

Commemoration of the Lives of Drs Rod Day and Gordon Troup

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In this invited presentation, we commemorate the lives of Drs Rod Day and Gordon Troup who passed away in 2015. The presentation briefly summarises their scientific careers and recognises particularly their respective contributions as enthusiastic supporters and regular contributors to the Annual Condensed Matter and Materials Meeting since its inception in 1977.

1. Introduction

I think that all of us here enjoy going to conferences and benefit from the interactions and the knowledge gained. But sometimes there are other events of importance in the conference and tonight I would like to commemorate the passing of two people who had a significant impact on the Wagga conference series.

2. Rod Day, 1937 - 2015

The first is Dr Rod Day who died on the 26th of July 2015, aged 78. Rod was born in Ipswich, Queensland, and did his first degree at the University of Queensland before becoming a teacher. He then went to Monash University where he did a PhD under Bob Street.

Rod joined CSIRO in 1969, just before the move to Lindfield. He worked on magnetic viscosity, Mössbauer effect studies of transition metals and alloys, glassy metals, hydrogen storage in metals and hard magnets. He and John Dunlop were the drivers of the establishment of a pilot plant to manufacture Nd-Fe-B magnets, a venture which resulted in a spin-off company, Australian Magnetic Technology. After retiring, Rod spent about 12 years making violins.



Fig. 1. John Dunlop (left) & Rod Day (right) at the CSIRO's Sydney University site during the 1970's.

Rod had a crucial connection with what we now call the “Wagga” conference. In the early and mid-1970's, physicists from, as I remember, CSIRO, ANU, Duntroon and Monash, including myself, attended the RACI Spectroscopy Conference series. Rod Day and John Dunlop were among them and they resolved that we needed, and could support, an AIP solid state physics conference.



Led by John Collins, Rod and John Dunlop (who was tragically killed in a helicopter accident two years ago) researched possible venues and selected Wagga for what was the first external conference ever held at the then Wagga Wagga Agricultural College, later the Riverina CAE and now the Wagga Wagga campus of the Charles Sturt University.

So that was the start of this very successful series, of which this is now the 40th. A summary of Rod Day's contributions to the Wagga series is given in Appendix 1.

3. Gordon Troup, 1932 - 2015

Gordon (Fig. 2) is well known as one of our larger-than-life characters. A formidably intelligent and challenging scientist, he always brought colour and enthusiasm to a discussion.

Gordon was born in what is now Sri Lanka, where his parents were engaged in tea planting. He started his research at the WRE Salisbury, working on masers and then lasers. From there he was seconded to the Royal Aircraft Establishment in Farnborough, during which time he also took out an MSc from the University of London for his work on masers.

Returning to Australia, he joined Monash in 1961 as a lecturer, rising to become a Reader in 1969. His research was mainly on lasers and electron paramagnetic resonance (EPR) and he wrote seven monographs including those on Masers, Masers and Lasers and Understanding Quantum Mechanics. He was recognised as the “founder of Australian laser research” [1].

In those days, physics research very much involved using equipment that you had designed and built and the next image (Fig. 3) shows Gordon with his gas laser. At Gordon's funeral, I was talking to a person who was a 3rd year student in 1964 and he recollected the day when they were doing lab and there was a great commotion in the research laboratory next door. They rushed in to observe the first firing of Gordon's He-Ne gas laser. Another piece of home-built equipment is the ultra-stable microwave generator seen here (Fig. 4) playing into a waveguide for an X-band EPR spectrometer.

However, life was not only about physics and Gordon was also the university fencing coach and is seen in Fig. 5 with the 1962 fencing team. He was always strongly interested in theatre and performances and, in Fig. 6, we see him choreographing two actors on the art of sword fighting for an upcoming performance of Shakespeare's Hamlet.

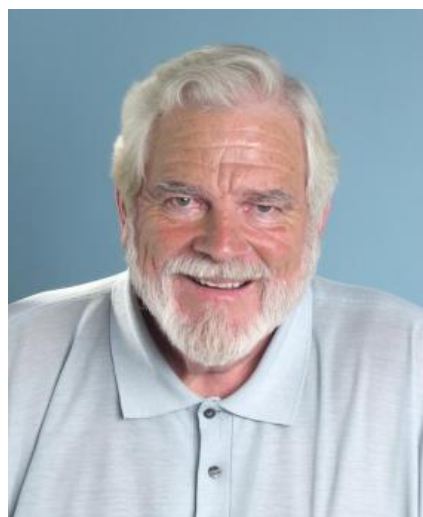


Fig. 2. Gordon Troup (photographer Steve Morton).



