

# THE PROGRESS OF THE NATION—1790—1870.

[PLATES XV—XIX.]

BY THE COMPILER OF THE ATLAS.

THE series of maps numbered 15 to 19 inclusive, is intended to exhibit the growth of the United States in population, from the date of the first census, 1790, through eight decades, to 1870. The method pursued in the compilation of these maps is in general that which has been adopted in the preparation of the geographical illustrations of the statistics of the ninth census. The county has ordinarily been taken as the unit of treatment. Its population at the period to which the individual map has reference, having been ascertained, and deduction having been made of the population of any city of 8,000 inhabitants or more found within it, in order that the population of such city might be represented separately from the other population of the county, the number of inhabitants was divided by the number of square miles in the county, the quotient representing the average density of settlement. Where, however, any county was of unusual extent, or there was reason known to the compiler for suspecting that various portions of it might be found in very different stages of settlement, the county was no longer taken entire, but the investigation was carried down to sections of the county and even to its several townships. The number of counties thus broken up for the purposes of this compilation, would naturally vary much. At some censuses, they would amount to several hundreds; at others, to scarcely as many score. The average density of each county or part of a county, by turns, having been thus ascertained, all were grouped according to five degrees of density, as exhibited in the scales accompanying the maps. The plan of grouping has been to make as large groups as could be done without merging any appreciable proportion of counties in groups of a markedly different grade. Thus, if a single county of small extent belonging to Group III. should appear surrounded by numerous counties of Group IV. or of Group II., it would not be preserved distinct, but would take the shading of its general section. If, however, a county of Group IV. or V. should appear among counties of Group I. or II. the distinction would be regarded as of sufficient importance to be maintained. Again, a county whose average brought it within Group IV. might come between III.'s and V.'s, appearing thus to belong to a group distinct from both. Yet the resolution of the county into its constituent townships might develop the fact that those parts of the county which bordered on the III.'s were themselves of that grade, while the parts bordering on the V.'s were of that degree of density. In such a case, the division of the county by a central line, and the throwing of the parts, on the one side and on the other, into the adjacent groups, would not only dispense with the necessity of preserving a troublesomely small group upon the map, but would even better represent the facts of the case. Again, a tier of counties along a river might yield a quotient showing an average population of but thirty to the square mile, and thus in Group III. while examination of the townships would show that for a few miles from the river the population was not less than one hundred to the square mile, and thus in Group V. while the portions of the county away from the river would sink back into Group II. or I.

The above illustrations will perhaps sufficiently convey the idea which has governed in the grouping of the smaller territorial divisions, for the purposes of these maps. The compiler has gone as low down as the county, or even as the township, not with a view to separately representing each such individual subdivision, but for the sake of more exactly determining the true line of demarcation between considerable groups, and of resolving such false appearances as those indicated in the latter two illustrations given above.

The difficulties experienced in carrying out this plan arose, first, from the failure of the publications of the earlier censuses, in no small proportion of cases, to give the facts of population for any smaller divisions than the county; and secondly, from the absence of good maps, representing the States in sufficient detail, at several of the periods taken for this treatment. I will not weary the reader with a description of the various means to which recourse was had in the course of this compilation, to obviate these difficulties; suffice it to say that in the main, the difficulties were overcome to an extent which allowed the delineation of groups of population to be as minute as the scale of the maps would admit. Had the maps been taken all of the same size, the increasing weight of these difficulties, as we go back in our national history, would have made the earlier ones less and less precise in their determinations of population. But as the scale of the maps for 1840 and 1830 is smaller than for 1870-50, and that for 1820-1790 much smaller still, most, if not all, the errors of delineation, slight even on the scale used for 1870-50, practically disappear.

Such being the system and scope of the illustrations under consideration, I propose to discuss the statistics of population, from 1790 to 1870, geographically and by methods somewhat novel. The discussion will have constant reference to the maps bearing plate

Nos. XV-XIX. As these maps do not profess to exhibit settlements which do not reach an average of two inhabitants to the square mile, for a tract large enough to be shown to the eye on the scale used in the smallest—those for 1790-1820, it follows that the outside lines of color indicate the limits of a population of two or more to the square mile. The petty population that lies beyond is made up of the solitary ranchman, the trapper and the fisherman, the small mining party, and the lumbering camp at the sources of streams that find their later way into more populous regions.

Let us consider the results of some measurements and computations as to the extent of these outside lines of color, and of the spaces which they enclose.

Measuring upon the larger map (scale 1 : 4000.000) from which the engraved maps have been reduced, I find the length of the unbroken line which starts on Passamaquoddy Bay in Maine, upon the map of 1790, and runs around the continuously populated region, in and out as the facts of settlement require, until it issues on the Atlantic just above the Florida boundary, to be 3,200 miles. In this measurement, no account is made of slight tremulous irregularities, as, for example, those which are due to the ordinary meanderings of a river forming the boundary of a group of population; but I have carefully traced all the ins and outs of this "line of population" which seem to indicate a distinct change of direction in the settlement of the country, for any cause, whether in progression or in retrogression.

What, now, is the area embraced between the coast and the line thus described? This, again, it has been sought to determine as closely as it could be done on a map of the scale used in the compilation, and also as the nature of the subject would allow. Such a determination must of necessity be merely approximate, inasmuch as the statements of the General Land Office, our highest official authority on this subject, in regard to the areas of the several States and Territories, are seldom the result of completed surveys. I have, moreover, taken these areas generally somewhat below the Land Office figures, in allowance for considerable bodies of water found within the limits of the States. No attempt has been made to deal with this matter with mathematical nicety. Errors to the extent of one or two per cent, in the case of any State, have been seen to be unavoidable in the nature of the subject, though it is not doubted that such errors will to a considerable extent neutralize each other, in the result for the whole United States. At the same time, while making no claims to minute accuracy, I shall preserve the results just as I reach them in my computations, giving the square miles down to hundreds, tens, and even units, not that it is to be supposed that the results are exact to anything like that degree, but at once for the greater convenience of discussion, and to allow each of my readers to make his own allowances for probable error.

The settled area of 1790, then, as indicated by the line traced, I find to be 226,085 square miles. The entire body of continuously settled territory, thus composed, lies between 31° and 45° N. Lat. and between 67° and 83° W. Long.

Outside, however, of this body of continuous settlement, there were, at 1790, in addition to a score of small and remote posts and settlements, such as Detroit, Vincennes, Kaskaskia, Prairie du Chien, Mackinac, Green Bay, Sault St. Marie, etc., and in addition to the humble beginnings of Elmira and Binghamton in New York, which then lay outside the line traced on the map, three considerable masses of population, one in Western Virginia, one in Kentucky, and the third in Tennessee, which require to be taken into account in computing the settled area. That in Western Virginia lay upon the Ohio and Kanawha rivers, and comprised about 750 square miles. That in Kentucky lay across the Licking, Kentucky, Salt and Green rivers, and comprised about 10,900 square miles. That in Tennessee lay along the Cumberland river, and embraced about 1,200 square miles. If we add 1,000 square miles for all the other patches of settlement outside the "line of population," we shall have the settled area of 1790, 239,935 square miles, the aggregate population being 3,929,214, and the average density of settlement 16.4 inhabitants to the square mile.

At the second census, 1800, the "line of population" had been rectified so that, though it embraced 282,208 square miles, it described a course, when measured as was that of 1790, of but 2,800 linear miles. The advance of the frontier line in every direction, at this census, is too plainly shown upon the map to require to be pointed out in detail. From the region thus defined, however, there must be deducted an unsettled tract in New York State containing not less than 10,300 square miles, embracing the counties of Hamilton, Essex and Warren, and large portions of Fulton, Herkimer, Lewis, St. Lawrence, Franklin and Clinton, being the general region of the Adirondack Mountains. So that

the actual area of settlement within the line of population is to be taken as 271,908 square miles. All this lay between  $30^{\circ}45'$  and  $45^{\circ}15'$  N. Lat. and between  $67^{\circ}$  and  $88^{\circ}$  W. Long.

Outside this line of continuous settlement, we have the Kentucky and Tennessee groups, now grown together across the common boundary of those States, and extended northward to cover the south bank of the Ohio for several hundred miles, and even to cross the river at numerous points in Indiana and Ohio. The Kanawha settlements have somewhat extended since 1790; while distinct strips of settlement appear along the Mississippi River, within the present State of that name, also on the same river at and below St. Louis; on the Mobile River, in the present State of Alabama; and at numerous points in the northwest. The aggregate extent of the Kentucky and Tennessee groups, together with these isolated settlements, I compute to be 33,800 square miles, making the total area of settlement at 1800, 305,708 square miles, the aggregate population being 5,308,483, and the average density of settlement, 17.3.

