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UNIVERSITY OF TASMANIA

Newsletter of the Centre for Ore Deposit Research at the University of Tasmania

This issue's research profiles: January – June 2000

- Proterozoic Cu
- Arthur Lineament

issn 1440-4109

AMIRA Proterozoic Cu deposits project underway

The new AMIRA P544: 'Proterozoic sediment-hosted copper deposits' project will investigate the origin of giant copper deposits found in Proterozoic sedimentary basins, and is an international collaboration between the University of Tasmania and the Colorado School of Mines.

The project commences in June this year, and will run for three years, with total funding from the Australian Mineral Industry Research Association (AMIRA) of $814,320. Application has been made to the ARC's SPIRT Scheme to fund aspects of the research on the Australian Proterozoic.

Drs Peter McGoldrick and Stuart Bull from CODES and Prof Murray Hitzman from the Colorado School of Mines will lead the team of researchers carrying out projects in Zambia, South Australia, Queensland and the Northern Territory.

Neoproterozoic sedimentary basins host much of the world's copper and cobalt, and by far the majority of this is found in large, high-grade deposits of the Central African Copperbelt in Zambia and the Democratic Republic of Congo.

Peter McGoldrick explains that by contrast, in Australia, similar geological sequences in South Australia and Queensland appear to contain much smaller amounts of these minerals, with the largest of these at Mt Isa.

"Little new research has been carried out in the African Copperbelt for decades" he says " and we will be investigating key deposits in Zambia in order to determine what is different about their settings compared with Australian deposits".

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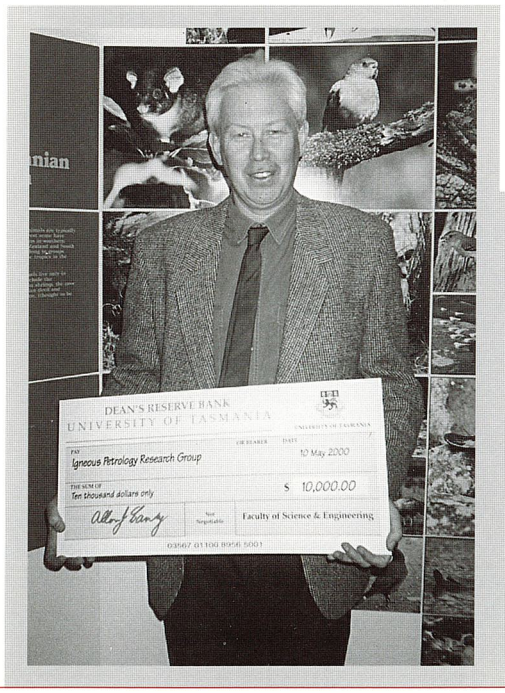
Research Team

Peter McGoldrick and Stuart Bull (leaders)
David Selley
Rob Scott
Ross Large
Garry Davidson
David Cooke
Jianwen Yang
Murray Hitzman (Colorado School of Mines)

Industry Partners

Anglo American, Anglovaal Mining, BHP Minerals International, Billiton, Inco, MIM Exploration, Phelps Dodge Exploration, Outokumpu, Primary Industry & Resource SA, Rio Tinto Exploration, Teck Corporation, WMC Resources



Award Winning Research

CODES Program 1 team, under the leadership of Tony Crawford, was recently recognised for its excellence with a University of Tasmania Faculty of Science & Engineering Research Excellence Grant for $10,000.

The award was formally presented at a special Faculty celebration of research grants and achivements, in May.

From the Editor

As this edition of OreSolutions went to press, the 1999 edition of the Annual Report was being mailed out to all our contacts. The report is once again a comprehensive overview of our achievements against our Strategic Plan, and it has been extremely well received. Stay tuned for your copy in the mail, or flip through a pdf on the web site. Once the annual report is mailed out, we will be using various digests of the information to update our web site, which is being progresisvely overhauled to provide overviews of our total research effort.
We have also introduced a new email for all publications–<publications@codes.utas.edu.au> to streamline processing of your orders. OS

News

Latest Grants

Dr Sue Golding, **Dr Khin Zaw**, Dr Yaoling Niu. ARC LArge Grant: 'Magmatic evolution nd source of volatiles in seafloor hydrothermal systems using in-situ microanalytical techniques'.

'Microanalysis of fluids involved in genesis of magmas and ore deposits - a state of the art facility' ARC REIF Grant.

Leonid Danyushevsky, ARC Small Grant: 'Melt inclusion, mineralogical and geochemical constraints on petrogenesis of primary subduction-related magmas from the Hunter Ridge, SW Pacific'.

Marc Norman, ARC Small Grant: 'Platinum-group elements, Gold and Osmium isotopes: development of geochemical methods and application to mantle plume volcanism'.