Fig. 3. Gordon Troup with He-Ne laser (Monash University Archives, IN5757).

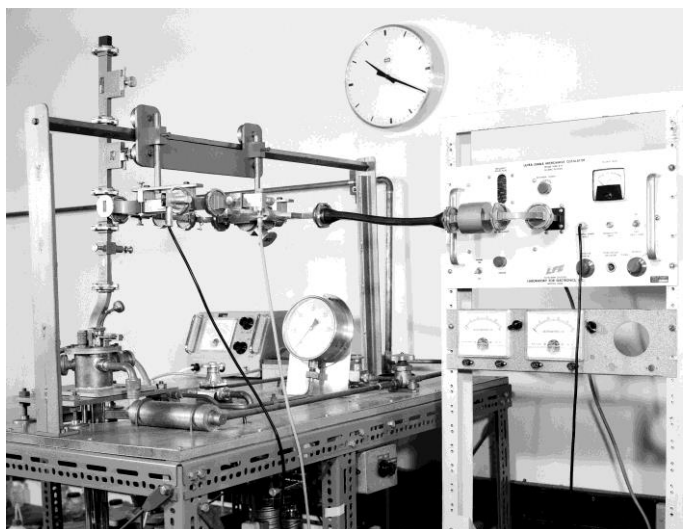


Fig. 4. Microwave generator driving into a waveguide (Monash University Archives, IN5531, photographer Bob Bryant).

Lecturing to 1st year engineers in the 1960's and 1970's was a challenging task – not for the faint hearted. There is a story, which I cannot verify, that after a particularly rowdy lecture, Gordon turned up to the next lecture with his sabre, slapped it on the big front bench and announced in his rich and commanding voice, “Today, we will have silence!” You will also be surprised that, in contrast, Gordon played the role of Tinker Bell in the 1979 Monash production of Peter Pan, using a laser to show how she flashed around.



Fig. 5. Gordon Troup as coach of the 1962 Monash University fencing team (Monash University Archives, IN5199, photographer Terry Martin).

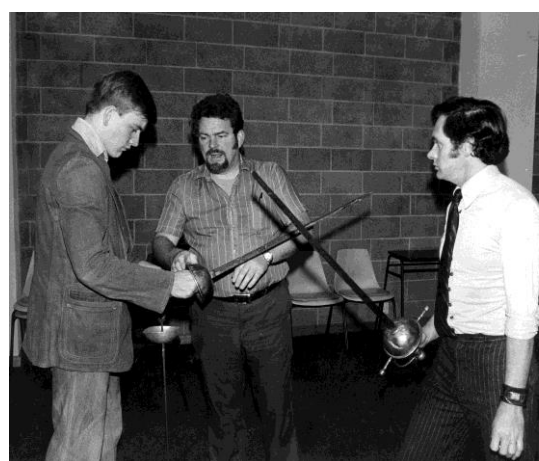


Fig. 6. Gordon Troup choreographing a duel for theatre (Monash University Archives, IN1737).

Gordon could be a forceful advocate for his point of view and in Fig.7 we see him in full flight with Logan Francey. Recognising that it seemed a little strange to be supervising PhD candidates when he did not have a PhD himself, Gordon went for the stronger approach and took out a DSc for a thesis on Quantum Electronics in 1972.

