Recent Apportionment in New York State

Walter Francis Willcox

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By WALTER FRANCIS WILLCOX[1]

Representative institutions presuppose a method of adjusting the number of representatives to the number of states, counties, wards or other governmental subdivisions, to the population of those subdivisions or to certain classes of the population. They also presuppose a method of readjusting the one to the other at intervals which in some cases, as Great Britain, are of irregular length and in other cases, as the United States and many of the states, are ten years long.

A provision for decennial readjustments was introduced into the Constitution of the United States in 1787 and has since been imitated in nearly all countries which have adopted written constitutions. Thus, in the Commonwealth of Australia under the Act of July 9, 1900, each of the six original states elects six senators. To apportion the members in the House of Representatives, the population of the Commonwealth "according to the latest available statistics," and this has apparently been interpreted to mean those of the last decennial census, is divided by 72, twice the number of senators, and the population of each original state divided by the quotient. The House of Representatives is slightly larger than 72 members, because Tasmania, entitled by population to only 3, receives 5 under a constitutional provision that no original state is to receive less than five members.

In the apportionment provisions of the constitutions or laws of the American states the county is usually the unit of area and population corresponding to the state as the unit in federal apportionment.

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[1]Professor of Economics and Statistics in Cornell University. Professor Willcox, while temporarily in the Census Bureau at Washington, prepared the tables upon which members of the House of Representatives were apportioned in 1901, and in 1910 he devised a new method and prepared apportionment tables in accordance with it which were accepted by Congress in preference to those submitted by the Census Bureau. In addition to various congressional documents dealing with the question, he has published "The Apportionment of Representatives" (*American Economic Review, Supplement* to Vol. VI (March, 1916), pp. 3-16), his annual address as President of the American Economic Association.

The numerical basis employed is usually the resident population or the inhabitants; but in some states, like Arkansas and Indiana, it is narrowed to the adult male population; in some, like California, to persons eligible for citizenship; in some, like Massachusetts and Texas, to legal voters; in some, like Oregon, to white population; and in some, like North Carolina and New York, to the population excluding aliens.

In New York State the problem of apportionment differs from that in the United States because in New York the size of the Assembly is rigidly fixed and that of the Senate is almost rigidly fixed by the State Constitution, while under the Federal Constitution the size of the House of Representatives is limited only to a minimum established by the number of states and the size of the Senate is rigidly fixed at twice the number of states. In New York State the number of assemblymen is 150 and that of senators, with an exception to be considered later, is 50.

The Apportionment of Assemblymen

The provisions of the State Constitution regarding the apportionment of members of the assembly are as follows:

"The Assembly shall consist of 150 members * * *. The members of the Assembly shall be chosen by single districts and shall be apportioned by the Legislature at the first regular session after the return of every enumeration among the several counties of the State as nearly as may be according to the number of their respective inhabitants excluding aliens. Every county * * * except the county of Hamilton shall always be entitled to one member of Assembly * * *. The county of Hamilton shall elect with the county of Fulton * * *.

"The quotient obtained by dividing the whole number of inhabitants in the State excluding aliens by the number of members of Assembly shall be the ratio for apportionment, which shall be made as follows: One member of Assembly shall be apportioned to every county * * * containing less than the ratio and one-half over. Two members shall be apportioned to every other county. The remaining members of Assembly shall be apportioned to the counties having more than two ratios according to the number of inhabitants excluding aliens. Members apportioned on remainders shall be apportioned to the counties having the highest remainders in the order thereof respectively. No county shall have more members of Assembly than a county having a greater number of inhabitants excluding aliens."

The Constitution of New York thus differs from that of the United States and agrees with those of more than one-half of the states in

describing the method of apportionment. The first step is to divide the population, excluding aliens, by the number of members of the Assembly, 150, in order to find the average citizen population to one assemblyman. Under the state enumeration of 1915 the citizen population was 8,059,515 and the average population to one assemblyman, 53,730. The second step is to divide the citizen population of each county by this number. The results may be conveniently expressed as a series of quotients in the form of whole numbers and decimals or decimals alone and arranged in order of size (putting Fulton and Hamilton together) as below.