CODES New Associate of CRC LEME

CODES has recently become an official Associate of CRC LEME. This association is aimed at promoting collaboration between the two groups in the areas of regolith science related to mineral exploration. Already several regolith-related student projects in Western Australia have been jointly supervised by CRC LEME and CODES staff. Last year, the Grevillea Zn-Pb gossan in northwest Queensland was the subject of detailed textural and geochemical investigations by CODES Honours student, Veryan Hann. It is hoped to extend CODES regolith studies to parts of northeast Tasmania in the near future.

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The project will use a proven modular approach that combines basin analysis with careful documentation of individual deposits to help develop criteria for determining copper-fertile basins and the geological and geochemical characteristics of the various deposit styles.

The project will compare Neoproterozoic successions from the Adelaide Geosyncline and Stuart Shelf areas of South Australia with similar age, highly mineralised, sequences in Zambia. In Queensland and the Northern Territory, minor copper occurrences and small deposits from older Proterozoic sequences will also be examined (these rocks contain Australia's largest sedimentary Cu deposit at Mount Isa).

Ultimately, Peter says, the project will develop new genetic models for sedimentary copper deposits that place deposits in a basin evolution context, and better empirical exploration models that combine geological, geochemical and isotopic vectors to ore.

Enquiries:
Dr Peter McGoldrick (P.McGoldrick@utas.edu.au) or Alan Goode (alan@amira.com.au) OS

From the Director

Recent events have given me optimism for the future; the mining industry is picking up, projected company profits are looking better and mineral exploration activity is gradually improving across Australia.

We are feeling this trend clearly by the industry support for CODES research projects. In 1999 we were at a ten-year low in terms of industry funding from AMIRA, dropping to a level of $120,000 pa compared with previous annual levels of $300,000 to $450,000 pa. The CODES team has worked closely with AMIRA over the past 18 months to reverse this trend, and with three new projects started recently (Epithermal Au/Ag Project P 511, Sedimentary Cu Project P 544 and Southern China Metallogenic Project P 603), we have successfully returned to a strong funding position in 2000 with industry collaborations contributing over $450,000 for the next three years.

This increase in industry support has been accompanied by a deliberate broadening of our research focus by introducing major new programs in Porphyry Cu-Au, Epithermal Au-Ag and Sedimentary Cu to compliment our established internationally recognised programs in sediment hosted Zn-Pb-Ag and volcanic hosted massive sulfide deposits.

These changes have also led to a greater proportion of our research being undertaken in overseas countries, supported by both Australian and international companies. Currently we have research projects in every continent, with 36% of our budget devoted to international projects, 43% in the rest of Australia and 21% in Tasmania.

Another notable change is that our research has become more collaborative in nature, with all our major projects now involving either national or international partners. For example our epithermal Au-Ag project is a collaboration with Auckland University, our sedimentary Cu project is a collaboration with Colorado School of Mines and our Fluid Flow in Sedimentary Basins research involves collaboration with Johns Hopkins University, AGSO, University of Queensland, Queens University and CSIRO.

There is no doubt in my mind that we have now entered a new era of research where the two central elements for success are 1) the development of strong multidisciplinary teams, and 2) collaboration with other national and international centres. OS

Dr Ken McQueen (LEME) and Dr Peter McGoldrick (CODES) have been appointed as the liaison contacts between the two organisations. The relationship between CODES and LEME will be further strengthened in the area of education and training through their joint membership of the National Geoscience Network initiative recently established by the Minerals Council of Australia.

New Course

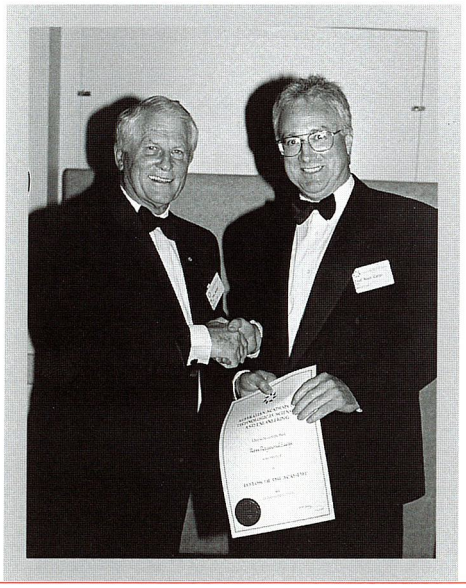
The University of Tasmania Council has recently approved a new course title and code **'Bachelor of Science (Economic Geology)** with Honours.