At 1810, the Kentucky and Tennessee groups of population, with the settlements upon the river in Ohio and upon the Tennessee River in North Alabama, were all embraced within the line of continuous settlement: but the Mississippi groups, northwest and southwest, were still separated from the "continent" of population by broad spaces vacant of settlement. The frontier line I find to have been then 2,900 miles long, and to have included between itself and the Atlantic 408,895 square miles of territory. But from this must be deducted the area of three large tracts, around which, but not over which, population had flowed, and which were hence included by the frontier, though not settled. These were the tract about the Adirondack region in New York, now considerably reduced in dimensions; another in northwest Pennsylvania and southwest New York, mainly within the former State, and the third in West Virginia extending even a little way into Kentucky. These tracts comprised 26,050 square miles, making the actual area of settlement included within the frontier, 382,845 square miles. All this lay between  $29^{\circ}30'$  and  $45^{\circ}15'$  N. Lat. and  $67^{\circ}$  and  $88^{\circ}30'$  W. Long.

Without the frontier thus traced, we have, in addition to a number of outposts and scattered settlements, four considerable bodies of settlement; one in Michigan reaching around from the river Raisin to lake St. Clair; one along the Mississippi, extending from New Madrid to Alton and St. Charles; one on the Mobile, now extending to  $32^{\circ}$  N. Lat. and reaching over into the present State of Mississippi; and lastly, an extensive group along the lower Mississippi and its branches, representing the Jefferson purchase, in which the small group which we noticed in 1800, east of the river and north of the 31st parallel, has been merged. The aggregate extent of these and of the numerous small patches of population scattered over the west and south, may be taken at 25,100 square miles, making the total area of settlement at 1810, 407,945 square miles, the aggregate population being 7,239,881, and the average density of settlement, 17.7.

At 1820, a new and striking feature is introduced into the course of our frontier line, which was perhaps getting to be rather humdrum in its steady movement northward and westward. Now we see the Louisiana group of population, not only running far up the Red and the Washita rivers to the west, but pushing eastward even to the Eastern boundary of Mississippi, while the great Kentucky and Tennessee group, so long poised above the 35th parallel, now pours a broad though irregular stream of population down across the whole length of Alabama, and makes connection with the Louisiana group across the Mobile and Pascagoula rivers, a connection never to be broken.

As a result, the frontier line now rests, when it has run its course, upon the Gulf of Mexico, instead of returning to the Atlantic; while this southwest connection has embraced within the frontier one other great vacant tract, soon, however, to be devoured by population. This interior unsettled tract I may call the Central Southern, consisting as it does of the extreme southeast corner of Tennessee, the extreme southwest corner of North Carolina, the eastern half of Alabama, and the western and southern portions (far more than the half) of Georgia. Most of this is occupied by Indians, for whose removal negotiations are already in progress. Florida, too, is at this date (1820) a blank upon a map of the population of the United States. The treaty which gives her to us is signed; but the delivery has not yet taken place. Turning to the northwest we find the Detroit and St. Clair settlements now for the first time embraced within the line of continuous settlement, while to the west population has pushed out along the Missouri River to the great salt springs.

Measuring the frontier of 1820, with all its ins and outs, from the St. Croix to the Gulf, we find our line, though it has no longer to return across the country to the Atlantic, to have extended to 4,100 miles, embracing an area, after deduction made, not only of the three interior vacant tracts in New York, Pennsylvania and Virginia previously described (all of which have been greatly encroached upon by population during the decade), but of the Central Southern tract just mentioned, of actual settlement, determined as heretofore, of 504,517 square miles, all lying between  $29^{\circ}30'$  and  $45^{\circ}30'$  N. Lat. and between  $67^{\circ}$  and  $93^{\circ}45'$  W. Long.

Outside the "line of population" we have small bodies of population on the Arkansas, White and Washita rivers in Arkansas, as well as some patches in the northwest. Computing these at 4,200 square miles in the aggregate, we have a total settled area of 508,717 square miles at 1820, the aggregate population being 9,633,822, and the average density of settlement 18.9 to the square mile.

The isolated patches of population at 1820 in Arkansas have at 1830 made connection with each other and with the Tennessee group, on the northeast, giving birth to a figure of extraordinary proportions, not unlike a marine monster formerly of fable, but now of

science; and as our plan requires us to measure the creature, not only from its head to its tail, but also according to the showman's rule, back again on the under side, from its tail to its head, if indeed such a monster can be said to have either head or tail, we have the frontier line enormously increased, namely to 5,300 miles. Florida now appears for the first time as contributing to the population of the United States. To the west, population has thrown itself forward along the Missouri River in a narrow belt of perhaps forty miles average width, till it rests on the western boundary of the State of Missouri. The aggregate area embraced between the Ocean (with the Gulf) and the frontier line as described on the map of 1830, is 725,406 square miles. Of this, however, not less than 97,389 square miles are comprised within the several interior vacant tracts (including the unsettled portions of Florida), leaving but 628,017 square miles as the settled area within the "line of population," all lying between  $29^{\circ}15'$  and  $46^{\circ}15'$  N. Lat. and between  $67^{\circ}$  and  $95^{\circ}$  W. Long.

Outside the body of continuous settlement, are found, at 1830, no longer large groups, like those of Kentucky and Tennessee at 1790 and 1800, of Louisiana at 1810, and of Arkansas at 1820, but a number of small patches of population in Ohio, Indiana, Illinois, Michigan and Wisconsin, aggregating perhaps 4,700 square miles, making the total settled area of 1830, 632,717 square miles, the aggregate population being 12,866,020, and the average density of settlement 20.3 to the square mile.

At 1840, the frontier line crosses Maine, Michigan and Wisconsin, notably higher up; takes in the southeast corner of Iowa, and, from the 40th parallel southward to the 31st, covers substantially the entire western boundary of Missouri, Arkansas, and Louisiana. The line thus traced is but 3,300 miles long. This astonishing shortening of the "line of population" is due to the rectification of the frontier, northwest, west, and southwest. The area included is 900,658 square miles, all between  $29^{\circ}$  and  $46^{\circ}30'$  N. Lat. and  $67^{\circ}$  and  $95^{\circ}30'$  W. Long.; the vacant tracts to be deducted, 95,516, and the settled tracts outside, 2,150; making the entire settled area of 1840, 807,292 square miles, the aggregate population being 17,069,453, and the average density of settlement 21.1 to the square mile.

At 1850, the frontier line crosses Michigan and Wisconsin higher up, takes in nearly all the eastern and southern half of Iowa, and passing down the western boundary of Missouri, Arkansas and Louisiana, much as at 1840, though somewhat more closely, it runs out into the newly acquired territory and newly admitted State on the southwest, Texas, reaching a point three degrees further west than the extreme frontier on the Missouri, and issuing finally on the Gulf of Mexico below the River Nueces, having described a course of 4,500 miles.

The aggregate area included thus is 1,005,213 square miles, from which deduction has to be made for vacant spaces (only one, that, namely, in the Adirondack region of New York, remaining out of the three described at 1810,) to the extent of 64,339 square miles, and to which addition must be made, on account of numerous settled tracts scattered outside the line of population, east of the 100th meridian, from Pembina to the Rio Grande, of 4,775 square miles.

But it is no longer by a line drawn around from the St. Croix to the Gulf of Mexico, that we embrace all the population of the United States, except only a few outlying posts and small scattered settlements. Already from the Pacific we may run a line around perhaps 80,000 miners and adventurers, the pioneers of more than one populous State soon to be formed. I will not interrupt the continuity of this paper by attempting to trace the course of this line, either at 1850, or at any subsequent census; but will content myself with indicating the addition to be made, on this account, to the populated area of the United States. In 1850, the Pacific settlements may, though of necessity very rudely, be computed at 33,600 square miles, making the total area of settlement at that date 979,249 square miles, the aggregate population 23,191,876, and the average density of settlement 23.7 to the square mile.

