

Problems in the S.E.R. calibration of ^{90}Sr surface contamination sources by a windowed proportional counter

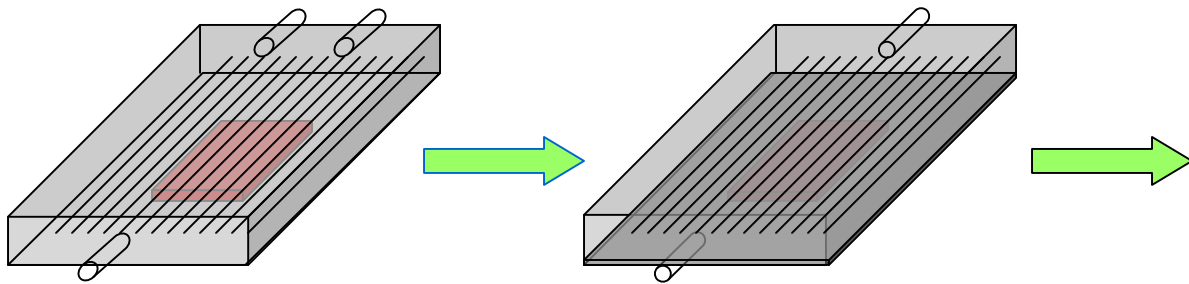
Sean Collins

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Windowed Large Area Proportional Counter

- Large area (220 x 330 mm)
- Aluminised mylar window
- Atmospheric Pressure
- Continuous Gas Flow (P10)
- 2150 Operating Voltage
- Threshold set in accordance with ISO 8769

Method Of Determining Calibration Factor (C.F.)



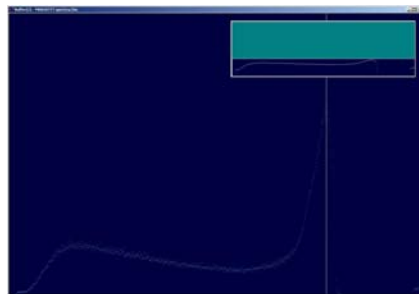
$$C.F. = \frac{SER}{CPS}$$

1. SER measured on the 1^o system

2. CPS measured on the 2^o system

3. Calibration factor calculated

A spectra was collected for each source on the both systems



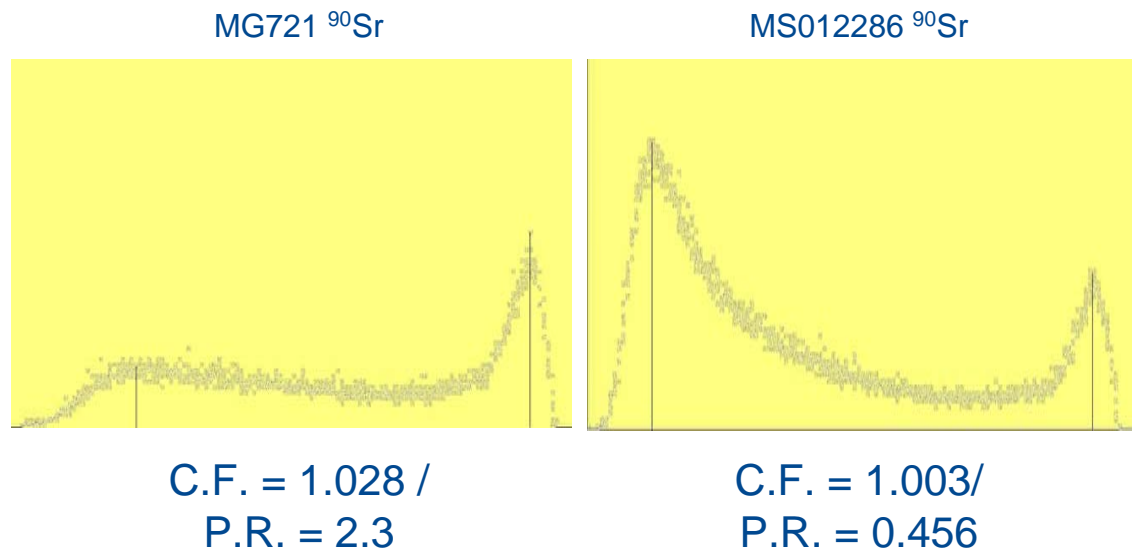
Houston we have a problem...

- A range of C.F. calculated for ^{90}Sr
 - From 1 to 1.06
- Apparent for ^{14}C ...not enough data
- No range for ^{36}Cl or ^{241}Am

- How can you know which C.F. to use?
- Is there an answer!?