County	Population excluding aliens, 1915	Population divided by 53,730	Final apportionment
Group 1:			
Putnam	11,739	0.22	1
Schuyler	13,533	0.25	1
Yates	18,256	0.34	1
Schoharie	22,440	0.42	1
Seneca	23,894	0.44	1
Lewis	24,751	0.46	1
Tioga	25,091	0.47	1
Cortland	28,851	0.54	1
Greene	28,960	0.54	1
Essex	30,917	0.58	1
Orleans	31,353	0.58	1
Wyoming	31,546	0.59	1
Warren	31,676	0.60	1
Tompkins	34,884	0.65	1
Sullivan	35,055	0.65	1
Livingston	35,717	0.66	1
Chenango	35,733	0.67	1
Genesee	36,826	0.69	1
Allegany	39,454	0.73	1
Madison	39,954	0.74	1
Columbia	40,693	0.76	1
Rockland	42,360	0.79	1
Franklin	42,718	0.80	1
Delaware	44,422	0.83	1
Washington	44,744	0.83	1
Clinton	45,243	0.84	1
Hamilton and Fulton	46,461	0.86	1
Otsego	47,241	0.88	1
Wayne	50,105	0.93	1
Ontario	51,870	0.97	1
Montgomery	52,037	0.97	1
Herkimer	56,332	1.05	1
Chemung	56,914	1.06	1
Saratoga	58,770	1.09	1
Cayuga	61,686	1.15	1
Cattaraugus	67,337	1.25	1
Oswego	71,195	1.33	1
Jefferson	74,813	1.39	1
Ulster	79,957	1.49	1
Total Group 1	1,615,528	30.09	39

County	Population excluding aliens, 1915	Population divided by 53.730	Final apportionment
Group 2:			
Steuben	81,326	1.51	2
St. Lawrence	83,153	1.55	2
Broome	83,216	1.55	2
Dutchess	84,022	1.56	2
Richmond	84,787	1.58	2
Schenectady	86,315	1.61	2
Niagara	91,783	1.71	2
Suffolk	92,208	1.72	2
Nassau	99,520	1.85	2
Chautauqua	106,861	1.99	2
Total Group 2	893,191	16.63	20
Group 3:			
Orange	108,226	2.01	2
Rensselær	115,575	2.15	2
Oneida	144,776	2.69	2
Albany	169,090	3.15	3
Onondaga	194,470	3.62	3
Westchester	273,069	5.08	4
Monroe	280,875	5.23	5
Queens	351,093	6.53	6
Bronx	493,134	9.18	8
Erie	506,983	9.44	8
Kings	1,441,221	26.81	24
New York	1,472,284	27.39	24
Total Group 3	5,550,796	103.28	91
Grand Total	8,059,515	150.00	150

The provisions of the constitution require that each of the 39 counties in Group 1 shall receive one member of assembly, each of the 10 counties in Group 2 shall receive two and each of the 12 counties in Group 3 shall receive two or more.   This disposes of 39 plus 44, or 83, members and leaves 67 of the 150 to be apportioned among the 12 populous counties of Group 3.   The sum of the ratios for these 12 counties is 103.28 and, if from this sum the 24 already assigned to them be deducted, the remainder, 79.28, shows the number which would fall to them if citizen population were the only element considered in apportionment.   The difference between this number and the 67 to be assigned them, which is 12.28 members, measures the extent to which the counties in Group 3 suffer from the fact that not only the citizen population but also the county as an area or administrative unit is considered in state apportionment.   On the basis of population alone the 39 small counties in Group 1 should receive 30.09 members of assembly and do receive 39; on the same basis the 10 counties of intermediate size in Group 2 should receive 16.63 assemblymen and do receive 20, the difference between 46.72 and 59,

which is 12.28 members of assembly, the amount by which Group 1 and Group 2 are overrepresented, being exactly equal to the under-representation of the more populous counties in Group 3.

