SIMULTANEOUS EXCESS POWER AND ANOMALOUS RADIATION

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CALORIMETRIC CELL DESIGN

Pd / D_2O + LiOD / Pt

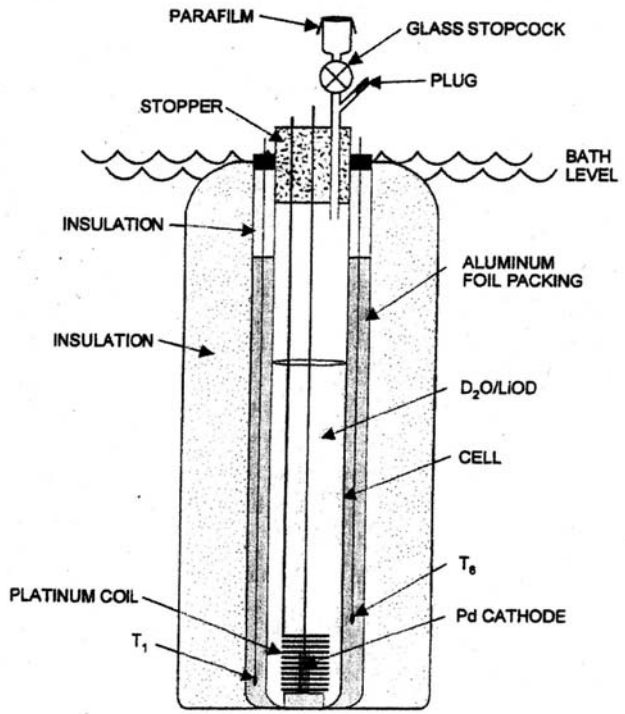


Fig. 1. Schematic of the calorimetric design for Cell A that shows the positioning for thermistors T_1 and T_6 relative to the palladium cathode rod and the platinum anode coil. The same calorimetric design was also used for Cell B that used thermistors T_3 and T_4.

AVERAGE CELL VOLTAGES

Constant Current Electrolysis (I = 0.30024 A)

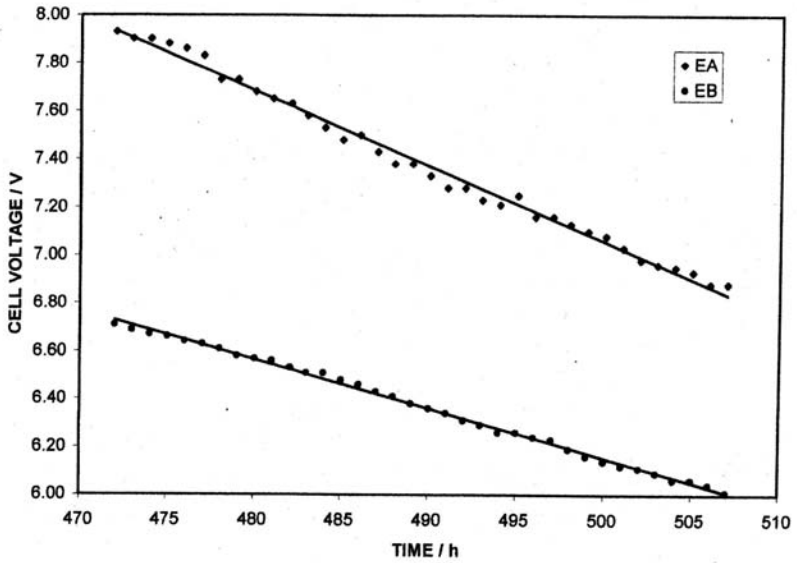


Fig. 4. Average voltages measured for Cells A and B during the same time period displayed in Fig. 3. The lines have slopes of -0.0314 V h^{-1} ($R^2 = 0.9919$) for Cell A and -0.0205 V h^{-1} ($R^2 = 0.9971$) for Cell B.