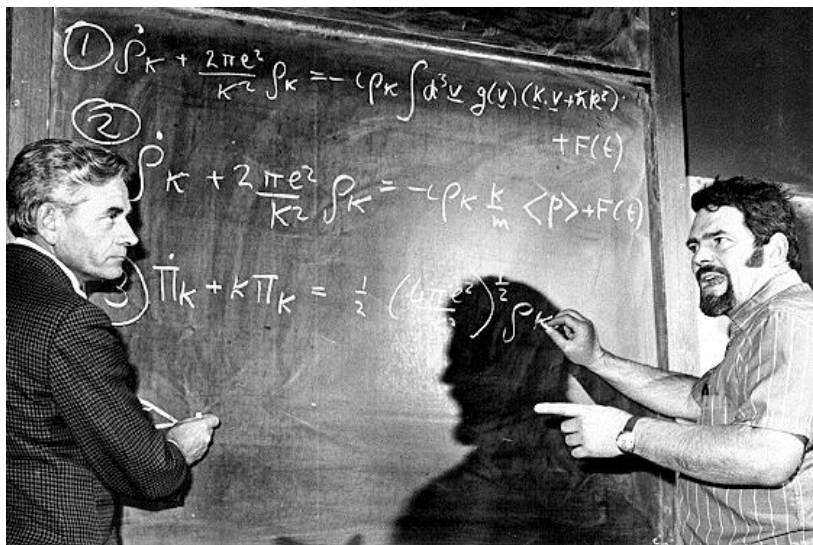


Fig. 7. Gordon Troup in discussion with Logan Francey (Monash University Archives, IN5197).

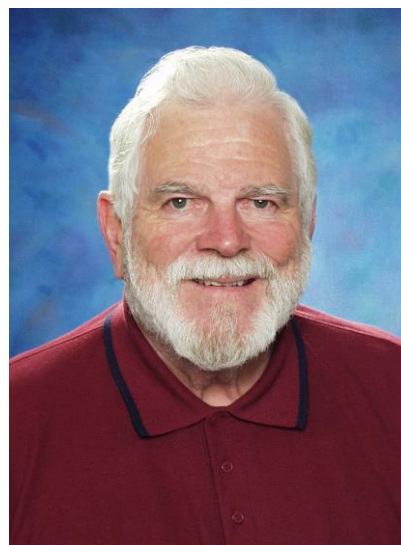


Fig. 8. Gordon Troup (photographer Steve Morton)

His daughters referred to him as the “Renaissance Man” and his love of things Italian covered the language, arts and culture, music, food and, of course, wine. His love of the arts was shared by his wife, Maggie, who was a ballet dancer. Gordon had a trained singing voice and also carried out research on musical acoustics, voice analysis and instrumentation, produced images of Italian vowel formants using X-rays and ultrasound and wrote a monograph on *The Physics of the Singing Voice*.

Gordon became an enthusiastic Wagga participant with twenty-seven contributions (listed in the Appendix). The contributions covered a wide range of topics, but particularly electromagnetism, studies of gemstones and the anti-oxidant properties of red wine, brandy and coffee. In this he practised what he preached and had no trouble solving the problem of what to do with the opened bottle after removing a 2 mL sample for the EPR experiment! One interesting result was when he was given a, I believe, 20 year sequence of one of the Wagga red wines and found that the free radical signal increased for the first ten years, flattened and then started to decrease. So this is how you decide when it is time to pull the remainder of the case out from the cellar!

As his daughter, Cynthia Troup described, her father (Fig. 8) had a passion for research. The pursuit was never merely cerebral. It involved creativity and the pleasure of sharing it with others. It was a great example of how to combine your work and your hobbies and make a story out of them. Gordon died on 22 December last, and his final two abstracts prepared for delivery at this conference are up in the poster room (Fig. 9).

Gordon – we will remember you.

