

NEWSLETTER OF THE STRUCTURAL GEOLOGY AND TECTONICS DIVISION GEOLOGICAL ASSOCIATION OF CANADA

December 1993

Here's all the latest news from the SGTD. Much of it stems from goings-on at the recent Canadian Tectonics Group meeting in Espanola, reported by the Division President, including the announcements of winners of the Best Paper and Best Thesis awards. So here's the low-down. Merry Christmas and a very good New Year to you!

CTG '93 Espanola

This year's annual meeting of the Canadian Tectonics Group in Espanola, Ontario (Oct. 15 - Oct. 17) was organized by Frank Fueten, Paula McKinnon and Sandy Cruden, to whom all participants expressed their appreciation for a job well done. As is customary, there was no pre-defined theme to the meeting. Contributions covered the structural spectrum. Participants were regaled with tales of strain analysis of linear elements, the use of Anisotropy of Magnetic Susceptibility as a tool in the study of granite emplacement, the physiognomy and the physiology of greenschist and granulite facies shear zones, TEM analysis of the deformation of feldspars and pyroxenes, the power of image analysis ... with examples from the Canadian Cordillera, the middle of the western Canadian Shield, California, Abitibi and the Appalachians, to name but a few of the topics addressed. Speakers had the opportunity to test some of their more innovative ideas on an interested and informed audience. The organizing committee laid on a particularly successful field trip, split across the Saturday and Sunday afternoons, to examine structural aspects of the Huronian rocks in the Espanola region. Lively debate concerning the nature of the diverse breccias in an area so close to Sudbury ... and the (in)famous Sudbury Breccias ... kept everyone warm despite the drizzle and cool temperatures.

SGTD business meeting

The most recent Structural Geology and Tectonics (SG&T) Division business meeting was held at the CTG meeting, on the Saturday evening, and was the occasion for announcing the winners of the Best Paper and Best Thesis awards, each worth \$100. The Best Paper is chosen by the Executive, from a short list provided by the Division Councilors, drawn from all eligible papers to have appeared in one of eight journals (see Main Thrust, Aug. 1993) during the past twelve months. To be considered, papers must be authored by Canadians, or be on a Canadian topic in Structural Geology / Tectonics. This year's Best Paper award was given to Sean Willett and colleagues at Dalhousie for their paper: Willett, S., Beaumont, C. and Fullsack, P. 1993. Mechanical models for the tectonics of doubly vergent compressional orogens. *Geology*, 21: 371-374. A full list of eligible papers to have appeared in the last year is included at the end of this newsletter.

Jeroen van Gool, of Memorial University, won this year's Best Thesis award for his PhD entitled: The Grenville Front Foreland Fold-and-Thrust Belt in SW Labrador: Mid-crustal Structural and Metamorphic Configuration of a Proterozoic Orogenic Thrust Wedge .

During the business meeting, a letter from Normand Goulet (UQAM) was read asking the SG&T Division to consider the possibility of advancing a sum of ca. \$1000 as seed money to the organizing committee of

the international Precambrian Orogenic Belts conference to be held in Montreal in 1995. In the absence of a quorum, it was suggested that the proposal be submitted formally to the AGM of the SG&T Division in Waterloo '94 for consideration and full discussion by members of the Division.

CTG 1994 meeting (an impassioned call)

CTG '93 participants were enthusiastic, if relatively few in number (28) for a meeting located within such easy reach of so many universities. As always, I came away from this meeting with a sense of new links established with young researchers in Structural Geology and Tectonics, as well as a renewal of contacts with long term colleagues. By their very nature CTG meetings, essentially geological retreats, offer participants something unique, something we do not find at larger national venues. I realize that funding is increasingly tight, and the overall ambiance and vision of the future in the research sphere have been somewhat gloomy. Perhaps they combine to add yet another step to the "activation energy barrier" we have to get over to attend yet another autumn meeting. However, we will only reap from an opportunity such as CTG what we are prepared to sow. Next year, we shall hold the meeting in Belleville, southern Ontario. I will coordinate things from Ottawa, and Pierre-Yves Robin and Paul Williams will collaborate to provide us with a field itinerary in the Tweed area to look at rocks of the Central Metasedimentary Belt, Grenville Province. We are looking forward to a well attended meeting. If your timetable really won't let you come, send us your graduate students! Put them in the departmental bus, gas it up and point them in the right direction. CTG is worth supporting.

