



WEEKLY "E" NEWS- from the RACI NSW 1st November 2008

Dear NSW RACI readers

Below are this week's announcements from the RACI NSW Branch, a summary is given and then scroll down for the full text.

RACI NSW One-Day Organic Chemistry Symposium 2008 3rd December, School of Chemistry, The University of Sydney – *See page 3 for the full program of talks.* If you would like to register please email racinsw@chem.unsw.edu.au

UTSpeaks: No Drugs for Bad Bugs This sobering public lecture scopes the enormity of drug resistance bacteria today. It touches on how we arrived at this point and the challenges facing science to find cures. It calls on the healthcare and agricultural sectors and the community to unite in slowing further drug resistance. **Speaker** Associate Professor Elisabeth Harry **When** Wednesday 12 November 2008 6.00pm drinks -- 6.30pm lecture start concluding 7.50pm **Where** UTS University Hall UTS Science Building, 745 Harris Street Ultimo (diagonally opposite ABC headquarters) **RSVP** Tuesday 11 November 2008 Register attendance with Robert Button Email: robert.button@uts.edu.au Tel: 02 9514 1734 *Full details see page 4*

RACI (NSW) Analytical Chemistry Group - Honours Student's Presentation Evening
When: Wednesday, 19th November 2008, 5.30 pm for 6.00 pm (*The NSW RACI Branch will be putting on Wine, and Cheese from 5.30pm at the event*) **Where:** University of Technology Sydney (Room 2.33, Building 4; officially labelled as CB04.02.33) **Cost:** FREE *Full details see page 5*

Call for Office Bearers of the RACI Organic Division As you may know Dr. Paul Savage will be the new Chair of the Division after the AGM at the ORGANIC 08 conference. Dr. Mike Sherburn has indicated that he will step down as treasurer at the end of 2008. Thus seeking expressions of interest for (i) chair elect (ii) treasurer (iii) State representatives *Full details see page 6*

Wentworth Group Scholarships To bridge the gap between science and public policy, scientists must learn to navigate the divide. This is the intention of the Wentworth Group Scholarships. <http://www.wentworthgroup.org/science-program/>

The 2009 Honours prize (RACI Western Sydney Section) will be awarded for the best Honours thesis produced in 2008 by a student who is resident and/or has studied or undertaken research in western Sydney throughout the year. The RACI Western Sydney Section Honours Prize is now open *Full details see page 7*

An Invitation The Royal Australian Chemical Institute (NSW Branch) in conjunction with The Dairy Industry Association (NSW Branch) and The Australian Institute of Food Science and Technology (NSW Branch) *proudly presents:* **RACI/AIFST/DIAA CHRISTMAS PARTY 2008** Friday 28th November – Darling Harbour **There are only a couple of Tickets remaining!! And a new Ticket Price (pages 8 and 9)**

Attending the 16th R&D Topics Student Conference? Do you have a student who has work to present? The conference committee are still keen to receive abstracts for oral and poster presentations. In addition to this, the RACI NSW Branch Invites RACI Student Members From NSW Universities To Apply For A Travel Bursary to present a paper at the 16th Annual RACI analytical and environmental divisions R&D Topics conference to be held from the 6th to 9th of December at Macquarie University (Located in Sydney). We now welcome Sydney student presenters to apply – Student Presenters residing in Sydney may be eligible for a petrol voucher to assist with travel costs associated with travelling to this event. This will be the last week we accept nominations.

HAVE YOUR SAY ON THE PROPOSED CONSTITUTION AND BY-LAW CHANGES If you are unable to attend the AGM but wish to vote either for or against the amendments please send a proxy vote to the Honorary General Secretary, RACI National Office, 21 Vale Street North Melbourne, VIC 3051, by close of business on Friday, 28 November. The 'Appointment of Proxy – General' form is Schedule A2 of the By-laws and is available on the RACI website (the last few pages of the document deal with the voting by proxy)

<http://www.raci.org.au/national/downloads/Amended%20RACI%20BY%20LAWS%202007.pdf>

Website of the Week: This week we look at Chemistry for your Iphone <http://mekentosj.com/iphone/solutions/> Special thanks goes to John Zavras who suggested this website.

