

Howard – The Early Years

Howard David Flack 1943-2017

Mike Glazer, Universities of Oxford and Warwick



Mike Glazer

24th Congress and General Assembly
of the International Union of Crystallography
Hyderabad International Convention Centre
21 - 28 August 2017, Hyderabad, India



- 1962-1965 HDF Chemistry BSc. At Nottingham University
- 1962-1965 AMG Chemistry BSc. St. Andrews University (Dundee)
- 1965-1968 HDF & AMG Chemistry Department University College London,
last two research students of Kathleen Lonsdale

- | | |
|--------------------------------|---|
| • Kathleen Lonsdale | • Robin Shirley |
| • Judith Milledge | • Eugene Hoff (USA) |
| • Eric Nave (Chief Technician) | • Terry Rummery (Canada) |
| • Marianne Ehrenberg | • Mike Ffrench (technician) |
| • June Sutor | • Maureen Julian (<i>O'Donnell</i>) (USA) |
| • Cedric J. Brown | • Tony Rood |
| • Jeff Harris | • Richard Welberry |
| • Richard Henriques (Jamaica) | |



Mike Glazer

24th Congress and General Assembly
of the International Union of Crystallography
Hyderabad International Convention Centre
21 - 28 August 2017, Hyderabad, India



Ferranti Pegasus Mark II computer ca 1965 at UCL

Mike Glazer

24th Congress and General Assembly
of the International Union of Crystallography
Hyderabad International Convention Centre
21 - 28 August 2017, Hyderabad, India



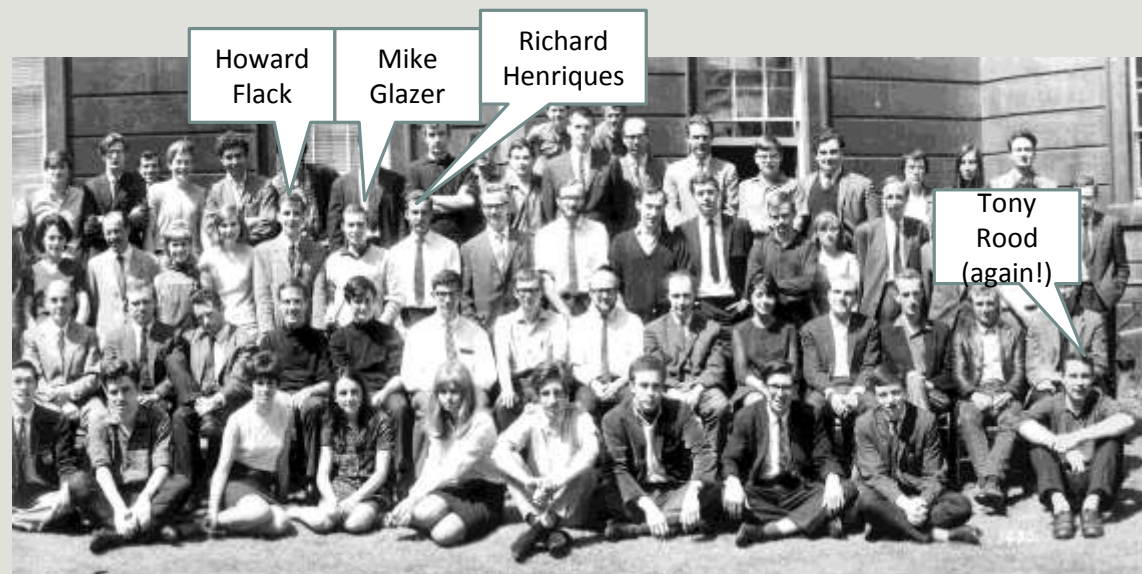
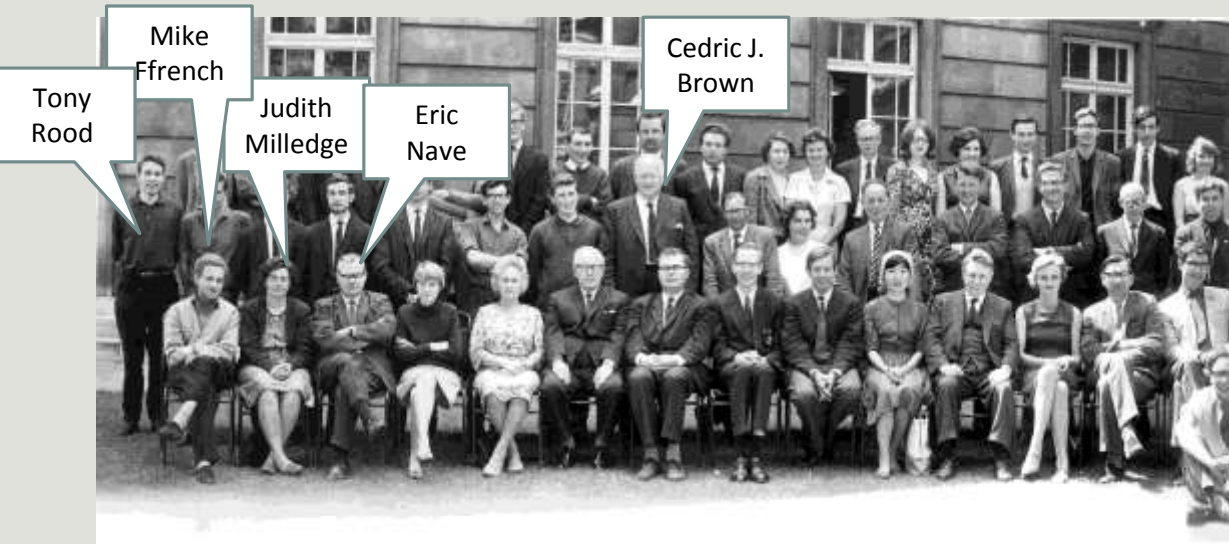