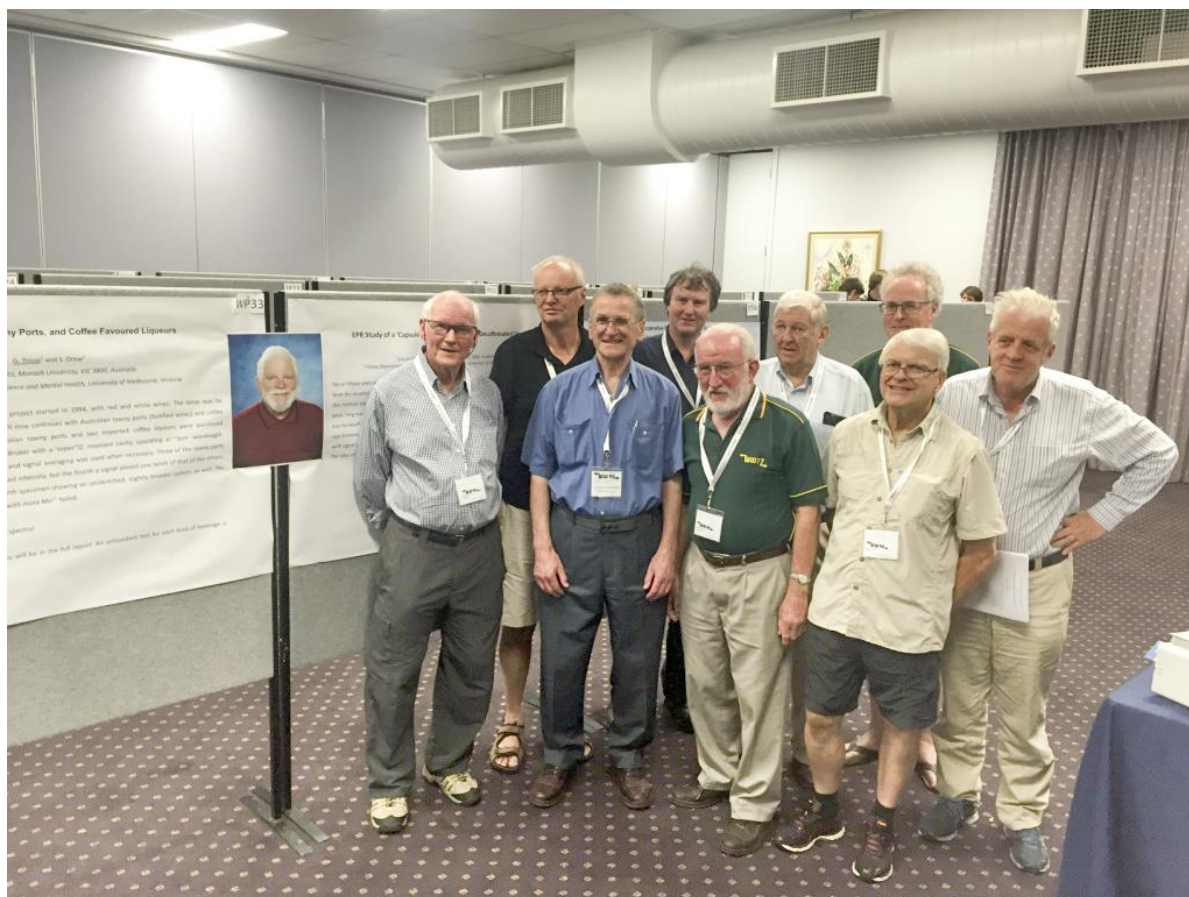


Fig. 9. Gordon Troup's poster abstracts at "Wagga 2016"

(L – R): John Cashion (Monash), Stephen Collocott (CSIRO), Stewart Campbell (UNSW Canberra), Wayne Hutchison (UNSW Canberra), Trevor Finlayson (Univ. Melbourne), Jaan Oitmaa (UNSW), Garry McIntyre (ANSTO), Glen Stewart (UNSW Canberra), Jeffrey Sellar (Monash) (photo: Trevor Finlayson).

Acknowledgments

I am grateful to Stephen Collocott for providing details of Rod Day's career and to Trevor Finlayson for collating both Rod Day's and Gordon Troup's Wagga publications for the Appendices. Also thanks to Glen Stewart and Steve Morton for assistance in the manuscript preparation.

Reference

[1] Pilbrow J B 2015 *Australian Physics* **52**(4) 117-120

Appendix 1. Wagga presentations by R. K. Day

- 1977 Attended
- 1978 *Mössbauer Effect in DyAl₂*, R.K. Day, J.B. Dunlop and G.J. Bowden
- 1979 *¹⁶⁹Tm Mössbauer Measurement*, R.K. Day and J.B. Dunlop
- 1980 *Unusually Slow Electronic Relaxation in the Paramagnetic Phase of Tm₃Al₂*, G.J. Bowden, J.M. Cadogan, R.K. Day and J.B. Dunlop
- 1981 *Crystal Field Quenching in TmFe₂*, R.K. Day, J.B. Dunlop, G.J. Bowden and J.M. Cadogan
- 1982 *Preparation and Electrical Resistivities of Zr_{1-x}Cu_x Metallic Glasses*, E. Babic, R.K. Day and J.B. Dunlop