The next step in solving the problem is to apportion these 67 additional members among the 12 counties in Group 3. If the ratio already established for the state as a whole, 53,730, is accepted and a member of assembly assigned for each unit or major fraction in the series of quotients, this would apportion 79 additional assemblymen to Group 3, or 12 more than are available. To reduce this number by 12, the ratio used as a divisor for the counties in Group 3 is gradually increased. As a result the quotient for each county gradually falls. When the ratio rises above 54,014 Queens County loses its seventh member; when it rises above 54,386 Kings County loses its twenty-seventh member and so on, until at 61,000 New York and Kings Counties have each lost three members and Erie, Bronx, Queens, Westchester, Onondaga and Oneida have each lost one, or a total of twelve, as appears in the following table for Group 3:

County	Population excluding aliens, 1915	Population divided by 61,000	Final apportion-ment
Orange	108,226	1.78	2
Rensselær	115,575	1.90	2
Oneida	144,776	2.37	2
Albany	169,090	2.77	3
Onondaga	194,470	3.19	3
Westchester	273,069	4.48	4
Monroe	280,875	4.60	5
Queens	351,093	5.76	6
Bronx	493,134	8.09	8
Erie	506,983	8.31	8
Kings	1,441,221	23.70	24
New York	1,472,284	24.20	24
Total	5,550,796	91.15	91

This analysis shows that, to carry out the constitutional provisions affecting the apportionment of members of assembly, two ratios or two numbers of citizens to each assemblyman must be used, the first found by dividing the citizen population of the state by 150 and used for the counties in Group 1 and Group 2 and the second and larger ratio, found by trial, and used for the more populous counties in Group 3. The size of this second ratio is fixed by the requirement that it must yield for the group of counties in Group 3 on page 4, each having at least twice as many citizens as the average state ratio, a number of members sufficient when added to those falling to the smaller counties to give the total of 150 prescribed by the constitution.

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The method thus described is a modification of that introduced into the practice of the United States in 1910 for the purpose of apportioning members of the House of Representatives; it meets exactly the terms of the State Constitution and in this instance it agrees perfectly with the results which were reached by the method employed in the legislative committee and accepted as a basis for the apportionment law recently passed.[2] This method is a purely numerical one and cannot in any case leave any scope for the exercise of legislative discretion in the apportionment of assemblymen to the several counties.

The Apportionment of Senators

The provisions of the State Constitution regarding the apportionment of Senators are as follows:

"The Senate shall consist of fifty members except as hereinafter provided. * * * The state shall be divided into fifty districts to be called senate districts each of whom shall choose one senator. * * * The said districts shall be so altered by the Legislature at the first regular session after the return of every enumeration th at each senate district shall contain as nearly as may be an equal number of inhabitants, excluding aliens, and be in as compact form as practicable * * *. and shall at all times consist of contiguous territory and no county shall be divided in the formation of a senate district except to make two or more senate districts wholly in such county. * * * No county shall have four or more senators unless it shall have a full ratio for each senator. No county shall have more than one-third of all the senators and no two counties or the territory thereof as now organized which are adjoining counties or which are separated only by public waters shall have more than one-half of all the senators. The ratio for apportioning senators shall always be obtained by dividing the number of inhabitants excluding aliens by fifty and the senate shall always be composed of fifty members except that if any county having three or more senators at the time of any apportionment shall be entitled on such ratio to an additional senator or senators such additional senator or senators shall be given to such county in addition to the fifty senators and the whole number of senators shall be increased to that extent."

Under these provisions the first process is to divide the citizen population by fifty in order to get the ratio for apportioning senators. According to the state enumeration of 1915, the citizen population was 8,059,515, a number which divided by 50 gives 161,192 as the average number of citizens to each senator. The next step is to determine whether the conditions warrant a continuance of the present size of the Senate at 51, a further increase in that size or a return to 50 members.

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[2]Laws of 1916, chap. 373.

This question has recently been answered by a unanimous decision of the New York Court of Appeals[3] holding that the Senate must continue to have 51 members. The argument by which this conclusion is supported is necessarily somewhat statistical in character. In view of that fact I may be allowed to express the opinion that it includes some weak links, but, as the final authority nas spoken, I shall not turn aside from my main object by attempting to point them out.

