Pick a Number, Any Number: State Representation in Congress After the 2000 Census

Paul H. Edelman† & Suzanna Sherry‡

The Y2K bug was not the year 2000's only claim to fame. The United States Constitution requires a census, and subsequent reapportionment of Congress, every ten years,[1] and thus we are once again faced with the apportionment follies. The most well-known act in this decennial struggle between law and mathematics is the battle that begins in every state legislature and ultimately spills over into the federal courts: drawing up districts in each state that are consistent not only with the one-person-one-vote principle of *Reynolds v. Sims*,[2] but also with the perceived needs of interest groups and incumbents. That the state of North Carolina has made four trips to the Supreme Court as a result of the 1990 round of reapportioument shows both the complexity and the staying power of this particular problem.[3]

The requirement of a decennial reapportionment also raises another issue, less well-known but perhaps even more interesting. Although the Constitution says that the seats in the House of Representatives must be apportioned among the states according to population, it does not specify the method of apportionment except to command that each state have at least one representative.[4] Figuring out how to allocate the 435 seats among the states, however, is not a trivial matter. Over the past two centuries Congress has used four different methods to allocate representation among the states, and each method produces quite different results.

As is to be expected, the size of a state's representation in Congress can be a contentious issue. Utah has already filed a federal lawsuit

---

† Professor of Mathematics and Professor of Law, Vanderbilt University.

‡ Cal Turner Professor of Law and Leadership, Vanderbilt University. We thank Daniel A. Farber, Steven Hetcher, and Kent Syverud for comments.

1. U.S. CONST. art. 1, § 2, cl. 3.
2. 377 U.S. 533 (1964).
3. *See* Hunt v. Cromartie, 532 U.S. 234 (2001); Hunt v. Cromartie, 526 U.S. 541 (1999); Shaw v. Reno, 509 U.S. 630 (1993); Shaw v. Hunt, 517 U.S. 899 (1996).
4. *See* U.S. CONST. art. I, § 2, cl. 3.

challenging its 2000 congressional allocation on the ground that the census regulations unfairly excluded some Utah citizens temporarily living overseas.[5] The House has agreed to delay certification of the seat, which would otherwise go to North Carolina, until the Supreme Court can rule on the question.[6] Similar issues will certainly arise again in 2010. In addition to this challenge, various scholars have questioned the fairness of Congress's current method of allocation.[7] The purpose of this Essay is to calculate, using the 2000 census figures, the number of representatives to which each state would be entitled under each of the methods used by Congress at one time or another. The patterns that emerge might help shape the ensuing debate over which method is the most satisfactory.

A brief history of apportionment in the House and a basic description of each of the four methods used may be useful as background.[8] Each of the four methods starts with the basic principle that a state's fraction of the House seats should be the same as its fraction of the total United States population. Unfortunately, however, performing the simple calculation that will yield that ratio, (*state population ÷ total population*) x *total House size*, rarely yields a whole number, and will almost certainly not yield a whole number for every state. Since one cannot allocate a fraction of a representative, this "perfect" but fractional number of representatives must be rounded into a number of actual whole people.[9] The four methods each provide different instructions for carrying out this rounding.

5. Michael Janofsky, *Utah, in Census War, Fights North Carolina for House Seat*, N.Y TIMES, Feb. 8, 2001, at A18. As this Essay went to press, the Supreme Court affirmed a lower court ruling against Utah. Utah v. Evans, 70 U.S.L.W. 3147 (Nov. 26, 2001).

6. *Id.*

7. *See* MICHEL L. BALINSKI & H. PEYTON YOUNG, FAIR REPRESENTATION: MEETING THE IDEAL OF ONE MAN, ONE VOTE 67-70 (2d ed. 2001); DONALD G. SAARI, GEOMETRY OF VOTING 317 (1994); Garrett Birkhoff, *House-Monotone Apportionment Schemes*, 73 PROC. NAT'L ACAD. SCI. USA 684-86 (1976); *see also* Book Note, 82 MICH. L. REV. 1028, 1032 (1984) (reviewing a previous edition of BALINSKI & YOUNG, *supra*, and suggesting that "Congress would do well to take note" of their proposal). The Supreme Court has indicated that the method of apportionment is largely within Congress's discretion. *See* United States Dep't of Commerce v. Montana, 503 U.S. 442, 464 (1992) ("[Congress's] apparently good-faith choice of a method of apportionment of Representatives among the several States 'according to their respective Numbers' commands far more deference than a state districting decision that is capable of being reviewed under a relatively rigid mathematical standard.").

