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Paul H. Edelman*, Department of Mathematics, 1326 Stevenson Center, Vanderbilt University, Nashville, TN 37240. *Mathematics and the law: The apportionment of the House of Representatives.*

Since the founding of the United States, the decennial ritual of apportioning representatives among the states to the House has generated controversy. Four distinct methods have been tried and more have been suggested. It has been the subject of political feuds, mathematical feuds, legal challenge and perorations to God. It is also an excellent example of how mathematics can illuminate the law and how law can motivate mathematics.

In this talk I will give a crash course in the theory of apportionment. While in one way apportionment is an elementary integer programming problem, the traditional focus has been on the algorithmic and axiomatic properties of the different methods. The relationship between the optimization and the algorithms is unusual and very beautiful. After some discussion of the history of the apportionment of the House, I will show how developments in the law point to new methods of apportionment that have never been employed and the surprising implications they have for the make-up of the House. (Received May 10, 2007)