At 1860, the frontier line includes a narrow strip of population along the entire northern and eastern boundary of Maine; embraces substantially all of Michigan as high as  $43^{\circ}30'$ , and of Wisconsin as high as  $44^{\circ}30'$ ; takes in the southeast quarter of Minnesota, and only excludes now the extreme northwest corner of Iowa. At the mouth of the Sioux River, it takes the first step of its great forward movement towards "The Plains," and, crossing the Missouri here, it annexes to the body of continuous settlement fully 20,000 square miles in Nebraska and Kansas. Respecting the faith of the Government pledged to the Indian tribes, it still confines itself to the western boundary of Arkansas, and then, running out along the Red River across nearly four degrees of longitude, it stretches with a bold, free course across the vast plains of Texas, almost touching in its furthest sweep the 100th meridian. The line thus described measures 5,300 miles, and embraces 1,126,518 square miles, lying between  $28^{\circ}30'$  and  $47^{\circ}30'$  N. Lat. and between  $67^{\circ}$  and  $99^{\circ}30'$  W. Long. From this, deduction is to be made, on account of vacant spaces, of 39,139 square miles. The outlying settlements east of the 100th meridian, are now more numerous than for many decades previous, including a strip extending far up the Rio Grande, and embrace 7,475 square miles; while the Pacific settlements, now comprising one sovereign State of the Union, are nearly three times as extensive as at 1850, embracing 99,900 square miles, making the total area of settlement at 1860, 1,194,754 square miles, the aggregate population being 31,443,321, and the average density of settlement 26.5 to the square mile.

At 1870, we learn the last the census has yet to tell us of the Progress of the Nation. The imperial sweep of the "line of population" now embraces 1,178,068 square miles, all between  $27^{\circ}15'$  and  $47^{\circ}30'$  N. Lat. and between  $67^{\circ}$  and  $99^{\circ}45'$  W. Long., from which, however, deduction has to be made of 37,739 square miles on account of interior spaces vacant of population. To what remains we must add 11,810 on account of settled tracts

east of the 100th meridian, and 120,100 on account of the Great Pacific settlements, making the area settled at 1870, according to the scale taken, viz., two inhabitants or more to the square mile, not less than 1,272,239 square miles, the aggregate population being 38,558,371, the average density of settlement being 30.2 to the square mile.

Tables I and II present the above recited facts in due order of succession, and in immediate relation to each other.

TABLE No. I.

DATE.	EXTENT OF FRONTIER. LINEAR MILES.		EXTENT OF CONTINUOUS SETTLEMENT.	
	Returning to the Atlantic.	Resting on the Gulf of Mexico.	N. Lat.	W. Long.
1790	3200		31° —45°	67°—83°
1800	2800		30° 45'—45° 15'	67°—88°
1810	2900		29° 30'—45° 15'	67°—88° 30'
1820		4100	29° 30'—45° 30'	67°—93° 45'
1830		5300	29° 15'—46° 15'	67°—95°
1840		3300	29° —46° 30'	67°—95° 30'
1850		4500	28° 30'—46° 30'	67°—99°
1860		5300	28° 30'—47° 30'	67°—99° 30'
1870		5700	27° 15'—47° 30'	67°—99° 45'

TABLE No. II.

DATE.	AREA, IN SQUARE MILES.				POPULATION.	Average Density of Settlement. Persons to a sq. mile.	
	Area embraced within the frontier.	Vacant tracts within the frontier.	SETTLED TRACTS WITHOUT FRONTIER.				Total Area of Settlement.
			East of 100th Merid.	West of 100th Merid.			
1790	226,085		13,850		239,935	3,929,214	16.4
1800	282,208	10,300	33,800		305,708	5,308,483	17.3
1810	408,895	26,050	25,100		407,945	7,239,881	17.7
1820	562,591	58,074	4,200		508,717	9,633,822	18.9
1830	725,406	97,389	4,700		632,717	12,866,020	20.3
1840	900,658	95,516	2,150		807,292	17,069,453	21.1
1850	1,005,213	64,339	4,775	33,600	979,249	23,191,876	23.7
1860	1,126,518	39,139	7,475	99,900	1,194,754	31,443,321	26.5
1870	1,178,068	37,739	11,810	120,100	1,272,239	38,558,371	30.2

Having thus gone through the successive censuses, tracing the course of the outside line of population, and estimating the settled area enclosed between this line and the ocean, let us now go back to 1790, and follow out the movement of population along the several degrees of latitude, to note the relative rapidity and steadiness of advance within each belt of territory. Owing to the difficulty of locating with precision the numerous small patches of population in the Pacific States and Territories, these computations are restricted to the country east of the 100th meridian.

But before the results of such computations can be satisfactorily stated, an explanation must be given of the method followed.

First: The successive parallels are taken as the central lines of zones half a degree wide; and where any parallel passes through vacant spaces, any body of population lying within a quarter degree, upon either side thereof, is referred thereto, after being reduced to the width of a half degree in latitude. Where a solid body of population lies close up against a parallel on one side, however, no reduction is made on account of the absence of population on the other side. The only important exception to the rule is in the case of the 34th parallel, where, after crossing the 94th meridian, it runs through the southern portion of the "Indian Territory," shortly above the northern line of Texas. As the absence of population as known to the census (Indians in tribal relations not being recognized by the census law) from the line of this parallel, in this part of its course, is the result of express exclusion by treaty stipulations, the population just below is not referred to it.

Second: The starting point on the coast is taken, not from the extreme end of any cape or promontory upon which the parallel may chance to emerge from the Atlantic, but from the average projection of the coast line in the general neighborhood of the parallel. In the case of Long Island, the eastern half was taken to fill up the western end of the Sound, and the 41st parallel was assumed for the purposes of these computations to begin with the 73° W. Long.

Third: The northern lakes and all considerable bays were "jumped," as also the British possessions when crossed by the parallels under measurement.

Fourth: All spaces vacant of population were skipped, the same rule being adopted for measuring and referring to parallels, spaces which are not directly upon any parallel, as in the case of the populated areas lying above or below a parallel when passing through vacant spaces.

The measurements as to all extensive bodies of continuous settlement have been made with as much exactness as the scale of the map (1: 4,000,000) would allow. Where, however, only one or two small parcels of population appear upon any parallel, as on the 31st for 1790 and 1800, the 28th at 1840, the 27th at 1860 and 1870, these have been taken roundly, without much care, as it is not possible to determine with precision the periphery of such isolated settlements. The measurements, therefore, have a far higher relative accuracy for the more central parallels than for those at the extreme north or south.

The result of the application of these rules to our measurements is to give the populated areas along each parallel, either in one continuous body, or in several groups, as population is broken by foreign territory, by lakes or bays, or by large vacant spaces. Consolidating all such, however, and reducing all the populated distances on each parallel to a continuous line, we have the following as the area of settlement along the successive parallels, at each census from 1790 to 1870.

TABLE III.

Degree of N. Latitude.	1790	1800	1810	1820	1830	1840	1850	1860	1870
47	0	0	0	0	0	0	79	131	209
46	0	0	0	0	15	20	50	125	230
45	30	317	392	392	392	421	437	521	858
44	226	252	279	279	299	308	404	731	777
43	339	355	425	425	485	792	816	1001	1137
42	234	375	568	581	691	963	984	1143	1248
41	238	396	471	548	663	1013	1107	1277	1325
40	358	371	584	613	912	1134	1140	1220	1252
39	270	456	565	888	1038	1043	1043	1168	1224
38	425	560	707	831	871	1020	1032	1141	1193
37	344	606	706	746	797	902	1018	1018	1134
36	462	533	682	751	878	1034	1057	1057	1057
35	384	395	391	575	961	976	1030	1030	1030
34	302	327	362	616	707	916	938	938	938
33	175	192	230	328	554	815	989	1105	1055
32	30	114	227	597	742	763	929	1023	1008
31	10	25	240	357	634	678	860	983	991
30	0	0	150	180	323	373	725	785	785
29	0	0	0	0	0	30	255	372	372
28	0	0	0	9	0	20	80	102	140
27	0	0	0	0	0	0	0	25	25
26	0	0	0	0	0	0	0	65	65

It will be noted that in the case of two parallels, the 32d and 33d, population has fallen off since 1860. This occurs in the more sparsely settled regions of Texas, where the degree of density is the slightest of all shown, and where, consequently, retrogression would imply the least actual diminution of population. How much of this result is due to the actual effects of the war; how much to changes of population following the extension of the railroad system, and how much to a closer definition of the range of population at 1870, I can not with satisfaction determine.