Ferranti Pegasus Mark II Science Museum London UK

Mike Glazer

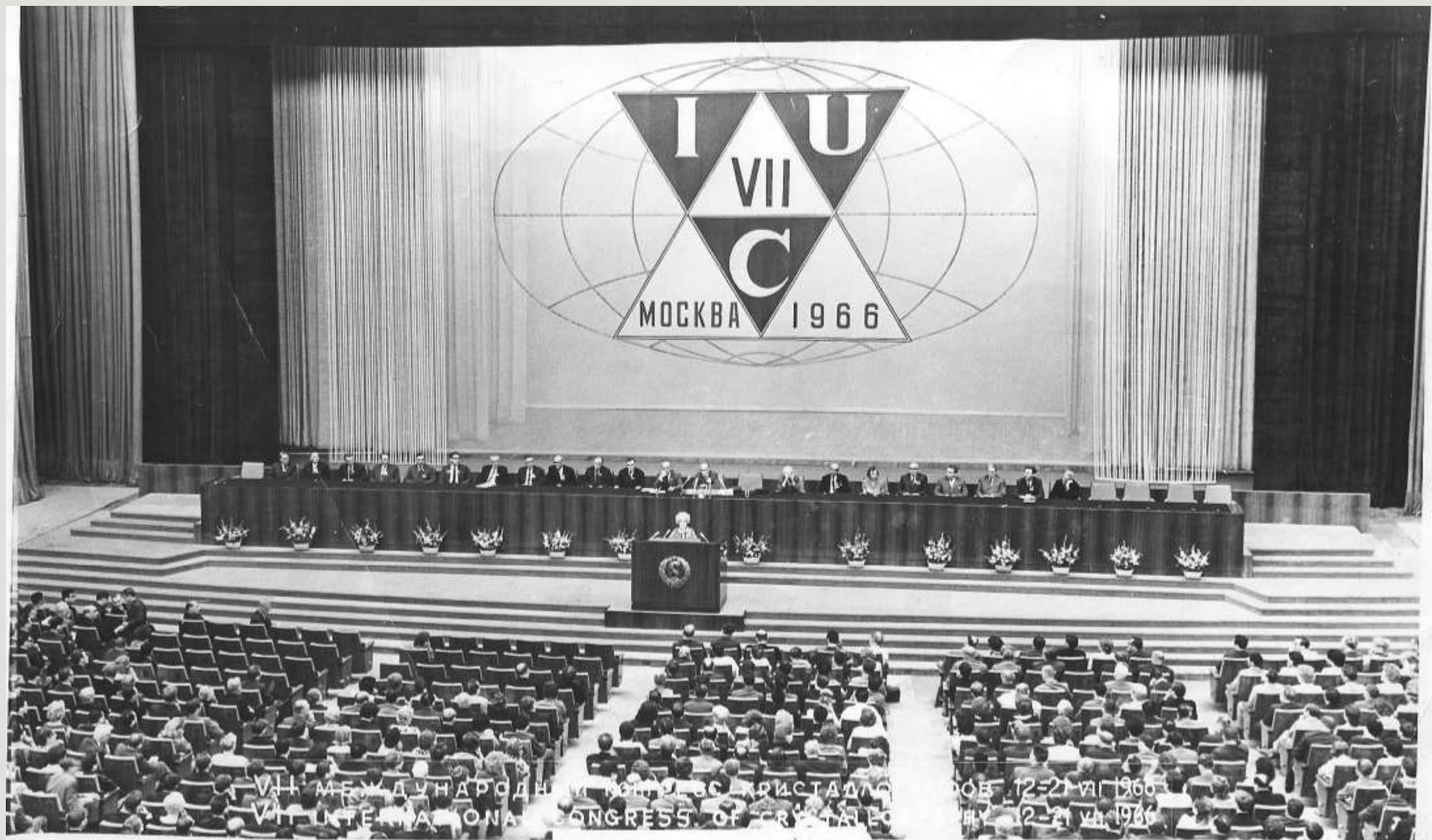
**24th Congress and General Assembly
of the International Union of Crystallography
Hyderabad International Convention Centre
21 - 28 August 2017, Hyderabad, India**