Award

Geophysics lecturer **James Reid** received the Best Published Paper award for his paper 'Current channelling in airborne transient electromagnetic data', presented at Australian Society of Exploration Geophysicists 14th International Conference and Exhibition, Perth, March 2000.

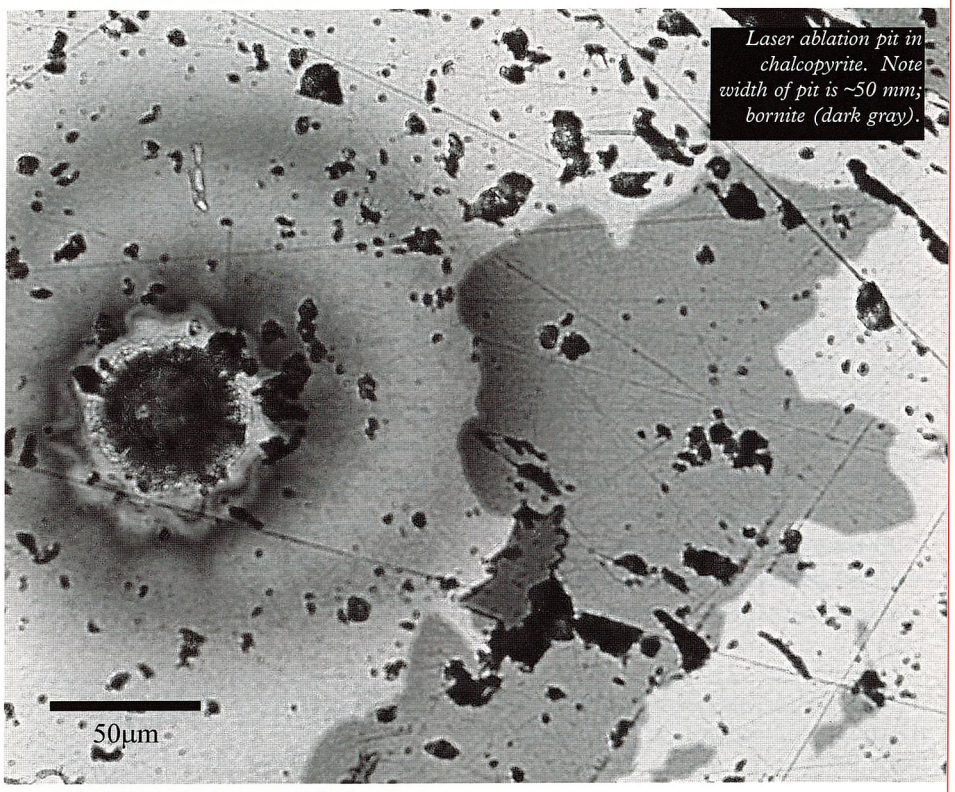
Fellow Award

Ross Large has been accepted as Fellow of the Australian Academy of Technological Sciences & Engineering in recognition of his world-leadership in ore deposit research. Other geoscientists recognised in the November ceremony included Ray Binns (CSIRO), Roderick Hill (CSIRO), Malcolm McPherson (Westralian Sands) and Ian Plimer (University of Melbourne). OS



New Developments in Ablating Sulfide Minerals

Sulfide minerals carry essential clues to the process that generate ore deposits in their composition and geochemistry. One of the new exciting developments at CODES has been the successful application of the laser ablation ICPMS (LA-ICPMS) microprobe to measuring trace element contents of diverse sulfides associated with a major ore deposit.



Laser ablation pit in chalcopyrite. Note width of pit is ~50 mm; bornite (dark gray).

This work promises to open new frontiers in ore deposit geochemistry by providing the ability to analyse ore minerals for a variety of trace elements at the scale of individual grains. Recently a number of pyrite and Cu sulfides were analysed using the LA-ICPMS system. Sub-ppm level abundances were detectable in the trace elements Pb, Tl, As, Co, Ni, Sb, Bi, and Mo. Within the suit of samples these trace element variations demonstrated systematic changes in the geochemistry of distinct paragenetic phases.

An immediate result of the LA-ICPMS program has enabled the finger printing of trace element signatures associated with the ore forming event. Application of this technique on widely disseminated sulfides may provide exploration vectors to mineralised fluid pathways.

ICP-MS Capabilities

- High spatial resolutions (>30-200mm)
- Low detection limits (sub ppm)
- Rapid analysis
- Simple sample preparation
- Variety of trace elements and target materials OS

Volcanic Environments and Massive Sulfide Deposits

International conference and field meeting • 17-19 November 2000 •

Centre for Ore Deposit Research, University of Tasmania.

Open for expressions of interest for papers, posters and registration.