We have thus far treated of a population of two or more to the square mile, without distinction of the higher degrees of settlement. Let us now proceed to discuss the distribution of the total area of settlement, at each census, as shown by Table II, according to the several degrees of density exhibited by the maps.

These degrees are as follows:

- I. A population of from 2 to 6 to the square mile.
- II. A population of from 6 to 18 to the square mile.
- III. A population of from 18 to 45 to the square mile.
- IV. A population of from 45 to 90 to the square mile.
- V. A population of 90 or more to the square mile.

Of these groups, as I will call them, the first three generally indicate a predominantly agricultural condition. Speaking broadly, agriculture in the United States is not carried to such a point as to afford employment and support to a population in excess of 45 to a square mile; and consequently, the fourth and fifth groups never appear with us, except as trade and manufactures arise, and the classes rendering personal and professional services are multiplied. Of the agricultural groups, the first represents a very sparse population such as in our western country might be sustained by grazing industry, without any cultivation of the soil; and accordingly we find this group, at the present time, mainly along the frontier in Iowa, Minnesota, Nebraska, Kansas, Arkansas and Texas. The poorest tillage regions also sink into this group, and hence we find not inconsiderable portions of some of the older States in this class. In 1790, however, No. I was the largest single group in Maine, New York, Pennsylvania, South Carolina and in what is now the State of West Virginia. The second group—6 to 18 inhabitants to the square mile—indicates almost universally the existence of defined farms or plantations, and the systematic cultivation of the ground, but this, either in an early stage of settlement or upon more or less rugged soil. Thus we find this group still large in many of the western and southwestern States and in the mountainous regions of the Atlantic slope. At 1790, however, this group far exceeded in area Nos. III, IV, and V combined. The third group—18 to 45 to the square mile—almost universally indicates a highly successful agriculture. Here and there the presence of petty mechanical industries raises a difficult farming or planting region into this group; but in general, where manufactures exist at all, they induce a population of 45 or more to the square mile. We should therefore expect to find, as we do find, No. III the predominant group in Alabama, Delaware, Georgia, Illinois, Iowa, Kentucky, Maryland, Michigan, Mississippi, Missouri, North Carolina, South Carolina, Tennessee and Virginia. Of the New England States, Maine, New Hampshire and Vermont also have large tracts in this degree of settlement. In 1790, No. III was the largest single group in Delaware, Maryland, Massachusetts, New Hampshire, New Jersey and Virginia (exclusive of West Virginia).

The fourth group almost universally indicates the existence of commercial and manu-

facturing industry and the multiplication of personal and professional services. New York, New Jersey, Pennsylvania, Ohio and Indiana are the States in which this group is found in excess of any other; in the latter State, however, this excess is but slight. Of these States, in none was this group in excess in 1790. Two of these, Ohio and Indiana, can scarcely be said to have been settled at all (Marietta, Ohio, having been founded in 1788, while in Indiana there were but two or three small settlements, the remains of French occupation). In New York and Pennsylvania, at that date, Group I was predominant.

The fifth group represents a very advanced condition of industry. At the first census, only a few counties, and even at the ninth census, less than 20,000 square miles, were found populated to this extent. In the lower three New England States—Massachusetts, Rhode Island, and Connecticut—alone, is this found in excess of every other group. In each of these, it is also in excess of all other groups, though not largely. This degree of settlement is only reached where manufacturing and trading villages are numerous. In the present condition of the United States, however, there appears to be a stronger tendency for tracts in Group IV to pass into Group V than for tracts in Group III to pass into Group IV; and it would not be unreasonable to anticipate that the census of 1880 will exhibit a larger proportional gain in the group we are now considering, than in any other.

Having thus sought to give a general, though necessarily a somewhat vague, impression of the significance of these group-numbers in such an analysis of our population, I ask the attention of my readers to the following table, which exhibits, for each census, the distribution of the total area of settlement among the several classes indicated:

TABLE IV.

IN SQUARE MILES.

DATE.	Total Area of Settlement: 2 or more to the square mile.	DENSITY OF SETTLEMENT, BY CLASSES.				
		I 2-6 to the square mile.	II 6-18 to the square mile.	III 18-45 to the square mile.	IV 45-90 to the square mile.	V 90 and over to the square mile.
1790	239,935	83,436	83,346	59,282	13,051	820
1800	305,708	81,010	123,267	82,504	17,734	1,193
1810	407,945	116,629	154,419	108,155	27,499	1,243
1820	508,717	140,827	177,153	150,390	39,004	1,343
1830	632,717	151,460	225,894	186,503	65,446	3,414
1840	807,292	183,607	291,819	241,587	84,451	5,828
1850	979,249	233,697	294,698	338,796	100,794	11,264
1860	1,194,754	260,866	353,341	431,601	134,722	14,224
1870	1,272,239	245,897	363,475	470,529	174,036	18,302

It will be noted that notwithstanding the constant passing of the lower groups into the higher, through the intensification of settlement, the lower groups are still so rapidly recruited by the annexation of fresh territory, in the westward extension of the frontier-line of population, as not only to maintain, but to increase them from census to census, without an exception, until at 1870 a slight falling off is disclosed in No. I. It should also be noted that the increase of No. II during the decade previous was comparatively slight. The reader may or may not deem these last results sufficiently significant to intimate a movement in the same direction during the current ten years.

The following table exhibits proportions existing between the several quantities in Table IV, namely, the increase, per cent, in the total area of settlement, from census to census, and the number of square miles, in each 1,000 settled at each census, occupied by a population of each specified degree of density.

TABLE IV.—A.

DATE.	Increase, per cent, in total area of settlement.	PROPORTION OF EACH GROUP OF POPULATION TO TOTAL AREA OF SETTLEMENT.					
		TOTAL	I	II	III	IV	V
1790		1000	348	348	247	54	3
1800	27.4	1000	265	403	270	58	4
1810	33.4	1000	286	379	265	67	3
1820	24.7	1000	277	348	296	76	3
1830	24.4	1000	239	357	295	103	6
1840	27.6	1000	228	361	299	105	7
1850	21.3	1000	239	301	346	103	11
1860	22.	1000	218	296	361	113	12
1870	6.5	1000	193	286	369	137	15

But we may carry our analysis down further, with results still more instructive. Those who have read the description given above of the progress of the "line of population" from census to census, will have observed that the States and Territories may naturally be grouped into three classes, with reference to the order in time of their settlement.

The first consists of the original Thirteen States, with those formed from them, viz., Vermont, Maine, and West Virginia.

The second consists of Kentucky and Tennessee, on the west, Ohio, Indiana, Illinois and Michigan on the northwest, Missouri, Arkansas, Louisiana, Mississippi and Alabama on the southwest, and Florida on the south. All these were largely represented in the tables showing the area of settlement at 1840. The third class consists of Wisconsin, Iowa, and Minnesota, Nebraska and Kansas, Texas, the present Territories, and the Pacific

States. None of these began to assume importance in the account of settled area prior to 1850.

The following tables—IV, B, C, and D, exhibit the same facts as are given in Table IV above, but separately for each of the groups of States just enumerated. The petty patches of population found within the third group prior to 1840, are disregarded.

TABLE IV.

B.—FIRST GROUP OF STATES.

DATE.	Total Area of Settlement, &c.	DENSITY OF SETTLEMENT, BY CLASSES.				
		I	II	III	IV	V
1790	224,685	72,386	79,146	59,282	13,051	820
1800	266,208	63,260	105,017	79,504	17,234	1,193
1810	297,668	56,979	115,462	97,385	26,599	1,243
1820	312,173	48,690	110,146	115,540	36,454	1,343
1830	348,902	45,245	115,255	130,642	54,346	3,414
1840	353,137	33,340	112,865	140,753	60,351	5,828
1850	359,692	28,213	89,941	164,050	66,224	11,264
1860	361,141	20,060	74,392	178,483	73,982	14,224
1870	358,546	17,000	66,449	177,723	79,072	18,302

C.—SECOND GROUP OF STATES.

DATE.	Total Area of Settlement, &c.	DENSITY OF SETTLEMENT, BY CLASSES.				
		I	II	III	IV	V
1790	15,250	11,050	4,200			
1800	39,500	17,750	18,250	3,000	500	
1810	110,277	59,650	38,957	10,770	900	
1820	196,144	91,737	67,007	34,850	2,550	
1830	282,815	105,215	110,639	55,861	11,100	
1840	438,355	138,467	174,954	100,834	24,100	
1850	493,757	114,459	184,607	160,646	34,045	
1860	519,957	62,450	182,689	220,698	54,120	
1870	527,627	48,637	167,576	228,450	82,964	

D.—THIRD GROUP OF STATES.

