1023-14-756   **Andrei Gabrielov*** (`agabriel@math.purdue.edu`), 150 N University St, West Lafayette, IN 47907-2067, and **Dimitri Novikov** and **Boris Shapiro**. *Mystery of Point Charges.*

In his famous Treatise on Electricity and Magnetism (1873) J.C. Maxwell considered the following problem: How many equilibrium points a potential of n fixed point charges in $\mathbf{R}^3$ may have? Maxwell applied Morse theory (developed 50 years later) to approach this problem. He claimed that there should be at most $(n-1)(n-2)$ equilibrium points. In a footnote to the third edition (1891) of the Maxwell's book, J.J. Thomson stated that he could not find any proof of this claim. Recent progress in this direction will be reported, based on fewnomial theory and Voronoi diagrams. (Received September 21, 2006)