Free Thermo Spectroscopic Solutions Seminar: Where: Parramatta Rydges When: 19th Nov Learn about FT-IR, Raman, and Near IR See page 6 for more details

Upcoming RACI Conferences and Symposia As evidenced by the lengthy E News' of late there is an awful lot going on at the moment. This article summarises all the upcoming conferences and symposia

Missed an edition of our weekly E-News? We now have an archive of old editions! Please see

<http://www.chem.unsw.edu.au/RACI/News.html>

Its here!!! The New 2008/2009 Entertainment Book has arrived: This book has been an important fundraiser for our branch the last few years. Purchase your brand new 2008/2009 Entertainment™ Book now

Important Dates in Chemistry's History Nov 7- 13 We again will celebrate many noble prize winners birthdays this week. Among these :the famous Marie Curie and the discoverer of Vitamin K

Please scroll down for further details.....

RACI NSW One-Day Organic Chemistry Symposium 2008
3rd December, School of Chemistry, The University of Sydney

- 8:30-9:10 Registration
- 9:10-9:15 Opening Remarks
- 9:15-9:40 **Stephen Hashmi**, Heidelberg University, "Gold Catalysis: Reactivity Patterns, Mechanisms and Benefits for Synthesis"
- 9:40-10:05 **Nadim A. Darwish**, School of Chemistry, UNSW, "L and Straight Shaped Norbornylogus Bridges with Steady Feet for Surface Electron Transfer Studies"
- 10:05-10:30 **Jimmy Lee**, School of Chemistry, The University of Sydney, "Synthesis and Photoinduced Electron Transfer in Porphyrins-Fullerene Donor-Acceptor Systems"

Coffee

- 11:00-11:25 **Jacqueline Poldy**, Department of Chemistry, ANU, "Fooled by a Flower: the Seductive Chemistry of *Chiloglottis* Orchids"
- 11:25-11:50 **Daniel Goldstein**, School of Chemistry, UNSW, "The Synthesis of Iridium Bisterpyridine Cytochrome c Bioconjugates for Bioelectronic Applications"
- 11:50-12:15 **Caroline Nesbitt**, School of Chemistry, The University of Sydney, "A Formal Total Synthesis of (-)-Kumausallene"

Lunch and Poster Session

- 1:45-2:10 **Shiva Prasad**, School of Chemistry, UNSW, Photocatalytic Reduction of NAD⁺ using tin(IV) porphyrins
- 2:10-2:35 **Stephen Butler**, School of Chemistry, The University of Sydney, "Cyclic peptide platforms as selective sensors for phosphate oxoanions"
- 2:35-3:00 **Thomas Fallon**, Research School of Chemistry, ANU "Double Additions to Dienynes"

Coffee

- 3:30-3:55 **Lidia Matesic**, School of Chemistry, University of Wollongong, "N-Alkylisatins as Potent Cytotoxins"
- 3:55-4:20 **Fiona Ky**, School of Chemistry, The University of Sydney, "Real-time Monitoring of Asymmetric Reactions by Polarimetry"
- 4:20-5:00 **Jackie Gervay-Hague**, University of California, Davis, "Synthesis of Sulfone-based Nucleotide Isosteres: Identification of CMP-Synthetase Inhibitors"
- 5:00-5:15 Closing Remarks and Awards

BBQ and drinks at the School of Chemistry

We gratefully acknowledge generous sponsorship by the following





Are we losing the evolutionary arms race against long-time foes?

Since antibiotics gained widespread use in the 1940s, much of the world has enjoyed relief from many infectious diseases that were likely killers. Yet these brief days in the sun and resultant complacency about some illnesses are over. Victories over diseases that once seemed certain are failing and the hunt for new and effective drugs in today's fight against antibiotic resistance is urgent.

This sobering public lecture scopes the enormity of drug resistance bacteria today. It touches on how we arrived at this point and the challenges facing science to find cures. It calls on the healthcare and agricultural sectors and the community to unite in slowing further drug resistance.



*Introduced by *Associate Professor Jock Harkness, Director of Microbiology, St Vincents Hospital

Speaker *Associate Professor Elisabeth Harry *Liz Harry is principal researcher with the UTS Institute for the Biotechnology of Infectious Diseases. After gaining a PhD at the University of Sydney, she went on to Harvard University as a postdoctoral fellow, revolutionizing our understanding of bacterial cell structure by pioneering fluorescence microscopy techniques for 'seeing' the location of proteins in bacterial cells.

After returning to Australia, Liz became an Australian Research Council Postdoctoral Fellow and then an ARC QEII Fellow at USYD. Now at UTS she works with industry to develop novel antibiotics that target the process of bacterial cell division. In 2002 she was awarded the Australian Eureka Prize for Scientific research, and in 2008 the ASM Frank Fenner Award, by the Australian Society for Microbiology.

