I summarized the disagreement between Drude theory and experiment in c_v, κ/σ and the thermopower Q. I said in class that the discrepancies could be summarized by saying that the Drude c_v is too big and the $\langle v^2 \rangle$ is too small. In a way this seems contradictory, since c_v measures the amount of energy in the electrons and so does v^2. Thus if one was too small, it would seem that the other should be too small, as well. In transport coefficients such as the thermal conductivity κ. There are two ways in which the v^2 matters. First, it determines the amount of heat that is transported. Second, it determines the rate at which this amount is able to move. This is why both c_v and $\langle v^2 \rangle$ enter in the formula for κ. Despite the resemblence between c_v and $\langle v^2 \rangle$, there is a clearcut difference. The $\langle v^2 \rangle$ measures the amount of kinetic energy per electron while the c_v measures the temperature derivitive of the energy (kinetic or otherwise). Thus, the discrepancy between Drude and experiment can be expressed by saying that the experimental kinetic energy $\frac{1}{2}m\langle v^2 \rangle$ is much larger but much less temperature-dependent than the classical ideal gas values used by Drude.