CELL TEMPERATURES

Anomalous Increase in Temperature for Cell A

M.H. Miles / J. Electroanal. Chem., 482 (2000) pp. 56-65

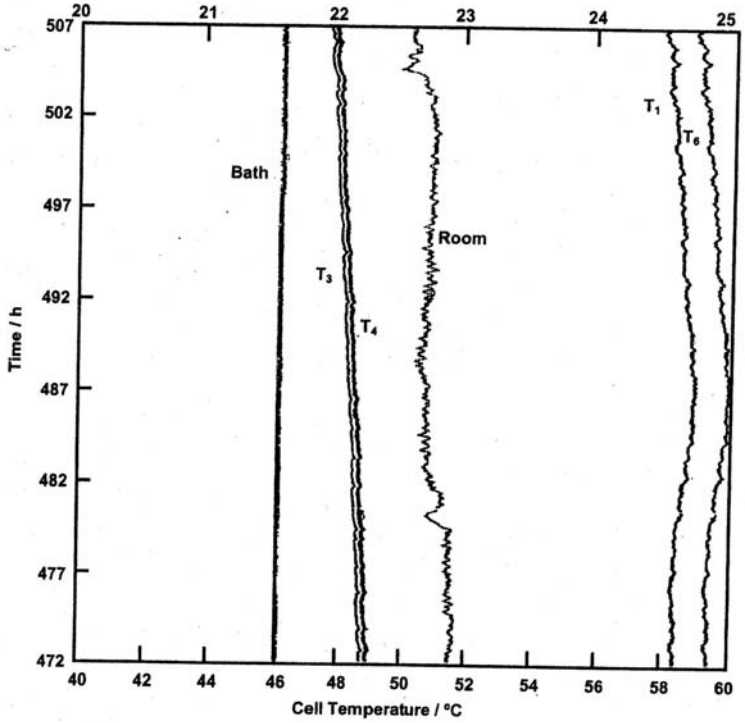
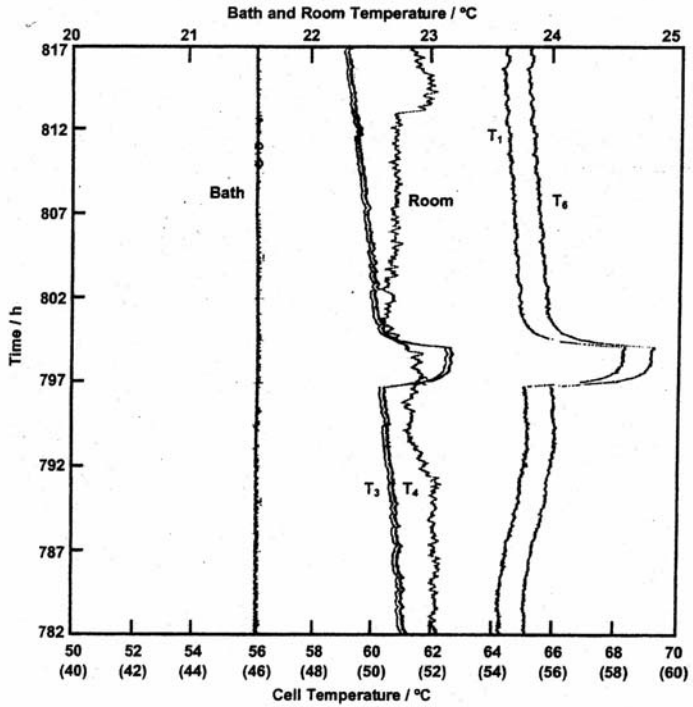


Fig. 3. Cell temperatures vs. time presenting an increase in excess power in Cell A (T_1, T_6) and normal behavior in Cell B (T_3, T_4). There is an increase in the temperature of Cell A beginning at 477 h. $I = 0.30024$ A. The room and bath temperatures are for the 20–25°C scale.

CELL TEMPERATURES

Anomalous Increase in Cell Temperature for Cell A

M.H. Miles / Journal of Electroanalytical Chemistry 482 (2000) 56–65



ANOMALOUS THERMISTOR READINGS
Cell A

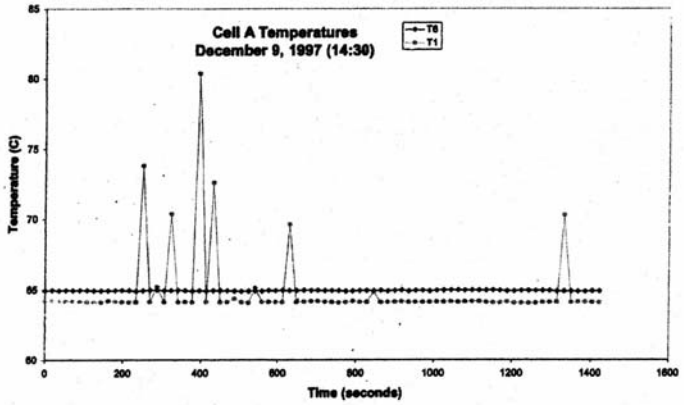


Figure 3. Thermistor readings versus time for Cell A (T_1, T_6).