DATE.	Total Area of Settlement, &c.	DENSITY OF SETTLEMENT, BY CLASSES.				
		I	II	III	IV	V
1840	15,800	11,800	4,000			
1850	125,800	91,025	20,150	14,100	525	
1860	313,656	178,356	96,260	32,420	6,620	
1870	386,066	180,260	129,450	64,356	12,000	

The most casual examination of these tables will show at once that the relations of the groups to the several epochs of our national development, have importantly changed from what appeared in Table IV. In the first group of States, from 1790 to 1830 inclusive, the increase in the settled area was marked at every decade. After that, the increase was down to 1860, scarcely more than nominal, the tracts desirable for settlement having, it may fairly be presumed, substantially all been taken up. But while the increase in the total area of settlement went on till 1830, Group I never increased at all, the higher groups not only absorbing all the current growth of settlement but steadily encroaching upon No. I, which has been reduced from 72,386 in 1790 to 17,000 in 1870, nearly all which remains being in the mountainous regions of West Virginia and Georgia. The increase in Group II stopped at 1810, when it reached its maximum at 115,462 square miles. It has since declined to 66,449, more than half this amount being in Georgia and North Carolina. This group appears, however, in Maine, New Hampshire and Vermont, in Pennsylvania, Virginia and West Virginia.

In Group III, the increase went on uninterruptedly until 1860. Between 1860 and 1870 there was a slight falling off. In Groups IV and V the increase has proceeded steadily from the first enumeration under the Constitution to the present time, and will doubtless continue, at the expense of the lower groups.

Attention will naturally be attracted to the falling off in the total area of settlement between 1860 and 1870. This occurred almost entirely in the State of Maine, where a low birth-rate (see Chart XL, and the figures for Maine on Charts XXVIII and XXXIX), the direct losses of the war, the superior attractions of prairie agriculture to eastern farmers, and of city life to the youth of the country, together with the prostration of one of the most important of the industries of the State, ship-building, have combined to reduce the population, always sparse, of extensive tracts along the northern frontier of settlement below 2 to the square mile, and thus to exclude these tracts from our table.

In the second group of States, the total area of settlement has continued to increase without interruption to the present date; Group I increased till 1840, since which time it has fallen off from its maximum of 138,467 to 48,637 square miles; Group II increased until 1850, since which time it has decreased, though not heavily; Groups III and IV have increased without interruption since 1790—Group V has never been formed in this body of States—that is, population has nowhere been found to the degree of ninety and more

to the square mile, for any tract sufficiently large to be shown to the eye on maps of the scale used. In the third group of States, the progress has thus far been uninterrupted, both in the total area of settlement, and in each of the (four) constituent groups of population, though it will be observed that the increase in Group I between 1860 and 1870 was almost at a minimum. Group V does not appear in this section of our table.

In the foregoing Tables, IV, B, C, D, we have the total settled area of each of three specified GROUPS OF STATES at each census, 1790 to 1870. The following table presents the population of each of these groups, at the dates taken, with the average density of settlement in each (cities here included):

TABLE IV.—E.

DATE.	FIRST GROUP.		SECOND GROUP.		THIRD GROUP.	
	Population.	Average density. Persons to a square mile.	Population.	Average density. Persons to a square mile.	Population.	Average density. Persons to a square mile.
1790	3,819,846	17	109,368	7.2		
1800	4,922,070	18.5	386,413	9.8		
1810	6,161,566	20.6	1,078,315	9.8		
1820	7,417,432	23.8	2,216,390	11.3		
1830	9,153,403	26.2	3,707,299	13.1		
1840	10,631,904	30.1	6,357,392	14.5	74,057	4.7
1850	13,218,496	36.7	9,078,288	18.4	895,092	7.1
1860	15,818,547	43.8	12,637,882	24.3	2,986,892	9.5
1870	17,964,592	50.1	15,594,721	29.5	4,999,058	12.9

CITIES.

It will be remembered that all cities of 8,000 inhabitants and over were excluded before determining the population-groups in which the several counties should be placed. We have, therefore, yet to speak of the urban population of the United States, in progress from 1790 to 1870.

Several difficulties, not a little annoying, arise during the reduction of these results to a form for comparison. For instance, what constitutes a city? In some States, the laws relating to the incorporation of villages and boroughs are so liberal, and the people are so well disposed towards this form of civil organization, that there is no danger of any considerable town failing to be distinguished from the mass of settlement. The liability to mistake is here rather in the chance that a "city" of 8,000 inhabitants may not imply a strictly urban population of those numbers, the municipal limits being sometimes so extended as to include considerable rural districts. But in New England and some of the Middle States, the township system is so highly organized and so generally accepted in popular estimation as sufficient for all the purposes of local administration, that townships may be found of nine, ten, twelve and even fifteen thousand inhabitants, without any interior municipal organization. It is evident that many of these are, in all but name, cities, often more importantly so than some which, from the formation of the national government, have boasted their Mayors, Aldermen and Sheriffs; and to omit these from the tale of cities in an account of the population of the United States, would clearly be an error. In cases of this kind, discretion has been exercised, and after what seemed a reasonable deduction, if any were necessary, for the rural parts of the township, the balance has been treated as a city population.

Again, at several natural centres, are, or in the past have been, groups of cities, one commonly much larger than any other, perhaps than all the others, which, while legally distinct, might be regarded as constituting a true unit of residence and industry. Shall these be taken separately in our account? or aggregated, in disregard of merely political divisions? It is more difficult to decide this question in undertaking an historical review like ours, than if we were making up an independent statement for a single period, inasmuch as these relations frequently change: two, three or even four cities at one census appearing ten years later as one, the growth of city population diminishing the number of cities. Nor is it always clear, what is to be regarded as a unit of residence and industry. While it is generally true that the small cities which surround a great one, owe their importance and even their existence to it, and, therefore, that in annexing them, it is simply claiming its own, there are instances of cities being closely coterminous, yet each having a clear *raison d'être* of its own, while in more than one case the limits of a modern city embrace the sites of at least two originally distinct and important centres of population and trade. The question is quite too large to be discussed here. These points are mentioned merely to show that no plan of treatment is without its own difficulties. For several reasons I have decided to follow the record, and at each census to count that as a distinct city which was so recognized at the time. The only exception is in the case of Philadelphia, where I follow Mr. De Bow, superintendent of the seventh census, in including the population of the suburbs, Kensington, Northern Liberties, Moyamensing, &c. &c., instead of treating these as distinct municipalities.

It will need, therefore, to be borne in mind that, while the determination of new centres of residence and industry, in the unceasing growth of population, has constantly tended to increase the number of cities known to the census, there has been a movement, far less considerable and very irregular, in the other direction, namely, to a reduction in the number of cities, through annexation and consolidation.

I will only add that in a very few cases, the most notable being that of Salem at 1790, I have included towns which only just failed of reaching the limit of population assigned.

The following table exhibits the number of cities of 8,000 or more inhabitants at each census of the United States:

TABLE V.

DATE.	CITIES BY CLASSES, ACCORDING TO SIZE.								TOTAL.
	8,000 to 12,000	12,000 to 20,000	20,000 to 40,000	40,000 to 75,000	75,000 to 125,000	125,000 to 250,000	250,000 to 500,000	500,000 and over.	
1790	1	3	1	1					6
1800	1		3	2					6
1810	4	2	3		2				11
1820	3	4	2	2	2				13
1830	12	7	3	1	1	2			26
1840	17	11	10	1	3	1	1		44
1850	36	20	14	7	3	3	1	1	85
1860	62	34	23	12	2	5	1	2	141
1870	92	63	39	14	8	3	5	2	226

The following Table exhibits the total population of the cities which appear in Table V. in comparison with the aggregate population at each census of the United States:

TABLE V.—A.

DATE.	Population of United States.	Population of Cities.	Inhabitants of cities in each 100 of the total population.
1790	3,929,214	131,472	3.4
1800	5,308,483	210,873	3.9
1810	7,239,881	356,920	4.9
1820	9,633,822	475,135	4.9
1830	12,866,020	864,509	6.7
1840	17,069,453	1,453,994	8.5
1850	23,191,876	2,897,586	12.5
1860	31,443,321	5,072,256	16.1
1870	38,558,371	8,071,875	20.9

Speaking roundly, it may be said that in 1790, one-thirtieth of the population was found in cities; in 1800 one-twenty-fifth; in 1810 and also in 1820, one-twentieth; in 1830, one-sixteenth; in 1840 one-twelfth; in 1850, one-eighth; in 1860 one-sixth; in 1870 more than one-fifth.