Mike Glazer

24th Congress and General Assembly
of the International Union of Crystallography
Hyderabad International Convention Centre
21 - 28 August 2017, Hyderabad, India



Mike Glazer

24th Congress and General Assembly
of the International Union of Crystallography
Hyderabad International Convention Centre
21 - 28 August 2017, Hyderabad, India

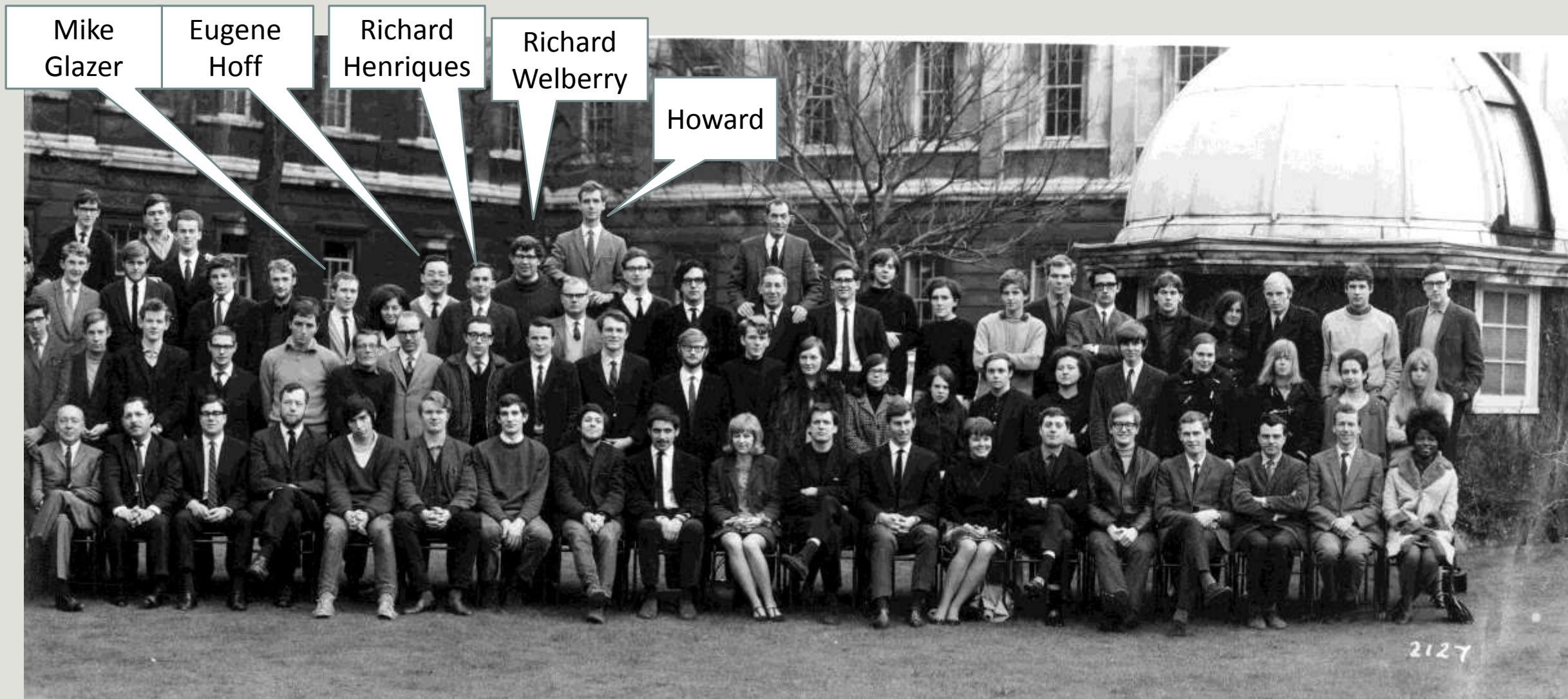


VII МЕЖДУНАРОДНЫЙ КОНГРЕСС КРИСТАЛЛОГРАФОВ 12-21 VII 1966
VII INTERNATIONAL CONGRESS OF CRYSTALLOGRAPHY 12-21 VII 1966



Mike Glazer

24th Congress and General Assembly
of the International Union of Crystallography
Hyderabad International Convention Centre
21 - 28 August 2017, Hyderabad, India



1968 UCL



Mike Glazer

**24th Congress and General Assembly
of the International Union of Crystallography
Hyderabad International Convention Centre
21 - 28 August 2017, Hyderabad, India**