When Wednesday 12 November 2008 6.00pm drinks -- 6.30pm lecture start concluding 7.50pm

*Where *UTS University Hall UTS Science Building, 745 Harris Street Ultimo (diagonally opposite ABC headquarters)

*RSVP *Tuesday 11 November 2008 Register attendance with Robert Button Email: robert.button@uts.edu.au Tel: 02 9514 1734

UTSPEAKS: is a free public lecture series presented by UTS experts discussing a range of important issues confronting contemporary Australia

RACI (NSW) Analytical Chemistry Group - Honours Student's Presentation Evening



When: Wednesday, **19th November 2008**, 5.30 pm for 6.00 pm
(The NSW RACI Branch will be putting on Wine, and Cheese from 5.30pm at the event)

Where: University of **Technology Sydney (Room 2.33, Building 4; officially labelled as CB04.02.33)**

Cost: FREE

Each year, the NSW Analytical Chemistry Group has an evening where selected undergraduate students present their honours project work on some aspect of analytical chemistry (15 minutes presentation + 5 minutes questions). Their presentation skills and knowledge of their topic are judged by a panel and **prizes of \$500 (First) and \$300 (Second)** are awarded. Each presenter will receive one year's student membership to the RACI.

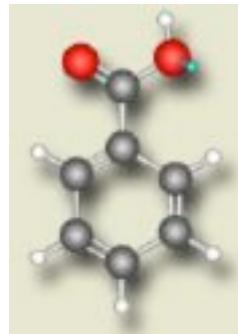
Although the speakers have not been confirmed they will be representing the Universities in the Sydney area.

There is no charge for the meeting and all members and visitors are welcome to join with us in encouraging these talented young people. An informal dinner will be arranged at a local restaurant after the meeting for those who wish to attend (at their own cost, except for the student presenters, for whom the dinner is free).

For more information, contact Clarrie Ng by email clarrieng@optusnet.com.au.

Call for Office Bearers of the RACI Organic Division

As you may know Dr. Paul Savage will be the new Chair of the Division after the AGM at the ORGANIC 08 conference. Dr. Mike Sherburn has indicated that he will step down as treasurer at the end on 2008.



I am thus seeking expressions of interest for

- (i) chair elect
- (ii) treasurer
- (iii) State representatives

Those wishing to be considered for these positions at the next AGM should also let me know by email by Friday the 21st November.

Steve Pyne
Chair Organic Division

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Contact details: Professor Stephen G. Pyne
Department of Chemistry
University of Wollongong
Wollongong, NSW, 2522
Australia
Phone: (61 2) 4221 3511
Facsimile: (61 2) 42214287
e-mail: spyne@uow.edu.au



Wentworth Group Scholarships

To bridge the gap between science and public policy, scientists must learn to navigate the divide. This is the intention of the Wentworth Group Scholarships. They seek to enable recipients to become active contributors at the interface of good decision making and world class science. Launched in February 2007, this is the second year that scholarships have been offered. The scholarships are awarded to post-graduate students. Each scholarship may be used over a 12 month period. Students must be an Australian citizen or have permanent residency status to be eligible. Students are given access to Master Classes and mentoring by some of Australia's best scientists. Above all, we hope that recipients will be encouraged, inspired and motivated.

<http://www.wentworthgroup.org/science-program/>

Do you supervise Hons students?

Did chemistry provide a solution?

Is your student eligible for an RACI prize...

... of \$200 and one year's RACI membership?

The 2009 Honours prize (RACI Western Sydney Section) will be awarded for the best Honours thesis produced in 2008 by a student who is resident and/or has studied or undertaken research in western Sydney¹ throughout the year.

The RACI Western Sydney Section Honours Prize is now open to

... applicants enrolled in ANY University, within ANY department/school/faculty. The project must include either 'pure' or 'applied' chemistry. This could be applied to fields such as agriculture, horticulture material science, nanotechnology, pharmacy, neuroscience, medicine, biochemistry, biology, environmental analysis, forensics, or any other discipline.

The winner will give an oral presentation at a meeting of the Royal Australian Chemical Institute Western Sydney Section during 2009 (date to be determined). **This is an opportunity to showcase your student's research to a range of RACI members and other students.**

The prize will be awarded to a project that demonstrates a high level of innovation, creativity and contribution to chemical knowledge. If more convenient, the thesis may be spiral- or 'perfect'-bound and may be submitted prior to examination as the final grade is not a determining factor.

