19	1,285,093	4,919	2,803	1,233,571	250.78	440.09	0.96
100,000 and over	22	7,473,228	18,654	15,169	30,542,593	1,637.32	2,013.40	4.09

In the improvement of parks, the largest cities have spent the most money per acre. It is also seen that the cost of improvements was 50 per cent of the cost of the land, as shown in Table 36. Comparing these two tables for the groups of population, it is shown that for the cities of from 10,000 to 15,000 the cost of improvements was 60.70 per cent of the cost of the land; in the cities of from 15,000 to 25,000, it was 38.46 per cent; in those from 25,000 to 50,000, 64.13 per cent; in those ranging from 50,000 to 100,000, it was 42.29 per cent, and for the cities of 100,000 population and upward, it was 56.81 per cent of the cost of the land. It should be borne in mind that Table 36 only includes reports of land purchased, taking no account of lands donated for park purposes; also that the average cost of improvements per acre for the total is affected by the same conditions that were shown in Table 36 as affecting the cost of land.

The cost of improvements per acre to each head of population ranges from a few cents in the smaller cities to $7.24 in Chicago, $7.96 in Baltimore, and $14.87 in Washington. It will be noted that in Washington the annual cost of maintenance is included in the cost of improvement.

Of the 28 cities having a population of 100,000 and over, 16 made reports showing the total area in parks, the improved area, cost of land, and cost of improvements.

Table 38 shows these areas and the cost of land and improvements per acre and per capita of the population.

TABLE 38.

CITIES.	Population.	PARK AREA. (ACRES.)		COST OF LAND.		COST OF IMPROVEMENTS.		
		Total.	Improved.	Per acre.	Per capita.	Per capita.	Per acre of total area.	Per acre of improved area.
Chicago	1,099,850	2,006	799	$2,673.70	$4.88	$7.24	$3,967.70	$9,961.46
Philadelphia	1,046,964	3,025	3,025	5,786.29	16.72	1.74	602.87	602.87
Brooklyn	806,343	685	568	5,916.86	5.03	6.72	7,912.36	9,542.19
St. Louis	451,770	2,130	2,127	615.00	2.90	3.32	704.23	705.22
Boston	448,477	1,130	1,130	2,504.28	6.31	6.90	2,772.57	2,772.57
Cincinnati	296,908	539	539	2,650.05	4.83	3.55	1,955.86	1,955.86
Cleveland	261,353	93	93	2,849.46	1.01	1.15	3,225.81	3,225.81
Buffalo	255,664	638	638	705.33	1.76	5.94	2,382.20	2,382.20
New Orleans	242,039	459	432	2,178.05	4.13	0.62	326.80	347.22
Pittsburg	238,617	610	610	1,023.41	2.62	0.32	125.58	125.58
Detroit	205,876	763	380	322.41	1.19	2.31	624.24	1,253.41
Minneapolis	164,738	1,489	1,361	421.76	3.81	1.67	184.35	201.69
Rochester	133,896	475	76	421.05	1.49	0.52	146.32	914.47
St. Paul	133,156	354	268	1,201.48	3.43	0.49	183.62	242.54
Providence	132,146	127	77	126.28	0.12	1.17	1,214.61	2,003.32
Denver	106,713	441	441	217.69	0.90	0.23	56.69	56.69

The average cost per capita for these 16 cities was, for the land, $6.05, and for the improvements, $3.98. The cost of land per capita in Philadelphia was $16.72, while the improvements cost but $1.74 per capita. Leaving Philadelphia out, the average for the remaining 15 cities was $3.81 for land and $4.46 for improvements. The average cost per acre of total area was, for the land, $2,438, and for the improvements, $1,604. Leaving Philadelphia out, it was $1,589 and $1,858, respectively. The average cost of improvements per acre for each acre improved was $1,910, or excluding Philadelphia, $2,325.

CEMETERIES.

Table 69 shows the number and area of all cemeteries used by each city, with the number and area of those inside the corporate limits, those discontinued being shown separately, with total number of interments in all cemeteries, and average number of interments made annually, divided as made outside and made inside the city limits. Percentages as to area and interments are also given. While the table shows the number of all cemeteries used, it should be kept in mind that places of interment outside the corporate limits are often used by a population much larger than that of the city to which the cemeteries are charged. The following remarks are limited to those cemeteries located inside the cities and still used as burial places and to the intramural interments.

Of the 345 cities, 302 made returns, while 43 failed to report. Of those reporting, 34 had no cemeteries inside the city limits and 9 failed to state the area. The remaining 259 cities, with an aggregate population of 15,531,934, reported a total area within their cemeteries of 41,889 acres, of which 22,474 acres, or 54 per cent, were inside the city limits, which shows that there were 1.45 acres of cemetery area inside to each 1,000 of the population. Table 39 shows these conditions for the cities, grouped according to size of population and by geographical divisions.

TABLE 39.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	Total area of all cemeteries. (Acres.)	AREA INSIDE CITY LIMITS.		
				Total. (Acres.)	Percentage of total area.	To each 1,000 of population. (Acres.)
Total	259	15,531,934	41,889	22,474	54	1.45
10,000 to 14,999	86	1,043,198	5,298	3,523	66	3.38
15,000 to 24,999	69	1,373,409	7,116	4,017	56	2.92
25,000 to 49,999	50	1,679,851	6,356	2,986	47	1.78
50,000 to 99,999	26	1,764,930	5,896	2,539	43	1.44
100,000 and over	28	9,670,546	17,223	9,409	55	0.97
Total	259	15,531,934	41,889	22,474	54	1.45
North Atlantic	112	7,937,923	19,330	12,394	64	1.56
South Atlantic	21	1,194,223	3,552	1,324	37	1.11
North Central	95	4,943,478	14,337	6,502	45	1.32
South Central	21	870,071	3,124	1,437	46	1.65
Western	10	586,239	1,546	817	53	1.39

From this it will be seen that the area inside the city limits to each 1,000 of the population gradually decreases as the cities grow larger, ranging from 3.38 acres in the smaller cities to 0.97 of an acre in the cities having a population of 100,000 and over. In the geographical divisions the range is from 1.11 in the South Atlantic to 1.65 in the South Central.

But 168 cities made reports as to the total number of interments. These cities had an aggregate population of 11,216,057 and 16,693 acres of cemeteries inside the city limits, in which there had been made 3,729,164 interments. This shows that there were 1.49 acres of cemetery area to each 1,000 of the population, and on an average 223.40 interments to each acre, and 332.48 to each 1,000 of the living population.

Table 40 shows the division of these figures into groups by geographical divisions and according to size of population.

Diagram 27 shows, by the population groups, the area to each 1,000 of the population and the number of interments to each acre.

DIAGRAM 27.—CEMETERIES INSIDE CITY LIMITS (168 CITIES).

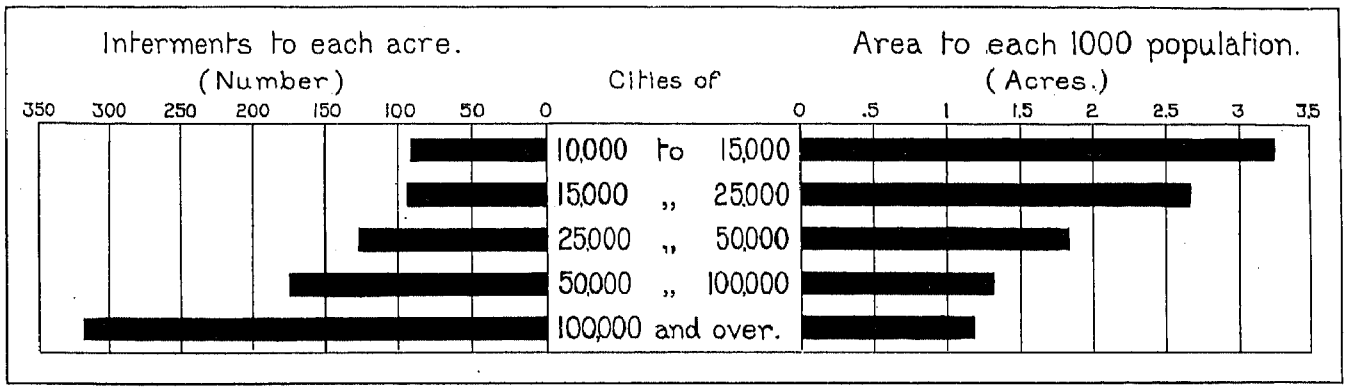


TABLE 40.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	Area. (Acres.)	INTERMENTS.		
				Total.	To each acre.	To each 1,000 of population.
Total	168	11,216,057	16,693	3,729,164	223.40	332.48
10,000 to 14,999	51	621,289	2,027	186,842	92.18	300.73
15,000 to 24,999	40	790,063	2,110	200,312	94.93	253.54
25,000 to 49,999	33	1,098,187	1,991	250,079	125.60	227.72
50,000 to 99,999	21	1,435,140	1,891	329,669	174.34	229.71
100,000 and over	23	7,271,378	8,674	2,762,262	318.45	379.88
Total	168	11,216,057	16,693	3,729,164	223.40	332.48
North Atlantic	67	5,349,166	8,680	2,345,915	270.27	438.56
South Atlantic	11	1,006,842	863	288,863	334.72	286.96
North Central	70	3,865,087	5,515	777,079	140.90	201.05
South Central	11	419,255	828	133,126	160.78	317.53
Western	9	575,707	807	184,181	228.23	319.92

This table and the diagram show that the density of interments increased with the size of the cities and that the area per 1,000 of the population as regularly decreases. The density ranges from 92.18 per acre in the smaller cities to 318.45 in those having a population of 100,000 and over, in which cities the cemetery area to each 1,000 of the population was but 1.19 acres, while the cities under 15,000 population had 3.26 acres per 1,000.

Table 41 shows for each city having a population of 50,000 and upward that made returns the relation of the cemetery area inside the city limits to the population, to the interments, to the total cemetery area and to the city area, and the average annual number of interments per acre made in intramural cemeteries.

TABLE 41.