These temperature excursions quickly returned to normal within the time period of the separate measurements (18 seconds). This suggests that the sudden rise and decline in the temperature readings for thermistor T_1 is due to electromagnetic radiation from the palladium cathode rather than actual increases in the temperature. Thermistor T_1 was located directly in line with the palladium cathode while thermistor T_6 was positioned higher on the outside cell surface. A schematic of the cell and thermistor positions is shown in Figure 4.

THERMISTOR POSITIONS IN CELL A

Direct Radiation Path to Thermistor T_1

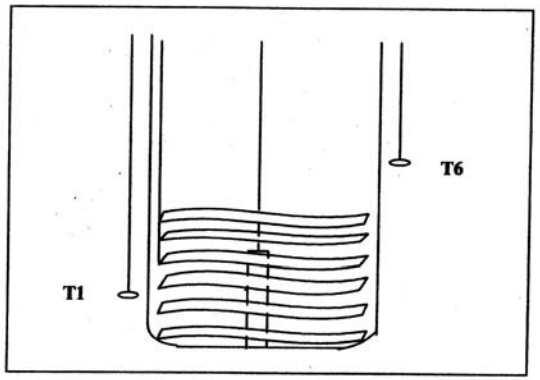
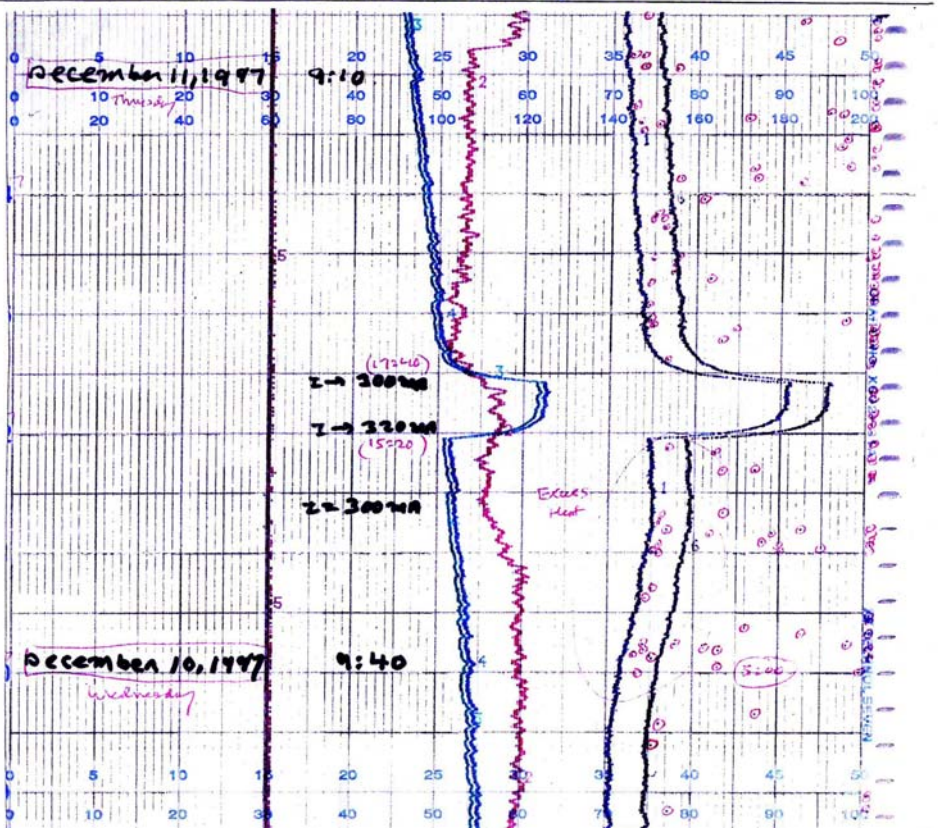