Sponsored by CODES SRC and the Society of Economic Geologists

Co-convened by Bruce Gemmell and Jocelyn McPhie, this conference will focus on current issues in research into massive sulfide deposits and the physical volcanology of their host successions. Emphasis will be on parallels between modern, active seafloor hydrothermal systems and their ancient analogs.

Sessions

- Global VHMS belts
- Deposit descriptions, new discoveries
- Sub-seafloor vs exhalative genesis
- VHMS-epithermal transition
- Subaqueous pyroclastic flows
- Submarine volcanic architecture
- Shallow water settings and VHMS deposition
- Tectonic setting of VHMS deposits
- Modern seafloor mineralisation

Field Trips

Identical pre-conference (Nov 10-16) or post-conference (Nov 20-26) trips will introduce volcanic lithologies and VHMS deposits of the Mount Read Volcanics, Tasmania. Mine visits will include Mt Lyell, Rosebery, Hercules, Henty and Hellyer. Optional visit to the Renison Sn mine.

To register, contact Conference Design
mail@cdesign.com.au
Tel: (03) 6224 3773 Fax: (03) 6224 3774

International Research Collaboration: Sweden

Over the last several years, CODES has progressively developed a research relationship with the Swedish exploration industry and geological survey (SGU). Stuart Bull reports.

The relatioship between CODES and the SGU has been instigated by Rod Allen, a colleague from my days as a PhD student at Monash University, and Boliden Minerals AB, a Swedish exploration and mining company. Rod has been working in Sweden for some time, initially in collaborative research projects with SGU on volcanic facies models for the Skellefte district in northern Sweden and the Bergslagen district around Stockholm, and subsequently as consultant for Boliden. I first visited Sweden in 1996 to on an informal field visit to both the areas where the volcanological studies had been carried out. Given that the rocks are Proterozoic in age and the regional metamorphic grade is upper greenschist to amphibolite, I was amazed at the remarkable degree of insight that Rod and his co-workers had gained into the relationship between volcanic facies patterns and favourable sites for mineralisation. Careful fieldwork in key areas demonstrated that textures critical for volcanological analysis, for example pumice fragments and accretionary lapilli, locally survive the regional deformation and metamorphism.

I returned to Sweden in 1997 with other members of the CODES team to present a short course, in collaboration with Rod, on exploration models for SEDEX and VHMS styles of base metal mineralisation at Lulea University . In 1998 Rod and I undertook a pilot study, financed by Boliden and North Limited, to investigate the potential for a regional research project on the stratigraphy, basin evolution and setting of Zn-Pb-Cu-Ag-Au deposits in the Bergslagen region. This was successful in determining that the carbonate rocks that host much of the mineralisation also locally preserve primary textures that facilitate palaeoenvironmental analysis.

The final outcome of the CODES – Swedish association is that a collaborative research project entitled "Regional stratigraphy, basin evolution, and the setting of stratabound Zn-Pb-Cu-Ag-Au deposits in Bergslagen, Sweden" will commence in mid 2000. This will involve myself, Rod Allen (Luleå University of Technology; Volcanic Resources Limited), Rolf Jonsson and Hans Christoffersson (Boliden Mineral AB) and Magnus Ripa (SGU). It will run for three years and is jointly funded by SGU and Boliden Mineral AB. Although not large by CODES standards, this project represents an exciting and ambitious international collaboration, which has come about because of the enthusiasm of our colleagues at SGU and Boliden, and in particular the unstinting financial and intellectual support.

Enquiries: Stuart Bull on S.Bull@utas.edu.au

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The Swedish team anjoying lunch by a lake in the Bergslagen district. Left to right: Rod Allen (Volcanic Resources), Annitca Wasström (Boliden), Assen Smineonov (Consultant), Magnus Ripa (SGU).

The world's largest scientific drilling ship - the *Joides Resolution* - visited Hobart during March in preparation for a two-month expedition in the Tasman Sea.

'Economic Geology' Special Issue

'Alteration, and its Exploration Significance, Associated with the Spectrum of Volcanic-Hosted Massive Sulfide Deposits'

Co-editors Bruce Gemmell and Wally Herrmann

This special issue is the culmination of the research undertaken in AMIRA P439 (Studies of VHMS-related Alteration: Geochemical and Mineralogical Vectors to Mineralisation) with one invited outside paper.