Simon Hanmer

THE SGTD MEDAL

The proposal for an SGTD medal is moving ahead. The GAC Executive will now coordinate the establishment of medals for all Divisions, and has asked that the SGTD provide information regarding the criteria for the award and its design. As discussed at the SGTD business meeting at Edmonton '93, and also in the last Main Thrust (Aug. 1993), a proposal has been tabled to award the medal annually for the Best Paper, along with the existing \$100 prize. One medal would be awarded to the first author, with all authors' names inscribed. The Executive proposes to hold a formal vote on this proposal at the business meeting at Waterloo '94.

A logo

The executive proposes that the Division logo which appears on the Main Thrust could also appear on the Best Paper medal. Any members of the Division who wish to propose an alternative logo for the medal may submit it to the Secretary of the Division by 1 April 1994. Alternatives will be discussed at the business meeting at Waterloo '94, and a final choice of the logo will be made at that time.

THREE CHEERS DEPARTMENT

The 1993 Governor General's Gold Medal for outstanding achievement in graduate studies has been awarded to Shoufa Lin for his PhD research concerning Appalachian shear zones on Cape Breton Island. Shoufa completed his thesis under the supervision of Paul Williams at the University of New Brunswick. Bravo for a splendid achievement!

WATERLOO '94

Special session (a reminder)

There will be a Special Session at the 1994 Geological Association of Canada meeting in Waterloo

dedicated to Applied Structural Geology. Contact person: Professor W.M. Schwerdtner, fax: (416) 978-3938. Another reminder

The Division will again award a prize of \$150 for the Best Student Abstract accepted for GAC '94 in Waterloo. Abstracts should be submitted to the Executive by 1 April 1994 for consideration.

THE FINANCIAL SITUATION

The Division has earned some and spent some since the last Main Thrust. Here is where it came from, where it went, and how much is left.

	Income	Expenses
Previous balance	5318.09	
interest	19.45	
membership dues	910.00	
Total	<u>6247.54</u>	
bank charges		12.00
Best Paper prize		100.00
Best Thesis prize		100.00
Refreshments GAC '93		99.95
Student travel support (CTG '93)		800.00
Total		<u>1111.95</u>
Total assets	5135.59	

THE CLASSIFIEDS

No classifieds were submitted this time around. Don't forget, if you have work or stipends for grads, or if you are looking for grads, post-docs, etc., here's the cheapest advertising space you are likely to find. Our circulation is in the hundreds!

That about wraps it up for this newsletter. Looking forward to seeing you in Waterloo. Here's how to reach the SGTD executive with ideas, suggestions, Student Abstracts, logo suggestions, etc.

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Structural Geology / Tectonics Papers on Canadian Topics, or authored by Canadians, to have

