

Palaeozoic sedimentary basin sequences. Cawood will undertake work with the British Geological Survey (Martin Smith and Jane Evans) and with Staci Loewy (PhD student at the University of Texas) on the provenance of the Dalradian Supergroup. In addition, he has commenced a project with Bill Thomas (University of Kentucky) and Ricardo Astini (National University of Cordoba, Argentina) on correlations between the Argentine Precordillera and the Laurentian margin.

Dalziel is investigating the possibility that the Kalahari craton collided with the Texas region as well as continuing work on possible East Laurentia-South American connections and implications for end Neoproterozoic to early Paleozoic palaeogeography.

*Outcomes:* In 2000 the project generated three papers (TSRC Publs #91, 92 and 102) and four conference proceedings, and a further three papers (TSRC Publs #105, 117 and 139) are in press.

*Participants:* Drs P.A. Cawood, A.A. Nemchin, G. Watt and P. Kinny, Professor C.McA. Powell, Ms S. Loewy (PhD student). Also Drs M. Smith, S. Robertson and J. Evans (British Geological Survey), W. Thomas (University of Kentucky, USA), R. Astini (Universidad Nacional de Cordoba, Argentina), P. McCausland (University of Western Ontario, Canada), G. Suhr (University of Cologne), Ms K. Thrane and Dr J. van Gool (Geological Survey of Denmark and Greenland), Drs C. Friend (Oxford Brookes University, UK) and Dr N. Soper (University of Sheffield, UK).

### ***Project 2.2.1: The Irumide Belt of Zambia, East African Orogen***

#### *Aims:*

The Mesoproterozoic Irumide belt of Zambia occupies a central position in a criss-crossing network of orogenic belts that characterises South-Central Africa. This elongate belt trends northeast-southwest and comprises granites and metasediments. It is truncated to the northeast by the reactivated Paleoproterozoic Ubendian belt, and to the southwest by the Neoproterozoic Lufilian Arc and Zambezi belt terranes. The aim of the project is to study the Irumide belt to constrain its tectonic setting, internal structure, tectono-thermal evolution and age, and place it in the regional network of orogenic belts. The Mesoproterozoic Irumide belt presents a unique opportunity to study the tectonic processes that were active prior to the events that led to the East African orogeny.

#### *Progress:*

Since the inception of the project, several teams of Zambian and international geologists have directed their research towards solving some of the many problems in the Irumide belt. Following a successful IGCP 418 field meeting in July 1999, organised by the Geological Society of Zambia and the Geology Department at the University of Zambia (Dr Francis Tembo, Mr Bert De Waele and Mr Crispin Katongo), considerable interest was raised in the region. This led Dr Michael Wingate and Mr Bert De Waele to study some plutons and extrusive volcanics in the northeastern parts of the belt, and Dr Simon Johnson to study the rocks exposed in the Chongwe area near the border with Zimbabwe. Ten samples were sent to the University of Harare, Zimbabwe, for zircon separation (Dr Benjamin Mapani), four of

which have since had preliminary SHRIMP dating by Dr Michael Wingate. The preliminary ages suggest an extensive granite magmatic event around 1040–1020 Ma.

In March 2000, follow-up fieldwork was done by Dr Francis Tembo, Dr Benjamin Mapani and Mr Bert De Waele in the central and northeastern parts of the Irumide belt. The aim of the fieldwork was to obtain samples for geochemistry and dating from key localities in the Serenje and Mpika areas. Twenty-seven samples were sent to Canada for geochemical analysis including granites and granite gneisses, as well as a suite of volcanic rocks exposed in the Katibunga area near Mpika. Preliminary geochemical work on the basaltic pillow lavas of Mpika reflects MORB characteristics. The geochemistry of the intrusive rocks allowed preliminary tectonic discrimination suggesting a syn-collisional setting for the fine-grained leucocratic granites, and a within-plate setting for the porphyritic and biotite-rich samples.

To expand the geochemical data, and collect a second suite of samples for geochronology, a second fieldtrip was undertaken by Dr Francis Tembo and Mr Bert De Waele, and additional samples were collected for geochemical analysis. Preliminary work on this second dataset indicates a granitic suite of calc-alkaline characteristics in the Serenje area, while all other samples plot in concurrence with the earlier data. Comparison of the Irumide granites with data from granites in the Kibaran belt indicates that the Irumide suites compare well with the Kibaran granites. However, the Kibaran belt has a suite of distinctly A-type character not recognised in the Irumide belt.

Apart from the first 10 zircon separates done in 1999, a further 35 samples, taken during the

fieldtrips of March and August 2000, are currently either being processed in Harare, or awaiting SHRIMP dating analysis in Perth, Australia.

#### *Outcomes:*

Four conference presentations have been made and two extended abstracts have been published so far.

#### *Aims for 2001:*

Fieldwork will be carried out in 2001 by Mr Bert De Waele in the northeastern part of the Irumide belt, to map out a cross section across the Shiwa N'Gandu area, and the Isoka ridge, as part of his PhD. Both areas expose a large section of the metasedimentary Muva Supergroup, in places intruded by plutons and showing complex relationships with granitic units. The Isoka ridge exposes a substantial metarhyolitic tuff, deposited with the metasediments, and later folded. The zircon separates from previous fieldwork will be processed, and selected samples will be dated using SHRIMP. Further work will be done on geochemistry to constrain better the different magmatic units in the belt.

*Participants:* Mr B. De Waele, Dr F. Tembo, Dr B. Mapani, Dr M. Wingate, Dr I. Fitzsimons. This research is done with the co-operation of the Geology Department at the University of Zambia, and preliminary work was co-funded by IGCP 418.