Two things need to be said in explanation of the relations of the tables above to the maps which show the density of population. The first is that the populations of two or more cities situated close to each other, have often been combined, and the aggregate thus obtained will be found represented on the maps by a circle of proportionate size. The scale of the maps has made it necessary to do this, instead of representing each city separately. The second is that the deduction of the population of cities sometimes brings a county into a lower population-group than at a preceding census, notwithstanding an actual increase of population, in both its rural and its urban parts. Thus, we may suppose a county with an area of 400 square miles, to have had at 1860 a population of 20,000, its shire town having 6,500 inhabitants. This county would, therefore, if treated as a whole, fall into Group IV, viz., 45-90 to the square mile. At 1870, however, we will further suppose the population to have increased to 24,000, of whom 8,500 are now found in the shire town, which thereupon becomes a city within our definition, and is excluded from the mass of population. The county thus sinks into Group III, viz., 18-45 to the square mile. Such cases are of course few in number, and the presence of the small circle in solid color which denotes a city on these maps will always suffice, on a careful examination, to correct the first impression of an absolute loss of population in the county.

CENTRE OF POPULATION.

The "centre of population" is a theme upon which there has been much speculation among writers for the public press in the United States; and the subject is deemed to have enough at once of curious and of serious interest, to justify the introduction of this feature into the maps which exhibit the Progress of the Nation.

Several different things may be covered by the phrase, "centre of population;" but what is commonly intended is the point at which equilibrium would be reached, were the country taken as a plane surface, itself without weight, but capable of sustaining weight, and loaded with its inhabitants, in number and position such as they are found at the period under consideration, each individual being assumed to be of the same gravity as every other, and consequently to exert pressure on the pivotal point, directly proportioned to his distance therefrom. It is in this sense that the phrase has been used upon the maps which show the density of population, in progress from 1790-1870.

In the determination of these successive points, the method taken was as follows: The population of each county, or smaller subdivision of territory where counties were exceptionally large or very irregularly populated, was assumed to be concentrated at its geographical centre. The parallel of the 24° N. Lat. and the meridian 67th West of Green-

wich were then chosen as convenient lines—being south and east respectively of all the population of the United States—to which to refer the position of the local centres thus taken. The distances of these centres north of the former line and west of the latter, were next ascertained. Distances westward were measured on parallels of latitude, and in determining them, the centres of all counties lying between the same two successive degrees of latitude were referred to the parallel of the intermediate half-degree. The population of each county, or smaller sub-division used, was thereupon multiplied successively into the corresponding distances thus obtained, and the aggregate of all products of population into distances northward was divided by the aggregate population of the country to determine the latitude of the centre of population, and the aggregate of all products of population into distances westward was divided by the same aggregate population to determine the longitude of the centre of population.

The centres of population, as located upon the maps, were obtained by the process described, except those for the sixth and seventh censuses (1840 and 1850) which were taken from a table and map prepared by Prof. J. E. Hilgard of the United States Coast Survey, and published in Scribner's Magazine in the year 1872, covering the period 1840-70. Impressed by the coincidence between Prof. Hilgard's figures for 1860 and 1870 and those obtained by my own far more laborious process, I determined to adopt, with due acknowledgment, his figures for 1840 and 1850, thus saving the expense of an independent computation. The following are Prof. Hilgard's results for 1860 and 1870, compared with those obtained by the treatment of the same quantities, as above described:

Prof. Hilgard, 1870—39° 15' N. Lat.: 83° 39' W. Long.  
 39° 12' N. Lat.: 83° 35'.7 W. Long.  
 Prof. Hilgard, 1860—39° 03' N. Lat.: 82° 50' W. Long.  
 39° 00'.4 N. Lat.: 82° 48'.8 W. Long.

When it is considered that Prof. Hilgard treated the States as entire bodies, after deduction of some leading cities, and obtained his local centres, not as the result of measurements and computations, but by the exercise of a trained judgment, merely, no one who is familiar with the intrinsic difficulties of such work, and with the great and often unaccountable diversities of settlement prevailing throughout the United States, can fail to admire the scope and grasp of thought and the intimate acquaintance with the history and present condition of our population, which were exhibited in so justly seizing the local centres of population for more than forty States and Territories. I do not regret the more minute and precise but more laborious and expensive determination of the centres of population at the remaining censuses; but I certainly should not have undertaken it had Prof. Hilgard already covered the ground.

With so much of explanation, let us trace upon our maps the progress, from decade to decade, of this most significant point.

At 1790, we find by our process the centre of population at 39° 16'.5 N. Lat. and 76° 11'.2 W. Long., which, from a comparison of the best maps available, would seem to be about twenty-three miles east of Baltimore. During the decade 1790-1800, it appears to have moved almost due west to a point about eighteen miles west of the same city, being in Lat. 39° 16', and Long. 76° 56'.5. From 1800 to 1810 it moved westward and slightly southward to a point about forty miles N. W. by W. from Washington, being in Lat. 39° 11'.5 and Long. 77° 37'.2. From 1810 to 1820, it moved westward and again slightly southward to a point about sixteen miles north of Woodstock, Va., being in Lat. 39° 05'.7, and Long. 78° 33'. From 1820 to 1830, it moved still westward and southward to a point about nineteen miles W. S. W. of Moorefield, in the present State of West Virginia, being in Lat. 38° 57'.9 and Long. 79° 16'.9. From 1830 to 1840 it moved still westward but slightly changed direction northward, reaching a point sixteen miles south of Clarksburg, being in Lat. 39° 02' and Long. 80° 18'. From 1840 to 1850 it moved westward and slightly southward again, reaching a point about twenty-three miles southeast of Parkersburg, being in Lat. 38° 59' and Long. 81° 19'. From 1850 to 1860 it moved westward and slightly northward, reaching a point twenty miles south of Chillicothe, Ohio; being in Lat. 39° 00'.4 and Long. 82° 48'.8. From 1860 to 1870 it moved westward and still more sharply northward, reaching a point about forty-eight miles east by north of Cincinnati.

The closeness with which the centre of population through such rapid westward movements as have been recorded, has clung to the parallel of the 39th degree, cannot fail to be noticed. The most northern point reached was at the start in 1790; the most southern in 1830, the preceding decade having witnessed a rapid development of population in the southwest in Alabama, Arkansas, Mississippi and Louisiana, and the accession of Florida to the Union. The extreme variation in latitude has been less than nineteen minutes; while the eighty years of record have accomplished a movement in longitude of nearly seven degrees and a half. Assuming the westward movement to have been uniformly along the parallel of the 39th degree, the westward movement for each decade has been as follows: 1790 to 1800, forty-one miles; 1800 to 1810, thirty-six miles; 1810 to 1820, fifty miles; 1820-30, thirty-nine miles; 1830 to 1840, fifty-five miles; 1840 to 1850, fifty-five miles; 1850 to 1860, eighty-one miles; from 1860 to 1870, forty-two miles. The sudden access between 1850 and 1860 was due to the transfer of a considerable body of population from the Atlantic to the Pacific coast, twelve individuals in San Francisco exerting as much

pressure at the pivotal point—say, the crossing of the 83d meridian and the 39th parallel—as forty individuals in Boston.

The following table exhibits in immediate connection the facts detailed above:

TABLE.

DATE.	POSITION OF CENTRE OF POPULATION.			Westward movement during preceding decade.
	N. Lat.	W. Long.	Approximate location by important towns.	
1790	39° 16'.5	76° 11'.2	23 miles E. of Baltimore.	
1800	39° 16'.1	76° 56'.5	18 miles W. of Baltimore.	41 miles.
1810	39° 11'.5	77° 37'.2	40 miles N. W. by W. of Washington.	36 miles.
1820	39° 05'.7	78° 33'	16 miles N. of Woodstock.	50 miles.
1830	38° 57'.9	79° 16'.9	19 miles W. S. W. of Moorefield.	39 miles.
1840	39° 02'	80° 18'	16 miles S. of Clarksburg.	55 miles.
1850	38° 59'	81° 19'	23 miles S. E. of Parkersburg.	55 miles.
1860	39° 00'.4	82° 48'.8	20 miles S. of Chillicothe.	81 miles.
1870	39° 12'	83° 35'.7	48 miles E. by N. of Cincinnati.	42 miles.
			Total . . . . .	399

The following map exhibits to the eye the westward movement of the centre of population from 1790 to 1870 which has been described in words and figures above:



#### POPULATION AND RIVER SYSTEMS.

I will close this long review of the geographical relations of our population, by exhibiting in tabular form, for convenient comparison, the statistics of population at 1870, which appear upon General Von Steinwahr's Map (Plates I and II of this Atlas) of the River Systems of the United States.