- 1983 *The Magnetic Structure of Er₃Al₂*, R.K. Day, J.B. Dunlop, R.L. Davis and C.J. Howard
Magnetic Properties of Amorphous PdSiFe, PdSiMn and PdSiCr Alloys, J. Crangle, R.K. Day and J.B. Dunlop
- 1985 *Properties of Fe₇₈Si₁₀B₁₂ Metallic Glasses Prepared from Commercial Ferro-Alloys*, R.K. Day, J.B. Dunlop and M. Sarwar
Magnetic Properties of Tm₂Fe₁₄B, R.K. Day, J.B. Dunlop, D.C. Price and R.L. Davis
- 1986 *Crystallisation Characteristics of Fe-B-Sc Metallic Glasses*, R.K. Day, J.B. Dunlop and C.P. Foley
⁵⁷Fe Mössbauer Measurements of the Spin Reorientation in Tm₂Fe₁₄B, R.K. Day, J.B. Dunlop and D.C. Price
Rare Earth/Iron Permanent Magnets, J.S. Cook, R.K. Day, J.B. Dunlop, P.B. Gwan and R.G. Heydon
Properties of Fe₇₈Si₁₀B₁₂ Metallic Glasses, R.K. Day, J.B. Dunlop and M. Sarwar
- 1987 *Magnetic Properties of Rapidly Quenched and Hot Pressed Nd-Fe-B Alloys*, P.B. Gwan, J.P. Scully, D. Bingham, J.S. Cook, R.K. Day, J.B. Dunlop and R.G. Heydon
- 1989 *Magnetic Viscosity Measurements in NdFeB Permanent Magnets: Experiment Interpretation and Conjecture*, R. Street, D. Bingham, R.K. Day, J.B. Dunlop and P.B. Gwan
Update on the Rare-Earth Magnet Production Plant, D. Bingham, J.D. Cadogan, J.S. Cook, R.K. Day, J.B. Dunlop, P.B. Gwan, P. Jansen and M. Sarwar
- 1991 *A Neutron Diffraction Study of Y₂Fe₁₇ and Y₂Fe₁₇N_{2.5}*, R.L. Davis, S.J. Kennedy, D. Bingham, R.K. Day and J.B. Dunlop
- 1992 *Preparation and Properties of some Rare Earth – Transition Metal Intermetallics and their Interstitial Nitrides*, S.J. Collocott, R.K. Day and J.B. Dunlop
- 1993 *Phase Equilibria for the Fe-rich Nd-Fe-Ti Ternary Alloy System at 1100 °C*, A. Margarian, J.B. Dunlop, R.K. Day and W. Kalceff
- 1996 Attended

Appendix 2. Wagga presentations by G. J. Troup

Drinks and Foods

- 1990 *Free Radicals in Red Wine, but not in White*, G.J. Troup (Oral Contribution)
- 1991 *ESR Detection of Free Radicals and Transition Metal Ions in Irradiated Spices and Other Foodstuffs*, G.J. Troup, J.R. Pilbrow, D.R. Hutton and C.R. Hunter (Oral Contribution)
(1) *Development of Free Radical ESR Signals in Red Wine with Aging*;
(2) *Free Radical ESR Signals in Red Wine Fractions*, G.J. Troup, D.R. Hutton, D.A. Hewitt, C.A. Hunter, M. Williams, B. Freeman and B. Williams
- 1996 *An Electron Paramagnetic Resonance Study of the Behaviour of Copper(II) in Ageing Catechin-Based Model Wines*, M. Mitri, G.R. Scollary, G.J. Troup, D.R. Hutton, C.A. Hunter and D.G. Hewitt
- 1996 *An EPR Study of the Laquer-Type Bottle Deposits from Red Wine*, G.J. Troup, D.R. Hutton, J.R. Pilbrow, C.A. Hunter and D.G. Hewitt
- 1997 *Free Radicals in PycnoGenolTM, a Phenolic Extract from Red Grape Seeds*, G.J. Troup, D.R. Hutton, J.R. Pilbrow, D. Hewitt and C. Hunter
- 1998 *Photophysics of the Variable Quantum Yield of Asymmetric Bilirubin (or – read the Whole Chapter)*, G.J. Troup, R. Pratesi, G. Agati and F. Fusi (Oral Contribution)