8. For a more detailed history of congressional struggles with apportionment, see *United States Department of Commerce v. Montana*, 503 U.S. at 447-57. *See also* Massachusetts v. Mosbacher, 785 F. Supp. 230, 244-51 (D. Mass 1992), *rev'd sub nom.* Franklin v. Massachusetts, 505 U.S. 788 (1992); BALINSKI & YOUNG, *supra* note 7.

9. "Rounding" is something of a misnomer. Contrary to one's intuition about how rounding works, the various methods can end up giving states a total number that is more than one away (either plus or minus) from their "perfect" number. Thus it is not "rounding" in the most common sense of the term. Indeed, this is a surprising feature of the various methods, and difficult to explain mathematically. An example may be found in the table at pages 219-20 (with a "perfect" representation of 52.45, California receives from 50 to 55 representatives under the various methods), and an explanation in BALINSKI & YOUNG, *supra* note 7, at 79-83.

After the 1790 census, Alexander Hamilton favored the simplest and most straightforward method. That method first rounds each state's "perfect" number of representatives down to the nearest whole number, yielding a House made up of too few representatives. Representatives are then added to each state's allocation in the order of the size of the original, rounded-away fraction, until the desired number of total representatives is reached.[10] In other words, after the initial downward rounding, the missing representatives are added back in, starting with the states whose rounded number is the furthest from their "perfect" representation. Thus a state entitled to 6.9 representatives would start with six representatives, and then get its seventh before any state whose "perfect" representation ended in a number lower than .9 received another representative. Although Hamilton persuaded Congress to adopt this method, George Washington vetoed the bill at the urging of Thomas Jefferson and convinced Congress to enact Jefferson's preferred method instead.[11]

Jefferson's method also begins, in essence, by rounding down the "perfect" number of representatives, but uses a different method of adding the missing representatives back in. Instead of adding them back in directly, depending on the size of the fraction that had been rounded off, Jefferson changed the calculation bit by bit until it yielded the desired total number of representatives.[12] Here's how it works: The "perfect" number of representatives, described above by the equation (*state population* ÷ *total population*) x *total House size*, can also be described as *state population* ÷ *average district size*.[13] The average district size, of course, is calculated by dividing the total population by the total number of representatives. The two equations yield identical numbers, but the latter description allows a different rounding method. If one slowly shrinks the average district size, one will slowly increase the number of representatives each state is entitled to. At some point along this continuum, rounding each state's representation down to the nearest whole number will produce the desired number of total representatives. Jefferson's method, however, was subject to the legitimate, and increasingly vociferous, charge that it favored large states.[14] In 1842, Congress rejected Jefferson's method as unfair.[15]

10. BALINSKI & YOUNG, *supra* note 7, at 17.

11. *Id.* at 18-21.

12. *Id.* at 18.

13. For those who have forgotten their sixth-grade arithmetic, the equation ($a \div b$) x c is equivalent to $a \div (b \div c)$. Thus, (*state population* ÷ *total population*) x *total House size* is equivalent to *state population* ÷ (*total population* ÷ *total House size*). The denominator is, as noted in the text, the average district size. Thus, *state population* ÷ *average district size* is equivalent to (*state population* ÷ *total population*) x *total House size*.

14. *See* BALINSKI & YOUNG, *supra* note 7, at 13, 23. Jefferson's method favors large states because they lose a smaller percentage of their total "perfect" representation when the fractional part of it is rounded away. For example, .3 is almost 10% of 3.3 but only about 3% of 10.3.

15. *Id.* at 34-35.