appeared over the past twelve months

- Bachu, S. 1993. Basement heat flow in the Western Canada Sedimentary Basin. *Tectonophysics*, 222: 119-135.
- Bassi, G., Keen, C.E. and Potter, P. 1993. Contrasting styles of rifting: models and examples from the eastern Canadian margin. *Tectonics*, 12: 639-655.
- Benn, K., Sawyer, W. and Bouchez, J.L. 1992. Orogen parallel and transverse shearing in the Opatica belt, Quebec: implications for the structure of the Abitibi Sub-province. *Canadian Journal of Earth Sciences*, 29: 2429-2444.
- Borradaile, G.J., 1993. Strain and magnetic remanence. *Journal of Structural Geology*, 15: 383-390.
- Borradaile, G.J. 1993. The rotation of magnetic grains. *Tectonophysics*, 221: 381-385.
- Borradaile, G.J. and Dehls, J.F., 1993. Regional kinematics inferred from magnetic subfabrics in Archean rocks of northern Ontario, Canada. *Journal of Structural Geology*, 15, 887-894.
- Borradaile, G.J., Werner, T., Dehls, J.F. and Spark, R.N. 1993. Archean regional transpression and paleomagnetism in northwestern Ontario, Canada. *Tectonophysics*, 222: 89-117.
- Brookfield, M.E. 1993. Neoproterozoic Laurentia-Australia fit. *Geology*. v. 21: 683-686.
- Brown, D., Rivers, T. and Calon, T. 1992. A structural analysis of a metamorphic fold - thrust belt, northeast Gagnon terrane, Grenville Province. *Canadian Journal of Earth Sciences*, 29: 1915-1927.
- Cassidy, J. and Ellis, R. M. 1993. S wave velocity structure of the northern Cascadia subduction zone. *Journal of Geophysical Research*, 98: 4407-4422.
- Chown, E.H., Daigneault, R., Mueller, W. and Mortensen, J.K. 1992. Tectonic evolution of the Northern Volcanic Zone, Abitibi belt, Quebec. *Canadian Journal of Earth Sciences*, 29: 2211-2225.
- Clowes, R.M. 1993. Variations in continental crustal structure in Canada from LITHOPROBE seismic reflection and other data. *Tectonophysics*, 219: 1-29.
- Clowes, R.M., Cook, F.A., Green, A.G., Keen, C.E., Ludden, J.N., Percival, J.A. Quinlan, G.M. and West, G.F. 1992. Lithoprobe: new perspectives on crustal evolution. *Canadian Journal of Earth Sciences*, 29: 1813-1864.
- Cook, F.A. and Van der Velden, A.J. 1993. Proterozoic crustal transition beneath the western Canada sedimentary basin. *Geology*, 21: 785-788.
- Cordey, F. and Schiarizza 1993. Long-lived Panthalassic remnant: the Bridge River accretionary complex, Canadian Cordillera. *Geology*, 21: 263-266.
- Costanzo-Alvarez, V., Dunlop, D. J. and Pesonen, L. J. 1993. Paleomagnetism of alkaline complexes and remagnetisation in the Kapuskasing structural zone. *Journal of Geophysical Research*, 98: 4063-4080.
- Craddock, J.P., Jackson, M., van der Pluijm, B.A. and Versical, R.T. 1993. Regional shortening fabrics in eastern North America: far-field stress transmission from the Appalachian-Ouachita orogenic belt. *Tectonics*, 12: 257-264.

- Cudrak, C. F. and Clowes, R. M. 1993. Crustal structure of Endeavour Ridge segment, Juan de Fuca Ridge, from a detailed seismic refraction survey. *Journal of Geophysical Research*, 98: 6329-6350.
- Currie, L. and Parrish, R.R. 1993. Jurassic accretion of Nisling terrane along the western margin of Stikinia, Coast Mountains, northwestern British Columbia. *Geology*, 21: 235-238.
- De Freitas, T.A. and Mayr, U. 1993. Middle Paleozoic tear faulting, basin development, and basement uplift, central Canadian Arctic. *Canadian Journal of Earth Sciences*, 30: 603-620.
- Desrochers, J.-P., Hubert, C., Luddon, J.N., Pilote: 1993. Accretion of Archean oceanic plateau fragments in the Abitibi greenstone belt, Canada. *Geology*, 21: 451-454.
- Dietrich J.R. and Lane L.S. 1992. Geology and structural evolution of the Demarcation Subbasin and Herchel High, Beaufort-Mackenzie basin (Arctic Islands, Canada). *CSPG Bulletin*, 40: 188-197.
- Erickson, S.G. 1993. Sedimentary loading, lithospheric flexure, and subduction initiation at passive margins. *Geology*, 21: 125-128.
- Erickson, G. and Arkani-Hamed, J. 1993. Subduction initiation at passive margins: the Scotian Basin, eastern Canada as a potential example. *Tectonics*, 12: 678-687.
- Eyles, N. and Eyles, C.H. 1993. Glacial geologic confirmation of an intraplate boundary in the Parana basin of Brazil. *Geology*, 21: 459-462.
- Farrar, E. and Dixon, J.M. 1993. Ridge subduction: kinematics and implications for the nature of mantle upwelling. *Canadian Journal of Earth Sciences*, 30: 893-907.
- Fyfe, W.S. 1993. Hot spots, magma underplating, and modification of continental crust. *Canadian Journal of Earth Sciences*, 30: 908-912.
- Garvin, J.B., Schnetzler, C.C. and Grieve, R.A.F. 1993. Characteristics of large terrestrial impact structures as revealed by remote sensing studies. *Tectonophysics*, 213: p.45-63.
- Geilikman, M.B. Spanos, T.J.T. and Nyland, E. 1993. Porosity in fluid-saturated media. *Tectonophysics*, 217: 111-117.
- Goodacre, A.K., Bonham-Carter, G.F. Agterberg, F.P. and Wright, D.F. 1993. A statistical analysis of the spatial association of seismicity with drainage patterns and magnetic anomalies in western Quebec. *Tectonophysics*, 217: 267- 285.
- Grieve, R.A.F. and Pesonen L.J. 1993. The terrestrial impact cratering record. *Tectonophysics*, 213: 1-31.
- Hanmer, S. and McEachern, S. 1992. Kinematical and rheological evolution of a crustal-scale ductile thrust zone, Central Metasedimentary Belt, Grenville orogen, Ontario. *Canadian Journal of Earth Sciences*, 29: 1779-1790.
- Hoffman, P. F. and Grotzinger, J.P. 1993. Orographic precipitation, erosional unloading, and tectonic style. *Geology*, 21: 195-198.
- Hughes, S. and Luetgert, J. H. 1992. Crustal structure of the southeastern Grenville Province, northern New York State and eastern Ontario. *Journal of Geophysical Research*, 97: 17445-17480.