CITIES.	CEMETERY AREA INSIDE CITY LIMITS.				Average annual number of interments made in intramural cemeteries per acre.
	To each 1,000 population. (Acres.)	To each 1,000 interments. (Acres.)	Percentage of, of all cemetery area.	Percentage of, of total city area.	
New York	0.28	.....	18.11	1.03	4.28
Chicago	0.81	6.66	58.60	0.87	7.85
Philadelphia	1.15	2.35	94.07	1.46	15.64
Brooklyn	0.94	1.21	61.10	4.19	12.26
St. Louis	1.60	4.93	83.26	1.84	8.81
Boston	1.37	2.36	100.00	2.53	16.28
Baltimore	0.95	2.43	52.35	2.18	13.31
San Francisco	1.12	2.23	100.00	1.24	17.91
Cincinnati	0.35	.....	12.34	0.69	.....
Cleveland	0.58	2.02	59.38	0.95	22.87
Buffalo	1.30	10.01	62.71	1.33	4.10
Pittsburg	2.66	7.12	81.07	3.65	5.38
Detroit	0.75	2.10	22.93	1.18	17.74
Washington	0.21	2.73	11.14	0.64	24.83
Newark (N.J.)	1.09	2.87	100.00	1.74	13.48
Minneapolis	2.03	13.35	100.00	1.01	5.22
Jersey city	0.43	0.47	100.00	0.84	43.43
Louisville	2.00	4.91	87.30	4.08	7.15
Omaha	0.18	.....	5.38	0.16	6.44
Rochester	1.59	4.55	43.92	2.13	6.20
St. Paul	1.23	7.08	76.64	0.50	9.49
Kansas city (Mo.)	1.19	11.81	33.05	0.76	8.47
Providence	3.01	10.68	100.00	4.29	2.82
Denver	1.03	27.02	35.48	1.04	2.27
Indianapolis	0.19	5.71	3.75	0.29	17.50
Alleghany	3.15	7.70	90.71	0.51	2.77
Albany	0.55	15.29	12.15	0.82	6.73
Syracuse	3.17	27.50	84.80	2.81	2.22
Toledo	0.69	2.04	19.11	0.44	14.89
Richmond (Va.)	1.11	6.50	60.81	2.30	4.01
New Haven	1.75	4.65	70.30	2.94	9.70
Paterson	1.29	10.27	40.56	1.69	4.86
Scranton	0.57	3.85	43.43	0.50	16.40
Fall River	1.32	9.21	100.00	0.45	10.85
Cambridge	1.17	2.74	100.00	2.20	11.52
Atlanta	1.30	3.27	12.32	1.50	9.12
Wilmington (Del.)	0.50	1.45	55.36	0.68	0.97
Dayton	1.73	5.88	54.08	1.82	4.71
Grand Rapids	0.71	20.48	22.16	0.75	6.09
Reading	3.05	5.92	100.00	4.32	5.03
Camden	3.17	22.35	100.00	6.66	1.96
Trenton	0.73	6.00	21.00	1.66	7.14
Charleston	0.20	2.53	10.96	0.65	12.81
Hartford	1.75	3.05	21.53	0.99	6.98
St. Joseph	0.65	3.40	40.96	0.74	9.56
Los Angeles	2.32	11.43	60.94	0.63	5.51

Diagram 28 shows for each city of 50,000 inhabitants and upward the average annual number of interments per acre in intramural cemeteries and the total number of interments per acre in such cemeteries.

PUBLIC BUILDINGS.

Table 70 shows for the individual cities the total number of the public buildings owned wholly by the city or in common with the county in which the city is located and the total cost to the city for construction (exclusive of the ground), the number used for each of specified purposes, with the cost of the city halls separately shown; also the annual rental, if any, paid by the city for buildings rented for municipal purposes.

Of the 345 cities treated, 290, with an aggregate population of 14,385,491, made reports showing that there were 7,404 such buildings owned by these cities, costing $207,180,344 in the aggregate to construct, which amounted to $14.40 per capita of their population.

Table 42 shows the distribution of these figures for the cities, grouped according to size of population and by geographical divisions.

TABLE 42.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	PUBLIC BUILDINGS.		
			Total number.	Cost to cities for construction.	Cost per capita.
Total	290	14,385,491	7,404	$207,180,344	$14.40
10,000 to 14,999	106	1,283,831	1,155	12,998,555	10.12
15,000 to 24,999	74	1,461,127	1,171	17,614,909	12.06
25,000 to 49,999	58	2,013,631	1,326	24,145,065	11.99
50,000 to 99,999	27	1,809,441	994	22,726,908	12.56
100,000 and over	25	7,818,061	2,758	129,694,907	16.59
Total	290	14,385,491	7,404	207,180,344	14.40
North Atlantic	115	6,494,652	3,538	101,804,417	15.68
South Atlantic	24	1,253,158	519	16,338,495	13.04
North Central	197	4,884,363	2,356	62,723,012	12.84
South Central	23	932,610	573	9,012,772	9.66
Western	21	820,699	418	17,301,648	21.08

From this it will be seen that the cost per capita increases with the size of the cities, the range being from $10.12 per capita in the cities having a population of from 10,000 to 15,000 to $16.59 per capita in the cities of the largest population, the average being $14.40 per capita. In the geographical divisions the range is from $9.66 in the South Central to $21.08 in the Western.

Diagram 29, for the various groups, illustrates the cost per capita of the public buildings.

There were 221 cities, with a total population of 12,557,239, which owned their city halls; Brooklyn, Kansas city (Kan.), Philadelphia, and San Francisco each owning two, making a total of 225 such buildings, costing the cities for construction $43,748,960, or $3.48 per capita of the population. The figures for these cities are summarized by groups of population and by geographical divisions, as shown in Table 43.

TABLE 43.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	CITY HALLS.		
			Number.	Cost to cities for construction.	Cost per capita.
Total	221	12,557,239	225	$43,748,960	$3.48
10,000 to 14,999	75	908,710	75	2,118,833	2.33
15,000 to 24,999	51	1,004,325	51	2,458,430	2.45
25,000 to 49,999	48	1,688,278	49	3,857,443	2.28
50,000 to 99,999	24	1,602,196	24	2,483,838	1.55
100,000 and over	23	7,353,730	26	32,830,416	4.46
Total	221	12,557,239	225	43,748,960	3.48
North Atlantic	92	6,004,042	94	24,119,086	4.02
South Atlantic	17	904,517	17	3,789,213	4.19
North Central	75	3,981,560	76	7,939,328	1.99
South Central	20	898,553	20	1,653,333	1.84
Western	17	768,567	18	6,248,000	8.13

BUREAU OF CENSUS LIBRARY

DIAGRAM 28.—INTERMENTS IN INTRAMURAL CEMETERIES.

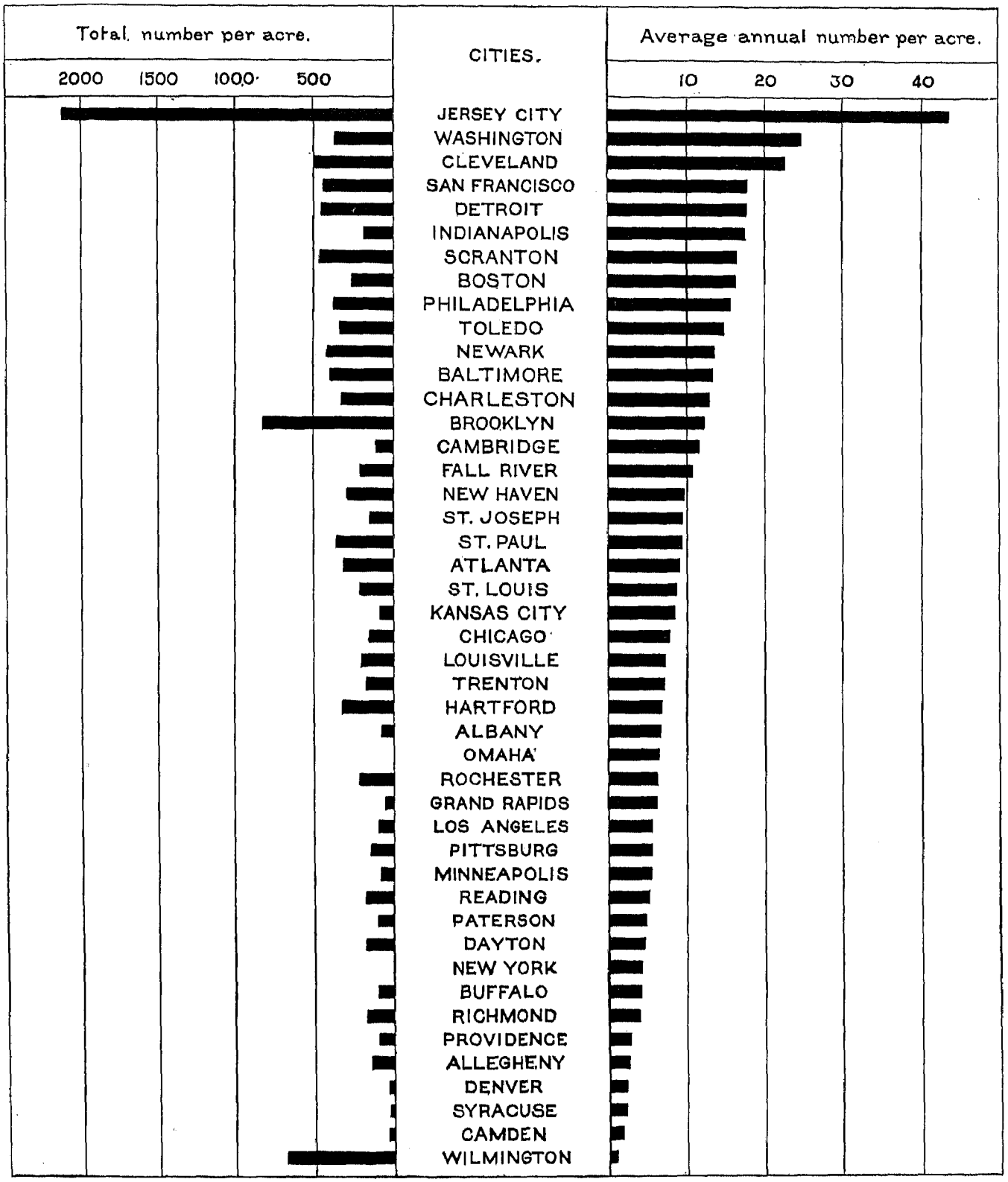
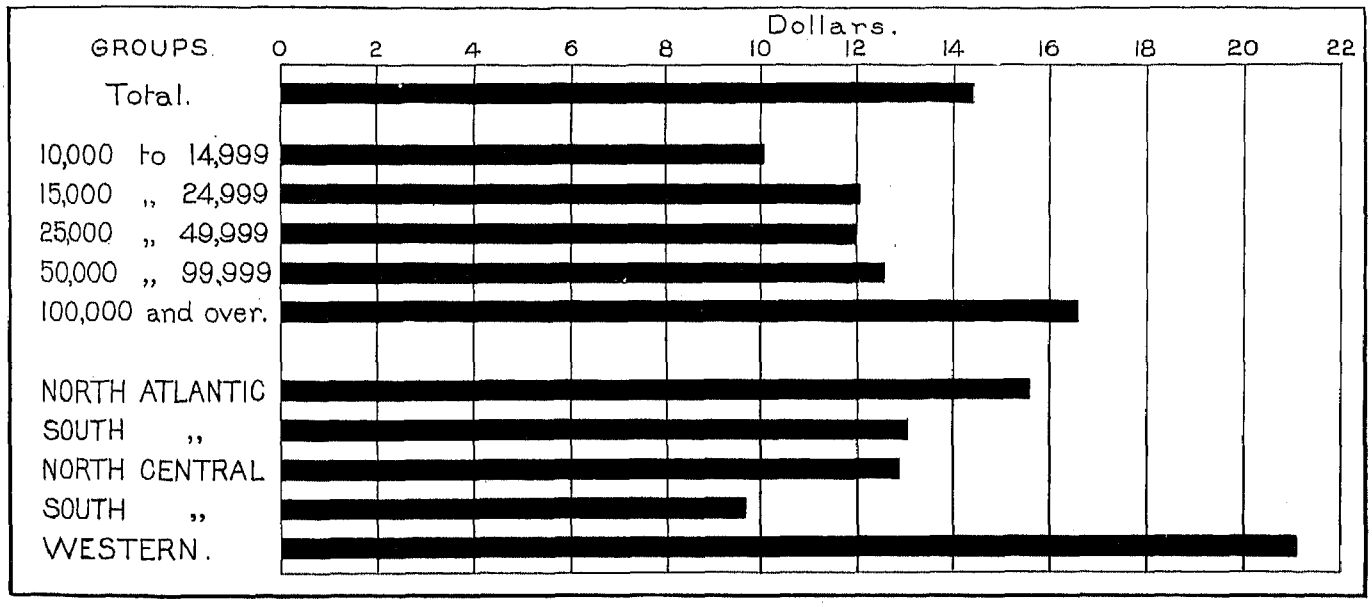


DIAGRAM 29.—COST OF PUBLIC BUILDINGS PER CAPITA (290 CITIES).



