Svedberg Anniversary Conference 2009

From Oil-turbine to Model E – Early Days in Retrospect

J. Michael Creeth

University of Bristol, UK

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J. Michael Creeth: Experience of U/C's : -

- **1946 -- OT 1 -- UK**
- **1948 --- Phywe --- UK**
- **1949 - 52 --- Spinco 1 --- UK**
- **1954 --- OT 2 ---USA**
- **1954 - 59 --- Spinco 2 ---Australia**
- **1960 --- OT3 --- UK**
- **1961 - 85 --- Spinco 3 --- UK**

Items of Possible Historical Interest

Nottingham

- **DNA (1946) Purity check**
- **DNA (1948) H-bond in bases identification (Jordan - Creeth – Gulland)**
- **(1948) Phywe ultracentrifuge - (1949) Spinco E**
- **BSA & HSA (1951) Spinco and OT *s* Values -**

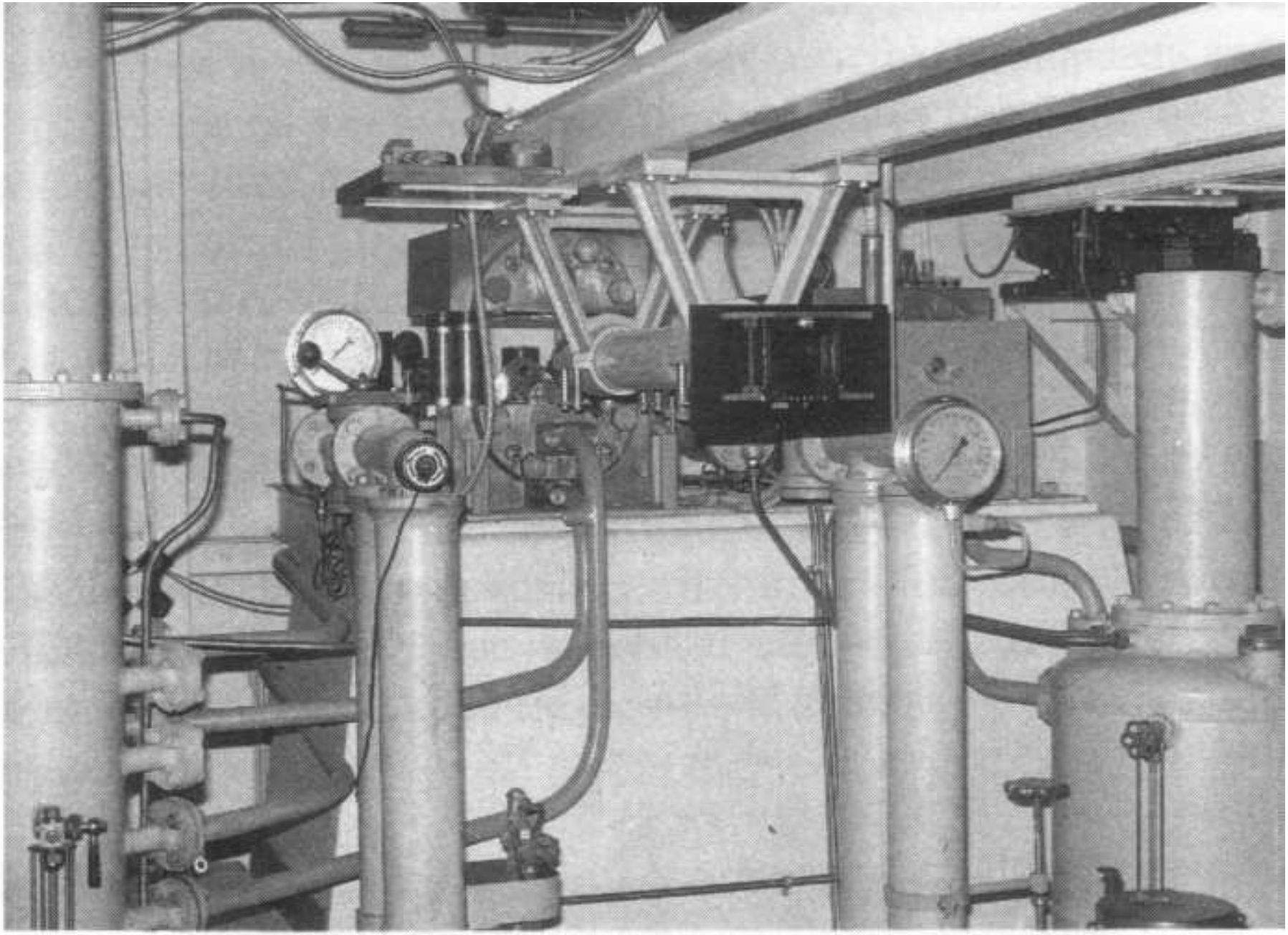
Wisconsin - Adelaide

- **RNAse (1954) OT Personal Use**
- **Theoretical (1958) Extended Svedberg Equation**

Lister Institute/Bristol **(1960)**

- **Svedberg oil turbine centrifuge still in operation**

Svedberg oil-turbine ultracentrifuge



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Hydrogen bonding in base pairs established:

Creeth, J.M., Jordan, D.O. and Gulland, J.M. (1949) *J. Chem. Soc*. 1406-1409

Creeth, J.M., Jordan, D.O. and Gulland, J.M. (1949) *J. Chem. Soc*. 1409-1413

Chargraff rule – A/T, C/G = unity

Chargraff, E., Lipshitz, R., Green, C., Hodes, M.E.(1951) *J. Biol Chem* **192**, 223-230