- ESR Identification of Free Radicals in Polyphenolic Extracts from Wine Grapes, Olives and Green Tea*, G.J. Troup, Annalisa Romani, Nadia Mulinacci, Franco F. Vincieri, D.R. Hutton, C.R. Hunter and D.G. Hewitt
- 1999 *Free Radicals in Synthetic and Natural Indigo*, G.J. Troup, D.R. Hutton, D.G. Hewitt, M. Picollo and A. Casini
A Study of the Red Clover Extract Trinovin by ESR, HPLC/MS and UVS, G.J. Troup, D.R. Hutton, C.R. Hunter and D.G. Hewitt
- 2002 *Three Diverse Solid Phenolics with Similar Hyperfine EPR Spectra – Why?*, G.J. Troup, S. Drew, D.R. Hutton, J.R. Pilbrow and D.G. Hewitt
An EPR Measure of Phenolic Content in Various Wine Grapeseeds from Marc and from Grapeseed Meals left after Oil Extraction, R. Jordan, R. Ponnusamy, G.J. Troup and D.R. Hutton
Red Wines Good, White Wines Bad?, D.P. van Velden, E.P.G. Mansvelt and G.J. Troup
- 2003 *EPR Studies of a Red Wine Bottle Deposit, and the Precipitates from ‘Model’ Wine and a White Wine, both Artificially Aged*, Manorah Mitri, G. Scollary, G.J. Troup, D.R. Hutton and J.R. Pilbrow (Oral Contribution)
Whisky – An ESR and Antioxidant Study, I. Cheah, J. Kelly, S.J. Langford and G.J. Troup
Development of a Theory of the Variable Quantum Yield of the Photoproducts from Asymmetric Bilirubin (Or: If You Have Read the Second Part of the Chapter, You May Well Not Have Solved the Whole Problem), G.J. Troup
- 2004 *Whisky: Further EPR and Antioxidant Efficiency Studies*, I. Cheah, S.J. Langford, J. Kelly and G.J. Troup
An EPR and Antioxidant Efficiency Study of the Pinebark Phenolic Extracts Pycnogenol® and Endogenol, I. Cheah, S.J. Langford and G.J. Troup
Theory of the Variable Quantum Yield of Bilirubin-IX Photoisomers: the End of the Chapter, G.J. Troup, Marina Mazzoni, G. Agati and R. Pratesi
- 2006 *EPR and Antioxidant Efficiencies Studies of Brandies*, G.J. Troup, Melissa Latter, I. Cheah, D.R. Hutton, J.F. Boas and S.J. Langford
EPR Studies of Milk Products Tested for Control of Grapevine Powdery Mildew, G.J. Troup, P. Crisp, Eileen Scott, J.F. Boas, D.R. Hutton and I. McKinnon
EPR and Antioxidant Studies of Anthogenol, G.J. Troup and J.F. Boas
EPR and Antioxidant Studies of a Red Wine Vinegar and a Cider Vinegar, G.J. Troup, Laura O’Dea, D.R. Hutton and S.J. Langford
An EPR Study of Dark (>75% Cocoa), Chocolate, G.J. Troup and D.R. Hutton
EPR and Antioxidant Efficiency Comparisons of the Flavonoids Quercetin and Fisetin, G.J. Troup, D.R. Hutton, Laura O’Dea and S.J. Langford
Resveratrol: EPR and Antioxidant Efficiency Studies, G.J. Troup, Laura O’Dea, S.J. Langford and D.R. Hutton
- 2008 *Detection of Cu²⁺ in Red Wines by EPR*, G.J. Troup, Laura O’Dea, J.F. Boas and S.J. Langford
Rogue Catalysts, Antioxidants, Paramagnetic Ions, EPR and HPLC: a New Protocol Needed, G.J. Troup, Laura O’Dea, J.F. Boas and S.J. Langford
- 2009 *Green Ginger Wine: EPR and Antioxidant Efficiency Studies*, G.J. Troup, Ruth Oliver, Laura O’Dea, J.F. Boas and S.J. Langford
- 2012 *An EPR Study of ‘Mineral Organic Formula’ and ‘Vein Eze’ Dietary Supplements*, G.J. Troup and J.F. Boas
- 2013 *In Scotch Whisky, Where Are the Fe³⁺ and Cu²⁺ Ions (EPR Detected) Formed?* S. Drew and G.J. Troup



- 2015 *The Apparent Neglect of the Effects on 'Winehealth', and in Wines, of 'Radical Ions'*,
G.J. Troup and S. Drew