Submitted manuscripts are either in the process of review or returned to authors for final corrections before publication. It is anticipated that the volume will be published in the first half of 2001. A preliminary table of contents for the volume is::

Preface — J.B. Gemmell and W. Herrmann

The spectrum of ore deposit types, volcanic environments, alteration halos and related exploration vectors in submarine volcanic belts: some examples from Australia — R.Large, J. McPhie, B.Gemmell, W. Herrmann, G. Davidson

SWIR infrared spectral analysis of hydrothermal alteration zones associated with base metal sulfide deposits at Rosebery and Western Tharsis, Tasmania, and Highway-Reward, Queensland — W.Herrman, M.Blake, M.Doyle, D.Huston, J.Kamprad, N.Merry, S.Pontual

The alteration Box Plot: a simple approach to understanding the relationship between alteration mineralogy and lithogeochemistry associated with VHMS deposits — R.Large, B.Gemmell, H.Paulick, D.Huston

Textural and chemical characteristics of diagenetic and hydrothermal alteration in glassy volcanic rocks; examples from the Mt Black Volcanics, Tasmania — C.C.Gifkins, R.L.Allen

Geological and geochemical characteristics of footwall and hangingwall alteration, Hellyer VHMS deposit, Tasmania, Australia. — B.Gemmell, R.Fulton

Geochemical modelling of the footwall alteration assemblages of the Hellyer VHMS deposit, western Tasmania, Australia — C.Schardt, D.Cooke, B.Gemmell, R.Large

Alteration halo model and volatile element halos for the Rosebery K lens VHMS deposit, western Tasmania — R.Large, R.L. Allen, M.D. Blake, W. Herrmann

Geology and host rock alteration of the Henty and Mt Julia deposits, Western Tasmania — T. Callaghan

Zonation of alteration facies at Western Tharsis: implications for the genesis of Cu-Au deposits in the Mt Lyell field, western Tasmania — D.Huston, J.Kamprad

A field study of the hydrothermal alteration zone at Mt Lyell, Tasmania – internal stratigraphy, relationship to mineralisation and host rocks and role in the geological evolution of the area. — K.D.Corbett

Volcanic influences on hydrothermal and diagenetic alteration: evidence from Highway-Reward, Mt Windsor Subprovince, Australia . — M. Doyle

The origin of chlorite-tremolite-carbonate rocks associated with the Thalanga VHMS deposit, North Queensland —W.Herrman, A.Hill

Alteration of felsic volcanics hosting the Thalanga massive sulfide deposit, north Queensland — H.Paulick W.Herrmann, B.Gemmell

Barren iron-silica lenses as windows into massive sulfide infancy: trace element, REE and radiogenic element geochemistry, depth of hydrothermal penetration and extent of hydrogenetic change, Mt Windsor Volcanic Belt, Australia — G.J.Davidson, J.A.Stolz, S.M.Eggins

Discovery of the West 45 VHMS deposit using oxygen isotopes and REE geochemistry — C.Miller S.Halley, M.Jones

Alteration of the Archean Golden Grove Formation at the Gossan Hill deposit, Western Australia: induration of a tuffaceous volcaniclastic succession as a focussing mechanism for mineralising hydrothermal fluids — R.Sharpe, B.Gemmell

Mass transfer patterns as indicators of the architecture of a complete volcanogenic massive sulfide hydrothermal alteration system in the Panorama District, Pilbara, WA — C.L.Brauhart, D.L.Huston, D.L.Groves, E.J.Mikucki, S.J.Gardoll

Immobile element lithogeochemistry in stratigraphic mapping and evaluation of alteration at the Parys Mountain VMS deposit, Wales, UK — TJ Barrett, W.H. MacLean, S.C. Tennant. OS

Education News

PhD Submissions

Bruce Anderson: 'Structure, alteration and geochemistry of the Nifty Cu deposit, WA'. WMC.

New PhD Students 1999/2000

Andrew Stewart: 'Volcanic facies architecture and mineralisation, Milos, Greece'.

Alan Wilson: Geology and exploration context of the Cadia porphyry Cu-Au deposits, New South Wales.' Newcrest..

Ben Jones: 'Porphyry Cu-Au–Cu oxide system, Peru.'

New Masters Students

Master of Economic Geology

Michael Buchanan, Hudson Bay Exploration & Development Company: 'Geology and mineral deposits of the Harmin and Fenton zone, Snowlake VHMS district, Manitoba, Canada'.

Andrew Dacey, Bolnisi Mining Operations: 'Stratigraphic and structurals controls on gold mineralisation, Sakdrisi deposit, Bolnisi district, Georgia'.

Honours 2000

Daniel Bombadieri: 'The evolution of picritic lavas, Koolau shield (Oahu, Hawaii) & Oceanus Procellarum (Apollo 12): evidence from phenocryst & melt inclusion chemistry'.

Noel Carpenter: 'Geophysical evaluation of potential waste disposal sites, Georgetown, N Tasmania'.

David Close: 'Geophysics of the Cadia Ridgeway porphyry Cu-Au deposit, NSW'.

Ben Harper: 'Distribution and intensity of hydrothermal alteration assemblages within and above the Cadia Ridgeway porphyry Cu-Au deposit, NSW'.