The next question for consideration is whether any exception can be made in the new apportionment to the provision that the Senate "districts shall * * * at all times consist of contiguous territory," or more specifically, whether Richmond County can be put in the same Senate district with any other county in the state. This question was not argued before the court or mentioned in its opinion. The only counties in the state which can be deemed "contiguous" to Richmond are Kings and New York and it cannot be joined with either because of the provision already quoted that "no county shall be divided * * * except to make two or more Senate districts wholly in such county." The same objection would lie to joining Richmond with Queens or Bronx, even if counties separated not only by at least eight miles of water but also along the land by another New York County could fairly be called "contiguous." The only counties in that part of the state with one of which Richmond could constitutionally be joined are Nassau, Suffolk or Rockland, no one of which can be deemed "contiguous" in any other than a strained and technical sense. The constitutional provision that each Senate "district * * * shall at all times consist of contiguous territory" appeared for the first time in the Constitution of 1846 and applied then to future alterations of Senate districts by the legislature at the first session after the return of every decennial enumeration. Consequently, a provision in the Constitution of 1846 whereby Suffolk and Queen Counties were combined with Richmond into Senate District No. 1 did not controvene the contiguity requirement. But when a statutory apportionment was made in 1857[4] the law followed the constitutional precedent rather than the constitutional mandate by again combining Richmond with Suffolk and Queens. The same precedent was followed also in 1866[5]. I am unable to see how the treatment of Richmond County in these statutory apportionments is to be reconciled with the terms of the Constitution and believe that in

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[3]Matter of Dowling, 218 N. Y. 44 (1916).
[4]Laws of 1857, chap. 339.
[5]Laws of 1866, chap. 805.

both cases the laws might have been successfully impeached in the courts, had the constitution then contained the provision for court appeal introduced in 1894. In 1879[6] Richmond County was by statute joined with part of New York County and in 1892[7] with part of Kings County to make Senate District No. 6. These are contiguous counties and the present constitutional prohibition upon such a combination, namely, "no county shall be divided * * * except to make two or more Senate districts wholly in such county," did not appear in the constitution until 1894 and then applied only to legislative reapportionments. Under the terms of that constitution, Richmond County was placed with Suffolk in Senate District No. 1.

Whether this series of precedents beginning in 1846 under which Richmond County has six times been combined with some non-contiguous county justifies the continuance of the practice in the teeth of the constitutional provision is apparently open to doubt. Placing Richmond in the same Senate district with non-contiguous counties, as the constitutions of 1846 and 1894 did, is not strictly inconsistent with the other provision in the same documents requiring all Senate districts to consist of contiguous territory because the latter applies only to cases of legislative reapportionment. The apportionment law of 1906 was declared unconstitutional but on other grounds. Whether the laws of 1857, 1866, 1907 and 1916 were constitutional in their treatment of Richmond County seems to me doubtful and that although the Court of Appeals stated in 1907, "In view of the construction placed on the Constitution by constitutional and legislative provisions it should be held that the county of Richmond is exempt from the constitutional provision requiring that Senate districts be composed of contiguous territory."[8]

I am unable to see why a specific constitutional provision binding on the state legislature should be held inapplicable to a particular case on the ground that the constitution itself had not followed that policy in the case in question. For this there are two reasons. First, a constitutional apportionment which must be laid before the voters for approval may override restrictions imposed upon the legislature; and, secondly, a specific mandate of the constitution binding on the legislature and on it alone should not be substantially qualified by the action of a constitutional convention.

Passing from these technical considerations to others which are more substantial,

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[6]Laws of 1879, chap. 208.
[7]Laws of 1892, chap. 397.
[8]Sherrill v. O'Brien, 188 N. Y. 208 (1907).

1. That the equitable, as distinguished from the legal or constitutional, claim of Richmond County to a senator has been steadily strengthening is shown by the following figures:

DATE OF STATE CENSUS						
	1855	1865	1875	1892	1905	1915
Per Cent. that the Citizen Population of Richmond County made of the Average Citizen Population to a Senator......................................	29	35	37	40	47	53

Richmond County in 1915 for the first time had more than one-half the average citizen population to one senator.

2. Richmond County is now a part of New York City. Other provisions of the State Constitution discriminate against New York City or parts of it: (a) by disregarding all aliens, (b) in the case of New York and Kings Counties by disregarding all fractions, however large, (c) by providing that no county shall have more than one-third and no two contiguous counties more than one-half of all the senators. To apply those provisions rigidly and ignore the only provision in the constitution which favors any county in New York City seems a biassed and indefensible procedure.

3. Probably the most common lines of cleavage between local interests in the legislature are those between city and country in general or between New York City and the rest of the State. In 1846 Richmond County was distinctly a rural area, but now it is predominantly an urban or suburban area, and as such its interests are likely often to run counter to those of a rural county like Rockland or Suffolk. It seems unwise, therefore, to bind together counties with such divergent interests.

For these reasons I am disposed to believe that, if the issue had been clearly raised and well argued, the Court of Appeals might have decided that Richmond County is entitled to a senator as a matter of constitutional right.