Double helix model

Watson, J.D, and Crick, F.H. (1953) *Nature* **171**, 737-738

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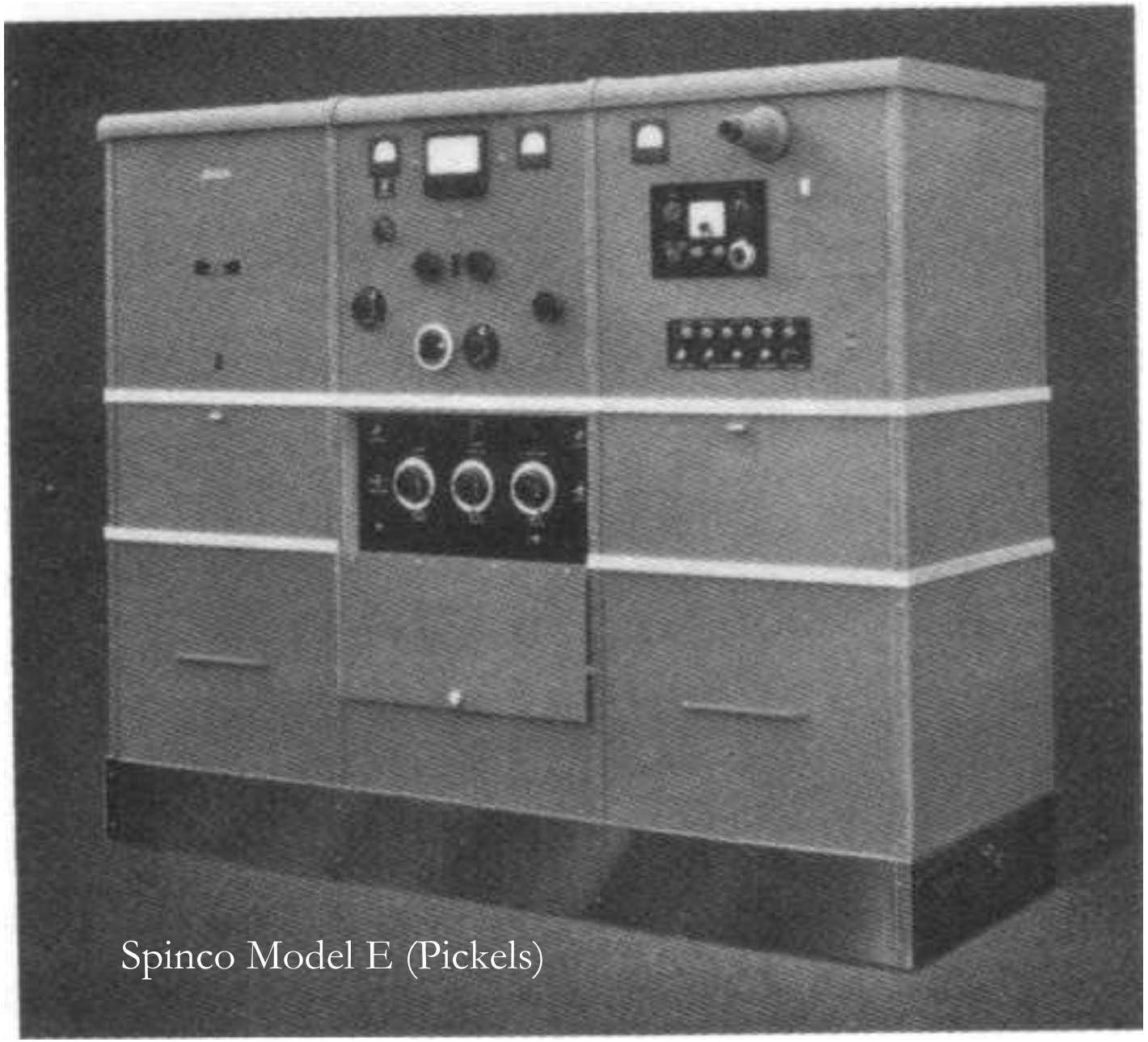
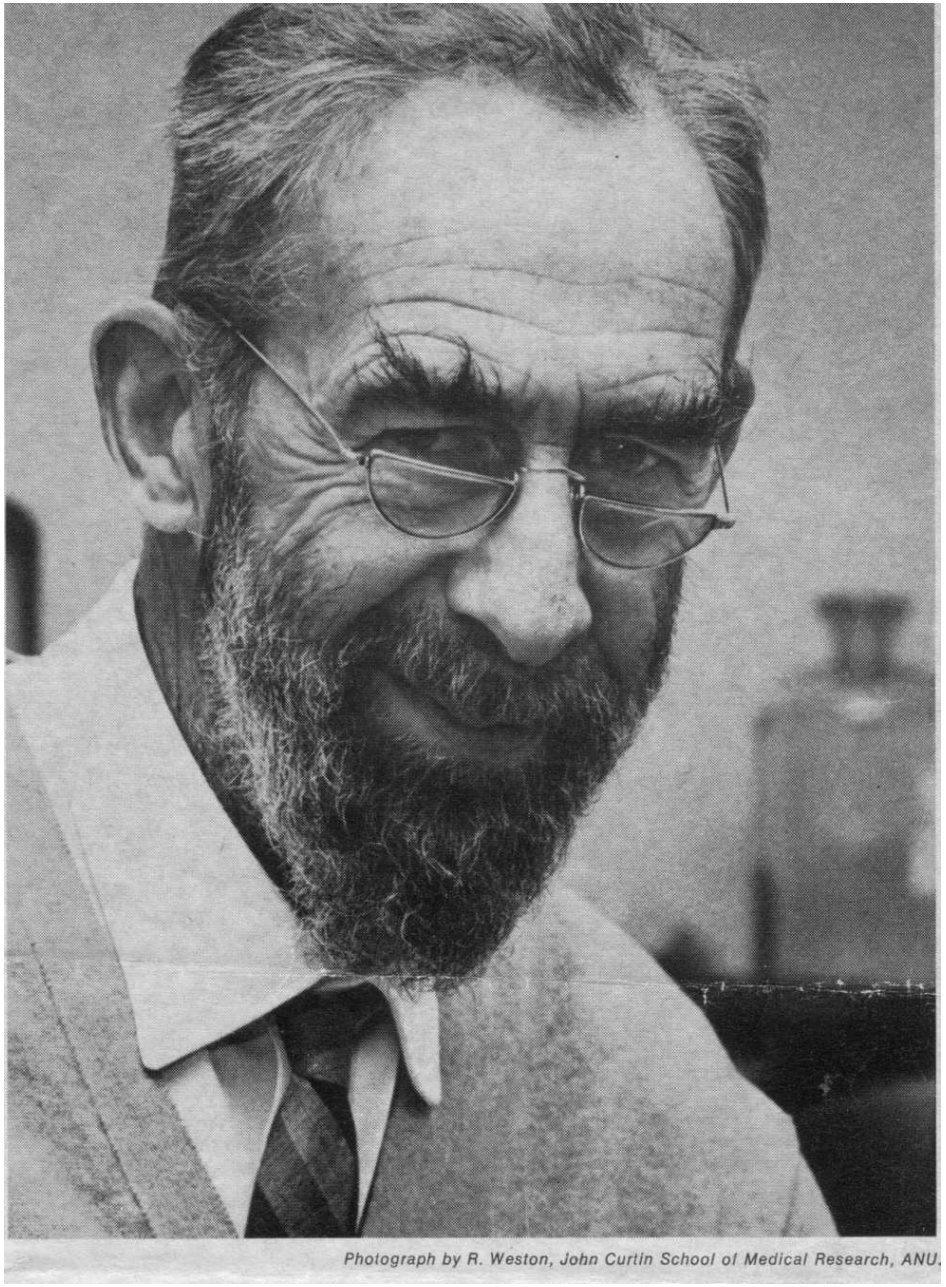
1948/9: Spinco Model E