Ashley Howlett: 'Hydrogeology of the Cape Portland area, NE Tasmania'.

Carl Jackman: 'Stratigraphy, structure and volcanic facies in the Mount Read Volcanics, Huxley Road area, South Queenstown, W Tasmania'.

Ami Libbiter: 'Character and setting of Ordovician volcanics in the Canowindra area, NSW'.

Unnikki Meskanen: 'Acid mine drainage at the Comstock Pb-Zn mine, W Tasmania'.

Kate Polglase: 'King River environmental geophysics and hydrology, W Tasmania'.

Donald Rockliff: 'Geology of the Comstock prospect, W Tasmania'.

Jacob Russell: 'Geophysics of the Comstock prospect, W Tasmania, W Tasmania'.

Helen Scott: 'The character and origin of the Howard's Basalt in the Mount Read Volcanics, W Tasmania'.

David Thompson: 'Geology of the Sidling Range, NE Tasmania'.

Ben Vallerine: 'Precious metal distribution in K lens, Rosebery Mine, W Tasmania.

Adrian Woolford: 'Geology and isotope geochemistry of Browns Tunnel, W Tasmania'.

Mid 1999 Start

Scott Boulton: 'Lithostratigraphy, geochemistry and alteration styles of the Oakdale Formation, Bell River, NSW'.

Kevin Cahill: 'Hydrologic modelling of the Tasmania Basin, Tasmania'.

Gavin Perri: 'Land utilisation of the Camelot Park area, Droughty Point, Hobart, Tasmania'.

Isabella von Lichtan: 'Xenoliths in the Tertiary Midland volcanoes, Tasmania'.

Nick Williams: 'Basin Lake hydrothermal system, W Tasmania'.

Awards

Masters student **Glen Masterman** has been awarded the 2000 Hugh McKinstry Grant of US$2,000. OS

Student Project Profile

Arthur Lineament: progress

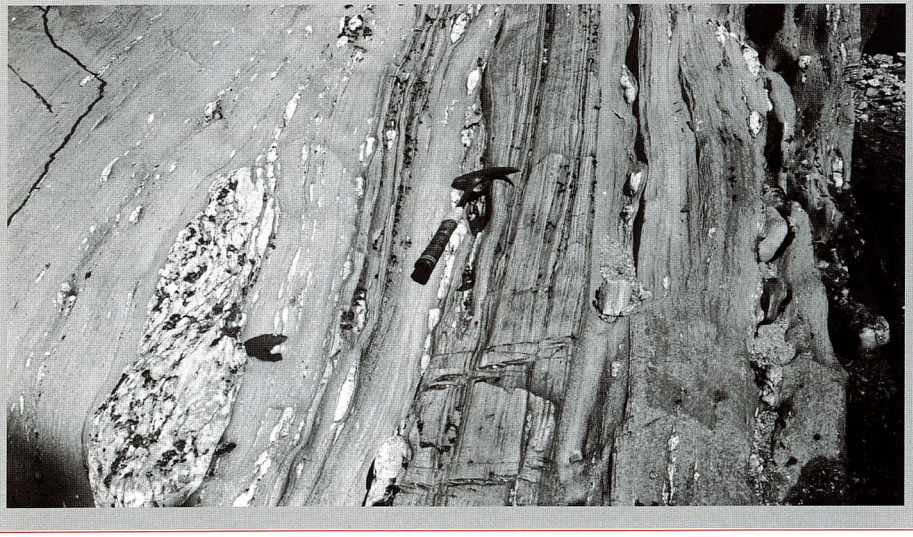
PhD Student Oliver Holm reports on recent progress in the structural interpretation of the Arthur Lineament and surrounds, NW Tasmania.

The aims of this latest field season were to complete a structural and metamorphic profile across the lineament, encompassing the units that bound the lineament to the east and west. Detailed mapping in the northern, central and southern parts of the lineament was carried out. The lineament contains the Timbs Group and the high strain Burnie/Oonah Formation. Some units of the Timbs Group contain magnetite and magnesite lenses, tholeiitic amphibolites and minor deformed granitoids. To the west of the Arthur Lineament lies the Rocky Cape Group, which is unconformably overlain at a low angle by the Ahrberg Group. To the east lies the low strain Burnie/Oonah Formation.

Key structural relationships have become evident:

- Two deformational episodes have resulted in the Arthur Lineament. Associated with these are isoclinal folds, schistose textures, thrust faults and common boudinage of competent layers. On the eastern margin, a gradational increase in deformational intensity occurs, peaking in the easternmost units of the Timbs Group, which feature lower amphibolite- and blueschist-facies peak metamorphic assemblages. The frequency of faulting increases accordingly, with the eastern margin of the lineament consisting of a series of east-dipping thrusts, the most significant are those that are synchronous with the earliest folding event. Approaching the lineament in the east there are some very interesting examples of rotational strain, which indicate a north-south stretching direction.