But the highest court has decided by implication and without argument that Richmond County and Rockland County may constitutionally be joined into one Senate District. As my main object is to ascertain whether this law conforms to sound statistical principles, I accept their judgment and assume from now on that Rockland and Richmond Counties should be conjoined in one district and that the Senate should have 51 members, although on both points I still feel some doubt.

The next step is to apportion so many of the 51 senators as can be apportioned with certainty because regarding them the constitution leaves no room for the exercise of legislative discretion. If the population of each county is divided by one fiftieth of the citizen

population of the state, or 161, 192, the quotients for the most populous counties and the number of senators to which each is entitled are as follows:

County	Population Divided by 161,192	Senators Apportioned
New York	9.13	9
Kings	8.94	8
Erie	3.15	3
Bronx	3.06	3
Queens	2.18	2
Monroe	1.74	2
Westchester	1.69	2
Onondaga	1.21	1
Albany	1.05	1
Richmond & Rockland	0.79	1
Nassau and Suffolk	1.19	1
	34.13	33

As Suffolk County is contiguous only to Nassau, and Nassau is contiguous only to Suffolk, Queens and possibly Westchester, Nassau and Suffolk must either be combined into one Senate district or each of them made a separate district. The latter procedure would sin flagrantly against .the Constitution, which requires in each Senate district " as nearly as may be an equal number of inhabitants excluding aliens." Accordingly there is no room for the exercise of legislative discretion in assigning 33 senators to these 13 populous counties. On citizen population alone they would be entitled to 34 senators, but under the Constitution they receive 33. The other 18 senators will go to combinations of the other 49 counties. The citizen population of these 49 counties is 2,558,421, which divided by 18 gives 142,135 as the average population per senator. If the citizen population of each of these counties is divided by 142,135, the series of quotients shown in the following table (p. 11) will indicate the fraction of a senator to which each of the counties was entitled by its citizen population.

The problem of further apportionment is apparently the problem of so combining contiguous counties as that the resulting series of fractions for each Senate District shall differ as little as possible from unity, or in the words of the constitution "that each Senate District shall contain as nearly as may be an equal number of inhabitants excluding aliens." If this provision of the constitution is to be deemed mandatory, or in words quoted with approval by the Court of Appeals regarding another constitutional provision is an "ironclad rule," then the other constitutional provision regarding compactness

County	Population Divided by 142,135
Oneida	1.019
Rensselær	.813
Orange	.761
Chautauqua	.752
Niagara	.646
Schenectady	.607
Dutchess	.591
Broome	.585
St. Lawrence	.585
Steuben	.572
Ulster	.563
Jefferson	.526
Oswego	.501
Cattaraugus	.474
Cayuga	.434
Saratoga	.413
Chemung	.400
Herkimer	.396
Montgómery	.366
Ontario	.365
Wayne	.353
Otsego	.332
Clinton	.318
Washington	.315
Delaware	.313
Franklin	.301
Fulton	.297
Columbia	.286
Madison	.281
Allegany	.278
Genesee	.259
Chenango	.251
Livingston	.251
Sullivan	.247
Tompkins	.245
Warren	.223
Wyoming	.222
Orleans	.221
Essex	.218
Greene	.204
Cortland	.203
Tioga	.177
Lewis	.174
Seneca	.168
Schoharie	.158
Yates	.128
Schuyler	.095
Putnam	.083
Fulton	.030
	18.000

is subsidiary to it. Let us first test in the way I have outlined the apportionment provided by the law which has just been held unconstitutional.