•[Refinement and Thermal Expansion Coefficients of the Structure of Anthrone \(20, -90 degrees C\) and Comparison with Anthraquinone](#)

•H. D. Flack

•Phil. Trans. R. Soc. Lond. A 1970 266 561-574; DOI: 10.1098/rsta.1970.0012. Published 16 July 1970

•You have accessRestricted access

•[Calculation of Dimensions of Ordered Regions in Triclinic and Monoclinic Pseudosymmetric Crystals from the Intensity of Diffuse Scattering](#)

•H. D. Flack

•Phil. Trans. R. Soc. Lond. A 1970 266 575-582; DOI: 10.1098/rsta.1970.0013. Published 16 July 1970

•You have accessRestricted access

•[Short-Range Order in Crystals of Anthrone and in Mixed Crystals of Anthrone-Anthraquinone](#)

•H. D. Flack

•Phil. Trans. R. Soc. Lond. A 1970 266 583-591; DOI: 10.1098/rsta.1970.0014. Published 16 July 1970

•You have accessRestricted access

•[Mixed Crystals of Phenazine and N-oxyphenazine: Refinement of Crystal Structures](#)

•A. M. Glazer

•Phil. Trans. R. Soc. Lond. A 1970 266 593-622; DOI: 10.1098/rsta.1970.0015. Published 16 July 1970

•You have accessRestricted access

•[Variation of Physical Properties with Composition of Phenazine-N-oxyphenazine Mixed Crystals](#)

•A. M. Glazer

•Phil. Trans. R. Soc. Lond. A 1970 266 623-634; DOI: 10.1098/rsta.1970.0016. Published 16 July 1970

•You have accessRestricted access

•[Short-Range Order in N-oxyphenazine and in Mixed Crystals of Phenazine-N-oxyphenazine](#)

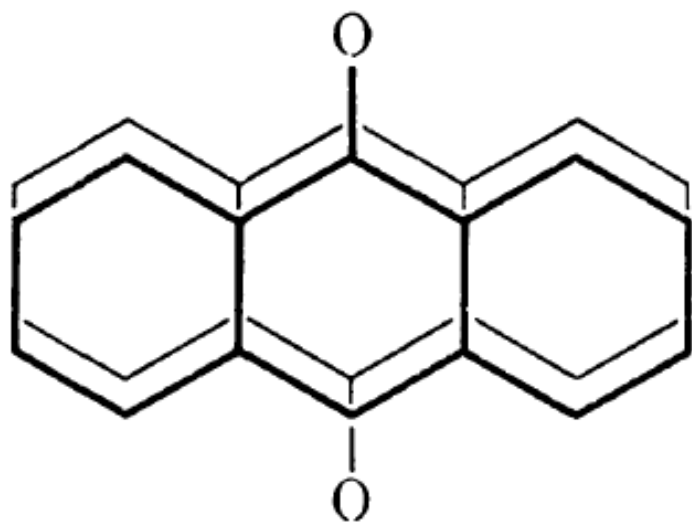
•A. M. Glazer

•Phil. Trans. R. Soc. Lond. A 1970 266 635-639; DOI: 10.1098/rsta.1970.0017. Published 16 July 1970

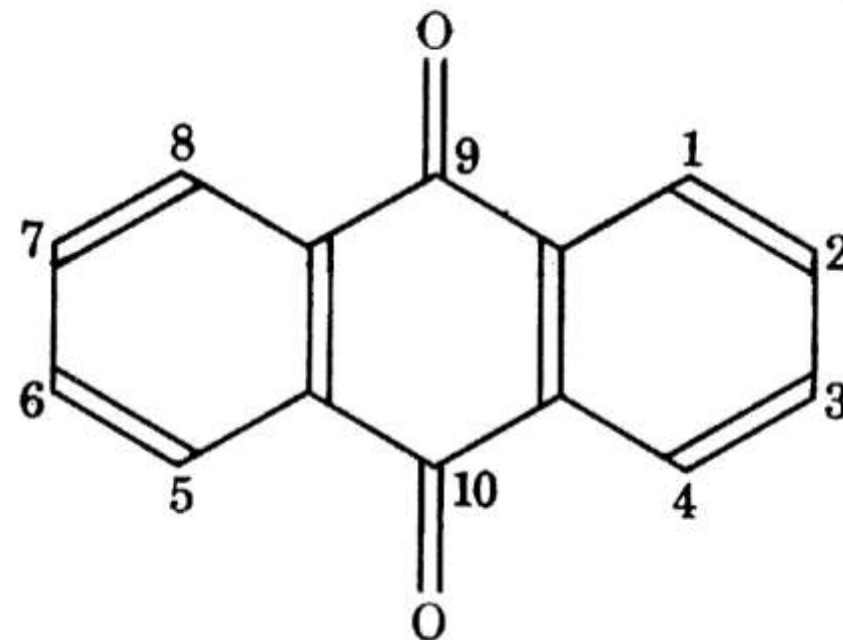


Mike Glazer

24th Congress and General Assembly
of the International Union of Crystallography
Hyderabad International Convention Centre
21 - 28 August 2017, Hyderabad, India