It will be seen that the cost per capita was quite uniform for the cities up to 50,000 population, ranging from $2.28 to $2.45, while for the cities of from 50,000 to 99,999 the cost falls to $1.55 and rises to $4.46 per capita in the cities of 100,000 and over. It will be seen by Table 70 that Philadelphia reported two city halls, costing $14,000,000. If this amount and the population of Philadelphia be deducted from the larger group, the cost per capita would be but $2.99.

Of the cities having a population of 100,000 and over, New York, Cleveland, Washington, Milwaukee, and Kansas city (Mo.) made no reports as to the cost of their city halls.

Seventeen of the cities in the Western division paid on the average $8.13 per capita for city halls, while the North and South Central each paid a little less than $2, and the North and South Atlantic each a little over $4 per capita.

There were 47 cities, having a population of 50,000 and over, which reported the cost; these cities are each shown in Table 44, arranged in the order of their magnitude, giving population, cost of city halls, and cost per capita.

TABLE 44.

CITIES.	Population.	COST OF CITY HALLS.		CITIES.	Population.	COST OF CITY HALLS.	
		Total.	Per capita.			Total.	Per capita.
Chicago	1,099,850	$1,716,390	$1.56	Syracuse	88,143	$300,000	$3.40
Philadelphia	1,046,964	14,000,000	13.37	Worcester	84,655	24,000	0.28
Brooklyn	806,343	715,000	0.89	Richmond (Va.)	81,388	28,000	0.34
St. Louis	451,770	200,000	0.44	New Haven	81,298	100,000	1.23
Boston	448,477	600,000	1.34	Paterson	78,347	100,000	1.28
Baltimore	434,439	3,000,000	6.91	Lowell	77,696	85,000	1.09
San Francisco	298,997	4,900,000	16.39	Nashville	76,168	100,000	1.31
Cincinnati	296,908	1,400,000	4.72	Scranton	75,215	126,448	1.68
Buffalo	255,664	725,000	2.84	Fall River	74,398	250,000	3.36
New Orleans	242,039	300,000	1.24	Cambridge	70,028	16,800	0.24
Pittsburg	238,617	500,570	2.10	Wilmington (Del.)	61,431	20,000	0.33
Detroit	205,876	865,000	4.20	Dayton	61,220	88,000	1.44
Newark (N. J.)	181,830	160,000	0.88	Reading	58,661	30,000	0.51
Minneapolis	164,738	56,000	0.34	Camden	58,313	150,000	2.57
Jersey city	163,003	40,000	0.25	Trenton	57,458	75,000	1.31
Louisville	161,129	500,000	3.10	Lynn	55,727	312,000	5.60
Omaha	140,452	350,000	2.49	Lincoln	55,154	8,000	0.15
Rochester	133,896	337,000	2.52	Charleston	54,955	100,000	1.82
St. Paul	133,156	1,014,000	7.62	Hartford	53,230	52,000	0.98
Providence	132,146	1,066,988	8.07	St. Joseph	52,324	75,000	1.43
Denver	106,713	180,000	1.69	Evansville	50,756	41,000	0.81
Indianapolis	105,436	141,000	1.34	Los Angeles	50,395	220,000	4.37
Allegheny	105,287	63,459	0.60	Memphis	50,313	40,000	0.80
Albany	94,923	142,500	1.50				

PLACES OF AMUSEMENT, SALOONS, PUBLIC VEHICLES, AND LICENSED DOGS.

Table 71 shows for individual cities the number of places of amusement, divided as theaters, halls, and beer gardens, with the seating capacity of each, the annual license paid for each class, and the seating capacity to each 1,000 of the population; the number of public vehicles for hire, with the annual license for each; the total number of drinking saloons, with the total yearly license paid by each grade, whether paid to the city, state, or county; the number of saloons to each 1,000 of the population; the number of dogs licensed annually, with the cost of each license, by sex, together with the average annual amount for 10 years received by the city for the above named licenses. While the licenses paid by saloons are the total licenses required of them for doing business, only that portion paid to the city is included in the revenue to the city from the licenses named.

PLACES OF AMUSEMENT.

For the places of amusement, 297 cities made returns and 48 failed to report. In the cities reporting, there were 2,625 places of amusement, of which 617 were theaters, 1,746 were halls, and 262 were beer gardens.

Table 45 shows these places of amusement distributed among the cities grouped with reference to the size of population and by geographical divisions.

TABLE 45.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	PLACES OF AMUSEMENT. (NUMBER.)				PERCENTAGE OF EACH OF TOTAL NUMBER.		
		Total.	Theaters.	Halls.	Beer gardens.	Theaters.	Halls.	Beer gardens.
Total	297	2,625	617	1,746	262	23.51	66.51	9.98
10,000 to 14,999	107	444	117	290	37	26.35	65.32	8.33
15,000 to 24,999	77	422	102	300	20	24.17	71.09	4.74
25,000 to 49,999	59	429	101	273	55	23.54	63.64	12.82
50,000 to 99,999	27	279	64	187	28	22.94	67.02	10.04
100,000 and over	27	1,051	233	696	122	22.17	66.22	11.61
Total	297	2,625	617	1,746	262	23.51	66.51	9.98
North Atlantic	116	903	237	571	95	26.25	63.23	10.52
South Atlantic	24	197	46	144	7	23.35	73.10	3.55
North Central	109	1,147	213	841	93	18.57	73.32	8.11
South Central	26	162	57	70	35	35.19	43.21	21.60
Western	22	216	64	120	32	29.63	55.56	14.81

There were 262 cities, with a population of 11,809,593, giving the total seating capacity of their several places of amusement. These cities had 473 theaters, with a total seating capacity of 50.98 per 1,000 of the population; 1,519 halls, with a seating capacity of 63.80 per 1,000 of the population, and 168 beer gardens, seating 19.53 per 1,000 of the population. The average total seating capacity for all was 134.31 per 1,000 of the population.

Table 46 shows in the aggregate the number of cities reported, number each of the several places of amusement, with their seating capacity per 1,000 of the total population of these cities, for the aggregate and for the population groups and geographical divisions. It should be borne in mind that this table does not show the true average seating capacity of these places of amusement; it simply shows the relation of their seating capacity to the total population.

TABLE 46.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	PLACES OF AMUSEMENT. (NUMBER.)			SEATING CAPACITY TO EACH 1,000 OF POPULATION.		
			Theaters.	Halls.	Beer gardens.	Theaters.	Halls.	Beer gardens.
Total	262	11,809,593	473	1,519	168	50.98	63.80	19.53
10,000 to 14,999	100	1,212,176	107	258	30	81.50	120.09	14.06
15,000 to 24,999	71	1,391,707	88	287	14	71.64	104.83	12.72
25,000 to 49,999	48	1,605,580	75	174	32	54.32	59.32	13.51
50,000 to 99,999	21	1,406,742	50	141	7	47.06	57.13	2.13
100,000 and over	22	6,193,388	153	659	85	40.39	46.24	27.64
Total	262	11,809,593	473	1,519	168	50.98	63.80	19.53
North Atlantic	103	4,676,846	148	491	46	40.82	52.42	5.88
South Atlantic	22	767,406	36	118	7	51.67	70.30	12.37
North Central	96	4,715,745	192	750	66	51.21	68.18	32.49
South Central	24	929,986	45	56	26	57.55	52.85	24.38
Western	17	719,610	52	104	23	106.17	116.31	23.42

From this table it will be seen that the relative seating capacity gradually declines as the cities grow larger, the smaller cities showing 81.50 per 1,000 of the population for theaters and 120.09 for halls, while the largest cities show but 40.39 and 46.24, respectively. The range, as shown for the individual cities in Table 71, runs, for theaters, from 10 each in Cincinnati and Jersey city and 23 in Chicago to 394 in Dallas, 333 in Moline, and 238 in Bradford. The halls go up from 4 in New Orleans, 9 in Newburg, and 10 each in Allegheny, Chattanooga, and Cincinnati to 741 in Woburn, 693 in Stockton, and 602 in Spokane. The seating capacity for beer gardens to each 1,000 of the population also differs largely, ranging from 8 in St. Paul, 11 in Manchester, and 17 each in Cincinnati and Louisville to 651 in Belleville, 514 in Milwaukee, 412 in Austin, and 383 in Atlantic city. The western cities show the greatest seating capacity in the geographical groups.

Diagram 30 shows the seating capacity per 1,000 of the population for theaters and halls, by the groups shown in Table 46.

DIAGRAM 30.—SEATING CAPACITY OF THEATERS AND HALLS PER 1,000 OF THE POPULATION (262 CITIES).

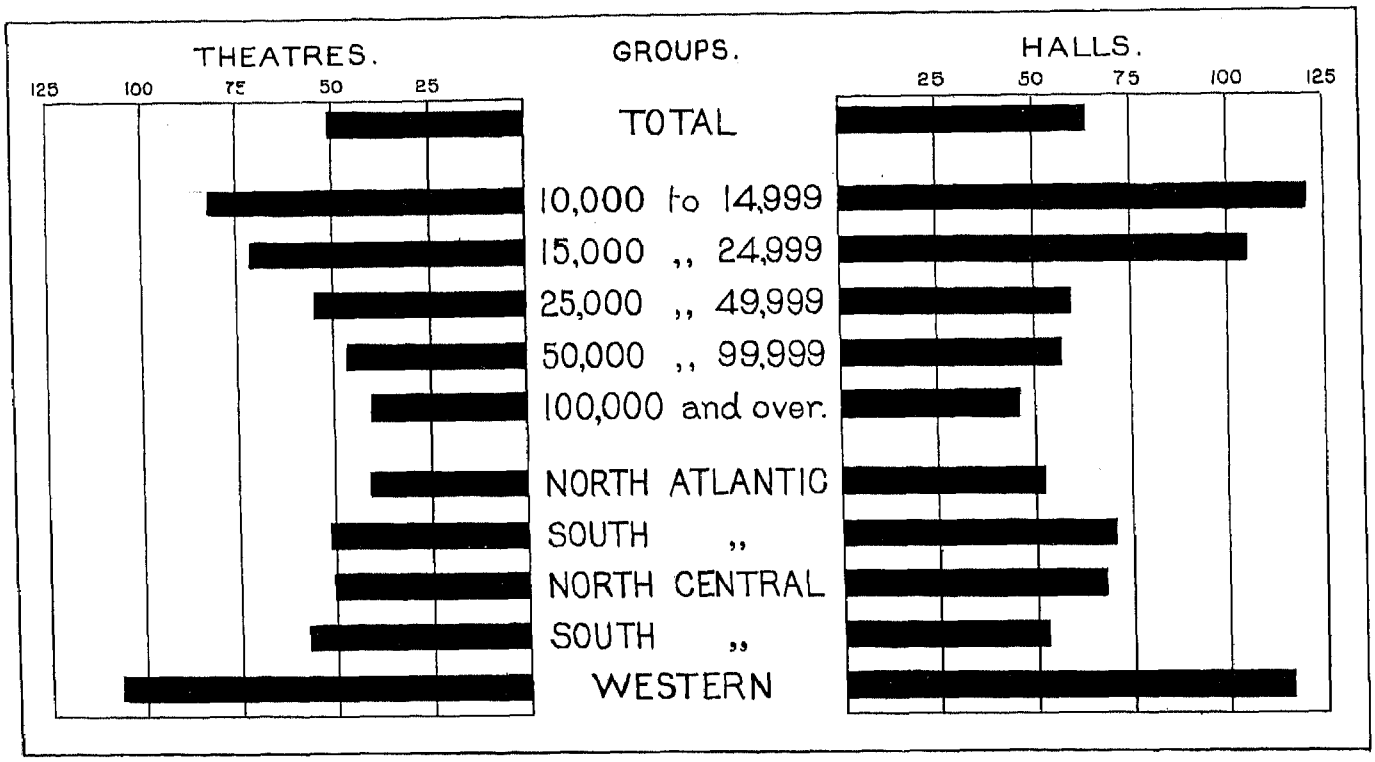


Table 47 shows for each of the cities of 50,000 inhabitants and upward the number each of theaters and halls, and the seating capacity of each per 1,000 of the population.