SENATE DISTRICTS UNDER LAW OF 1916, SHOWING RATIO OF
POPULATION TO DISTRICT AVERAGE

Senate District	Counties	RATIO		VARIATION FROM AVERAGE	
		For County	For District	Excess	Shortage
27	Sullivan	0.247			
	Orange	0.761	1.008	0.008	
28	Putnam.................	0.083			
	Dutchess...............	0.591			
	Columbia	0.286	0.960		0.040
29	Ulster	0.563			
	Greene	0.204			
	Delaware	0.313	1.080	0.080	
31	Rensselaer	0.813	0.813		0.187
32	Saratoga	0.413			
	Schenectady	0.607	1.020	0.020	
33	Clinton	0.318			
	Essex	0.218			
	Warren	0.223			
	Washington	0.315	1.074	0.074	
34	St. Lawrence	0.585			
	Franklin	0.301	0.886		0.114
35	Lewis..................	0.174			
	Herkimer	0.396			
	Hamilton	0.030			
	Fulton	0.297	0.897		0.103
36	Oneida	1.019	1.019	0.019	
37	Jefferson	0.526			
	Oswego	0.501	1.027	0.027	
39	Otsego	0.332			
	Madison	0.281			
	Montgomery	0.366			
	Schoharie	0.158	1.137	0.137	
40	Cortland	0.203			
	Broome	0.585			
	Chenango	0.251	1.039	0.039	
41	Schuyler	0.095			
	Tompkins	0.245			
	Chemung	0.400			
	Tioga....	0.177	0.917		0.083
42	Cayuga	0.434			
	Seneca	0.168			
	Wayne	0.353	0.955		0.045
43	Ontario	0.365			
	Yates..................	0.128			
	Steuben................	0.572	1.065	0.065	
44	Genesee................	0.259			
	Wyoming	0.222			
	Allegany	0.278			
	Livingston	0.251	1.010	0.010	

SENATE DISTRICTS UNDER LAW OF 1916, SHOWING RATIO OF
POPULATION TO DISTRICT AVERAGE

Senate District	Counties	RATIO		VARIATION FROM AVERAGE	
		For County	For District	Excess	Shortage
47	Orleans	0.221			
	Niagara.................	0.646	0.867		0.133
51	Chautauqua	0.752			
	Cattaraugus	0.474	1.226	0.226	
	Total excess or shortage			0.705	0.705
	Average excess or shortage			0.064	0.101

I have tried to apportion the same number of Senators to the same
counties in such a way as to conform, if possible, more closely to the
constitutional requirement, and have reached the following results:

SENATE DISTRICTS UNDER ALTERNATIVE PLAN, SHOWING RATIO
OF POPULATION TO DISTRICT AVERAGE

Senate District	Counties	RATIO		VARIATIONS FROM AVERAGE	
		For County	For District	Excess	Shortage
27	Sullivan	0.247			
	Orange	0.761	1.008	0.008	
28	Putnam................	0.083			
	Dutchess...............	0.591			
	Columbia	0.286	0.960		0.040
29	Ulster	0.563			
	Greene	0.204			
	Schoharie	0.158	0.925		0.075
31	Rensselaer	0.813	0.813		0.187
32	Saratoga	0.413			
	Schenectady	0.607	1.020	0.020	
33	Clinton	0.318			
	Essex	0.218			
	Warren	0.223			
	Washington	0.315	1.074	0.074	
34	St. Lawrence	0.585			
	Franklin	0.301			
	Lewis..................	0.174	1.060	0.060	
35	Herkimer	0.396			
	Hamilton	0.030			
	Fulton	0.297			
	Montgomery	0.366	1.089	0.089	
36	Oneida	1.019	1.019	0.019	

SENATE DISTRICTS UNDER ALTERNATIVE PLAN, SHOWING RATIO
OF POPULATION TO DISTRICT AVERAGE

Senate District	Counties	RATIO		VARIATIONS FROM AVERAGE	
		For County	For District	Excess	Shortage
37	Jefferson	0.526			
	Oswego	0.501	1.027	0.027	
39	Otsego	0.332			
	Chenango	0.251			
	Madison	0.281			
	Cortland	0.203	1.067	0.067	
40	Broome	0.585			
	Delaware	0.313	0.898		0.102
41	Schuyler	0.095			
	Tompkins	0.245			
	Chemung	0.400			
	Tioga.................	0.177	0.917		0.083
42	Cayuga	0.434			
	Seneca	0.168			
	Wayne	0.353	0.955		0.045
43	Ontario	0.365			
	Yates.................	0.128			
	Livingston	0.251			
	Genesee...............	0.259	1.003	0.003	
44	Wyoming	0.222			
	Allegany	0.278			
	Steuben...............	0.572	1.072	0.072	
47	Orleans...............	0.221			
	Niagara...............	0.646	0.867		0.133
51	Chautauqua .:.........	0.752			
	Cattaraugus	0.474	1.226	0.226	
	Total excess or shortage			0.665	0.665
	Average excess or shortage			0.060	0.095

It is clear that the second of these two apportionments conforms more closely than the first to the requirement of the constitution "that each Senate District shall contain as nearly as may be an equal number of inhabitants excluding aliens." If so, the first is apparently open to attack as unconstitutional.