- Hyndman, R. D. and Hamilton, T. S. 1993. Queen Charlotte area Cenozoic tectonics and volcanism and their association with relative plate motions along the northeastern Pacific margin. *Journal of Geophysical Research*, 98: 14257-14278.
- James, D.T. and Mortensen, J.K. 1992. An Archean metamorphic core complex in the southern Slave Province: basement - cover structural relations between the Sleepy Dragon Complex and the Yellowknife Supergroup. *Canadian Journal of Earth Sciences*, 29: 2133-2145.
- Ji, S. and Zhao, P. 1993. Location of tensile fracture within rigid-brittle inclusions in a ductile flowing matrix. *Tectonophysics*, 220: 23-33.
- Ji, S. and Salisbury, M.H. 1993. Shear-wave velocities, anisotropy and splitting in high-grade mylonites. *Tectonophysics*, 221: 453-475.
- Ji, S., Salisbury, M.H. and Hanmer, S. 1993. Petrofabric, P- wave anisotropy and seismic reflectivity of high grade tectonites. *Tectonophysics*, 222: 195-227.
- Jones, A.E. 1993. Electromagnetic images of modern and ancient subduction zones. *Tectonophysics*, 219: 29-47.
- Jones P.B. 1993. Structural geology of the modern Frank Slide and ancient Bluff Mountain Slide, Crownsnest, Alberta, *CSPG Bulletin*, 41: 232-243.
- Journey, J.M. and Friedman, L.M. 1993. The Coast Belt Thrust System: evidence of late-Cretaceous shortening in southwestern B.C. *Tectonics*, 12: 756-775.
- Kumarapeli, P.S. 1993. A plume-generated segment of the rifted margin of Laurentia, Southern Canadian Appalachians, seen through a completed Wilson cycle. *Tectonophysics*, 219: 47-57.
- Lafrance, B. and Williams, P.F. 1992. Silurian deformation in eastern Notre Dame Bay, Newfoundland. *Canadian Journal of Earth Sciences*, 29: 1899-1914.
- Leclair, A.D., Ernst, R.E. and Hattori, K. 1993. Crustal-scale auriferous shear zones in the central Superior province, Canada. *Geology*, 21: 399-402.
- Lefort, J.P., Miller, H.G. and Wiseman, R. 1993. Reconstitution of east-facing Variscan nappes between the Grand Banks of Newfoundland and Spain. *Tectonophysics*, 217: 331-443.
- Lickorish, W.H., 1993. Structural evolution of the Porcupine Creek anticlinorium, Western Main Ranges, Rocky Mountains, British Columbia. *Journal of Structural Geology*, 15: 477-490.
- Liu, M. and Furlong, K.P. 1993. Crustal shortening and Eocene extension in the southeastern Canadian Cordillera: some thermal and rheological considerations. *Tectonics*, 12: 776-786.
- Lowe, C. and Ranalli, G. 1993. Density, temperature, and rheological models for the south-eastern Canadian Cordillera: implications for its geodynamic evolution. *Canadian Journal of Earth Sciences*, 30: 77-93.
- Lynch, G. 1992. Deformation of Early Cretaceous volcanic-arc assemblages, southern Coast Belt, British Columbia. *Canadian Journal of Earth Sciences*, 29: 2706-2721.
- MacLean B.C. and Cook D.G. (1992): The influence of Proterozoic structures on the development of Laramide structures, northern Interior Plains, NWT, Canada. *CSPG Bulletin*, 40: 222-253. Malpas, J.,