TABLE 47.

CITIES.	TOTAL NUMBER.		SEATING CAPACITY PER 1,000 OF POPULATION.			CITIES.	TOTAL NUMBER.		SEATING CAPACITY PER 1,000 OF POPULATION.		
	Theaters.	Halls.	Total.	Theaters.	Halls.		Theaters.	Halls.	Total.	Theaters.	Halls.
New York	37	(a)	(a)	41	(a)	Albany	3	1	79	53	26
Chicago	15	250	68	23	45	Syracuse	2	.....	34	34	.....
Philadelphia	22	4	42	35	7	Worcester	1	19	.....	.....	.....
Brooklyn	17	(a)	(a)	26	(a)	Toledo	3	31	48	48	.....
St. Louis	12	.....	49	49	.....	Richmond (Va.)	5	20	178	55	123
Boston	13	(a)	40	40	.....	New Haven	3	.....	62	62	.....
Baltimore	8	6	.....	.....	.....	Paterson	2	3	32	32	.....
San Francisco	14	6	187	117	70	Lowell	4	5	105	45	60
Cincinnati	5	4	20	10	10	Nashville	5	7	237	79	158
Cleveland	8	125	172	38	134	Scranton	2	10	103	37	66
Buffalo	8	67	149	49	100	Fall River	1	4	62	24	38
New Orleans	6	1	29	25	4	Cambridge	1	(a)	18	18	.....
Pittsburg	5	12	67	37	30	Atlanta	1	7	108	23	85
Detroit	4	24	137	37	100	Wilmington (Del.)	2	4	88	46	42
Milwaukee	6	15	137	39	98	Dayton	2	2	90	65	25
Washington	5	2	49	38	11	Grand Rapids	3	1	.....	.....	.....
Newark (N. J.)	3	4	58	35	23	Reading	2	4	103	60	43
Minneapolis	5	14	112	43	69	Camden	.....	10	129	.....	129
Jersey city	1	20	148	10	138	Trenton	3	6	59	59	.....
Louisville	6	2	90	64	26	Lynn	3	8	52	52	.....
Rochester	4	.....	30	30	.....	Lincoln	2	5	47	47	.....
St. Paul	4	20	116	41	75	Charleston	2	19	128	55	73
Kansas city (Mo.)	10	11	145	103	42	Hartford	1	8	145	32	113
Providence	5	31	.....	.....	.....	St. Joseph	3	.....	52	52	.....
Denver	7	50	242	101	141	Evansville	3	6	158	69	89
Indianapolis	3	25	275	85	190	Los Angeles	2	6	219	60	159
Allegheny	.....	3	10	.....	10	Memphis	3	1	143	119	24

a No data.

San Francisco had 16 beer gardens, with a total seating capacity of 15,000, being a seating capacity of 50 for each 1,000 of population; Cincinnati had 6 beer gardens, with a seating capacity of 5,000, or 17 for each 1,000 of population; Cleveland had 5 beer gardens, with a seating capacity of 9,000, or 30 per each 1,000 of population; Milwaukee had 5 beer gardens, with a reported seating capacity of 105,000, or 514 per each 1,000 of population; Washington reported 3 beer gardens, seating 5,500, or 27 per each 1,000 of population; Jersey city reported 21 beer gardens, with a seating capacity of 18,000, or 110 per each 1,000 of population; Louisville reported 3 beer gardens, with a seating capacity of 2,700, or 17 per each 1,000 of population; St. Paul had 10 beer gardens, seating capacity 1,000, or 8 per each 1,000 of population; Indianapolis had 15 beer gardens, seating 10,000, being 95 per each 1,000 of population; Richmond had 3 beer gardens, seating capacity 2,000, or 25 per each 1,000 of population, and Evansville had 4 beer gardens, with a total seating capacity of 1,000, or 20 per each 1,000 of population.

SALOONS.

There were 297 cities which reported on their saloons, while 48 made no returns; 257, with a population of 15,316,167, had saloons, while 40, with a population of 862,729, reported "no saloons".

Of the cities which reported "no saloons", 23 are in the North Atlantic, 16 in the North Central, and 1 in the Western division. In the order of the population, 17 cities were between 10,000 and 14,999, 12 in the next largest group, 10 in the next, and 1 in the next. Cambridge, Mass., which adjoins Boston, is the largest city that reported "no saloons". These 257 cities had 61,346 saloons, or an average of 1 saloon to each 250 of the population.

Table 48 shows the distribution of these saloons in relation to the population by total of all and by groups.

TABLE 48.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	SALOONS.	
			Total.	To each 1,000 of population.
Total	257	15,316,167	61,346	4.01
10,000 to 14,999	90	1,089,579	3,796	3.48
15,000 to 24,999	65	1,262,927	4,929	3.90
25,000 to 49,999	50	1,748,174	6,793	3.89
50,000 to 99,999	25	1,657,979	5,848	3.53
100,000 and over	27	9,557,508	39,980	4.18
Total	257	15,316,167	61,346	4.01
North Atlantic	94	7,505,724	27,426	3.65
South Atlantic	24	1,263,781	4,535	3.59
North Central	92	4,703,137	20,126	4.28
South Central	26	991,129	3,762	3.80
Western	21	852,396	5,497	6.45

It will be noticed that on the average there are 4.01 saloons to each 1,000 of the population, and that they are quite equally distributed, both as to size of cities and as to geographical location; for the population groups the average is only exceeded by 0.17 of a saloon to each 1,000 of the population in the larger cities and 0.27 of a saloon in the North Central division. In the Western division, however, there are 6.45 saloons to each 1,000 of the population.

Diagram 31 illustrates the distribution of these saloons among the cities grouped by size of population and by geographical divisions.

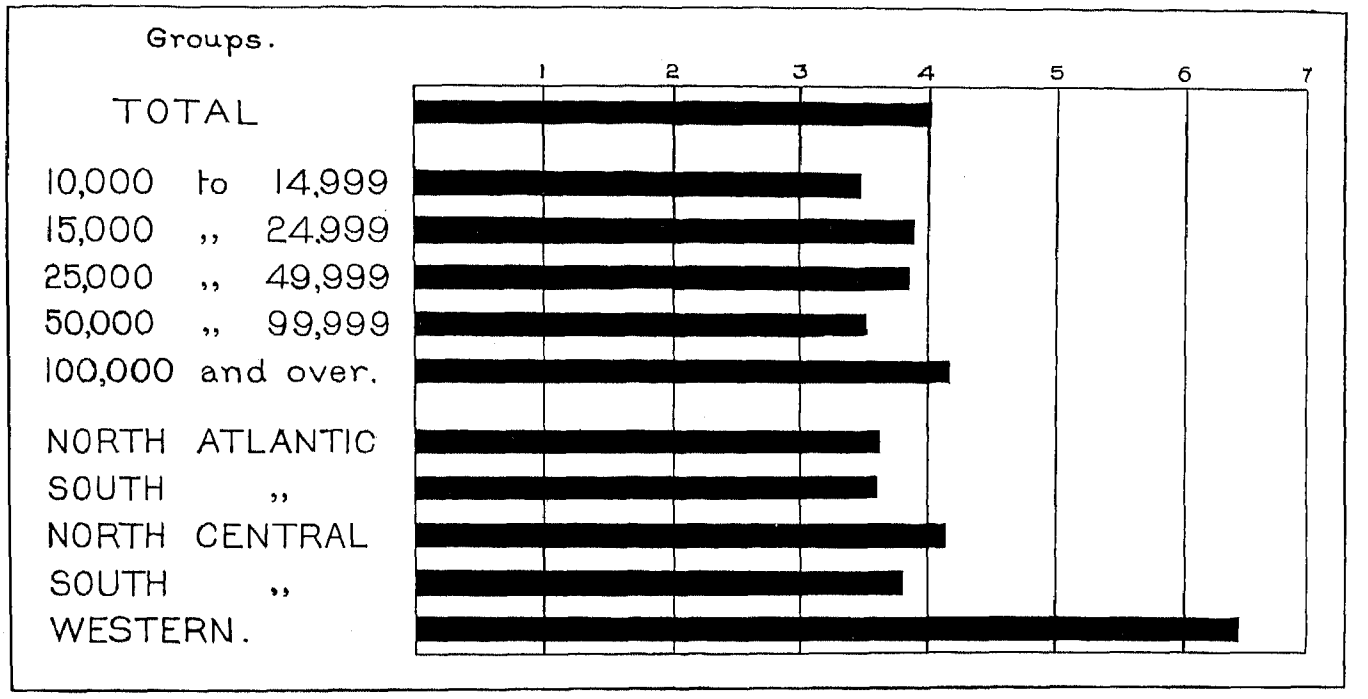
In the cities of 50,000 inhabitants and upward the number of saloons per 1,000 of population was as follows: Albany, 9.86; San Francisco, 9.70; Syracuse, 8.17; Buffalo, 7.81; Cincinnati, 7.04; Rochester, 6.85; Milwaukee, 6.44; Newark, 6.13; Paterson, 5.71; Dayton, 5.34; Jersey city, 5.21; Louisville, 5.09; New York, 5.00; Cleveland, 4.97; Detroit, 4.93; Charleston, 4.80; Chicago, 4.73; Trenton, 4.63; Brooklyn, 4.54; Denver, 4.48; New Haven, 4.45; Evansville, 4.43; Baltimore, 4.37; Los Angeles, 3.87; Richmond, 3.83; Memphis, 3.78; Kansas city, 3.74; Indianapolis, 3.56; St. Louis, 3.54; Washington, 3.41; Providence, 3.03; Hartford, 3.02; St. Paul, 2.89; Reading 2.88; Camden, 2.68; New Orleans, 2.58; Grand Rapids, 2.52; Nashville, 2.46; Scranton, 2.42; Wilmington, 2.39; St. Joseph, 2.29; Minneapolis, 1.51; Boston, 1.33; Atlanta, 1.22; Allegheny, 1.19; Philadelphia, 1.15; Lowell, 0.82; Lynn, 0.79; Fall River, 0.75; Lincoln, 0.67; Worcester, 0.58; Pittsburg, 0.41.