The next method of allocating representatives had an equally illustrious parentage and an even shorter life. Daniel Webster devised, and Congress adopted, a method that treated small and large states equally by changing the rounding formula once again.[16] Under Webster's method, each state's "perfect" allocation is rounded either up or down, depending on whether the fraction is equal to, greater than, or less than half—the rounding method we all learned in elementary school. Depending on the exact size of each fraction, this might yield a House of Representatives that is too large, too small, or just right. If the House was smaller than desired, Webster adopted Jefferson's tactic of slowly shrinking the average district size until the total number of representatives was achieved. If the House was larger than desired, Webster simply enlarged the average district size. We leave as an exercise for the reader what happened if the initial rounding produced a House of the desired size. While Webster's method favored neither small nor large states, it still produced what were seen as discrepancies in representation; states with nearly equal population might in some cases get the same number of representatives and in some cases get different numbers. Thus, Congress tried again in 1850.

The replacement for Webster's method was actually not new: it was simply Hamilton's idea recycled by Ohio Representative Samuel Vinton.[17] It is a lovely method with but one serious flaw, known as the Alabama paradox. In 1880, Congress desired to expand the size of the House. It asked the chief clerk of the Census Office, C.W. Seaton, to calculate states' allocations for a House of various sizes between 275 and 350.[18] Using the 1880 census data, Seaton discovered a curious fact: Alabama lost a representative if the size of the House went up from 299 to 300.[19] Hamilton's method thus produced changes in representation without any changes in population, a serious problem indeed. Congress finessed the problem by choosing a number (325) that did not produce any such anomaly, and under which Hamilton's and Webster's methods reached the same apportionment.[20] The same solution was used in 1891, when the House expanded to 356.[21]

In 1901, however, politics again reared its ugly head. Using Hamilton's method, Congress considered all House sizes between 350 and 400.[22] Several states' allocations bounced around: Maine's allocation, for

16. The description of Webster's method in this paragraph is taken from BALINSKI & YOUNG, *supra* note 7, at 32.

17. *Id.* at 37.

18. *Id.* at 38.

19. For an easily understood mathematical explanation of the paradox, see BALINSKI & YOUNG, *supra* note 7, at 39.

20. *Id.* at 40.

21. *Id.*

22. The description of the struggle over the 1900 census in this paragraph is taken from BALINSKI & YOUNG, *supra* note 7, at 40.

example, was 3 at all House sizes between 350 and 382, 4 if the House contained between 383 and 385 members, back to 3 for a House size of precisely 386, and so forth. But it was Colorado's allocation that proved to be the downfall of Hamilton's method. Under every House size except 357 members, Colorado would be entitled to 3 representatives. But if the House was set at exactly 357 members, Colorado would have only 2 seats. Colorado, however, was a Populist state, and the chairman of the committee that was considering the issue was anti-Populist. The committee bill proposed expanding the House to 357.

It is safe to say that all hell broke loose. It was Maine Representative John Littlefield who railed most eloquently against the Hamiltonian method that produced such havoc: "God help the State of Maine when mathematics reach for her and undertake to strike her down!"[23] Congress expanded the size of the House to 386, and without changing Vinton's law specifying Hamilton's method, simply dictated the number of representatives allotted to each state, using Webster's method for the actual calculations.[24] Congress did essentially the same thing in 1910, specifying a House size that did not cause any state to lose a representative and performing the actual calculation using Webster's method.[25]

With Vinton's Hamiltonian method still the official guide to congressional apportionment, Congress escaped serious controversy over the 1920 census by the simple expedient of not reapportioning at all (unconstitutional, but apparently unchallenged).[26] As the 1930 census approached, however, Congress began to get nervous. With the help of Edward Huntington, a Harvard professor of mathematics, Congress and the chief statistician of the Census Bureau, Joseph Hill, came up with a refined version of Webster's method.[27]

Hill's method, also known as the method of equal proportions, follows Webster's except that the point of rounding is different. Instead of rounding up or down depending on whether the fraction is higher or lower than .5, Hill's method rounds up or down depending on whether the fraction is higher or lower than the geometric mean of the two adjacent integers.[28] One consistent effect of Hill's refinement is that it is kinder to small states. Using the 1920 census data, for example, Hill and Webster produce different allocations for six states. Hill's method gives New York, North Carolina, and Virginia each one fewer representative than Webster's does,

23. 34 CONG. REC. H591-93 (1901).