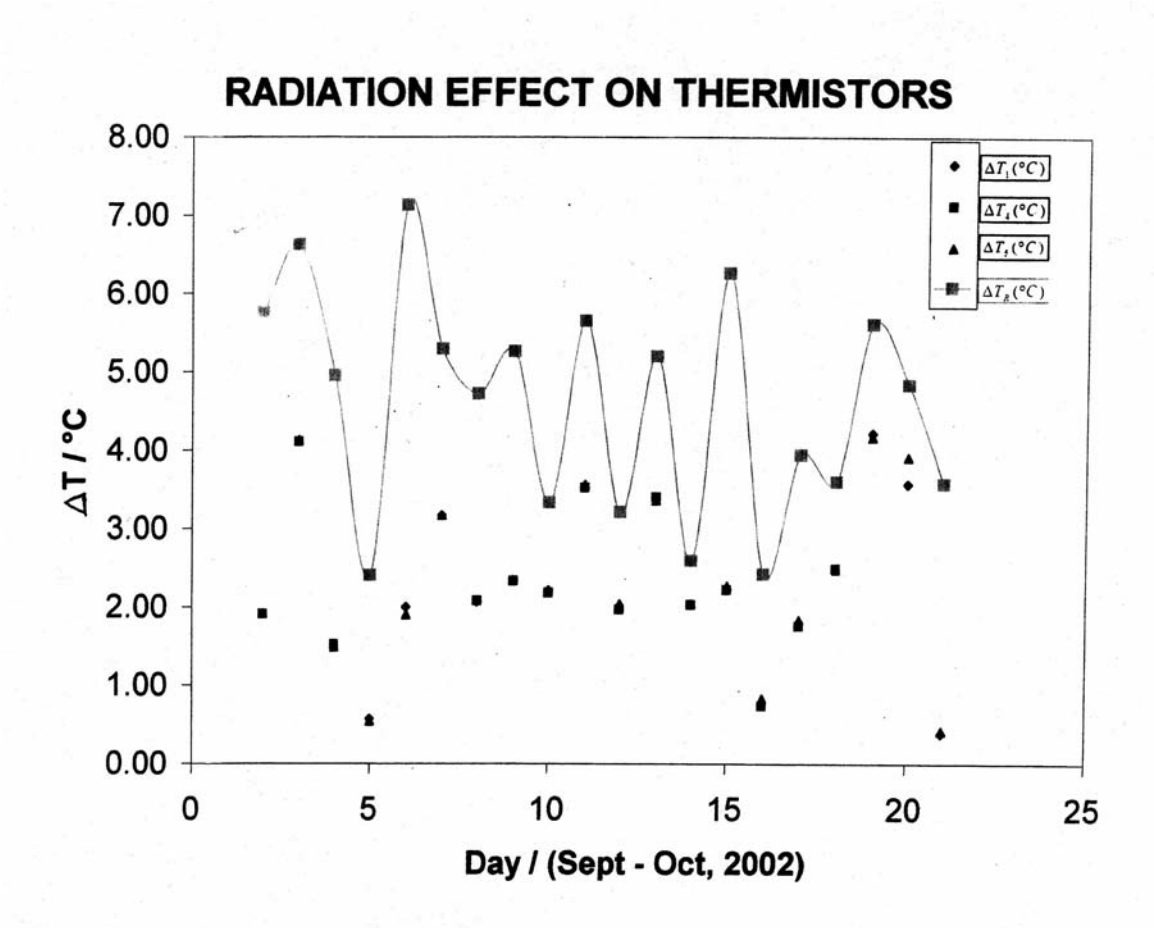
Figure 4. Schematic of positioning of thermistor T_1 and T_6 relative to the palladium cathode rod and platinum anode coil.

It is readily seen that any electromagnetic radiation from the cathode could pass directly between the platinum coils to reach thermistor T_1, while thermistor T_6 is completely screened from the cathode by the platinum anode coils. Furthermore, the intensity of such radiation would be much less for thermistor T_6 since its distance from the cathode (R) is approximately four times that of thermistor T_2; 4 cm vs. 1 cm (Intensity $\propto 1/R^2$).