By that map, the territory of the United States comprises four great river systems, the Atlantic, the Northern Lake, the Mississippi, and the Pacific systems.

The Atlantic system is arbitrarily divided into a northern and a southern section, by a line drawn from a point on the coast just above Baltimore, across Maryland and the extreme southwestern counties of Pennsylvania, to the Alleghenies. This division is made with reference to a marked change in the conditions of settlement and of industry, which is noted as occurring in the general neighborhood of the line thus drawn.

The Northern Lake system is, for somewhat similar reasons, divided arbitrarily into an eastern and a western section, by the prolongation northward of the boundary between Indiana and Illinois.

The divisions effected in the other systems, for the purposes of this representation, are mainly natural.

The Mississippi system is divided into the Basin of the Mississippi, which is again divided as Upper and Lower, by a line drawn between Alton and Cairo; the Basins of the Ohio, the Missouri, the Red, the Arkansas and the Rio Grande (the portions of the latter outside the territory of the United States being excluded from the computation as respects both area and population); the Basin which I will call the Alabama Basin, though including large portions of Mississippi on the west, and of Georgia and Florida on the east, embracing the Pearl, Mobile, Chattahoochee, Appalachian and Sawanee Rivers and their tributaries; and, last, the Basin of Central Texas, embracing all the rivers between the Rio Grande and the Bayou Teche.

The Pacific system is divided as follows: the Basin of the Columbia; the Basin northwest of the Columbia which I will call the Puget Sound Basin; the Basin of the Sacramento and San Joaquin; the Basin of the Klamath and the Coast Ranges; the Basins of the Colorado and of the Salinas, and the Basin of Southwestern California embracing the streams from the Santa Maria to the Mexican boundary.

Table VII exhibits the populations of the several basins enumerated, as nearly as the

same can be ascertained, with the approximate area of each as obtained by measurements with the planimeter conducted by my able assistant, Mr. Joseph J. Skinner, C. E.

TABLE VII.

	Population.	Area, square miles.	Inhabitants to a square mile.
<b>ATLANTIC SYSTEM.</b>			
Northern . . . . .	9,983,412	135,417	73.7
Southern . . . . .	4,224,041	169,121	25.
Total . . . . .	14,207,453	304,538	46.6
<b>NORTHERN LAKE SYSTEM.</b>			
Eastern . . . . .	3,575,721	82,007	43.6
Western . . . . .	823,883	102,332	8.
Total . . . . .	4,399,604	184,339	23.7
<b>MISSISSIPPI SYSTEM.</b>			
Basin of the Upper Mississippi . . . . .	4,179,407	179,635	23.3
Basin of the Lower Mississippi . . . . .	1,795,294	65,646	27.3
Basin of the Ohio . . . . .	7,806,453	207,111	37.7
Basin of the Missouri . . . . .	1,524,171	527,690	2.9
Basin of the Red . . . . .	468,298	92,721	5.1
Basin of the Rio Grande . . . . .	117,522	101,334	1.1
Basin of the Arkansas . . . . .	517,923	184,742	2.8
The Alabama Basin . . . . .	1,978,742	145,990	13.6
The Texas Basin . . . . .	723,994	178,434	4.6
Total . . . . .	19,111,804	1,683,303	11.3
<b>PACIFIC SYSTEM.</b>			
Basin of the Columbia . . . . .	106,718	219,706	.5
Basin of the Colorado . . . . .	16,144	264,386	.06
Basin of the Sacramento and San Joaquin . . . . .	455,972	66,927	6.8
Basin of the Salinas . . . . .	23,419	9,753	2.4
The Puget Sound Basin . . . . .	13,216	20,046	.6
Basin of the Klamath and the Coast Ranges . . . . .	55,867	45,960	1.2
The Basin of S. W. California . . . . .	35,404	17,262	2.
The Great Interior Basin . . . . .	132,770	210,274	.6
Total . . . . .	839,510	854,314	.98
<b>RECAPITULATION.</b>			
Atlantic System . . . . .	14,207,453	304,538	46.6
Northern Lake System . . . . .	4,399,604	185,339	23.7
Mississippi System . . . . .	19,111,804	1,683,303	11.3
Pacific System . . . . .	839,510	854,314	.98
Total . . . . .	38,558,371	3,026,494	12.7

POPULATION OF THE UNITED STATES EACH YEAR FROM 1780 TO 1880, WITH PROCESS OF ESTIMATE AND INTERPOLATION.

BY E. B. ELLIOTT, U. S. BUREAU OF STATISTICS.

The first census of the United States was taken in 1790, and a census has been taken decennially ever since. It is sometimes important to know approximately the probable number of the population at years intermediate between those when the enumerations were made, and also, for certain purposes, at each year of the decade just preceding the taking of the first census in 1790, and of the current decade, that from 1870 to 1880. By examining the numbers of population reported in the census for each of the years 1790, 1800, 1810 and 1820, the second differences of the series are found not to differ greatly from each other; and if we suppose the increase of the population between 1780 and 1790 to have followed the same law as in the thirty years from 1790 to 1820 we may readily work back to the term of the series for 1780. We also observe that the second differences derived from the enumerated numbers for the years 1830, 1840, 1850 and 1860 are nearly identical with each other, although larger than the second differences just mentioned for the earlier years. On the assumption that the series for the years from 1860 to 1880, had there been no civil war or other important disturbance, would have followed the same law of progression as between 1830 and 1860, we may readily find the terms of the estimated series for 1870 and 1880.

TABLE SHOWING THE NUMBERS OF THE POPULATION AT EACH UNITED STATES CENSUS FROM THE YEAR 1790 TO 1860, BOTH INCLUSIVE; TOGETHER WITH ESTIMATED POPULATION FOR THE YEAR 1780, DERIVED FROM THE NUMBERS ENUMERATED FOR THE YEARS 1790, 1800, 1810 AND 1820; ALSO ESTIMATED POPULATION FOR THE YEARS 1870 AND 1880 ON THE ASSUMPTION THAT THE CIVIL WAR HAD NOT TAKEN PLACE, DERIVED FROM THE ENUMERATED NUMBERS OF THE YEARS 1830, 1840, 1850 AND 1860.

Years.	Population.	First Differences.	Second Differences.
1780	[3,069,597]		
1790	3,929,214	[859,617]	
1800	5,308,483	1,379,269	[519,652]
1810	7,239,881	1,931,398	552,129
1820	9,658,453	2,418,572	487,174
1830	12,866,020	3,207,567	788,995
1840	17,069,453	4,203,433	995,866
1850	23,191,876	6,122,423	1,918,990
1860	31,443,321	8,251,445	2,129,022
1870	[41,718,772]	[10,275,451]	[2,024,006]
1880	[54,018,229]	[12,299,457]	[2,024,006]

In the above table the numbers in brackets are estimated. The other numbers are the immediate results of the decennial enumerations. In the column of second differences the number in brackets at the top, viz. 519,652, is the mean of the two numbers in the same column which immediately follow, viz. 552,129 and 487,174. In the column of first differences the number at the top, viz. 859,617, is derived from the number immediately following (1,379,269) by subtracting therefrom the newly estimated second difference (519,652). The number at the top of the column headed population (3,069,597) is derived from the number immediately below (3,929,214), by subtracting therefrom the newly estimated first difference (859,617). The estimated numbers of the population in this table for the years 1870 and 1880, viz. 41,718,772 and 54,018,229, are derived from the four preceding values by observing, as already mentioned, that the second differences of these four numbers (1,918,990 and 2,129,022) are very nearly identical, and assuming their mean (2,024,006) as the constant second difference in continuing the table. The number thus estimated for the year 1870, viz. 41,718,772, when compared with the result of the official enumeration, viz. 38,558,371, shows the estimate, on the assumption that no war had occurred, to be in excess of the result of official enumeration for that year by 3,160,401. If we assume the calculated number for the year 1880 (54,018,229) to be in excess of the probable number for that year by the same amount, our estimate for the year 1880 will be 50,857,828, or, disregarding numbers less than 1,000, we shall have in round numbers for the estimated population of that year, 50,858,000, which is the number assumed in the accompanying tables.