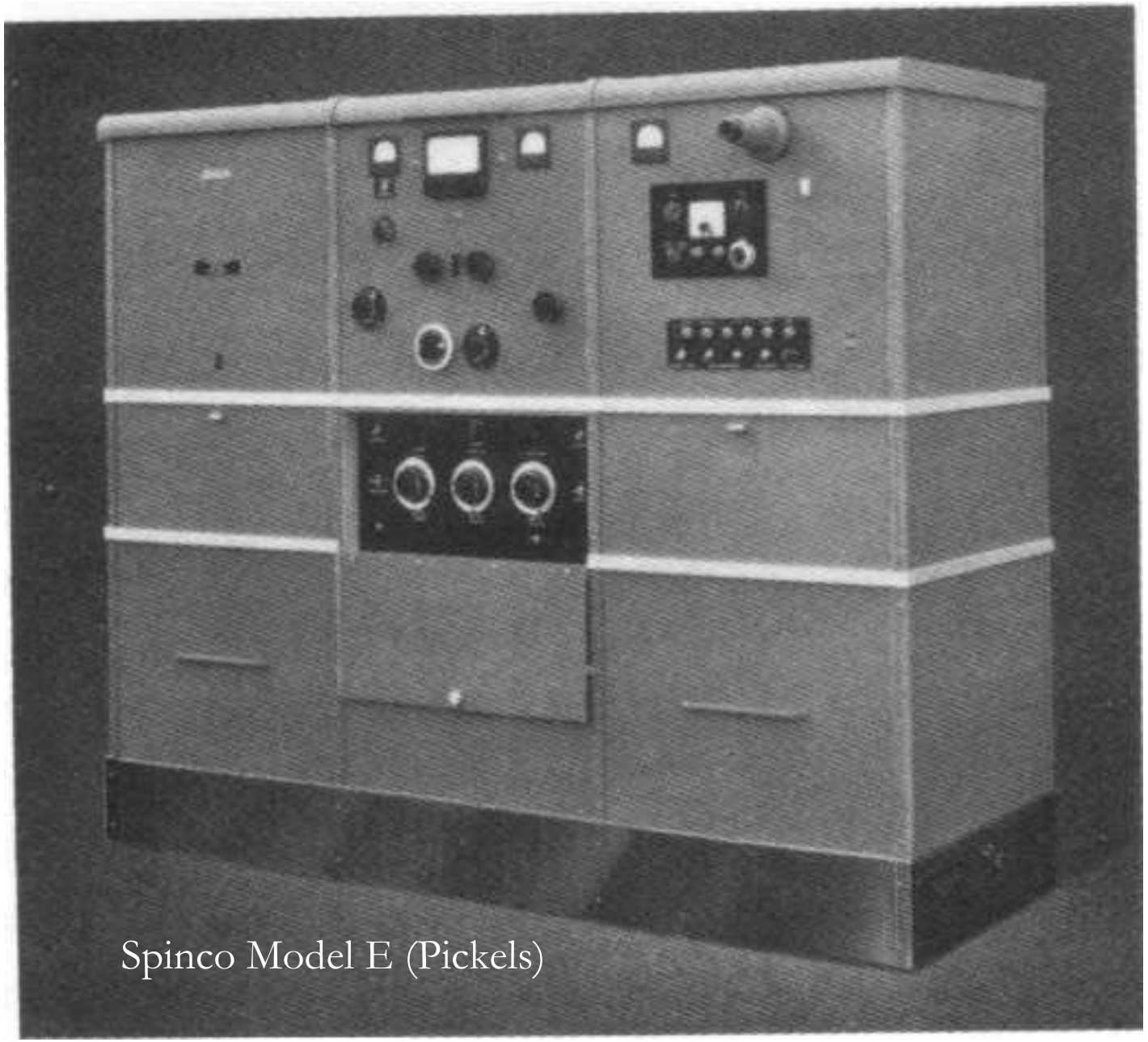


Spinco Model E (Pickels)



A.G. “Sandy” Ogston - Oxford

1948/9: Spinco Model E



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J.W. “Jack” Williams - Wisconsin

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1958: Extended Svedberg Equation

$$M = \frac{R\,T\,s}{D\,(1 - \bar{v}\,\rho)}\,(1 + d\ln y / d\ln c)$$

? Valid where thermodynamic factor ≠ 1 ?

? Suitable Test Substance ?

Test Substance selected :- Thallous Sulphate

- **$Tl_2 SO_4$: FW = 505; very dense; 3-ions: association:**

  y strongly dep. on c

- **In range where t.f. = 0.8……..0.6, can predict *s***

  ? How well ?

s vs c for Tl_2SO_4
Solid line is theoret., X are obs.

