detection of 20 mK out of 300 K is about 70 ppm; or about 3 microvolts out of the total RTD voltage of about 50 mV, with a current of about 0.5 mA. More precisely, with the stated temperature coefficient of 0.385 ohms/K, the voltage represented by 20 mK is 3.85 microvolts.

A false signal of this magnitude would be produced by a shunt resistance of some 1.5 megohms, or a current leakage into the resistor itself of some 30 nanoamperes.

Discussion.

Concentrating on cells L3 and L4, we note that a chemical reaction involving the Pd at perhaps 1.5 eV per atom would correspond to about 3.5 kJ of heat; this is to be compared with the 3 MJ of "excess heat" observed, so such an excess could not possibly be of chemical origin. If it were to be related to the electrolysis of water at 1.5 eV per hydrogen (3 eV per mole of water) it would correspond to the electrolysis of some 10 moles or 180 g of water.

The current experiments are being done at near-atmospheric pressure and room temperature, in view of the greater difficulty and hazard of working at high pressure as was done for awhile in this program. However, work done by others has the characteristic that the longer it is pursued and the better the circumstances, the smaller the effect. This "quit while you are ahead" trait does not give confidence that theirs is a real effect; quite the contrary.

We are concerned about a number of possibilities for producing apparent excess heat where none exists. The excess seems to be proportional to the current, when conditions are "right" for it to manifest itself. If the multimeter would read low while measuring the cell voltage, this would be the sign of the effect. That it does not occur until after "conditioning" takes place may simply mean that it doesn't occur until a while into the experiment, although time alone is not enough for every cell to exhibit the excess heat.

The other possibility that immediately comes to mind is an error in reading the temperature of the effluent water. That both output RTDs read the same is encouraging, but the possibility might be an electrical leakage. This is made less likely by the fact that the same multimeter reads the resistance of the input RTDs.

We believe that there are a few things (probably irrelevant) not very well understood by the experimenters. One is the magnitude of the heat loss by evaporation from the warm bath, although this would seem to have no impact at all on the analysis. Furthermore, bringing all the experimental circuits to the same plastic Jones barrier strip, itself mounted on a plastic panel, is asking for trouble. If the sensing leads from each of the circuits were brought to a separate two-bar Jones strip mounted on a common grounded metal panel, this would eliminate the potential for leakage along the plastic panel or the plastic of the Jones strip.

Although the cells are operated "closed" they are not in fact totally closed from the beginning of the experiment, since the cell volume is not adequate to contain the amount of hydrogen that must be absorbed in "loading" the cathode. Under existing safety regulations, the gas lead to the cell consists of two concentric tubes, so that one can actually FLUSH the cell. Previously, with only a single tube, the following would appear to happen as the cell was electrolyzed at the beginning of the experiment:

> As current was passed through the cell in order to produce hydrogen on the cathode, the absorption of hydrogen into the cathode would yield an excess of oxygen in the