Table 49 shows for each of the cities of 50,000 inhabitants and upward the total sum required for the yearly license of saloons, distinguished as first, second, and third grade, the cities being arranged in the order of the magnitude of the population.

TABLE 49.

CITIES.	TOTAL YEARLY LICENSE FOR EACH SALOON.			CITIES.	TOTAL YEARLY LICENSE FOR EACH SALOON.		
	First grade.	Second grade.	Third grade.		First grade.	Second grade.	Third grade.
New York	$200	$50	$30	Albany	$60		
Chicago	500			Syracuse	100	$75	$100
Philadelphia	500			Worcester	1,200	500	
Brooklyn	100	75	50	Toledo	250		
St. Louis	550			Richmond (Va.)	175	100	
Boston	1,200	1,000	500	New Haven	400	200	
Baltimore	51			Paterson	250		
San Francisco	84			Lowell	1,200	1,100	1,000
Cincinnati	250			Nashville	72		
Cleveland	250			Scranton	500		
Buffalo	125			Fall River	1,000		
New Orleans	300 / 200	150 / 100	75 / 50	Atlanta	1,000		100
Pittsburg	500			Wilmington (Del.)	100		
Milwaukee	200			Dayton	250		
Washington	100			Grand Rapids	10		
Newark (N. J.)	250			Reading	500		
Minneapolis	1,000			Camden	250		
Jersey city	250			Trenton	250		
Louisville	250	125	75	Lynn	1,500	1,000	300
Rochester	100	50		Lincoln	1,000		
St. Paul	1,000			Charleston	200		
Kansas city (Mo.)	800			Hartford	400	200	
Providence	400			St. Joseph	1,000		
Denver	1,000	800	600	Evansville	75		
Indianapolis	350			Los Angeles	600		
Allegheny	500			Memphis	50		

DIAGRAM 31.—NUMBER OF SALOONS TO EACH 1,000 OF THE POPULATION (257 CITIES).



The highest amount required for the license of a saloon of the first class, namely, $1,500, was demanded of saloons in the city of Lynn. Next to this came Boston, Worcester, and Lowell, requiring $1,200. Minneapolis, St. Paul, Denver, Fall River, Atlanta, Lincoln, and St. Joseph each demand $1,000, the lowest demands being Grand Rapids, $10; Memphis, $50; Baltimore, $51; Albany, $60; Nashville, $72; Evansville, $75, and San Francisco, $84.

It should be borne in mind that the whole of the license paid does not in all cases go to the city, it frequently being divided between state, county, and city. For instance, the license of $51 for Baltimore (in 1889) was a state tax, the city receiving no share. In Charleston, S. C., one-half of the license of $200 went to the county and the other half to the city. In Hartford, Conn., the city received 5 per cent and the town 95 per cent. In Kansas city, Mo., the state and county combined had $550 and the city $250. It is possible that some of the cities shown in Table 71 reported only such part of the license required as was paid to the city.

PUBLIC VEHICLES.

The following are the average annual amounts reported by the cities of 50,000 inhabitants and upward as received from licenses granted to public passenger vehicles, exclusive of herdics, omnibuses, stages, etc., running over advertised routes, saloons, and licensed dogs, the cities being arranged in the order of the magnitude of the amounts: Chicago, $2,600,000; New York, $1,524,080; St. Louis, $887,000; Boston, $650,000; Philadelphia, $531,692; Cincinnati, $527,400; Denver, $400,000; St. Paul, $399,750; Detroit, $351,950; Cleveland, $336,400; Brooklyn, $326,855; Newark, $296,319; Milwaukee, $267,031; Minneapolis, $257,464; Buffalo, $250,495; San Francisco, $225,000; Jersey city, $217,750; Providence, $130,000; Kansas city, $127,500; Paterson, $116,720; Indianapolis, $100,000; Washington, $92,526; Louisville, $90,109; Trenton, $70,000; Atlanta, $67,300; Lowell, $63,325; St. Joseph, $60,000; Albany, $55,000; Rochester, $46,140; Fall River, $44,970; New Orleans, $42,116; Lincoln, $40,800; Camden, $38,000; Reading, $35,700; Scranton, $32,582; Charleston, $27,590; Evansville, $22,661; New Haven, $18,869; Nashville, $14,500; Memphis, $12,000; Allegheny, $11,906; Baltimore, $3,500; Grand Rapids, $2,500; Wilmington, $2,150.

Table 50 shows for each of the cities of 50,000 inhabitants and upward from which the data was supplied the number of public passenger vehicles, the number per 1,000 of population, and the sum required for the yearly license for each vehicle.

TABLE 50.

CITIES.	Population.	PUBLIC VEHICLES. (NUMBER.)		Annual licenses for passenger vehicles.
		Total.	Per 1,000 of population.	
New York	1,515,301	1,500	0.99	Hacks, $5.00; renewal, $2.50; cab, $3.00; renewal, $1.50.
Chicago	1,099,850	1,200	1.09	Hacks, $5.00; coupes and cabs, $2.50.
Brooklyn	806,343	86	0.11	Hacks, $3.00; cabs, $1.50.
St. Louis	451,770	(a)	.....	Hacks, $5.00; cabs, $3.00.
Boston	448,477	(a)	.....	Hackney carriages, $1.00.
Baltimore	434,439	350	0.81	Two-horse vehicles, $5.50; renewal, $5.00; 1-horse, $3.50; renewal, $3.00.
San Francisco	298,997	442	1.48	Hacks, $5.00; coupes, $3.00; coaches, $10.00.
Cleveland	261,353	850	.....	Carriages, $5.00.
Buffalo	255,664	94	0.37	Five dollars each.
New Orleans	242,039	132	0.55	Four dollars each.
Milwaukee	204,468	222	1.09	Hacks, $5.00; cabs, $3.00.
Washington	202,078	480	2.36	One-horse, $6.00; 2-horse, $10.00.
Newark (N. J.)	181,830	(a)	.....	Five dollars each.
Minneapolis	164,738	100	0.61	Two-horse, $10.00; 1-horse, $5.00.
Louisville	161,129	170	1.06	Five dollars each.
St. Paul	133,156	100	0.75	Hacks, $10.00; cabs, $5.00.
Kansas city (Mo.)	132,716	110	0.83	Fifteen dollars.
Providence	132,146	150	1.14	One dollar each.
Denver	106,713	850	7.97	Twenty dollars.
Indianapolis	105,436	225	2.13	Hacks, $12.00.
Allegheny	105,287	(a)	.....	Ten dollars each.
Albany	94,923	34	0.36	One-horse, $3.00; 2 or more horses, $5.00.
Worcester	84,655	113	1.33	One dollar each.
Richmond (Va.)	81,388	90	1.11	Carriages, $15.00; buggies, $7.50.
New Haven	81,298	239	2.94	Vehicle and driver, $1.50.
Paterson	78,347	44	0.56	Five dollars each.
Lowell	77,696	25	0.32	One dollar each.
Nashville	76,168	71	0.93	Carriages, $24.00; gurneys, $12.00.
Fall River	74,398	82	1.10	One dollar each.
Atlanta	65,533	40	0.61	Two-horse hacks, $25.00; 1-horse hack, $15.00.
Grand Rapids	60,278	60	1.00	Two dollars and fifty cents each.
Lynn	55,727	10	0.18	One dollar each.
Lincoln	55,154	250	4.53	Ten dollars each.
Charleston	54,955	37	0.67	Two-horse, $6.40; single, $5.00.
Hartford	53,230	106	1.99	No license; 25 cents clerk fee.
St. Joseph	52,324	50	0.96	Hacks and carriages, 2-horse, $15.00; 1-horse, $10.00.
Los Angeles	50,395	90	1.79	Two dollars per month.
Memphis	b50,313	47	0.93	Hacks, $10.00; coupes, $5.00.

a No data. b Not including a population of 14,182 for territory recently annexed, but which is not yet formally under control of the city.

LICENSED DOGS.

Table 51 shows for each of the cities of 50,000 population and upward which made reports the average annual number of licensed dogs for 10 years and the amount of license required for each, by sex.

TABLE 51.

CITIES.	Average annual number of dogs licensed. (For 10 years.)	AMOUNT OF LICENSE REQUIRED FOR EACH.		CITIES.	Average annual number of dogs licensed. (For 10 years.)	AMOUNT OF LICENSE REQUIRED FOR EACH.	
		Male.	Female.			Male.	Female.
New York	6,000	*a*$2.00	*a*$2.00	Indianapolis	3,000	$1.00	$1.00
Chicago	17,000	2.00	2.00	Syracuse	500	0.50	0.50
Philadelphia	203	1.00	*b*1.00	Worcester	1,700	3.00	6.00
Brooklyn	8,000	2.00	2.00	Toledo	50	1.50	1.50
St. Louis	4,000	3.00	3.00	Richmond (Va.)	2,500	1.00	2.00
Boston	6,906	2.00	5.00	New Haven	1,000	1.15	6.15
Baltimore	600	*c*3.00	*c*3.00	Paterson	*h*3,200	1.00	1.00
San Francisco	2,800	2.00	2.00	Lowell	1,200	2.00	5.00
Cincinnati	*d*750	2.00	2.00	Fall River	1,616	2.00	5.00
Cleveland	6,000	1.00	2.00	Cambridge	1,500	2.00	5.00
New Orleans	*e*619	2.00	2.00	Atlanta	200	1.25	1.25
Detroit	1,751	1.00	2.00	Wilmington (Del.)	2,000	1.00	1.00
Milwaukee	5,000	2.00	2.00	Grand Rapids	450	1.50	2.50
Washington	*f*4,432	2.00	2.00	Lynn	1,500	2.00	5.00
Minneapolis	1,515	1.20	2.20	Lincoln	550	2.00	2.00
Louisville	4,029	2.00	2.00	Hartford	1,000	1.15	6.15
St. Paul	1,500	2.00	4.00	St. Joseph	600	1.25	2.25
Kansas city (Mo.)	1,500	1.00	3.00	Evansville	1,400	1.00	2.00
Providence	4,240	*g*1.15	*g*5.15	Los Angeles	(*i*)	1.00	4.00
Denver	1,300	2.00	5.00				

a Renewal, $1.
b Only a registration fee, good during life of dog.
c Renewal, $1.50.
d Average for 7 years.
e One year.
f Includes the District of Columbia.
g One dollar additional if payment is delayed 1 month.
h Average for 5 years.
i No data.

Evidently in many of these cities a large number of dogs are unlicensed, since the number of dogs actually living in the cities is probably between 3 and 4 to each 100 of the population, the proportion being smaller in the more densely populated cities.

Table 52 shows for each of 15 principal cities the arithmetical mean population from the data of 1880 and 1890, and the number of licensed dogs per 1,000 of such population.

TABLE 52.