Gemmology

- 1992 *Electron Paramagnetic Resonance and Fluorescence of Ti^{3+} in Australian Biron Synthetic Beryl*, G.J. Troup, D.R. Hutton, J.R. Pilbrow, Jane Warne and Angela McGregor
- 1993 *Optical Fluorescence and Gain Measurements in Synthetic "Biron" Ti^{3+} Beryl*, G.J. Troup, R. Salimbeni, R. Pini, Marina Mazzoin, J.R. Pilbrow, D.R. Hutton and Angela McGregor
- 1994 *ESR of γ Irradiated Synthetic and natural Vanadium Beryls*, D.R. Hutton and G.J. Troup
EPR of Cu^{2+} in Paraiba Tourmaline, T. Lennie, G.J. Troup and D.R. Hutton
- 1995 *The Optical Puzzle of Ti^{3+} Beryl*, G.J. Troup, G. Poci, N. Manson, L. Dubicki, D.R. Hutton, R. Pini, N. Rigby and R. Salimbeni
An ESR Study of Three Nigerian Blue-Green Beryls, G.J. Troup, D.R. Hutton and H. Hänni
EPR Spectra of Synthetic and Natural Opals – A Pilot Study, D.R. Hutton, Mary Young and G.J. Troup
- 1996 *The Possible Use of EPR Spectroscopy for Paint Pigment Identification*, G.J. Troup, D.R. Hutton, M. Bacci, F. Lotti, A. Casini and M. Picollo
- 1997 *The Use of EPR Spectroscopy for Paint Pigment Identification - 2*, G.J. Troup, D.R. Hutton, J.R. Pilbrow, M. Bacci, F. Lotti, A. Casini and M. Picollo
- 1998 *ESR Detection of Implanted Cr^{3+} and Ti^{3+} in Al_2O_3* , L. Morpeth, C. Noble, D.R. Hutton, J. McCallum and G.J. Troup
An ESR Study of the Quartz Sands of "Squeaky Beach", Wilson's Promontory, Victoria, G.J. Troup, D.R. Hutton and Maggie Troup
- 1999 *An ESR Study of the Spectra of Paint Pigments in "Drying" Linseed Oil*, Robyn Sloggett, G.J. Troup and D.R. Hutton
- 2000 *EPR Spectroscopy Can Help with Paint Pigment Provenance*, G.J. Troup, D.R. Hutton, Robyn Sloggett, M. Bacci, F. Lotti, M. Picollo and A. Casini
- 2012 *A Simple Student-made Optical Spectrometer Modified for Gemmology Use*, T. Hughes and G.J. Troup

Theory and other EPR studies

- 1984 *Reverse Phase E.S.R. Spectra Induced by Angular Modulation*, D.R. Hutton, J.R. Pilbrow, G.R. Sinclair and G.J. Troup
- 2003 *Naphthalene Diimides as Molecular Device Components*, G. Andric, J. Boas, A. Bond, S.J. Langford, J.R. Pilbrow and G.J. Troup
The Effect of Unequal Davidoff (Exciton) Linewidths on the Quantum Yield of the Photoproducts of Asymmetrical Bichromophoric Molecules, G.J. Troup, M.A.B. Deakin, Marina Mazzoni, G. Agati and R. Pratesi
- 2009 *Special Relativity and Spontaneous Emission of Radiation*, G.J. Troup, D. Paganin and A.E. Smith
- 2011 *From Radiation Damage, through Minerals and Gemstones, to Art, with EPR*, G.J. Troup, D.R. Hutton, J.F. Boas, A. Casini, M. Picollo and Robyn Sloggett



2012 *Cutting Entanglement*, G.J. Troup, D. Paganin and A.E. Smith

Cultural

- 1996 *Blessed Niels Stensen: Dane, Florentine and Bishop; A Founding Father of Crystallography*, A.E. Smith and G.J. Troup
- 2000 *Albert Einstein and Olinto Di Pretto. The True Story of the Most Famous Formula in the World*, G.J. Troup
- 2006 *Ultrasound Observations of Vowel Tongueshapes in Trained Singers*, G.J. Troup, Tania Griffiths, Michal Schneider-Kolsky and T.R. Finlayson
- 2012 *A Thermodynamic/Information Theory Analysis of Library Operation*, G.J. Troup