ACTUAL CHART OF THERMISTOR RECORDINGS

Excess Heat Production By Cell A




RADIATION EFFECT ON THERMISTORS
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
ΔT / °C
0
5
10
15
20
25
Day / (Sept - Oct, 2002)
ΔT1 (°C)
ΔT4 (°C)
ΔT3 (°C)
ΔT8 (°C)

EXPOSURE OF THERMISTORS TO A CS-137 RADIATION SOURCE

($t_{1/2}$ = 30.23 years, 94% 0.511 MeV, 6% 1.176 MeV)

September – October, 2002

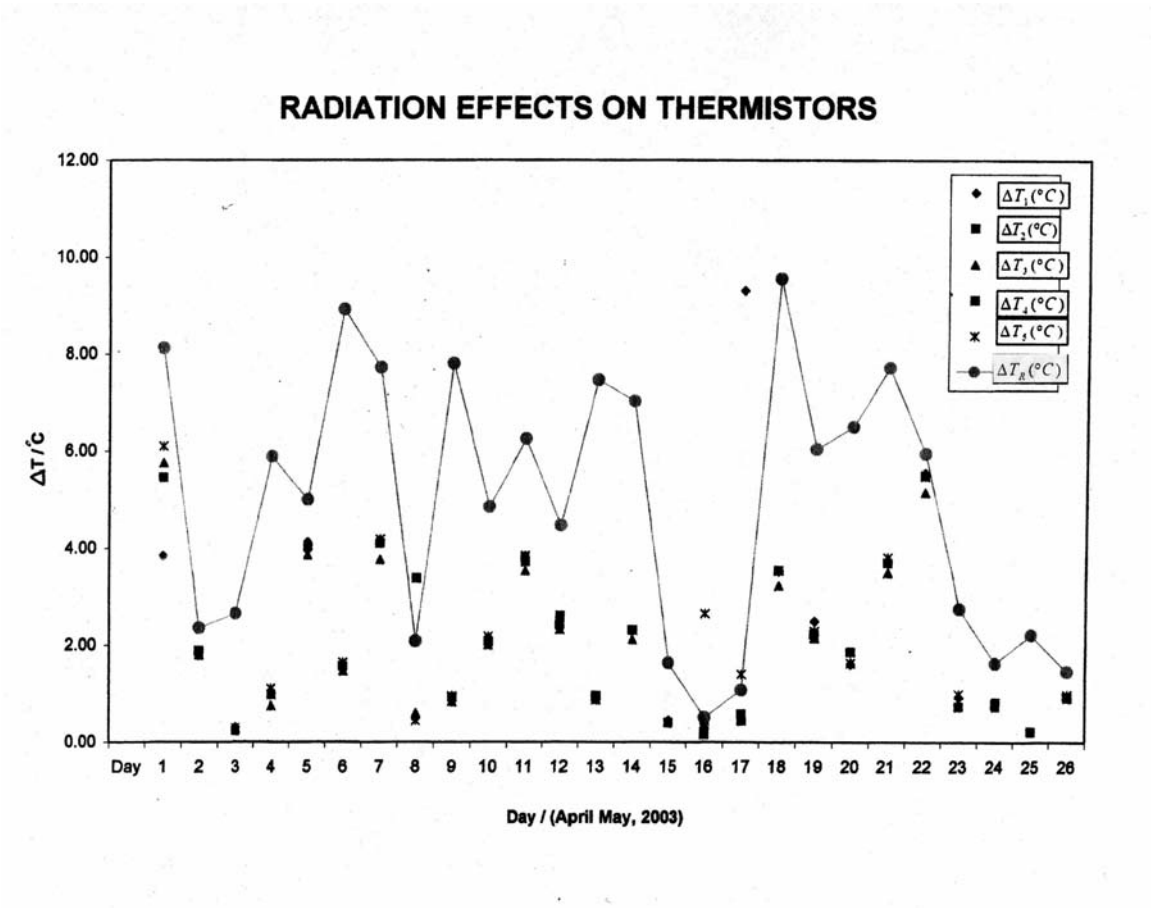
Day	Date	ΔT_1 (°C)	ΔT_4 (°C)	ΔT_5 (°C)
1	9/18/2002	5.74	1.91	1.92
2	9/19/2002	6.61	4.11	4.13
3	9/20/2002	4.94	1.52	1.49
4	9/23/2002	0.57	2.39	0.54
5	9/24/2002	2.00	7.12	1.90
6	9/26/2002	3.17	5.28	3.17
7	9/28/2002	2.07	2.08	4.71
8	9/29/2002	2.34	2.33	5.25
9	9/30/2002	2.21	2.18	3.32
10	10/2/2002	5.64	3.52	3.56
11	10/3/2002	3.20	1.97	2.04
12	10/4/2002	5.19	3.40	3.36
13	10/5/2002	2.58	2.03	2.04
14	10/6/2002	6.25	2.22	2.27
15	10/7/2002	2.41	0.74	0.83
16	10/8/2002	3.93	1.76	1.84
17	10/10/2002	3.59	2.49	2.48
18	10/11/2002	4.22	5.60	4.17
19	10/12/2002	3.57	4.83	3.91
20	10/13/2002	0.39	3.56	0.42