Anthrone



Anthroquinone

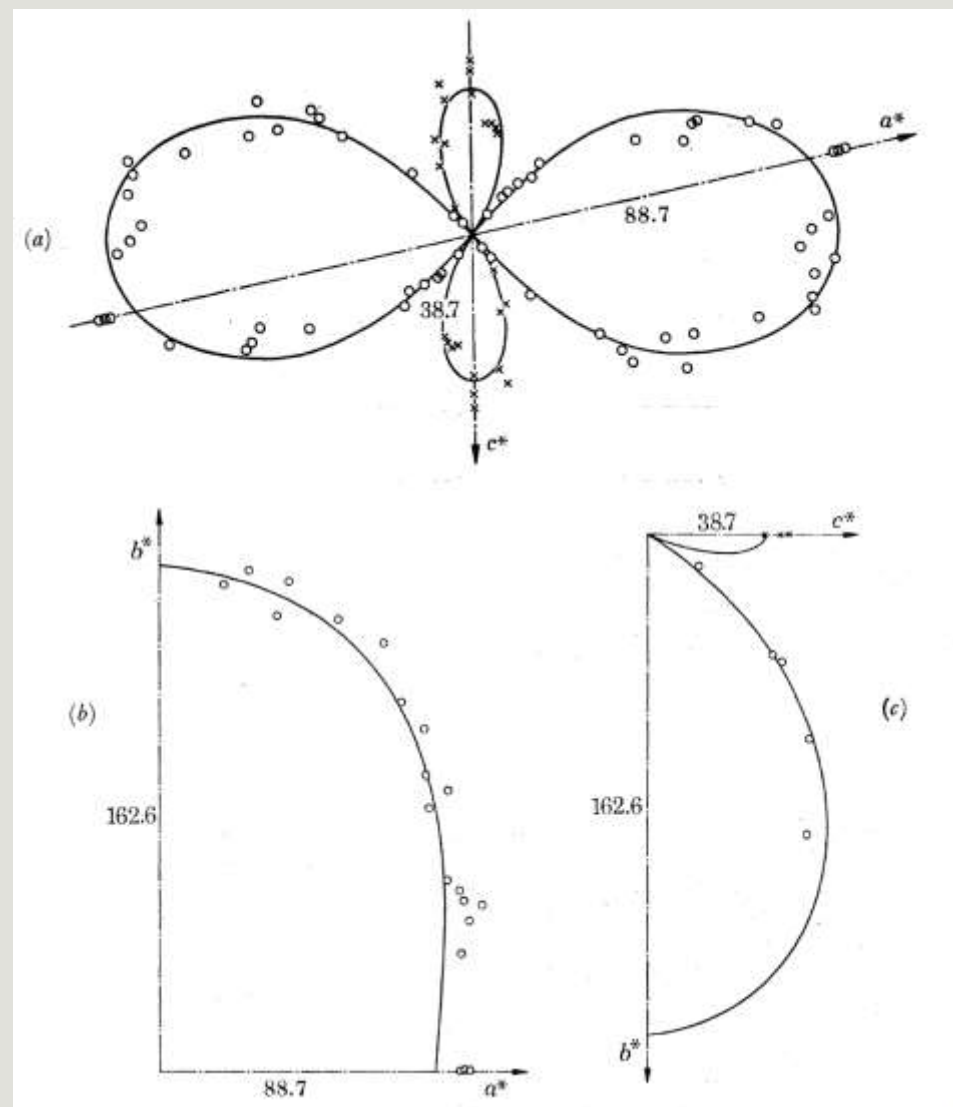


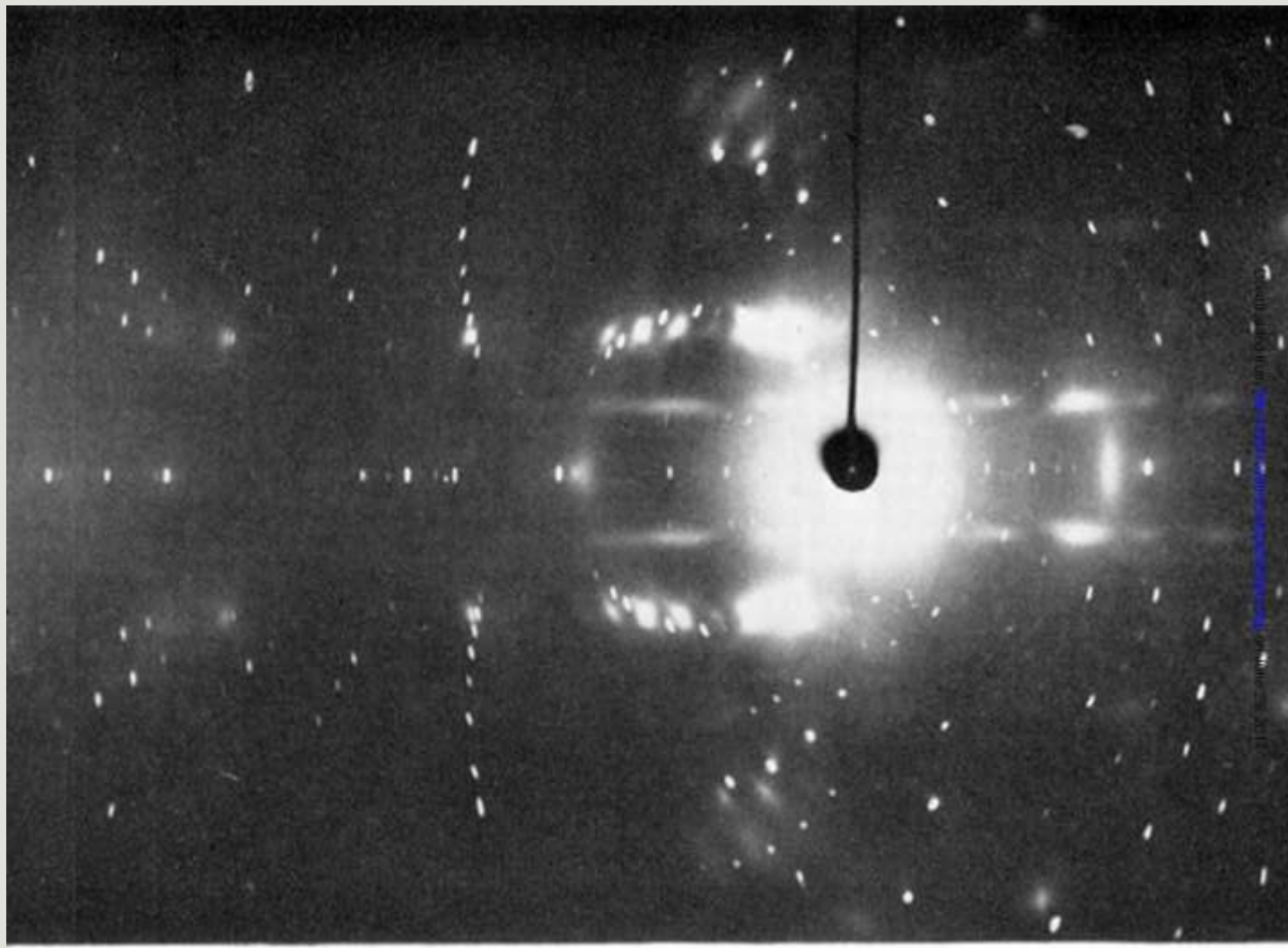
Structures solved by inclined beam oscillation photographs during 1955 and

Mike Glazer

24th Congress and General Assembly
of the International Union of Crystallography
Hyderabad International Convention Centre
21 - 28 August 2017, Hyderabad, India

Thermal expansion of anthrone





Mike Glazer

**24th Congress and General Assembly
of the International Union of Crystallography
Hyderabad International Convention Centre
21 - 28 August 2017, Hyderabad, India**



$$\frac{1}{2}(G_0 - G'_0) \{ [1 - 2(1 - 2\alpha) \cos H + (1 - 2\alpha)^2] [1 - 2(1 - 2\beta) \cos K + (1 - 2\beta)^2] \\ \times [1 - 2(1 - 2\gamma) \cos L + (1 - 2\gamma)^2] \}^{-\frac{1}{2}} \exp \{ i(\phi_1 + \phi_2 + \phi_3) \}$$

for $0 < \alpha < 1$, $0 < \beta < 1$, $0 < \gamma < 1$, or

$$\frac{1}{2}(G_0 - G'_0) (y_a \times y_b \times y_c)^{\frac{1}{2}} \exp \{ i(\phi_1 + \phi_2 + \phi_3) \}$$