24. BALINSKI & YOUNG, *supra* note 7, at 42.

25. *Id.* at 47.

26. *Id.* at 51.

27. *Id.* at 47-50.

28. *Id.* at 48-50. The geometric mean of two numbers is the square root of their product. Thus while the mean of 4 and 5 is 4.5, the geometric mean is 4.47. Therefore Webster's method would round 4.49 down, while Hill's would round it up.

concomitantly adding a representative apiece to the allocations of Rhode Island, New Mexico, and Vermont, whose combined populations do not reach the population of Virginia, the smallest of the three states disfavored under Hill's method.[29]

In 1929, Congress passed a bill requiring the Census Bureau to provide, for the 1930 census, the apportionment figures obtained from both the Webster method and the Hill method.[30] Although the bill also gave Congress the power to choose between the two methods, in the end that provision proved unnecessary: the 1930 population produced identical apportionments under both methods.[31] Congress had dodged the bullet once more.

The 1940 census forced Congress to the test. Once again, calculations were performed using both Hill and Webster.[32] Almost but not quite identical, Hill's method gave 7 seats to Arkansas and 17 to Michigan while Webster's allocated 6 to Arkansas and 18 to Michigan. Arkansas, like the majority in both the House and the Senate, was Democratic, while Michigan tended to vote Republican. Webster never had a chance. In 1941 Congress passed, and President Roosevelt signed, a law designating Hill's as the method of choice for that and all future congressional apportionment.[33] Hill's method has been used ever since.

Thus a combination of politics, mathematics, and serendipity conspired over time to produce four different methods of apportionment, each with distinct advantages and disadvantages. Which should we choose?

The criterion for choice is simple, but its application defies solution. We should, of course, choose the system that produces the fairest allocation. But what "fair" means is a question that has bedeviled politicians and scholars alike.[34] So rather than defining fairness, we provide a comparison of the various numbers, make a few observations, and let the reader draw her own conclusions.

One last matter warrants discussion. We all unthinkingly assume that the House, unlike the Senate, is purely proportionate. That is not quite true, however; in addition to the inevitable discrepancies that arise because of rounding, the Constitution adds another wrinkle. Under all the methods except Hill's, it is possible to reach a result that entitles one or more states

---

29. *Id.* at 50.

30. *Id.* at 57.

31. *Id.*

32. The description of the events after the 1940 census in this paragraph is taken from BALINSKI & YOUNG, *supra* note 7, at 57-58.

33. *See* 2 U.S.C. § 2(a) (1994).

34. *See, e.g.*, H. PEYTON YOUNG, EQUITY IN THEORY AND PRACTICE 43-44 (1994); STEVEN J. BRAMS & ALAN D. TAYLOR, FAIR DIVISION (1996).

to no representatives at all.[35] The simplest example comes using Hamilton's method: a state whose "perfect" representation was .3 would have its representation rounded down to zero, and would be unlikely to receive an additional representative before the numbers ran out. Since that result is flatly prohibited by the Constitution, how should we remedy it?

There are two possible solutions to this "zero problem." One is simply to tinker with the results at the end to avoid the unconstitutional result. If, for example, Wyoming and Vermont end up with no representatives, we take the last two representatives allocated to other states and give them to Wyoming and Vermont instead. Thus, again using the same example, and assuming that Wyoming and Vermont are each entitled to .3 representatives, we might end up taking a representative away from each of the two states whose fractions were, say, 10.31 and 7.32, and instead give them to the two forlorn but mathematically undeserving states. All of the scholars who have previously addressed the question have assumed that this is the best way to remedy the problem.[36] But there is another solution to the problem of a state without representation: eliminate the possibility that the problem will ever arise. We can do this by first giving each state one representative, and only then calculating the apportionment of the remaining 385, using whichever method we favor.

