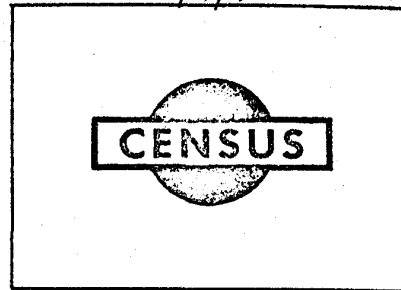


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In response to requests from newsmen and other interested persons concerning the method of reapportionment of seats in the House of Representatives, Dr. Conrad Taeuber, Associate Director, Bureau of the Census, has written the following explanation.

REAPPORTIONMENT

Once every ten years the country faces the task of reapportionment-- that is, of determining how many seats each State should have in the House of Representatives. The Founding Fathers determined that Representatives were to be apportioned among the several States according to their respective numbers. Accordingly an enumeration has taken place once every 10 years, providing a sound basis for Congressional apportionment.

In the early years it was a relatively easy matter to make the periodic adjustment, in part by increasing the size of the House of Representatives. However, the size of the House has been held at 435 since 1912, with temporary exceptions when Hawaii and Alaska were admitted as States.

The problem is one of determining how most equitably to distribute the 435 seats among States which range in population from the 20 million of California to Alaska's 304 thousand. The Constitution provides that each State is entitled to at least one seat, regardless of its size. Thus, the first 50 seats are fixed. The question then is how to divide the other 385 in such

a way that the percentage difference in the population per Representative in any pair of States will be at a minimum.

A State either gets a second seat in the House, or it doesn't; there is no way of assigning a fractional Representative to a State, or of giving a Representative a fractional vote. Nor is there any way by which two States could share the same Representative.

There are a number of ways of distributing the 385 seats among the 50 States in the most equitable manner. Over the years, different ones have been tried. In 1941 the Congress adopted the method of equal proportions as the one to be followed thereafter. This method had been recommended by a Committee of the National Academy of Sciences which had been established at the request of Speaker of the House, Nicholas Longworth. It filed its report in 1929. The Committee pointed out that if fractional voting were permitted, each Congressman having a number of votes in proportion to the number of persons he represents, the matter would be a simple one. Since this is not the case, a method other than simply dividing the population of the State by the average number of persons per Representative would be required. The mathematical method known as the method of equal proportions was recommended by the Committee as the most equitable one. By this method, the proportional differences in the number of persons per Representative for any pair of States is at a minimum. They also felt that this method would be fair to the larger as well as the smaller States.

Priority Values

Making the computation is a relatively simple and straightforward

matter. The problem is to determine whether a given State is entitled to a second, third, etc., seat-- the first having been assigned automatically. In making this computation, the apportionment population of the State is multiplied by a decimal fraction which is given as $\frac{1}{\sqrt{n(n-1)}}$ ("n" is the number of seats for the State). The result of this multiplication is a number, which is called a priority value. For 1970, the priority value for the second seat for California is determined by multiplying the apportionment population, 20,098,863 by $\frac{1}{\sqrt{2(2-1)}}$ (or 0.707 10678). The result is 14,212,042. The computation is then done for New York, which involves multiplying New York's 18,287,529 by this same factor, 0.707 10678. The result is 12,931,236. This operation is repeated for every State. The result for Alaska is 215,008. To determine the priority value for the strength of California's claim to a third seat, one multiplies the population of the State by $\frac{1}{\sqrt{3(3-1)}}$ (or .408 24829). The result is a priority value of 8,205,326. This process can be repeated for every State for any desired number of seats. Thus, to determine the strength of California's claim to a 40th seat, the multiplier is $\frac{1}{\sqrt{40(40-1)}}$ (or .025 31848); the resulting priority value is 508,873. The priority value determines the strength of a State's claim to a second, third, fourth, etc., additional seat.

Obviously it will not be necessary to determine the strength of Alaska's claim to a 40th seat. The lowest priority value which is likely to establish a claim to a seat is in the vicinity of 470,000. This is approximately the average number of persons in the total population per seat in a House with

435 seats.

When the necessary priority values for all the States have been computed, they are arrayed in order, by size. California, with the largest priority value for a second seat, gets that seat, which is number 51 for the entire House. New York comes next in line with a second seat, which is number 52.

The first 10 and last 10 priority values and the States involved are:

<u>Size of House</u>	<u>State</u>	<u>Size of State Delegation</u>	<u>Priority Value</u>
51	California	2	14212042
52	New York	2	12931236
53	Pennsylvania	2	8403479
54	California	3	8205326
55	Texas	2	7989449
56	Illinois	2	7908509
57	Ohio	2	7587397
58	New York	3	7465852
59	Michigan	2	6319552
60	California	4	5802042

426	Michigan	19	483268
427	Texas	24	480908
428	South Carolina	6	477855
429	Ohio	23	477016
430	South Dakota	2	476058
431	Illinois	24	476036
432	New York	39	475041
433	Florida	15	473088
434	California	43	472947
435	Oklahoma	6	472043

Seat number 435 goes to Oklahoma. It is the 6th seat for the State. If the size of the House were only 60, California would have 4 seats; New York 3; Illinois, Michigan, Ohio, Pennsylvania, and Texas would each have 2, and

all other States would have only 1. By extending the computation, it becomes apparent that Oregon with an apportionment population of 2,110,810, has a priority value of 471,991 for its 5th seat. This would be seat number 436 in the House, and, therefore, Oregon does not get that seat. The question may well be asked whether this is fair in terms of the criterion set out, namely that the percentage difference in population per Representative should be the smallest possible for any pair of States.

Some Two-State Comparisons

Interest has been expressed in relation to the apportionment to Oklahoma and Connecticut. With 6 seats for Oklahoma, the average number of persons per Representative is 430,914. Connecticut also has 6 seats; its average is 508,449, which is 17.99 percent higher than the average for Oklahoma. If a seat were taken from Oklahoma and given to Connecticut, the difference in the number of persons per Representative would be 18.65 percent.

Another example: With 4 seats, Oregon has 527,702 persons per Representative. This is 22.46 percent greater than the average for Oklahoma. However, if a seat were taken from Oklahoma and given to Oregon, the difference would be 22.48 percent, which is slightly larger. In these instances the differences are not large, but the apportionment as reported yields a smaller difference than those for the arbitrary assignment used in this example.

As computed, California receives 43 seats, New York receives 39. The difference in the number of persons per Representative is less than 1 percent. However, if California were to receive only 42, while New York received 40, the difference would be 4.67 percent.

South Dakota receives 2 seats; North Dakota receives only 1. The difference is 85.2 percent. However, if the situation were reversed, North Dakota receiving 2 and South Dakota receiving only 1, the difference would be 115.72 percent.

In each of these comparisons the test is met; that is, the proportional difference between the numbers per Representative is smaller for the apportionment as computed than would be the case with the alternatives listed. A similar comparison could be carried out in relation to the number of Representatives per million of the population, and the results would be the same.

Persons per Representative

The fact that each State receives at least one seat regardless of its population size means that there will be some inequality among the States in respect to the number of persons per Representative. In the smaller States this number varies from 304,067 for Alaska to 624,181 for North Dakota. As the number of seats in a State is increased, the average number of persons per Representative approaches the national average. Among the States entitled to 10 or more seats, the average ranges only between 457,000 and 480,000.