Boudinaged quartz veins and laminated magnetite in chloritic schist, Rocky River.



- On the west coast, a previously identified "Cambrian" slice on the eastern margin of the belt, has been shown to be Timbs Group, featuring two schistosities, parasitically folded amphibolite boudins, and south-plunging stretching lineations.

- The western margin of the lineament features a sharp structural domain- and metamorphic grade-boundary. To the west of the Arthur Lineament the deformational history of the Ahrberg and Rocky Cape Groups is markedly different to that of the Timbs Group. West over east folding has affected these, resulting in the Rocky Cape Group structurally overlying the Ahrberg Group in places. The contact between the Ahrberg Group and Timbs Group features a sudden increase in strain, reflected by textures which undergo a transition from slaty to schistose over the space of several hundred metres. This represents a major structural boundary.

The task ahead now focuses on:

- Whole rock geochemical analysis of the different mafic sequences,
- Definition of structural domains,
- Metamorphic texture and strain analysis,
- Analysis of monazite compositions in order to establish the ages of different units. OS

In Circulation

Staff Changes

Administrative Officer **Marilyn Feast** has sadly left us, moving to the University of Tasmania's Menzies Centre for Population Research to reconnect with her research career. Her replacement is **Lynne Vaudrey**. As well, **Angela Hockington** has joined us as Secretary and is now the friendly voice on the phone.

Visitors

During February **Duncan Large**, Consulting Geologist from Braunschweig (Germany) gave a GSA presentation on' Tectonic setting and characteristics of the Zn-Pb sulfide mineralisation in central Europe'.

1999-2000 SEG International Exchange Lecturer, **Dr Mark Barton**, visited CODES during March as the 1999-2000 SEG International Exchange Lecturer.

During his visit he gave two lectures:

- Extension, fluid flow and mineralization in the Basin and Range Province [focus on variety of mid-Tertiary hydrothermal systems -- revisiting an old topic with new thoughts].
- Saline hydrothermal systems and the origins of Fe-oxide(-Cu-Au-REE) deposits: A perspective from SW North America- a discussion of the characteristics and various models for these systems using mainly Phanerozoic North American examples, modern systems, and physical and chemical modelling.

Also during March, **Kevin Johnson** from WMC visited CODES and the School of Earth Sciences for graduate recruitment.

Jean Cline, Associate Professor at the University of Nevada, Las Vegas (USA) visited between April 15 and April 23. The visit was part of a sabbitical trip to visit people and mines in Australia. Jean also hosted workshops on work done on Carlin-type gold deposits, porphyry copper deposits, and Climax-type molybdenum deposits in the US.

John Walshe, Senior Principal Research Scientist, Division of Exploration and Mining, CSIRO, Collaborative research, AMIRA P511 - Chile porphyry project, Jan 24-28

Paul Gow, Research Fellow, Division of Exploration and Mining, CSIRO , Collaborative research, AMIRA P511 - Chile porphyry project.

Richard Glen, Principal Research Scientist, Mineral Resources, Geological Survey of New South Wales, Collaborative Research - SPIRT Project - Ordovician: presented a seminar, Mar-16.

Chris Pigram, Chief Minerals Division, AGSO, Science Planning Panel Meeting; CODES Advisory Board Meeting, Mar-28.

Darren Holden, of Fractal Graphics gave a presentation 'Interpreting crustal-scale features using wavelet-based, multi-scale edge analyses of regional gravity datasets', Apr-10.

Fernando Barriga from the University of Lisbon (Portugal) visited CODES during June to present a seroes of talks on the massive sulfide deposits of the Iberian Pyrite Belt, Portugal.

Carlos Inverno from the Instituto Geologico e Mineiro (Portugal) visited during June as one of a series of regular visits for collaborative research.

Student Visitors

Paul Hodkiewicz, PhD student, University of Western Australia, Sulfur isotope-laser ablation studies at CODES and CSL, May 1-12.

Presentations

Jianwen Yang gave a number of presentation at the 1999 American Geophysical Union Fall Meeting in San Fransisco, USA:

- 'The effect of normal faults on hydrothermal fluid circulation and seafloor heatflow: example of the DSDP/ODP site 504'.
- "Numerical simulation of subseafloor hydrothermal fluid migration association with the genesis of the Gossan Hill volcanic-hosted massive sulfide deposits, WA'.