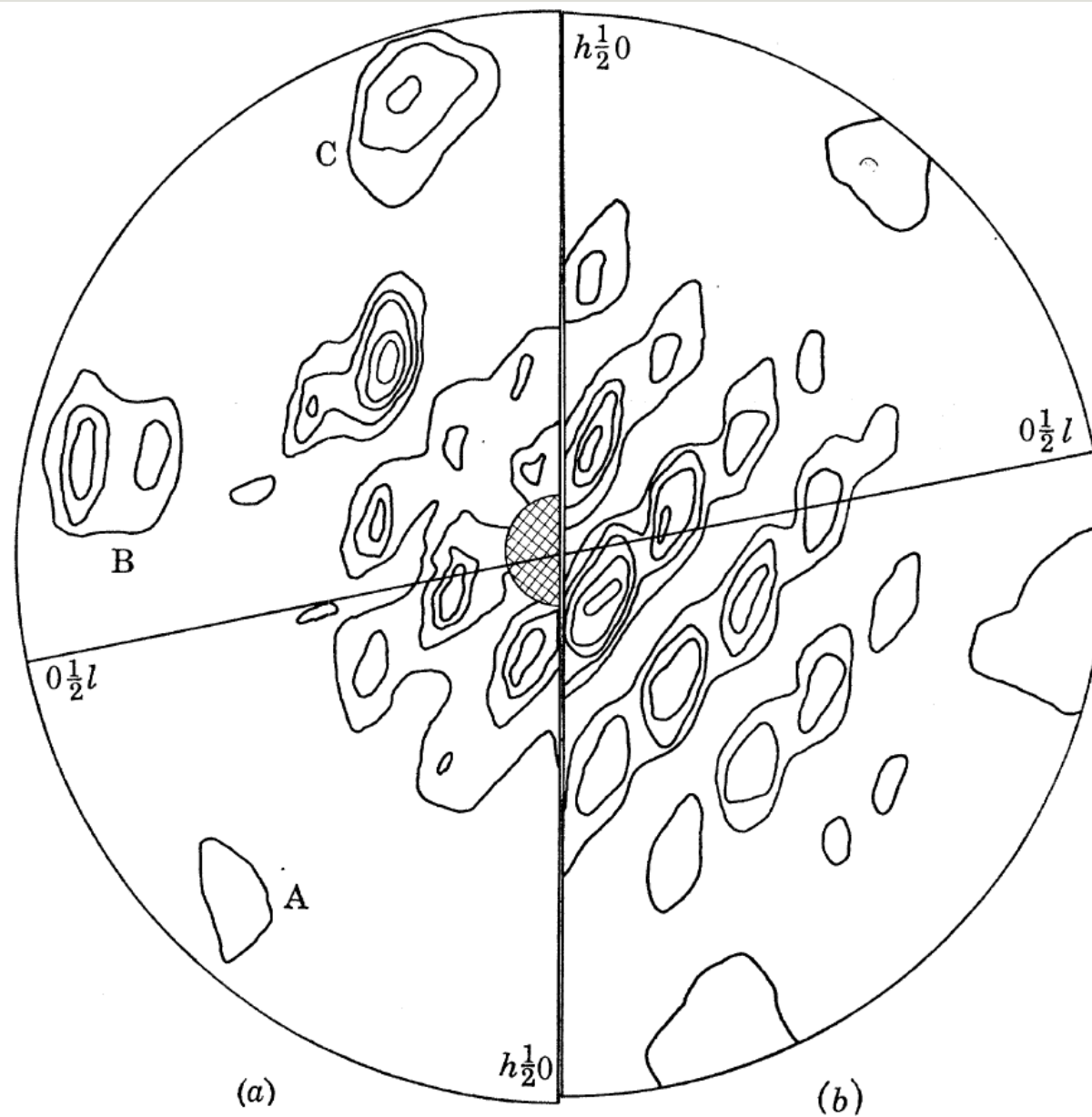
$$\overline{F^2} = \frac{1}{4} |G_0 + G'_0 + G_1 + G'_1|^2 \frac{\sin^2 \frac{1}{2} MH}{\sin^2 \frac{1}{2} H} \frac{\sin^2 \frac{1}{2} NK}{\sin^2 \frac{1}{2} K} \frac{\sin^2 \frac{1}{2} QL}{\sin^2 \frac{1}{2} L} + \frac{1}{4} \{ |G_0 - G'_0|^2 + |G_1 - G'_1|^2 \} y_a y_b y_c.$$



Mike Glazer

24th Congress and General Assembly
of the International Union of Crystallography
Hyderabad International Convention Centre
21 - 28 August 2017, Hyderabad, India