These two responses to the zero problem will often produce dramatically different allocations, as the table below demonstrates. Using Jefferson's method of rounding, almost half the states (23) receive different allocations depending on how we accommodate the zero problem. Like the choice of methods of rounding, then, how we deal with the zero problem raises normative questions of fairness and constitutional interpretation.

While a definitive statement about the relative fairness of the two methods is as elusive as deciding which of the original methods of rounding is fairest, a few words can be said about the two solutions. The way we resolve the zero problem can be viewed as a choice between two perspectives on the constitutional guarantee that each state have at least one representative: Is it an affirmative entitlement or a backstop? That is, should we think of each state's first representative as its due, or should we think of the guarantee as a method of ensuring that no state is left without representation? There is not a sharp line between the two perspectives, but they lead us in different directions. The entitlement perspective suggests that we ought to deal out one representative to each state before we make any further allocations; the backstop perspective suggests that we need only confront the zero problem if it actually arises, and then by making the

35. The reason that Hill's method cannot result in an allocation of zero representatives to any state is that the geometric mean of 1 and 0 is 0 rather than .5. Thus, any number between 0 and 1 will be rounded to 1.

36. BALINSKI & YOUNG, *supra* note 7, at 186 nn.1, 3, 6; YOUNG, *supra* note 34, at 59.

minimum number of changes necessary to prevent the unconstitutional result.

So which is the better interpretation of the constitutional language that prohibits an allocation of zero? This, of course, is not a question that the Founding generation confronted directly. They had their hands full deciding between the Hamiltonian and Jeffersonian views, on this as well as on many other questions of constitutional significance. The disparities in population among the states were also smaller, and the likelihood of any state receiving no representatives under any method of allocation was slim. Indeed, the problem of an allocation of zero did not actually arise until the mid-nineteenth century.[37]

Nevertheless, we can draw a few tentative conclusions from the relevant constitutional language and history. The prohibition on depriving any state of representation in the House appears almost as an afterthought. No such provision appeared in the earliest draft of the Constitution, written by the Committee on Detail more than halfway through the Constitutional Convention.[38] John Dickinson of Delaware, the smallest state represented at the Convention, suggested a few days later that the phrase be added, and the delegates agreed without discussion.[39] The initial absence of any guarantee, its introduction by a delegate from a small state that might have feared losing representation, and the lack of any controversy all suggest that the clause was designed as a final safeguard rather than as a preliminary entitlement.

The language is similarly suggestive. The relevant paragraph of Article I, Section 2 begins by specifying the basic rule of proportional representation, then provides for a first census within three years and subsequent ones at least every ten years. The next sentence sets a minimum size of congressional districts—no smaller than 30,000 people—and continues, "but each State shall have at least one representative." Both the placement of the limiting language and its introduction with the word "but" suggest that the allocation of a numerically undeserved representative to a state that would otherwise have none is an exception to the Constitution's theories of

37. The first time a state's "perfect" representation (or "quota") fell below one was in 1850. That year both Florida and Delaware had a quota below one. Hamilton's method, in use at that time, ended up allocating a single representative to each state, so Congress did not need to confront the zero problem. *See* BALINSKI & YOUNG, *supra* note 7, at 162-63 (calculation performed by authors). In the 1860s, however, the application of Hamilton's method to Oregon's quota of .428 would have deprived that state of any representation. Perhaps for other reasons, Congress solved the problem by simply adding eight seats, allocating them all to Northern states (including one to Oregon). BALINSKI & YOUNG, *supra* note 7, at 37. The mathematical effect, however, was equivalent to taking one seat from Alabama and giving it to Oregon. *See* BALINSKI & YOUNG, *supra* note 7, at 162-63 (calculation performed by authors).

38. *See Notes by James Madison (Aug. 6, 1787), in* NOTES OF DEBATES IN THE FEDERAL CONVENTION OF 1787 REPORTED BY JAMES MADISON 385-96 (Adrienne Koch ed., 1966) (hereinafter *Madison's Notes*).