CITIES.	Mean population, 1880-1890.	LICENSED DOGS.		CITIES	Mean population, 1880-1890.	LICENSED DOGS.	
		Average annual number. (For 10 years.)	Number per 1,000 of mean population.			Average annual number. (For 10 years.)	Number per 1,000 of mean population.
Wilmington (Del.)	51,954	2,000	38.50	Chicago	801,517	17,000	21.21
Providence	118,501	4,240	35.78	St. Paul	87,314	1,500	17.18
Richmond (Va.)	72,494	2,500	34.49	Boston	405,658	6,906	17.02
Milwaukee	160,027	5,000	31.24	Brooklyn	680,503	8,000	11.65
Cleveland	210,749	6,000	28.47	San Francisco	266,478	2,800	10.51
Louisville	142,443	4,029	28.28	St. Louis	401,144	4,000	9.97
Washington	181,425	4,432	24.43	New York	1,360,800	6,000	4.41
Worcester	71,473	1,700	23.79				

FIRE DEPARTMENT.

Table 72 shows for the fire department the total force, apparatus used, alarm system, total number of fires and total loss during the year, the loss per capita and the percentage of loss of insurance involved, with the largest loss at any one fire; also the average annual cost of the department for the 10 years ending December 31, 1889, and the casualties and death rate in the force.

There were 299 cities, with an aggregate population of 16,358,338, which reported a total force of 40,856, of which 3,598 were officers and 37,258 were men. This force was made up of 10,454 regulars, 11,309 call men, and 19,093 volunteers, there being 2.50 of the total force to each 1,000 of the population and 0.64 regulars to each 1,000 of the population. These cities had 1,201 steam and 54 hand engines, 1,427 extinguishers, 2,073 hose carts with 2,758,315 feet of hose, 589 hook and ladder trucks with 132,584 feet of ladders, and 5,919 horses.

DIAGRAM 32.—TOTAL FORCE AND REGULAR MEN OF THE FIRE DEPARTMENT.

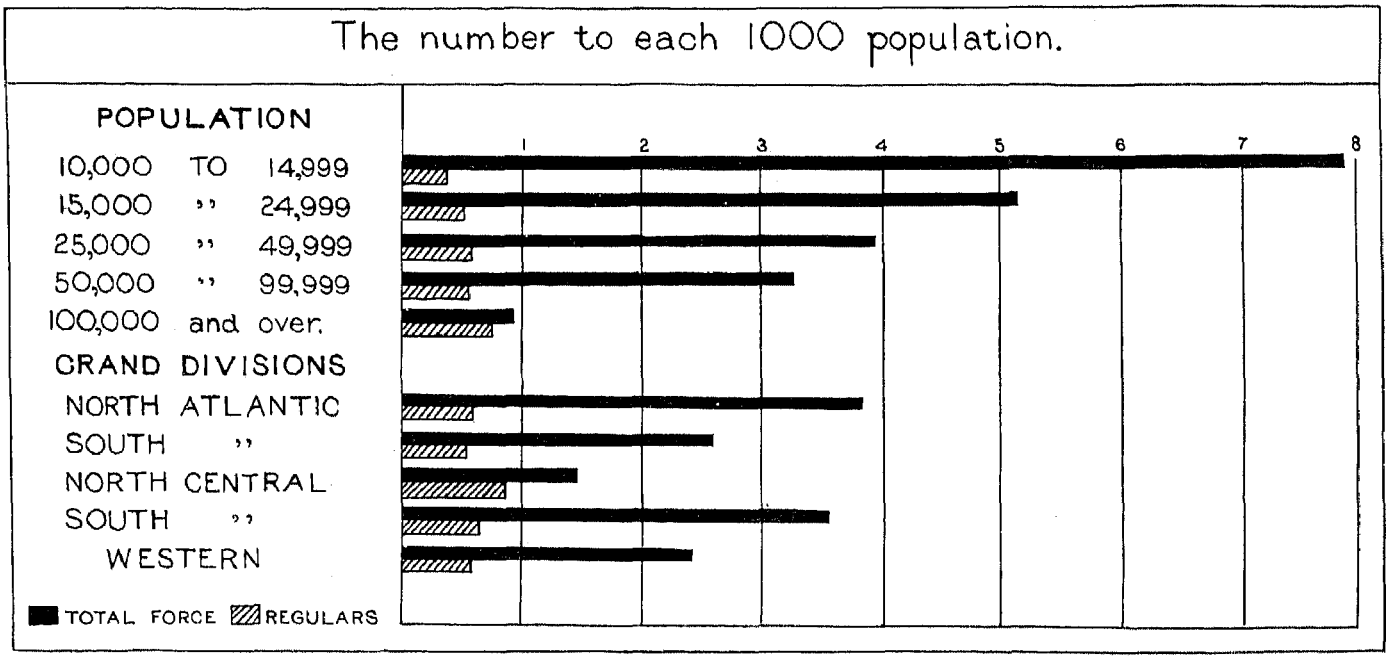


Table 53 shows the distribution of the force by population groups and geographical divisions.

TABLE 53.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	CITIES.		FORCE.			CLASSIFICATION OF FORCE.			PERCENTAGE OF TOTAL FORCE.			TO EACH 1,000 OF POPULATION.	
	Number.	Population.	Total	Officers.	Men.	Regulars.	Call men.	Volunteers.	Regulars.	Call men.	Volunteers.	Total force.	Regulars.
Total	299	16,358,338	40,856	3,598	37,258	10,454	11,309	19,093	25.59	27.68	46.73	2.50	0.64
10,000 to 14,999	110	1,327,891	10,584	640	9,944	401	3,073	7,110	3.79	29.03	67.18	7.97	0.30
15,000 to 24,999	76	1,498,665	7,821	457	7,364	752	2,728	4,341	9.62	34.88	55.50	5.22	0.50
25,000 to 49,999	57	1,990,839	7,768	672	7,096	1,121	2,473	4,174	14.43	31.84	53.73	3.90	0.56
50,000 to 99,999	28	1,870,397	5,988	604	5,384	1,031	1,489	3,468	17.22	24.87	57.91	3.20	0.55
100,000 and over	28	9,670,546	8,695	1,225	7,470	7,149	1,546	.....	82.22	17.78	.....	0.90	0.74
Total	299	16,358,338	40,856	3,598	37,258	10,454	11,309	19,093	25.59	27.68	46.73	2.50	0.64
North Atlantic	116	8,004,520	24,660	1,873	22,787	4,597	7,249	12,814	18.64	29.40	51.96	3.08	0.57
South Atlantic	23	1,221,014	3,190	316	2,874	610	638	1,942	19.12	20.00	60.88	2.61	0.50
North Central	112	5,302,690	7,459	1,069	6,390	4,203	1,497	1,759	56.35	20.07	23.58	1.41	0.79
South Central	26	966,578	3,454	211	3,243	569	1,078	1,807	16.47	31.21	52.32	3.57	0.59
Western	22	863,536	2,093	129	1,964	475	847	771	22.69	40.47	36.84	2.42	0.55

From this it will be seen that the total force to each 1,000 of the population diminishes regularly as the cities grow larger, while the number of the regular or fixed force increases with regularity. These conditions exist because the cities depend less upon call men and volunteers as they increase in population, there being no volunteer force in the cities of 100,000 and over, while for the smaller cities 67.18 per cent of the total force are volunteers and 96.21 per cent volunteers and call men combined. In the geographical divisions the total force to each 1,000 of the population ranges from 1.41 in the North Central to 3.57 in the South Central. The North Central had the largest percentage of regulars and the South Atlantic the smallest percentage of regulars and the largest percentage of volunteers.

Diagram 32 shows the number of the total force and the number of the regular force to each 1,000 of the population for these divisions.

Table 54 gives a summary by population groups and by geographical divisions of the apparatuses used in the fire departments for these 299 cities.

TABLE 54.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	ENGINES. (NUMBER.)		Extinguishers. (Number.)	Horses. (Number.)	Hose carts. (Number.)	Hose. (Feet.)	Hook and ladder trucks. (Number.)	Ladders. (Feet.)
		Steam.	Hand.						
Total	299	1,201	54	1,427	5,919	2,073	2,758,315	589	132,584
10,000 to 14,999	110	143	26	177	444	461	452,700	121	22,433
15,000 to 24,999	76	138	11	184	682	348	421,800	98	25,199
25,000 to 49,999	57	181	14	190	891	356	446,775	94	18,778
50,000 to 99,999	28	108	1	233	772	223	321,173	65	16,105
100,000 and over	28	571	2	643	3,130	685	1,115,867	211	50,069
Total	299	1,201	54	1,427	5,919	2,073	2,758,315	589	132,584
North Atlantic	116	606	26	749	2,460	939	1,421,502	267	64,429
South Atlantic	23	87	5	93	433	136	164,450	40	6,610
North Central	112	346	16	414	2,284	720	890,303	198	48,667
South Central	26	85	2	60	362	135	136,450	43	6,188
Western	22	77	5	111	380	134	145,550	41	6,690

Table 55 shows for each of the cities of 50,000 inhabitants and upward the number of steam fire engines, number of hose carts, number of hook and ladder trucks, number of fire alarm boxes, total loss in dollars during the last year, loss per capita of population, and the death rate for the force.

TABLE 55.

CITIES.	APPARATUS.			Fire alarm boxes.	TOTAL LOSS.		Death rate per 1,000 of force.	CITIES.	APPARATUS.			Fire alarm boxes.	TOTAL LOSS.		Death rate per 1,000 of force.
	Steam engines.	Hose carts.	Hook and ladder trucks.		For the year.	Per capita.			Steam engines.	Hose carts.	Hook and ladder trucks.		For the year.	Per capita.	
New York	91	93	37	1,040	$4,142,777	$2.73	9.74	Albany	10	11	3	144	$265,004	$2.79	.....
Chicago	66	77	26	733	2,154,340	1.96	3.28	Syracuse	6	6	3	79	252,712	2.87	15.87
Philadelphia	40	44	10	550	1,500,000	1.43	7.68	Worcester	4	17	3	93	102,590	1.21	.....
Brooklyn	26	28	8	387	2,510,043	3.11	7.59	Toledo	4	8	1	228	75,829	0.93	.....
St. Louis	31	33	8	502	1,500,000	3.32	5.57	Richmond (Va.)	7	10	3	73	21,251	0.30	22.90
Boston	34	42	13	490	1,078,333	2.40	11.82	New Haven	8	8	3	104	48,000	0.59	.....
Baltimore	14	28	6	277	482,916	1.11	15.15	Paterson	10	9	3	88	317,341	4.05	6.35
San Francisco	23	23	8	308	476,695	1.59	10.99	Lowell	5	9	3	78	182,577	2.35	6.91
Cincinnati	26	62	10	334	621,033	2.09	.....	Nashville	5	6	7	54	123,823	1.63	.....
Cleveland	18	15	6	220	(a)	.....	9.57	Scranton	5	14	1	55	200,000	2.66	2.35
Buffalo	21	20	6	203	1,602,930	6.27	15.87	Fall River	7	9	4	106	43,195	0.58	.....
New Orleans	20	20	5	105	559,955	2.31	103.08	Cambridge	6	8	2	82	53,175	0.76	.....
Pittsburg	19	17	4	245	443,770	1.86	.....	Atlanta	3	4	2	40	97,400	1.49	35.71
Detroit	17	17	7	247	237,046	1.15	13.89	Wilmington (Del.)	8	6	2	37	44,695	0.73	3.68
Milwaukee	16	14	5	225	217,633	1.06	14.29	Dayton	4	10	3	86	72,000	1.18	.....
Washington	10	10	3	156	112,151	0.55	.....	Troy	8	1	2	73	29,096	0.48	.....
Newark (N. J.)	13	11	4	143	185,006	1.02	.....	Grand Rapids	4	7	2	76	41,042	0.68	25.00
Minneapolis	11	15	5	182	275,000	1.67	.....	Reading	8	12	2	48	49,871	0.85	.....
Jersey city	11	12	5	96	407,448	2.50	.....	Camden	5	5	2	32	127,316	2.18	22.73
Louisville	13	13	2	230	2,177,052	13.51	48.39	Trenton	9	11	2	73	117,000	2.04	12.00
Omaha	4	5	3	67	140,000	1.00	15.38	Lynn	5	5	2	66	5,008,331	89.87	8.13
Rochester	4	10	3	117	147,375	1.10	.....	Lincoln	2	3	1	.....	38,000	0.69	.....
St. Paul	10	11	8	135	293,557	2.20	5.10	Charleston	9	7	2	98	67,888	1.24	.....
Kansas city (Mo.)	3	12	3	(a)	244,948	1.85	.....	Hartford	7	8	1	52	10,000	0.19	.....
Providence	7	21	9	202	153,188	1.16	9.30	St. Joseph	1	5	1	60	65,000	1.24	.....
Denver	6	10	3	103	140,000	1.31	.....	Evansville	3	9	2	52	16,446	0.32	.....
Indianapolis	6	10	2	124	241,902	2.29	11.49	Los Angeles	7	8	1	39	90,000	1.79	13.16
Allegheny	11	12	2	112	64,636	0.61	22.99	Memphis	8	7	2	60	78,221	1.55	.....