$h\frac{1}{2}l$ section



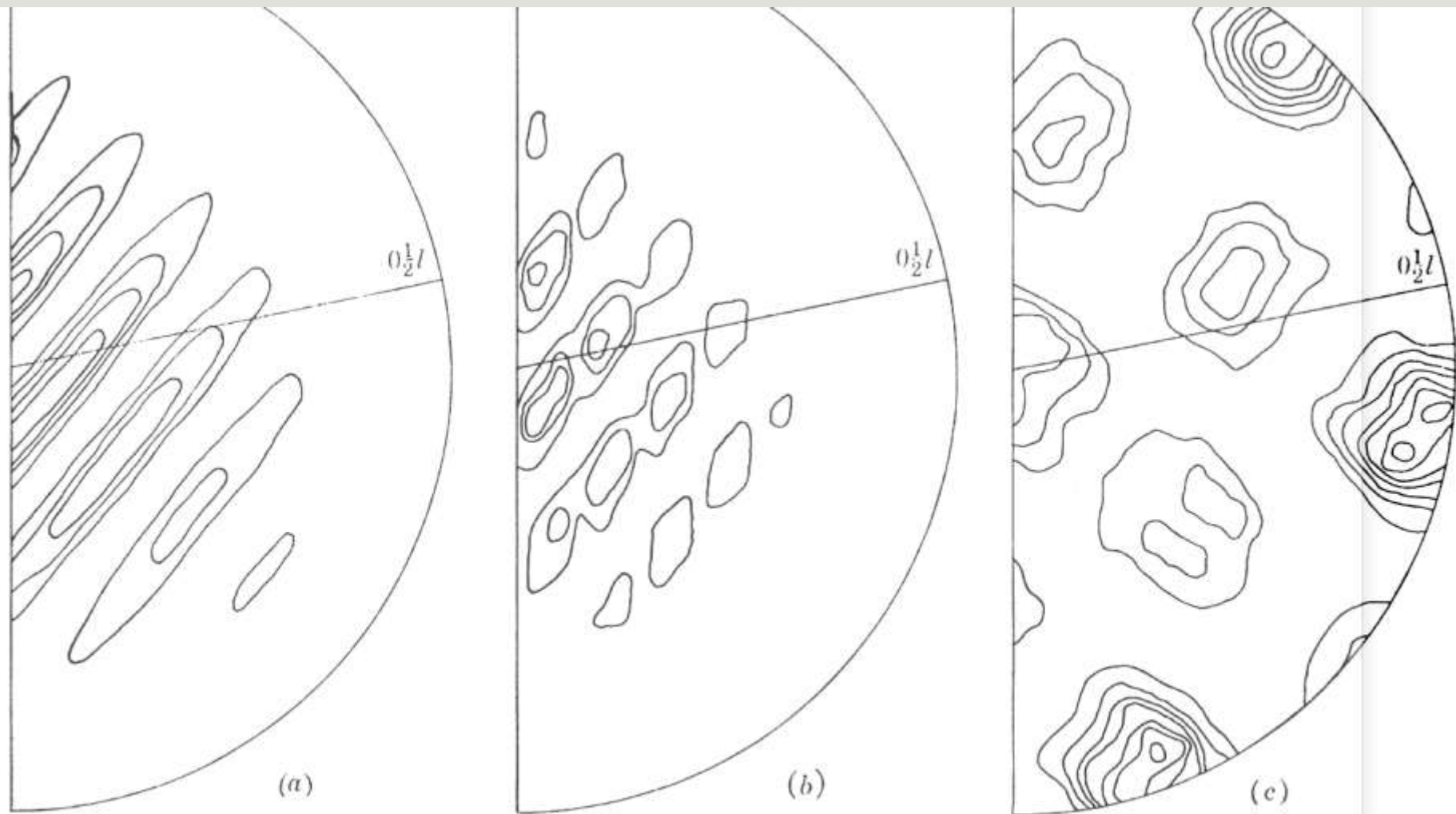


FIGURE 10. Calculated diffuse scattering for $\{h\frac{1}{2}l\}$: (a) for 'disorder' only, based on $\alpha = \gamma = 0.5$, $\beta = 0.89$; (b) for 'disorder' only, based on $\alpha = 0.5$, $\beta = 0.89$, $\gamma = 0.68$; (c) for difference Fourier transform only. (Note that figure 7b shows the sum of 10b and c together.)

Acta Cryst. (1970). A26, 678

Interpretation of Anomalous Streaks in Crystals of Anthrone

BY H. D. FLACK*

Department of Chemistry, University College London, Gower Street, London W.C.1, England

(Received 29 April 1970)

Streaks on $\{h1l\}$ Weissenberg photographs of some anthrone crystals have been explained as being due to disorder in the stacking sequence of a layer structure or to multiple twinning on $(20\bar{1})$. The two views are geometrically identical. With such a model no streaks are either expected or observed on $\{h0l\}$ Weissenberg photographs.



Mike Glazer

24th Congress and General Assembly
of the International Union of Crystallography
Hyderabad International Convention Centre
21 - 28 August 2017, Hyderabad, India

- 1968 HDF and AMG Ph.D.
- 1968 HDF Cavendish Laboratory Cambridge to work for David Tabor
- 1968 AMG Chemistry Dept., Harvard University to work for Jack Gougoutas
- 1969 AMG Cavendish Laboratory Cambridge to work for Helen D. Megaw
- 1969 HDF met his future wife Evelyne in Cambridge
- Moved to Geneva.
- Adopted a French accent!
- We continued to communicate using Russian swearwords!



Mike Glazer

24th Congress and General Assembly
of the International Union of Crystallography
Hyderabad International Convention Centre
21 - 28 August 2017, Hyderabad, India