39. *Id.* at 413.

representation. In other words, the requirement of at least one representative per state is a protection against deprivation rather than an affirmative entitlement. Also mitigating against an entitlement theory is a glaring absence: although the Constitution provides that no state shall be deprived without its consent of its cqual suffrage in the Senate, there is no similar language regarding representation in the House.[40] Presumably, then, a later generation could amend the Constitution to dictate that a state whose population would mathematically entitle it to zero representatives could be given exactly that number. Not much of an entitlement.

Thus it seems fair to conclude that tinkering with the results at the end is a better remedy than allocating one representative to each state at the beginning. Nevertheless, in the interests of full disclosure, we have calculated apportionment both ways for Jefferson's method, which is the only method under which any state would otherwise receive no representatives for the 2000 census.[41]

With that background, we present the various 2000 allocations in the table below, and conclude with a few comments.

State	2000 Population	"Perfect" Represen-tation	Hill Method	Jefferson I	Jefferson II	Webster Method	Hamilton Method
California	33,930,798	52.45	53	55	50	53	52
Texas	20,903,994	32.31	32	33	31	32	32
New York	19,004,973	29.38	29	30	28	29	29
Florida	16,028,890	24.78	25	26	24	25	25
Illinois	12,439,042	19.23	19	20	19	19	19
Pennsylvania	12,300,670	19.01	19	19	19	19	19
Ohio	11,374,540	17.58	18	18	17	18	18
Michigan	9,955,829	15.39	15	16	15	15	15
New Jersey	8,424,354	13.02	13	13	13	13	13
Georgia	8,206,975	12.69	13	13	13	13	13
North Carolina	8,067,673	12.47	13	13	12	13	13
Virginia	7,100,702	10.98	11	11	11	11	11
Massachusetts	6,355,568	9.82	10	10	10	10	10
Indiana	6,090,782	9.41	9	9	9	9	9

40. U.S. CONST. art. V.

41. In the table that follows, "Jefferson I" refers to the method by which the allocation is tinkered with at the end, and "Jefferson II" refers to the method in which each state is given a representative and the remainder are divided according the usual Jefferson method.

Washington	5,908,684	9.13	9	9	9	9	9
Tennessee	5,700,037	8.81	9	9	9	9	9
Missouri	5,606,260	8.67	9	9	9	9	9
Wisconsin	5,371,210	8.30	8	8	8	8	8
Maryland	5,307,886	8.20	8	8	8	8	8
Arizona	5,140,683	7.95	8	8	8	8	8
Minnesota	4,925,670	7.61	8	7	8	8	8
Louisiana	4,480,271	6.93	7	7	7	7	7
Alabama	4,461,130	6.90	7	7	7	7	7
Colorado	4,311,882	6.66	7	7	7	7	7
Kentucky	4,049,431	6.26	6	6	6	6	6
South Carolina	4,025,061	6.22	6	6	6	6	6
Oklahoma	3,458,819	5.35	5	5	6	5	5
Oregon	3,428,543	5.30	5	5	6	5	5
Connecticut	3,409,535	5.27	5	5	6	5	5
Iowa	2,931,923	4.53	5	4	5	5	5
Mississippi	2,852,927	4.41	4	4	5	4	4
Kansas	2,693,824	4.16	4	4	4	4	4
Arkansas	2,679,733	4.14	4	4	4	4	4
Utah	2,236,714	3.46	3	3	4	3	4
Nevada	2,002,032	3.09	3	3	3	3	3
New Mexico	1,823,821	2.82	3	2	3	3	3
West Virginia	1,813,077	2.80	3	2	3	3	3
Nebraska	1,715,369	2.65	3	2	3	3	3
Idaho	1,297,274	2.01	2	2	2	2	2
Maine	1,277,731	1.98	2	2	2	2	2
New Hampshire	1,238,415	1.91	2	2	2	2	2
Hawaii	1,216,642	1.88	2	1	2	2	2
Rhode Island	1,049,662	1.62	2	1	2	2	2
Montana	905,316	1.40	1	1	2	1	1
Delaware	785,068	1.21	1	1	2	1	1
South Dakota	756,874	1.17	1	1	2	1	1
North Dakota	643,756	0.995	1	1	1	1	1
Alaska	628,933	0.97	1	1	1	1	1
Vermont	609,890	0.94	1	1	1	1	1
Wyoming	495,304	0.77	1	1	1	1	1