In view of the importance of this conclusion, another method of presenting essentially the same argument may be ventured.

In these 49 counties, in which alone the legislature is given any discretion under the constitution, the average citizen population to each senator is 142,135. In the two apportionments to be compared there are 11 districts which agree. The other seven districts show the following variations from the standard.

SENATE DISTRICTS SHOWING VARIATIONS FROM THE AVERAGE
DISTRICT POPULATION

Districts Under Law of 1916

Senate District	Counties	POPULATION		VARIATION FROM AVERAGE	
		Of County	Of Senate District	Excess	Shortage
29	Ulster	79,957			
	Greene	28,960			
	Delaware	44,422	153,339	11,204	
34	St. Lawrence	83,153			
	Franklin	42,718	125,871		16,264
35	Lewis...............	24,751			
	Herkimer	56,332			
	Hamilton	4,295			
	Fulton	42,166	127,544		14,591
39	Otsego	47,241			
	Madison	39,954			
	Montgomery	52,037			
	Schoharie	22,440	161,672	19,537	
40	Cortland	28,851			
	Broome	83,216			
	Chenango	35,733	147,800	5,665	
43	Ontario	51,870			
	Yates..............	18,256			
	Steuben............	81,326	151,452	9,317	
44	Genesee............	36,826			
	Wyoming	31,546			
	Allegany	39,454			
	Livingston	35,717	143,543	1,408	
	Total		1,011,221	47,131	30,855
	Average excess or shortage			9,426	15,428
	Average variation		11,141		

Districts Under Alternative Plan

Senate District	Counties	POPULATION		VARIATION FROM AVERAGE	
29	Ulster	79,957			
	Greene	28,960			
	Schoharie	22,440	131,351		10,778
34	St. Lawrence	83,153			
	Franklin	42,718			
	Lewis..............	24,751	150,622		
35	Herkimer	56,332		8,487	
	Hamilton	4,295			
	Fulton	42,166			
	Montgomery	52,037	154,830		
37	Otsego	47,241		12,695	
	Chenango	35,733			
	Madison	39,954			
	Cortland	28,851	151,779	9,644	
40	Broome	83,216			
	Delaware	44,422	127,638		14,497

SENATE DISTRICTS SHOWING VARIATIONS FROM THE AVERAGE
DISTRICT POPULATION

Districts Under Alternative Plan

Senate District	Counties	POPULATION		VARIATION FROM AVERAGE	
		Of County	Of Senate District	Excess	Shortage
43	Ontario	51,870			
	Yates...............	18,256			
	Livingston	35,717			
	Genesee.............	36,826	142,669	534	
44	Wyoming	31,546			
	Allegany	39,454			
	Steuben.............	81,326	152,326	10,191	
	Total		1,011,221	41,551	25,275
	Average excess or shortage			8,310	12,638
	Average variation		9,547		

In the apportionment contained in the law the average departure
from the standard on the upper side is 9,426, and on the lower side is
15,428, or on both sides it is 11,141. In the substitute proposed the
average departure on the upper side is 8,310 and on the lower side is
12,638, or on both sides it is 9,547. In other words, the average
departure in the apportionment here suggested is only five-sixths
of that in the apportionment made by the law. Clearly, then, the
substitute apportionment conforms to the constitutional requirement
"that each Senate District shall contain as nearly as may be an equal
number of inhabitants" better than the apportionment enacted by
the legislature.

In the course of the preceding analysis two objections have been
developed to the constitutionality of a new apportionment law in
which only such defects in the old law are remedied as have been
pointed out by the Court of Appeals.

1. To combine Richmond County with Rockland County into a
single Senate district is of doubtful legality.

2. To combine the 49 smaller counties into 18 Senate districts as
the law of 1916 provides, when one other series of combinations at
least makes the districts more nearly equal in population, is of doubt-
ful legality.