Students should forward a copy of the thesis plus a covering letter containing personal details (including student's email address) to one of the contacts below. The thesis will be returned.

DEADLINE: MARCH 31ST 2009.

Earlier submission is

encouraged

Enquiries and submission to:

Dr Deidre Tronson (FRACI), 21 Eagle Creek Rd, Werombi, 2570.

Ph 02 4653 1430; email: deidre@bowtie.com.au.

OR leave the thesis, **clearly marked "WSS Honours Prize"**, at the RACI office, UNSW.

¹ 'Western Sydney" is defined by the following postcodes: 2076-2077; 2111-2126; 2128; 2133; 2140-2168; 2170; 2171; 2173; 2174; 2176; 2177; 2190-2200; 2205-2214; 2216-2234; 2558-2560; 2563-2579; 2745; 2747-2768; 2770; 2773-2787; 2790

An Invitation

The Royal Australian Chemical Institute (NSW Branch)
in conjunction with

The Dairy Industry Association (NSW Branch)
and
The Australian Institute of Food Science and Technology
(NSW Branch)
proudly presents:



RACI/AIFST/DIAA CHRISTMAS PARTY 2008

Friday 28th November – Darling Harbour

The RACI NSW Branch has joined this year, for the first time, the NSW Branches of AIFST and DIAA the celebration of the year past and so strengthening the relationship between the three organisations.

Members and Guests will board the beautifully restored **South Steyne** floating restaurant moored at Darling Harbour from 7pm for welcome drinks and finger food, before sitting down to a sumptuous 2 course dinner. Gary Kennedy will be our MC, raffling the many hampers donated annually by organisations from the Food and allied industries and providing musical entertainment as our DJ until the evening closes at 11.30pm.

The RSVP date is 14th November and it is advisable to book early as this venue has limited capacity. Being a combined event for several industry organisations this year capacity is expected to be met. Please book by calling or emailing Dr. Attila Tottszer on 02 9888 9077 or <attila.tottszer@advancedanalytical.com.au>. **HURRY!** Places are filling quickly for the 2008 Christmas party, an event enjoyed by members and their guests for many years now. **Seats are limited, BOOK NOW.**

Ticket Prices: RACI Member rate - **\$66.00**; rate applicable for bookings made for 10 or more.

Non-Member - **\$99.00**

(Prices include G.S.T and drinks package which excludes spirits).

We thank all sponsors! Please take a moment to study the next page. Thank-you.





ACKNOWLEDGING OUR CONFIRMED SPONSORS

We wish to express our sincere appreciation to:

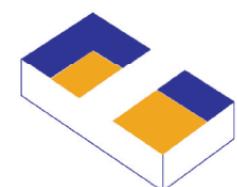
GOLD SPONSOR:



SILVER SPONSORS:



BRONZE SPONSORS:



Attending the 16th R&D Topics Student Conference?

Do you have a student who has work to present? The conference committee are still keen to receive abstracts for oral and poster presentations. The RACI NSW Branch Invites RACI Student Members From NSW Universities To Apply For A Travel Bursary to present a paper at the 16th Annual RACI analytical and environmental divisions R&D Topics conference to be held from the 6th to 9th of December at Macquarie University (Located in Sydney).

Applications should include an abstract of the paper to be presented (up to one A4 page) and a letter of support written by the academic supervisor outlining how attendance at the conference would benefit the student's chemistry career. Send applications to:

RACI NSW office:

The School of Chemistry

UNSW

Sydney, 2052

Or racinsw@chem.unsw.edu.au Applications need to be in by Friday 7th November 2008 (Students particularly from regional areas of NSW are encouraged to apply: eg Wollongong, Wagga, Albury, Newcastle, Lismore, Dubbo, Armidale)

We now welcome Sydney student presenters to apply – Student Presenters residing in Sydney may be eligible for a petrol voucher to assist with travel costs associated with travelling to this event. This will be the last week we accept nominations.

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The 'Appointment of Proxy – General' form is Schedule A2 of the By-laws and is available on the RACI website (the last few pages of the document deal with the voting by proxy)

<http://www.raci.org.au/national/downloads/Amended%20RACI%20BY%20LAWS%202007.pdf>

Website of the Week



Chemistry for your iPhone

<http://mekentosj.com/iphone/solutions/>

Whether you are a chemist, biologist or student, no one likes the calculations needed before making chemical solutions. Solutions is the solution, and it's fun too!