We might make a few observations about these numbers. As expected, Jefferson's method, ab initio (Jefferson I), favors large states: the five largest states gain between 1 and 3 representatives each as compared to the other basic methods.[42] Perhaps the smaller states were right to be afraid, in debates over the drafting and ratification of the Constitution, of creating an overly powerful Virginia delegation. The fear was that the large states would band together to further their common interests, trampling the smaller states as they went. As Gunning Bedford of Delaware put it:

> [The large states] insist that although the powers of the general government will be increased, yet it will be for the good of the whole; and although the three great States form nearly a majority of the people of America they will never hurt or injure the lesser states. *I do not, gentlemen, trust you.* If you possess the power, the abuse of it could not be checked; and what then would prevent you from exercising it to our destruction?[43]

Madison's response to this concern was to point out that "the States were divided into different interests not by their difference of size, but by other circumstances."[44] In other words, he argued, Virginia had more in common with little Georgia than she did with populous New York.

Comparing Jefferson's method with the current method (Hill's) gives us some anecdotal insight into this dispute. Jefferson's method adds two representatives to California's allocation, and one each to those of Texas, New York, Florida, Illinois, and Michigan, and subtracts one each from those of seven states: Minnesota, Iowa, New Mexico, West Virginia, Nebraska, Hawaii, and Rhode Island. Since 2000 was also the year of the most hotly contested election, and the closest electoral college vote, in over a hundred years, it is interesting to ask whether the results would have been different had Jefferson's allocation been in effect rather than Hill's. The answer is no. Gore would have gained 5 electoral votes—2 from California and 1 each from New York, Illinois, and Michigan—and lost 5 electoral votes—from Minnesota, Iowa, New Mexico, Hawaii, and Rhode Island. Bush would have gained 2 electoral votes—from Texas and Florida—and lost 2—from West Virginia and Nebraska. It seems that Madison was right: it's not necessarily size that determines common interests.

Notice that the strangest results occur when we adapt Jefferson's method by allocating a single representative to each state and then calculate the apportionment of the remaining 385 (Jefferson II). The largest state, California, suddenly loses 5 representatives, and its allocation is now

---

42. We exclude here the further embellishment provided by changing the way that Jefferson's method addresses the zero problem (Jefferson II).

43. DANIEL A. FARBER & SUZANNA SHERRY, A HISTORY OF THE AMERICAN CONSTITUTION 125 (1990) (quoting notes of Robert Yates as reprinted in TANSILL, DOCUMENTS ILLUSTRATIVE OF THE FORMATION OF THE UNION OF THE AMERICAN STATES, H.R. DOC. No. 398 (1st Sess. 1927)).

44. *Madison's Notes (June 30, 1787), supra* note 38, at 224.

lower than under any of the other methods. Fourteen of the smallest twenty-four states gain a representative compared to their allocation under Jefferson I, with six of them, but not the smallest six, receiving an allocation larger than under any other method. For a system that was designed solely to gnarantee that no state would be deprived of any representation, these are extremely odd results, further suggesting that the better solution to the zero-representative problem is to tinker with the results at the end.

Hill's method and Webster's method happen to produce, as they did in 1930, identical results, but as the 1920 and 1940 census data show, this is not always true. What is even more interesting, however, is that the allocation under Hamilton's method is also very similar. But the difference may turn out to be important, for Hamilton's method happens to give an extra seat to one state and one state only: Utah.[45] So once again, an essentially political dispute may end up in the judiciary.[46] The year 2000 seems, in the end, to be the year of the Court.

45. It comes at the expense of California, which is reduced from 53 to 52 representatives.

46. *See* Bush v. Gore, 531 U.S. 98 (2000).