He also co-authored

- 'Fracture-dominated hydrothermal convection' with M Ryan (USGS).
- "The convective transport of extremophilic microbes in two-and three-dimensions: interacting biological, geological and fluid physical property values' with M Ryan.

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Society of Economic Geologists
University of Tasmania
Student Chapter
sponsored by CODES SRC

Annual General Meeting

The University of Tasmania's Student Chapter of the Society of Economic Geologists held its 1999 AGM on 13 December, 1999. The newly elected Executive and committee are:

President: Rick Squire
Vice President: Owen Hatton: **Treasurer**: Vanessa Lickfol **Secretary**: Darryl Clark
Committee: Kirstie Simpson, Andrew Davies, Sarah Jones, Dene Carroll, David Rawlings, Rohan Wolfe and Glen Masterman

Professional Development Seminar

Professors David Groves (UWA) and Andy Gleadow (Uni of Melb) and Assoc. Prof Tony Crawford (CODES) provided an informative discussion on what examiners expected in a PhD thesis. The discussion session covered topics including time management, thesis structure and organisation, how to write a thesis as a set of papers, how not to annoy your examiners and provided suggestions on how students can complete their thesis in 3 years.

Visiting Lecture

Student Chapter of the Society of Economic Geology hosted a talk by David Lowell during May. David is the 2000-2001 SEG International Exchange Lecturer and his talk was titled 'The story of the Pierina discovery and sale to Barrick Escondida'.

Field Trips

Central western New South Wales

A field trip has been planned for the first week in November to investigate the three major types of Ordovician magmatic/hydrothermal Cu-Au deposits in the region: porphyry, skarn and high sulphidation epithermal deposits. The trip will provide an opportunity to:

- Inspect the three major types of magmatic/hydrothermal Cu-Au deposits hosted by Early Ordovician to Early Silurian volcanics of the Lachlan Fold Belt, eastern Australia. Deposits visited will include the world-class Cu-Au porphyries at Cadia and Goonumbla, high sulphidation epithermal system at Peak Hill and skarn mineralisation at Junction Reefs and Big Cadia.
- Discuss the distribution, regional and spatial compositional variation, alteration styles and tectonic significance of the belts of Early Ordovician to Early Silurian volcanics and associated rocks in the Lachlan Fold Belt.
- Discuss the controls on magmatic/hydrothermal Cu-Au mineralisation in the Lachlan Fold Belt and how they may be applicable to mineralisation in other volcano-intrusive belts of the Pacific Rim. The trip is planned for 1-5 November 2000 and is open to SEG Student Chapter members and other students and well as geologists from industry and research institutions. Places are limited. Details on the web site at www.geol.utas.edu.au/codes.

Beaconsfield mine and eastern Arthur Lineament field trip

In mid May a group of 14 postgraduate students and post docs visited the historic Beaconsfield gold mine for an underground tour. The deposit has recently been brought back to life, producing high-grade gold ore in a quartz vein-hosted shear zone-related ore body. Following the underground tour the participants spent the afternoon in exploring the Beaconsfield Mining Museum. An evening of merriment followed, with the next morning being spent studying the coastal exposure of the eastern Arthur Lineament, before returning to Hobart.

The Beaconsfield field trip group near the headframe at Beaconsfield Gold Mine, Tasmania.

Fax to (03) 6226 7662
Mail to GPO Box 252-79
Hobart Tas 7001

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Publications I wish to receive are (tick)
△ OreSolutions △ Short Course flyers △ Annual Report

short course dates

ore deposit studies & exploration models
19 June - 1 July 2000. Leader: Ross Large
Covers all the major classes of ore deposits: volcanogenic massive sulfides; sediment-hosted Pb-Zn-Cu; carbonate-hosted Pb-Zn; Broken Hill type; Proterozoic Cu-Au; Sn-W; porphyry Cu; epithermal Au-Ag; Archean Au; Ni; and PGE deposits. Features of the deposits relating to their genesis and exploration will be discussed and exploration models will be presented.

tectonics, structure and ore deposits
16 - 28 October 2000. Leader: Ron Berry
Deals with tectonic and structural controls on ore deposits, and includes field trips to northeastern and western Tasmania. Sessions examine structural techniques and the broad tectonic setting and magmatism associated with ore deposits. The course emphasises applications of structural techniques to geological problems in exploration and mining geology, and explores the relationship between modern tectonics, structure and ore deposits.

exploration and hydrothermal geochemistry
March 2001 Leader: Bruce Gemmell & David Cooke
Covers recent developments in exploration geochemistry, with particular emphasis on the importance of the regolity andlandscape evolution, as well as an introduction to the chemistry of hydrothermal systems. Includes a review of the importance of metal solubilities and ore fluid chemistry in controlling types and locations of ore deposits.

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