How many grams of caffeine do you need to make a 1 molar coffee solution? What's the molarity of water? In what volume do I have to dissolve 10 grams of glucose for my experiment? Never before it was so easy, and without mistakes. Solutions tells you straight away.

Special thanks goes to John Zavras who suggested this website.

Three informative seminars in one day!

Free Spectroscopic Solutions Seminars—2008



Brisbane—November 17
AIBN-University of Queensland

Sydney—November 19
Rydges-Parramatta

Melbourne—November 21
Novotel-Glen Waverley

FT-IR



- Learn about the latest developments in FTIR microscopy & imaging
- See live demonstrations of the new Nicolet iN10 microscope and Nicolet iS10 spectrometer on real samples.
- Discover advanced new software tools to make data collection and material characterization easier than ever before
- Improve your FTIR techniques & skill

Raman

- Learn about the fundamentals of Raman spectroscopy
- Discover how recent developments in Raman instrumentation make Raman more affordable and easier to use
- See a live "Point & Shoot" Raman demonstration
- Learn about applications of Raman in Forensics, Material ID and QC labs



Near-IR



- Learn about the theory of NIR spectroscopy & Instrumentation
- Discover how to build a "Workflow" that seamlessly takes you from data collection to report generation
- Learn about using chemometrics for qualitative and quantitative analysis
- See live demonstrations of the Antaris II performing "real world" applications

Thermo Scientific is pleased to announce that our popular Spectroscopic Solutions Seminar Series will make a return to Brisbane, Sydney and Melbourne in November.

This years seminar series will be divided into three sessions: FT-IR, Raman & Near-IR and you may register to attend any of the sessions to suit your individual interest and available time.

Each session will showcase our widest range of new molecular spectroscopy products ever released, including:

- The Nicolet iN10 & Nicolet iN10 MX range of integrated single point and imaging FTIR microscopes
- The foolproof Nicolet iS10 FTIR spectrometer for QA/QC and analytical laboratories
- The new family of DXR Raman microscope and SmartRaman spectrometers
- OMNIC Specta advanced material characterization software tools
- The Antaris family of FT-IR & NIR analyzers for at-line and on-line applications

Who should attend?

- Laboratory Managers
- Forensic Scientists
- Failure Analysis Investigators
- QA/QC and Analytical Chemists
- Material Scientists
- Researchers
- Anyone wishing to dramatically improve FT-IR, Raman or NIR measurements in their labs or on their production floors

Why you should attend

- This will be the most fun and informative spectroscopy seminar you have ever attended
- You will discover the latest developments and applications in FTIR, Raman and Near-IR spectroscopy
- You will be able to share your knowledge and experiences with other attendees

More Information and Registration

To view the seminar agenda and to register on-line, please visit <http://www.accelacom.com/jp/source/35/50080581/>
Alternatively, contact us by phone: +61 2 8844 9500 or email: analyze.au@thermo.com

Don't miss out!

Space at each seminar is limited, so register your interest to attend as soon as possible and no later than November 14.

Upcoming Conferences and Symposia



**23rd RACI Organic Division Conference,
ORGANIC 08, Hobart,**

Tasmania 7 – 12 December 2008

Register online at

<http://www.organic08.org/>

ACROSS Symposium on Advances in Separation Science



8-10th of December 2008. (<http://www.across.utas.edu.au/ASASS>)

The key dates for the conference

17th of October 2008	Abstract Deadline for Oral and Poster Presentations
31st of October 2008	Notification of abstract acceptance and finalisation of the program
14th of November 2008	Deadline for Early Registration
8th of December 2008	Opening of the Symposium

16th RACI R&D Topics Student Conference. This year it is being held again in NSW!