a No data.

There were 290 cities, with a total population of 15,950,240, which reported the total loss at fires during the year, amounting in the aggregate to $41,244,916, or $2.59 per capita of the population.

Table 56 shows the population, total force, divided between regulars, call men, and volunteers, with the total and the per capita loss for these cities, grouped according to geographical location and by size of population.

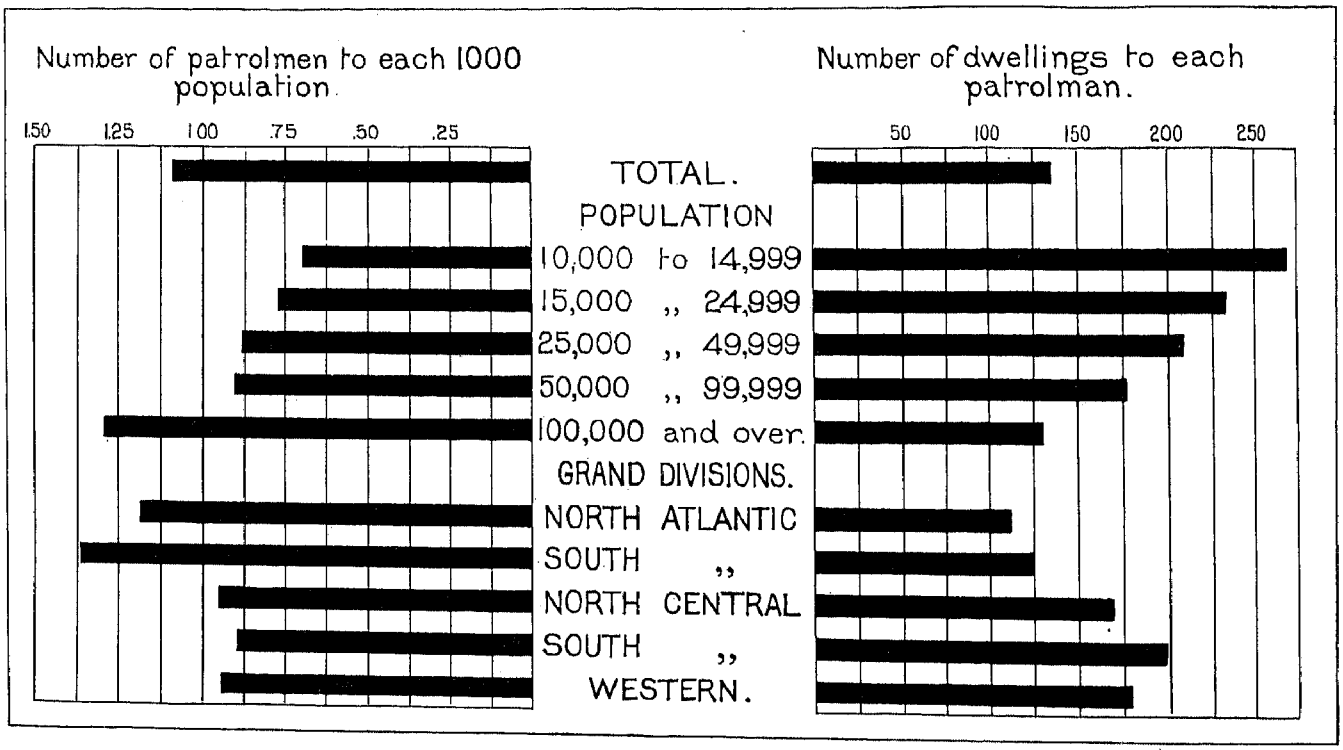
TABLE 56.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	FORCE.				LOSS BY FIRE.	
			Total.	Regulars.	Call men.	Volunteers.	Total.	Per capita of the population.
Total	290	15,950,240	39,941	10,160	11,238	18,543	$41,244,916	$2.59
10,000 to 14,999	108	1,306,866	10,425	392	3,073	6,960	2,606,786	1.99
15,000 to 24,999	71	1,398,819	7,536	688	2,657	4,191	3,672,200	2.63
25,000 to 49,999	56	1,964,965	7,506	1,109	2,473	3,924	5,215,300	2.65
50,000 to 99,999	28	1,870,397	5,988	1,031	1,489	3,468	7,640,806	4.09
100,000 and over	27	9,400,193	8,486	6,940	1,546	.....	22,109,734	2.35
Total	290	15,950,240	39,941	10,160	11,238	18,543	41,244,916	2.59
North Atlantic	114	7,978,180	24,360	4,597	7,249	12,514	21,829,724	2.74
South Atlantic	23	1,221,014	3,190	610	638	1,942	3,095,721	2.54
North Central	107	4,957,529	7,115	3,930	1,426	1,759	11,118,180	2.24
South Central	25	940,704	3,192	557	1,078	1,557	3,751,198	3.99
Western	21	852,813	2,084	466	847	771	1,450,093	1.70

From this it will be seen that the cities of 100,000 and over sustained 53.61 per cent of the total loss, but that it only amounted to $2.35 per capita of their population, while the losses in the other cities ranged from $1.99 per capita in the cities of from 10,000 to 15,000 to $4.09 in those of from 50,000 to 100,000.

In the geographical divisions the loss per capita was largest in the South Central and smallest in the Western.

DIAGRAM 33.—PATROLMEN (310 CITIES).



There were 284 cities which reported the number of fires, amounting to 29,853, at which the loss was $40,716,788, making the average loss for each fire $1,364.

It will be noticed in Table 72, showing for each of the cities individually, that the greatest loss at any one fire was in Lynn, Mass., being $4,959,989, and the next greatest in Louisville, Ky., where it amounted to $1,500,000.

The cost of the departments, as stated by the officials making the reports, is also shown for each city in this table; such cost, however, is the average annual cost for the 10 years ending December 31, 1889, and can not properly be summarized. While this cost is generally approximately correct, it is probable that the purpose of the inquiry was not fully understood in every case, and that in some instances the cost stated included only the salaries of the force, while in others horse feed, repairs, etc., were included.

POLICE DEPARTMENT.

Table 73 shows for the police department the total force employed, divided between the officers and the men, the number of patrolmen to each 1,000 of the population, and the number of dwellings to each patrolman, with the average annual force and cost, the average annual number of arrests and station house lodgers for past 10 years, average annual value of lost and stolen property recovered, and average annual number of arrests to each of the average annual force; deaths in the force during the past 10 years from disease and from injuries received in line of duty and the average annual death rate. But little of the material in this table can be summarized, for the reason that the figures are averages for the 10 years ending December 31, 1889.

There were 310 cities, with an aggregate population of 16,604,097, which reported the total force for the year, divided between officers and patrolmen; there being 2,828 officers and 18,218 men, 86.56 per cent of the total force being patrolmen, there were, on the average, 1.10 patrolmen to each 1,000 of the population, and 135.54 dwellings to each patrolman.

Table 57 shows these figures subdivided into groups of population and by the geographical divisions, from which it will be seen that the proportion of patrolmen to the total force is very evenly distributed throughout the groups, the range being from 83.35 per cent to 87.21 per cent. The number of patrolmen to each 1,000 of the population increases and the number of dwellings decreases as the cities grow larger.

TABLE 57.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	FORCE.				
			Total number.	PATROLMEN.			
				Number.	Percentage of total force.	To each 1,000 of population.	Number of dwellings to each.
Total	310	16,604,097	21,046	18,218	86.56	1.10	135.54
10,000 to 14,999	113	1,363,142	1,135	953	83.96	0.70	269.70
15,000 to 24,999	80	1,578,958	1,419	1,223	86.19	0.77	232.76
25,000 to 49,999	61	2,121,054	2,002	1,728	86.31	0.81	208.41
50,000 to 99,999	28	1,870,397	1,943	1,700	87.49	0.90	177.63
100,000 and over	28	9,670,546	14,547	12,614	86.71	1.30	100.32
Total	310	16,604,097	21,046	18,218	86.56	1.10	135.54
North Atlantic	126	8,181,909	11,182	9,698	86.73	1.19	111.42
South Atlantic	24	1,272,122	2,033	1,748	85.98	1.37	124.92
North Central	112	5,293,027	5,815	5,071	87.21	0.96	167.26
South Central	25	957,497	1,027	856	83.35	0.89	198.89
Western	23	893,542	989	845	85.44	0.94	179.68

Diagram 33 shows by population groups and by geographical divisions the number of patrolmen to each 1,000 of the population and the number of dwellings to each patrolman.

Table 58 shows for each of the cities of 100,000 and over which made reports the number of patrolmen employed during the year, the number per 1,000 of the population, the average annual total force, and the average annual arrests to each, with the average annual cost of force.

TABLE 58.