We have now a series of numbers, observed or estimated, at intervals of ten years, from the year 1780 to the year 1880, both inclusive. It is desired to interpolate numbers for each year intermediate between these given decennial numbers. This has been readily accomplished on the assumption that the numbers for the years intermediate between any two consecutive decennial numbers progressed in conformity to a law of constant second differences, derived in general from comparison of four consecutive decennial terms.

TABLE SHOWING THE NUMBERS OF THE POPULATION ENUMERATED AT EACH DECENNIAL CENSUS OF THE UNITED STATES FROM THE YEAR 1790 TO THE YEAR 1870, BOTH INCLUSIVE, TOGETHER WITH ESTIMATED NUMBERS OF THE POPULATION FOR THE YEARS 1780 AND 1880.

Years.	Population.	First Differences.	Second Differences.	Mean of Consecutive Second Differences.
1780	3,070,000			
1790	3,929,214	859,214		
1800	5,308,483	1,379,269	520,055	520,055
1810	7,239,881	1,931,398	552,129	536,092
1820	9,658,453	2,418,572	487,174	519,652
1830	12,866,020	3,207,567	788,995	638,084
1840	17,069,453	4,203,433	995,866	892,430
1850	23,191,876	6,122,423	1,918,990	1,457,428
1860	31,443,321	8,251,445	2,129,022	2,024,006
1870	38,558,371	7,115,050	— 1,136,395	496,314
1880	50,858,000	12,299,629	5,184,579	2,024,092
				5,184,579

In all these successive computations respecting the population of the United States, Alaska has been excluded inasmuch as no census has ever been taken under national authority in that remote district.

Indians in tribal relations are not recognized by the census law of 1850, and are, therefore, not reckoned in the account of population. The principal reservations and ranges of the several tribes are, however, shown upon the map for 1870—Plates XVIII and XIX.

The following named gentlemen have assisted in the computations required for this memoir:—H. R. Elliot, A.B.; H. A. Hazen, A.B.; J. O. Maxon, Ph.B., and C. B. Dudley, Ph.D.

The delineation of the groups of population has been mainly the work of my principal assistant, S. A. Galpin, LL.B.

Prof. John E. Clark has kindly assisted me in the resolution of several difficulties encountered in the course of this compilation.

In connection with the foregoing discussion, the compiler has great pleasure in introducing the following paper by E. B. Elliott, Esq., Chief Clerk of the United States Bureau of Statistics, read before the American Association for the Advancement of Science, at its meeting at Hartford in August 1874, and kindly revised by Mr. Elliott for the purposes of the present publication.

In interpolating the numbers for the several years in any decennial group, the one-hundredth part of the corresponding mean of the second differences as derived from the data at decennial intervals (see last column of the immediately preceding table), was taken as the constant second difference of the new annual series (see last column of the following table); and the one-tenth part of the corresponding first difference of the numbers at the decennial periods, less four and one-half times the second difference just described for the annual interpolation was taken to represent the first difference in effecting the interpolation (see the next to the last column of the following table.) These first and second differences, properly combined with the numbers of population at the decennial periods readily gave the several annual series desired.

TABLE SHOWING FOR DECENNIAL GROUPS OF YEARS, FROM 1780 TO 1880 INCLUSIVE, THE POPULATION AT THE COMMENCING YEAR OF EACH GROUP; ALSO THE CORRESPONDING COMPUTED FIRST DIFFERENCE AND SECOND DIFFERENCE OF THE SERIES OF YEARLY NUMBERS COMPRISING SUCH GROUPS.

Decennial Periods.	Population at the commencement of the several decennial periods.	First differences of the annual numbers to be interpolated in each of the several decennial periods specified.	Second differences of the annual numbers to be interpolated in each of the several decennial periods specified.
1780 to 1790	3,070,000	62,518.925	5,200.55
1790 to 1800	3,929,214	113,802.76	5,360.92
1800 to 1810	5,308,483	169,755.46	5,196.52
1810 to 1820	7,239,881	213,143.42	6,380.84
1820 to 1830	9,658,453	280,597.35	8,924.30
1830 to 1840	12,866,020	354,759.04	14,574.28
1840 to 1850	17,069,453	521,162.03	20,240.06
1850 to 1860	23,191,876	802,810.37	4,963.14
1860 to 1870	31,443,321	620,420.86	20,240.92
1870 to 1880	38,558,371	996,656.845	51,845.79

From the numbers in this table the interpolated numbers, in the following table of population by years, were readily obtained; the number in the column of second differences corresponding to any decennial period in the above table being added successively to the corresponding number in the column of first differences in the same table; and this number, with the resulting numbers, in turn added successively to the corresponding number in the column immediately preceding, headed population.

TABLE SHOWING THE POPULATION OF THE UNITED STATES FOR EACH YEAR FROM 1780 TO 1880, THE NUMBERS NOT THE RESULTS OF OFFICIAL ENUMERATION BEING DERIVED FROM THE NUMBERS ENUMERATED AT THE SEVERAL DECENNIAL CENSUSES.

It will be seen that the numbers within the several decennial periods progress by constant second differences.

Years.	Population.	Years.	Population.
1780	3,070,000 (estimated.)	1783	3,273,000 (estimated.)
1781	3,133,000 "	1784	3,351,000 "
1782	3,200,000 "	1785	3,435,000 "

Years.	Population.	Years.	Population.
1786	3,523,000 (estimated.)	1834	14,373,000 (estimated.)
1787	3,617,000 "	1835	14,786,000 "
1788	3,716,000 "	1836	15,213,000 "
1789	3,820,000 "	1837	15,655,000 "
1790	3,929,214 (enumerated.)	1838	16,112,000 "
1791	4,043,000 (estimated.)	1839	16,584,000 "
1792	4,162,000 "	1840	17,069,453 (enumerated.)
1793	4,287,000 "	1841	17,591,000 (estimated.)
1794	4,417,000 "	1842	18,132,000 "
1795	4,552,000 "	1843	18,694,000 "
1796	4,692,000 "	1844	19,276,000 "
1797	4,838,000 "	1845	19,878,000 "
1798	4,990,000 "	1846	20,500,000 "
1799	5,146,000 "	1847	21,143,000 "
1800	5,308,483 (enumerated.)	1848	21,805,000 "
1801	5,478,000 (estimated.)	1849	22,489,000 "
1802	5,653,000 "	1850	23,191,876 (enumerated.)
1803	5,833,000 "	1851	23,995,000 (estimated.)
1804	6,019,000 "	1852	24,802,000 "
1805	6,209,000 "	1853	25,615,000 "
1806	6,405,000 "	1854	26,433,000 "
1807	6,606,000 "	1855	27,256,000 "
1808	6,812,000 "	1856	28,083,000 "
1809	7,023,000 "	1857	28,916,000 "
1810	7,239,881 (enumerated.)	1858	29,753,000 "
1811	7,453,000 (estimated.)	1859	30,596,000 "
1812	7,673,000 "	1860	31,443,321 (enumerated.)
1813	7,898,000 "	1861	32,064,000 (estimated.)
1814	8,131,000 "	1862	32,704,000 "
1815	8,369,000 "	1863	33,365,000 "
1816	8,614,000 "	1864	34,046,000 "
1817	8,866,000 "	1865	34,748,000 "
1818	9,124,000 "	1866	35,469,000 "
1819	9,388,000 "	1867	36,211,000 "
1820	9,658,453 (enumerated.)	1868	36,973,000 "
1821	9,939,000 (estimated.)	1869	37,756,000 "
1822	10,229,000 "	1870	38,558,371 (enumerated.)
1823	10,527,000 "	1871	39,555,000 (estimated.)
1824	10,834,000 "	1872	40,604,000 "
1825	11,151,000 "	1873	41,704,000 "
1826	11,476,000 "	1874	42,856,000 "
1827	11,810,000 "	1875	44,060,000 "
1828	12,153,000 "	1876	45,316,000 "
1829	12,505,000 "	1877	46,624,000 "
1830	12,866,020 (enumerated.)	1878	47,983,000 "
1831	13,221,000 (estimated.)	1879	49,395,000 "
1832	13,590,000 "	1880	50,858,000 "
1833	13,974,000 "		