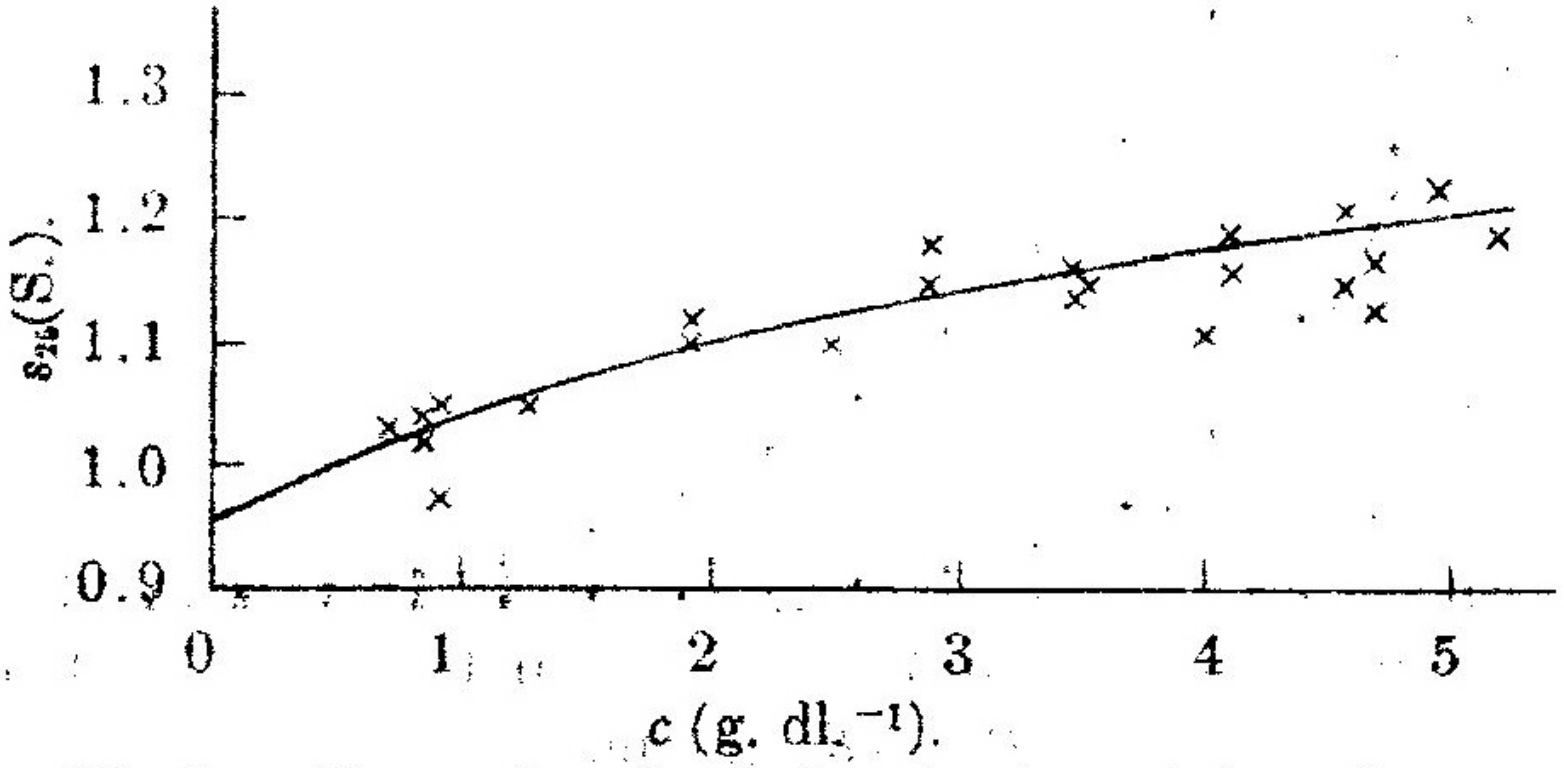
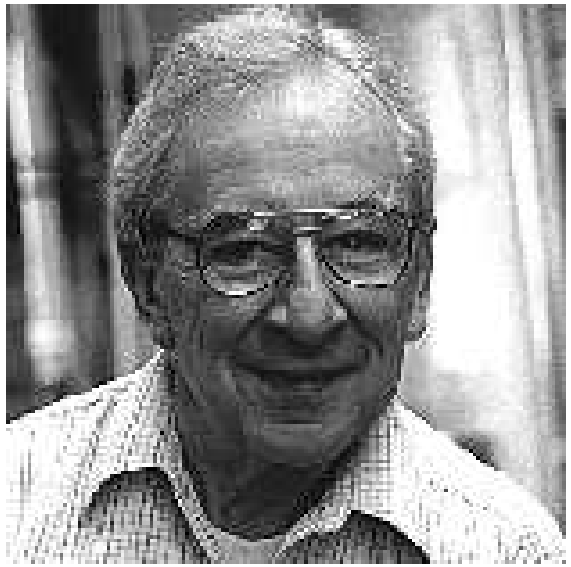
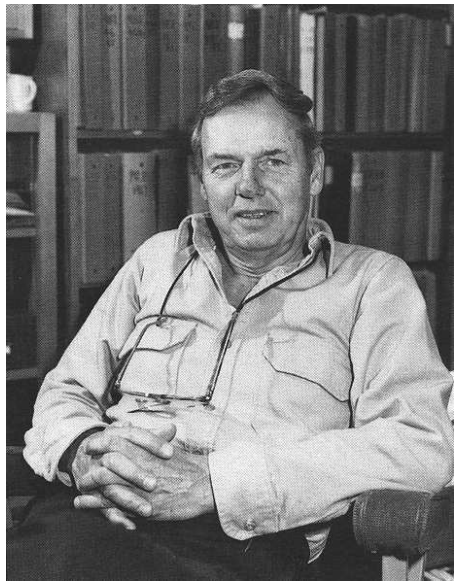


Fig. 3.—Observed and calculated values of the sedimentation coefficient of Tl_2SO_4 at 25°. Experimental points are shown as ×, while the solid line has been calculated from the known diffusion and thermodynamic characteristics, using eq. 15.



Howard Schachman

David Yphantis



Kensal E van Holde

The Third Generation

Taking delivery of the Beckman Optima XLA analytical ultracentrifuge.

IT is said that when policemen look young and undergraduates positively juvenile, one is getting old. There is

were two in the UK; one at the Lister Institute, now demolished, in Chelsea Bridge Road, and one in the Department

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