EXPOSURE OF THERMISTORS TO A CS-137 RADIATION SOURCE

($t_{1/2}$ = 30.23 years, 94% 0.511 MeV, 6% 1.176 MeV)

April – May, 2003

DAY	Date	ΔT_1(°C)	ΔT_2(°C)	ΔT_3(°C)	ΔT_4(°C)	ΔT_5(°C)
1	4/25/03	3.83	5.45	5.74	8.11	6.09
2	4/26/03	1.83	1.87	1.78	2.34	1.86
3	4/17/03	0.30	0.22	0.26	2.64	0.29
4	4/28/03	1.04	5.87	0.74	0.97	1.10
5	4/29/03	4.12	4.99	3.84	4.04	3.87
6	4/30/03	1.58	1.55	1.46	8.91	1.64
7	5/2/03	4.16	4.09	3.75	7.70	4.18
8	5/3/03	0.49	2.07	0.59	3.38	0.43
9	5/4/03	0.91	7.79	0.82	0.91	0.94
10	5/5/03	2.14	4.85	1.99	2.07	2.17
11	5/6/03	6.23	3.81	3.52	3.71	3.83
12	5/7/03	4.47	2.40	2.31	2.60	2.58
13	5/12/03	0.95	0.92	0.86	0.95	7.45
14	5/13/03	2.28	2.30	2.10	2.30	7.01
15	5/14/03	0.44	0.39	0.40	0.39	1.62
16	5/15/03	0.29	0.14	0.50	0.44	2.64
17	5/17/03	9.30	0.57	1.06	0.43	1.39
18	5/18/03	3.51	3.52	3.22	9.53	3.53
19	5/19/03	2.48	2.20	2.14	6.02	2.28
20	5/20/03	1.60	1.84	1.62	6.48	1.62
21	5/22/03	3.73	3.68	3.49	7.70	3.80
22	5/23/03	5.53	5.48	5.14	5.93	5.47
23	5/24/03	0.92	0.72	0.76	2.74	0.98
24	5/25/03	1.61	0.75	0.73	0.81	0.79
25	5/26/03	2.20	0.21	0.21	0.22	0.22
26	5/27/03	1.45	0.93	0.91	0.92	0.98


RADIATION EFFECTS ON THERMISTORS
12.00
10.00
8.00
6.00
4.00
2.00
0.00
ΔT/°C
Day 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
Day / (April May, 2003)
ΔT1(°C)
ΔT2(°C)
ΔT3(°C)
ΔT4(°C)
ΔT5(°C)
ΔTR(°C)

ANOMALOUS THERMISTOR READINGS FOR RADIATION EXPOSURE

- September / October, 2002

20/20 Correct Using Three Thermistors

$$P = \frac{20!}{20!0!}(0.333)^{20}(0.667)^{0} = \boxed{2.87 \times 10^{-10}}$$

- April / May, 2003

23/26 Correct Using Five Thermistors

$$P = \frac{26!}{23!3!}(0.200)^{23}(0.800)^{3} = \boxed{1.12 \times 10^{-13}}$$

SUMMARY

- **Cell A Produced Excess Power**
- **Thermistor T_1 Simultaneously Gave Anomalous Temperature Excursions**
- **Cs – 137 Radiation Source Produces Anomalous Thermistor Readings.**
- **Anomalous Temperature Excursions In Active Cells Were Much More Frequent Than Effects Using Cs-137**
- **Inactive Cells Always Gave Normal Temperature Readings.**