Eureka!?

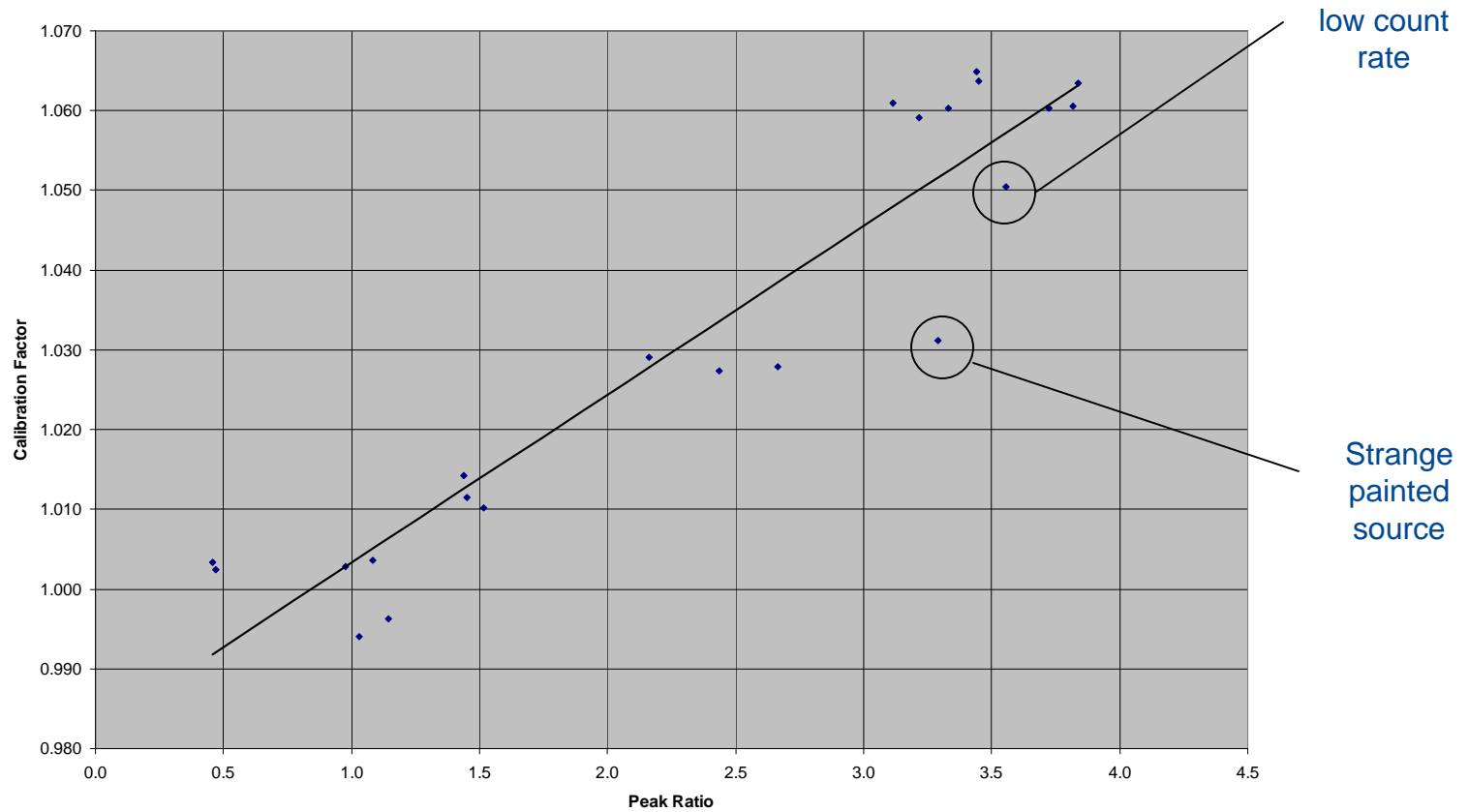
- 2 peaks observed in the ^{90}Sr spectra
- Difference in the peak heights was observed between different sources e.g.



- Could the peak ratios (P.R.) be used to determine the C.F.?

Yes!

Peak Ratio vs Calibration Factor
(with linear trendline)



Conclusion

- The method of C.F. determination appears to work
- Construction of source affects the C.F.
 - Anodised aluminium C.F. can vary
 - Different production methods
- All of the C.F. = 1 sources predate 1990
 - Mix of Silver and anodised aluminium sources
- Not sure why it happens!

The End

Questions?