Macquarie University Saturday, December 6 - Tuesday, December 9

<http://www.cbms.mq.edu.au/rdtopics/index.html>

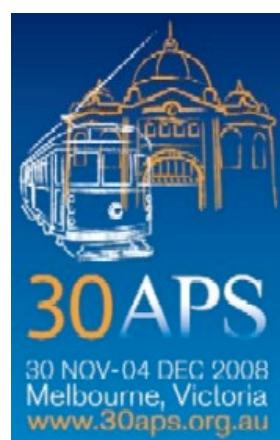
RACI Electrochemistry Symposium: New materials and New Methods in Electrochemistry Nov 27-28 @ UNSW

http://www.chem.unsw.edu.au/RACI/RACIElectrochemDiv%20webpage/raci_electrochemistry_symposium.htm

NSW RACI Organic Symposium 2008 Location: School of Chemistry, University of Sydney, NSW 2006 Date: Wednesday December 3rd

<http://www.chem.unsw.edu.au/RACI/NSWOrganic2008.pdf>

ChemEd 08 Notre Dame University, Fremantle, Western Australia Final Registration: Closes 21 November 2008
<http://www.raci-chemed08.org>



30 APS - 30th Australasian Polymer Symposium The Albert Park Sebel Hotel, Melbourne, Victoria <http://www.30aps.org.au>

Important Dates in Chemistry's History Nov 7-13

7

- b. **1867 Marja S. Curie** (later Marie) discovered radium (Ra, 88) with Pierre Curie, 1898; discovered polonium (Po, 84), 1898; Nobel Prize in Physics with husband Pierre in recognition of the extraordinary services they have rendered by their joint researches on the radiation phenomena discovered by Professor Henri Becquerel shared with A. Henri Becquerel; Nobel Prize (1911) <http://almaz.com/nobel/chemistry/1911b.html> in recognition of her services to the advancement of chemistry by the discovery of the elements radium and polonium, by the isolation of radium and the study of the nature and compounds of this remarkable element.
- b. **1878 Lise Meitner** explained nuclear fission; discovered protactinium (Pa, 91) 1917.
- b. **1888 Chandrasekhara V. Raman** discovered the Raman effect; Nobel Prize (1930) in Physics for his work on the scattering of light and for the discovery of the effect named after him.
- b. **1851 Siegmund Gabriel**, discovered method of preparing amino acids from amines (Gabriel Synthesis).
- b. **1929 Eric Kandel** discovered how efficiency of synapses can be modified; molecular mechanism of memory; Nobel Prize in Physiology or Medicine, (2000) with Arvid Carsson & Paul Greengard for their discoveries concerning signal transduction in the nervous system.

8

- b. **1711 Mikhail V. Lomonosov** suggested the law of conservation of mass & theory of heat as a form of motion; opposed phlogistic chemistry; first to record the freezing of mercury (Hg, 80).
- b. **1919 Herbert S. Gutowsky**, research in chemical shifts, spin-spin coupling, and chemical exchange in NMR (Nuclear Magnetic Resonance); led to chemical structure determinations using NMR.

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- b. **1867 Vladimir N. Ipatieff**, researcher in catalytic chemistry of unsaturated hydrocarbons.
- b. **1897 Ronald G. W. Norrish**, researcher in extremely fast chemical reactions; Nobel Prize (1967) with George Porter and Manfred Eigen for their studies of extremely fast chemical reactions, effected by disturbing the equilibrium by means of very short pulses of energy.
- Creation of three atoms of element 110 at GSI in Darmstadt, Germany, 1994.
- Thermo Fisher Scientific Company formed from a merger of Thermo Electric Corp. and Fisher Scientific International Inc., 2006.

10

- b. **1764 Andrés M. Del Rio** discovered vanadium (V, 23) 1801, which he called erthronium, (Nils G. Sefstrom often given credit, 1830).
- Johnson & Johnson incorporated, 1887.

11

- Glenn T. Seaborg announced discovery of americium (Am, 95) & curium (Cm, 96) on the Quiz Kids radio program, 1945.
- Discovery of cosmic rays announced, Madison, Wisconsin, 1925.

12

- b. **1842 Lord Rayleigh (John W. Strutt)** discovered argon (Ar, 18) with William Ramsay, 1894; Nobel Prize (1904) in Physics for his investigations of the densities of the most important gases and for his discovery of argon in connection with these studies.
- John Dalton announced the first example of the law of multiple proportions, 1802.
- EG&G Idaho incorporated as Ederton, Gernhausen & Grier, 1947.

13

- b. **1831 James Clerk Maxwell**, research in electromagnetic theory and kinetic theory of gases.
- b. **1867 Kristian Birkeland** with Samuel Eyde received a patent for the first industrial fixation of nitrogen (1903).
- b. **1893 Edward A. Doisy**, researcher on sex hormones; isolated theelin (oestrone), 1929, & vitamin K₁, 1939; Nobel Prize in Medicine (1943) for his discovery of the chemical nature of vitamin K and Henrik C. P. Dam for his discovery of vitamin K.