CITIES.	PATROLMEN.			AVERAGE ANNUAL—(FOR 10 YEARS)		
	Number.	To each 1,000 of population.	Number of dwellings to each.	Total force.	Arrests to each of total force.	Cost of force.
New York	2,922	1.93	28.00	2,974	25	$4,391,766
Chicago	1,458	1.33	87.70	907	44	979,894
Philadelphia	1,425	1.36	131.26	1,400	36	1,000,000
Brooklyn	900	1.12	91.42	867	33	859,184
St. Louis	535	1.18	113.90	440	40	475,408
Boston	679	1.51	77.57	784	42	963,355
Baltimore	639	1.47	112.85	667	40	677,914
San Francisco	336	1.12	140.43	403	58	545,500
Cincinnati	400	1.35	83.72	393	36	330,000
Cleveland	252	0.96	173.95	230	33	250,000
Buffalo	272	1.06	137.10	275	41	297,994
New Orleans	173	0.71	248.55	200	75	170,000
Pittsburg	240	1.01	157.19	206	60	183,100
Detroit	297	1.44	124.55	244	29	222,509
Milwaukee	172	0.84	191.21	121	30	122,488
Washington	365	1.80	94.64	250	71	399,060
Newark (N. J.)	181	1.00	128.71	174	33	170,000
Minneapolis	168	1.02	150.48	149	31	a151,337
Jersey city	170	1.04	109.19	180	33	149,361
Louisville	176	1.00	142.04	200	35	165,000
Omaha	80	0.57	252.43	85	13	b65,000
Rochester	98	0.73	244.43	100	40	99,307
St. Paul	125	0.94	167.81	104	31	98,708
Kansas city (Mo.)	125	0.94	185.12	85	47	100,000
Providence	165	1.25	106.90	190	33	206,469
Denver	75	0.70	240.13	40	125	50,000
Indianapolis	79	0.75	267.57	77	47	a50,079
Allegheny	107	1.02	154.61	90	28	90,000

a Average for 5 years. b Average for 2 years.

Table 59 shows for each of the cities from 50,000 to 100,000 inhabitants the number of patrolmen and the number to each 1,000 of population, the number and cost of the average annual force for the last 10 years, the number of dwellings to each patrolman and the average annual number of arrests to each member of the average force.

TABLE 59.

CITIES.	PATROLMEN.		AVERAGE ANNUAL FORCE. (FOR 10 YEARS.)		Number of dwellings to each patrolman.	Average annual arrests to each member of the average annual force. (For 10 years.)
	Number.	To each 1,000 of population.	Number.	Cost.		
Albany	101	1.06	125	$130,000	130.23	32
Atlanta	107	1.63	60	60,000	106.98	100
Cambridge	65	0.93	70	71,756	158.54	22
Camden	42	0.72	36	30,000	294.33	69
Charleston	80	1.46	100	70,168	102.05	34
Dayton	50	0.82	48	39,131	247.32	68
Des Moines	36	0.72	(a)	.....	275.64	(a)
Evansville	43	0.85	45	28,098	211.42	44
Fall River	77	1.03	81	70,407	86.29	28
Grand Rapids	56	0.93	51	37,310	203.77	33
Hartford	50	0.94	40	55,000	131.06	85
Lincoln	13	0.24	8	6,000	680.62	100
Los Angeles	73	1.45	30	28,800	142.03	77
Lowell	66	0.85	63	70,552	163.55	52
Lynn	44	0.79	40	40,000	193.91	42
Memphis	45	0.89	52	42,624	195.16	111
Nashville	65	0.85	55	46,000	211.48	82
New Haven	85	1.05	95	102,481	131.69	58
Paterson	62	0.79	58	50,121	159.19	51
Reading	33	0.56	36	24,280	354.33	31
Richmond (Va.)	83	1.02	88	78,000	151.06	72
St. Joseph	40	0.76	30	24,000	236.50	107
Scranton	33	0.44	21	(a)	371.61	57
Syracuse	61	0.69	54	55,000	256.41	65
Toledo	70	0.86	73	73,000	226.31	51
Trenton	50	0.87	55	55,000	228.56	45
Troy	80	1.31	100	85,000	97.56	32
Wilmington (Del.)	42	0.68	48	30,000	282.81	(a)
Worcester	84	0.99	77	73,332	116.49	43

a No data.

SUBURBAN TRAVEL.

Table 74 shows the number of all trains to and from the city daily, the suburban travel within a radius of 20 miles, with the number of trains, annual number of passengers and commuters, with the ratio of commuters to total passengers, and the number of passengers to each 1,000 of the population.

Of the 345 cities having a population each of 10,000 and upward, 169 made reports showing the number of suburban trains and the annual number of passengers carried by them. These cities had an aggregate population of 13,562,345, with 11,746 trains carrying 207,418,783 passengers, or 152.94 passengers to each 1,000 of the population.

Table 60 shows the distribution of these figures by the population and by geographical divisions.

TABLE 60.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Population.	Number of trains.	PASSENGERS CARRIED ANNUALLY.	
				Total number.	To each 1,000 of population.
Total	169	13,562,345	11,746	207,418,783	152.94
10,000 to 14,999	49	598,398	1,232	8,066,200	158.66
15,000 to 24,999	38	726,900	991	8,812,257	121.23
25,000 to 49,999	38	1,360,803	1,852	24,080,928	176.96
50,000 to 99,999	24	1,605,602	1,104	12,730,862	79.29
100,000 and over	26	9,360,642	6,567	153,728,536	164.23
Total	169	13,562,345	11,746	207,418,783	152.94
North Atlantic	99	7,575,683	8,101	145,255,029	191.74
South Atlantic	18	1,153,330	509	6,611,166	57.32
North Central	30	3,450,683	1,833	39,602,860	114.77
South Central	12	705,333	204	2,624,559	37.21
Western	10	677,316	1,030	13,325,169	196.73

One hundred and fifty-one of these cities also reported the number of commuters.

Table 61 shows the number of suburban trains for these 151 cities, the total number of passengers carried by them, and the number of commuters, with the ratio of commuters to total passengers. (*a*)

TABLE 61.

POPULATION GROUPS AND GEOGRAPHICAL DIVISIONS.	Number of cities.	Number of trains.	PASSENGERS.		
			Total number.	Commuters.	Percentage who were commuters.
Total	151	11,520	205,567,549	95,335,224	46.38
10,000 to 14,999	39	1,199	7,802,390	2,627,244	33.29
15,000 to 24,999	36	984	8,745,457	2,138,640	24.45
25,000 to 49,999	29	1,678	22,743,605	6,667,220	29.31
50,000 to 99,999	23	1,098	12,718,208	3,956,938	31.11
100,000 and over	24	6,561	153,467,799	79,945,182	52.09
Total	151	11,520	205,567,549	95,335,224	46.38
North Atlantic	93	8,052	144,819,092	61,154,671	42.23
South Atlantic	17	491	6,245,111	1,698,173	27.19
North Central	23	1,774	39,160,232	26,018,853	66.44
South Central	9	188	2,357,045	405,280	17.19
Western	9	1,015	12,985,169	6,058,247	46.66

a "Passenger" and "commuter" are each used in this connection to signify a ticket canceled.

Table 62 shows for the cities of 50,000 inhabitants and upward, arranged in the order of magnitude of population, the number of railroads, the number of daily trains, and the amount of suburban travel within a radius of 20 miles.

TABLE 62.

CITIES.	Number of railroads.	All trains to and from the city daily. (Number.)	SUBURBAN TRAVEL WITHIN A RADIUS OF 20 MILES.				
			Trains to and from the city daily. (Number.)	Passengers. (Annual number.)	Commuters.		Annual number of passengers to each 100 of population.
					Annual number.	Percentage of, of total passengers.	
New York	13	1,588	1,135	32,090,623	8,643,428	26.93	2,117.77
Chicago	21	783	448	19,664,911	16,902,663	85.95	1,787.96
Philadelphia	14	790	636	15,152,999	10,713,858	70.70	1,447.33
Brooklyn	2	516	474	3,297,801	641,806	19.46	408.98
St. Louis	17	291	179	2,855,688	2,163,829	75.77	632.11
Boston	7	1,152	854	39,107,897	24,587,218	62.87	8,720.16
Baltimore	7	299	159	2,803,303	719,082	25.65	645.27
San Francisco	5	429	369	6,350,817	2,367,449	37.28	2,124.04
Cincinnati	15	289	162	4,253,250	3,697,174	86.93	1,432.51
Cleveland	7	122	38	388,931	68,219	17.54	148.81
Buffalo	10	220	126	1,929,669	138,930	7.20	754.77
New Orleans	7	35	4	224,137	(a)	.....	92.60
Pittsburg	10	383	235	5,525,293	2,697,603	48.82	2,335.55
Detroit	7	94	2	36,600	(a)	.....	17.78
Milwaukee	5	98	.....	.....	.....	.....	.....
Washington	3	168	75	893,787	290,830	32.54	440.34
Newark (N. J.)	5	383	234	5,988,134	1,887,212	31.52	3,293.26
Minneapolis	11	417	306	4,034,572	700,201	17.50	2,449.08
Jersey city	7	656	499	867,514	140,391	16.18	532.21
Louisville	7	156	100	1,250,355	99,428	7.95	776.00
Omaha	5	98	52	340,770	44,181	12.97	342.62
Rochester	6	127	20	237,455	5,000	2.11	177.34
St. Paul	10	288	152	2,622,615	1,607,308	61.29	1,969.58
Kansas city (Mo.)	14	169	67	947,200	329,540	34.79	713.70
Providence	4	223	109	552,466	212,567	38.48	418.67
Denver	7	124	54	398,780	190,959	47.89	373.69
Indianapolis	11	105	(a)	135,216	6,606	4.89	128.24
Allegheny	3	110	78	1,912,969	1,090,237	56.99	1,816.91
Albany	4	248	26	106,462	62,163	58.39	112.16
Columbus	11	80	.....	.....	.....	.....	.....
Syracuse	6	120	10	(a)	(a)	.....	.....
Worcester	6	144	66	809,598	271,177	33.50	956.35
Toledo	13	124	6	12,564	(a)	.....	15.43
Richmond (Va.)	5	52	6	80,695	27,298	33.83	60.15
New Haven	2	101	71	878,516	199,346	22.69	1,080.61
Paterson	3	148	95	1,231,578	446,955	36.29	1,571.05
Lowell	3	102	8	515,392	104,013	20.18	663.34
Nashville	2	50	12	387,148	59,512	15.37	503.28
Scranton	3	100	4	366,569	37,734	10.29	487.36
Fall River	1	36	31	127,680	9,168	7.18	171.62
Cambridge	1	71	68	546,435	404,304	73.99	780.31
Atlanta	8	62	24	298,945	108,136	36.17	450.17
Wilmington (Del.)	3	136	64	531,885	88,099	16.56	865.83
Dayton	5	75	.....	.....	.....	.....	.....
Troy	3	163	10	335,913	44,535	13.26	551.07
Grand Rapids	6	60	.....	.....	.....	.....	.....
Reading	3	121	88	551,987	53,173	9.63	940.98
Camden	5	190	137	754,117	416,766	55.27	1,293.22
Trenton	2	179	101	557,540	32,780	5.88	970.34
Lynn	2	162	162	2,245,091	959,734	42.75	4,028.74
Lincoln	4	46	.....	.....	.....	.....	.....
Charleston	3	42	14	229,000	66,950	29.24	416.70
Hartford	3	79	68	1,357,313	479,244	35.31	2,549.90
St. Joseph	7	46	2	13,411	6,102	45.50	25.63
Evansville	5	28	2	20,346	4,075	20.03	40.69
Los Angeles	2	66	25	701,741	73,518	10.48	1,392.48
Memphis	10	52	8	70,936	2,156	3.04	140.99
Des Moines	9	58	.....	.....	.....	.....	.....

(a) No data.

This table indicates that a much larger proportion of the persons doing business in the city live outside of it in the case of Boston than in that of any other city, the annual number of passengers being over 39,000,000 and the annual number of commutation trips over 24,500,000. New York city has a greater number of daily trains devoted to suburban travel, namely, 1,135, Boston coming next with 854, and Philadelphia next with 636.