There is a third ground for questioning at least the social justice,
if not the constitutionality, of any apportionment resting upon the
state enumeration of 1915. This is the fact that the accuracy of that
enumeration in New York City and especially in the Borough of
Manhattan has been questioned by many competent judges. The

following figures suggest the reason for the doubt. The most recent
censuses of New York City before 1915 were taken in 1905 by New
York State and in 1910 by the United States. Both were excellently
managed and neither has ever been suspected of serious error. The
results reached in the several counties of New York (or boroughs, as
Manhattan and the Bronx were at both dates) were as follows:

County	POPULATION IN		INCREASE 1905–1910	
	1905	1910	Amount	Per Cent.
New York	2,122,380	2,331,542	209,162	9.8
Kings	1,358,686	1,634,351	275,665	20.3
Queens	198,240	284,041	85,801	43.3
Bronx	271,630	430,980	159,350	58.7
Richmond	72,845	85,969	13,124	18.0
Total.................	4,023,781	4,766,883	743,102	18.5

From the foregoing figures the probable population of each county
in 1915 may be estimated by either of two simple methods: first,
by adding to the population of each county in 1910 the amount by
which it increased between 1905 and 1910, as shown in the third
column; and, secondly, by assuming that each borough increased
1910–1915 by the same per cent. that it did 1905–1910, as shown in the
fourth column. The former, or arithmetical method, at least until
recently, has yielded results in the United States as a whole closer
than any other to the figures revealed by subsequent enumerations,
and because of that fact it is rightly preferred by the federal govern-
ment. The latter method has been found more accurate for New York
City since the Civil War and because of that fact it is preferred by the
city government. We may disregard the fact that the interval
between the censuses of 1905 and 1910 was only 4⅞ years and that
between the censuses of 1910 and 1915 was 5⅛ years, because to
introduce that refinement would only increase the discrepancy
between the estimate and the census results and we are concerned
here with nothing more than a rough measure of the probable error.
In the following table (p. 18) the results from each method of estima-
tion are compared with those of the state enumeration of 1915.

The differences between the estimate reached by either method
and the census results are startling. If we accept the more conserva-
tive figures, the state enumeration has undercounted the population
of New York City by not far from 500,000.

The presumption in favor of a count is far too strong, however, to
be rebutted by this evidence alone. The question may be probed

County	POPULATION IN 1915 ESTIMATED BY METHOD OF		Population in 1915 according to Enumeration	DIVERGENCE OF ENUMERATION FROM METHOD OF	
	Constant Amount	Constant Rate		Constant Amount	Constant Rate
New York.........	2,540,704	2,560,033	2,137,747	—402,957	—422,286
Kings	1,910,016	1,966,124	1,798,513	—111,503	—167,611
Queens	369,842	407,031	396,727	+ 26,885	— 10,304
Bronx	590,330	683,965	615,600	+ 25,270	— 68,365
Richmond.........	99,093	101,443	98,634	— 459	— 2,809
Total	5,509,985	5,718,596	5,047,221	—462,764	—671,375

further by examining the annual figures of births, marriages and deaths in the several counties. Probably no American city and perhaps no city anywhere has a more effective Department of Health than New York. The death rate in nearly every large city is falling rapidly. This is true of New York as a whole and of every borough with the exception that, if the enumeration of 1915 was correct, the death rate of New York County was 16.6 in 1910 and 17.2 in 1915. The figures for births and marriages tell the same story and concur in discrediting the census.

It is a commonplace among statists that to count the population of New York City and especially of its most congested districts is a task perhaps more difficult than any other census problem. The federal census of 1890 failed at the same point and in the same way. A careful examination of the results of that census which I made in 1897 led to the unexpected conclusion that the census for the country as a whole was accurate or more specifically was within one per cent. of the truth, but that in New York City about 100,000 residents had been omitted, the error there amounting to at least six per cent. That conclusion has been strengthened by subsequent evidence.

The present situation in New York City is apparently similar, the state census outside of New York City was accurate but within New York City it omitted perhaps as many as 400,000 persons. In partial explanation of the result it may not be invidious to point out that taking an accurate census is a difficult technical problem and no one connected with the state count of 1915 in a responsible way had any previous knowledge of the problem by which the state was faced and of the technical difficulties with which it bristled.

This conclusion is supported by the recent decisions of the Federal Census Bureau, the New York State Department of Health and several of the New York City departments, including the Department of Health, to reject the figures of the state enumeration relating to New York City.

If my conclusion is correct, any system of apportioning senators and assemblymen based upon the results of the count of 1915 will deprive New York City for ten years to come of about two senators and six assemblymen to which under a complete enumeration it would be entitled.