- Xenophontos C. and Williams, D. 1992. The Ayia Varvara Formation of SW Cyprus: a product of complex collisional tectonics. *Tectonophysics*, 212: 193-213.
- McGill, G.E. 1992. Structure and kinematics of a major tectonic contact, Michipicoten greenstone belt, Ontario. *Canadian Journal of Earth Sciences*, 29: 2118-2132.
- Milkereit, B., Forsyth, D.A., Green, A.G., Davidson, A., Hanmer, S., Hutchinson, D.R., Hinze, W.J., and Mereu, R.F. 1992. Seismic images of a Grenvillian terrane boundary. *Geology*, v. 20: 1027-1030.
- Moffat I.W. and Bustin R.M. 1993. Deformational history of the Groundhog Coalfield, NE Bowser Basin, B.C.; styles, superposition and tectonic implications. *CSPG Bulletin*, 41: 1-16.
- Mohajer, A., Eyles, N., Rogojina, C. 1992. Neotectonic faulting in Metropolitan Toronto: Implications for earthquake hazard assessment in the Lake Ontario region. *Geology*, v. 20: 1003-1006.
- Nelson, J.L. 1993. The Sylvester Allochthon: upper Paleozoic marginal-basin and island-arc terranes in northern British Columbia. *Canadian Journal of Earth Sciences*, 30: 631-643.
- Nelson, J. and Mihalynuk, M. 1993. Cache Creek Ocean: Closure or enclosure? *Geology*, 21: 173-176.
- O'Brien, B.H., O'Brien, S.J., Dunning, G.R. and Tucker, R.D. 1993. Episodic reactivation of a late Precambrian mylonite zone on the Gondwana margin of the Appalachians, S. Newfoundland. *Tectonics*, 12: 1043-1055.
- Percival, J.A., Mortensen, J.K., Stern, R.A., Card, K.D. and Bergin, N.J. 1992. Giant granulite terranes of northeastern Superior Province: the Ashuanipi complex and Minto block. *Canadian Journal of Earth Sciences*, 29: 2287-2308.
- Powell, W.G. and Hodgson, C.J. 1992. Deformation of the Gowganda Formation, Matachewan area, Ontario, by post-Early Proterozoic reactivation of the Archean Larder Lake - Cadillac break, with implications for gold exploration. *Canadian Journal of Earth Sciences*, 29: 1580-1589.
- Pryer, L.L., 1993. Microstructures in feldspars from a major crustal thrust zone: the Grenville Front, Ontario, Canada. *Journal of Structural Geology*, 15: 21-36.
- Quinlan, G., Beaumont, C. and Hall, J. 1993. Tectonic model for crustal seismic reflectivity patterns in compressional orogens. *Geology*, 21: 663-666.
- Reid, I. 1993. Velocity structure of reflective lower crust beneath the Grand Banks of Newfoundland. *Journal of Geophysical Research*, 98: 9845-9860.
- Relf, C. 1992. Two distinct shortening events during late Archean orogeny in the west-central Slave Province, Northwest Territories, Canada. *Canadian Journal of Earth Sciences*, 29: 2104-2117.
- Ricketts, B.D., Evenchick, C.A., Anderson, R.G., and Murphy, D.C. 1992. Bowser Basin, northern British Columbia: constraints on the timing of initial subsidence and Stikinia-North America terrane interactions. *Geology*, v. 20: 1119-1122.
- Ross, J.V. and Bauer, S.J. 1992. Semi-brittle deformation of anhydrite-halite shear zones simulating mylonite formation. *Tectonophysics*, 213: 303-321.
- Salisbury, M.H., and Keen, C.E. 1993. Listric faults imaged in oceanic crust. *Geology*, 21: 117-120.

- Smith, M.T., Dickinson, W.R., and Gehrels, G.E. 1993. Contractional nature of Devonian-Mississippian Antler tectonism along the North American continental margin. *Geology*, 21: 21-24.
- Solheim, L.P. and Peltier, W.R. 1993. Mantle phase transitions and layered convection. *Canadian Journal of Earth Sciences*, 30: 881-892.
- Spray, J. G. 1993. Viscosity determinations of some frictionally generated silicate melts: implications for fault zone rheology at high strain rates. *Journal of Geophysical Research*, 98: 8053-8068.
- Stephenson, R.A., van Berkel, J.T. and Cloetingh, S.A.P.L. 1992. Relation between salt diapirism and the tectonic history of the Sverdrup Basin, Arctic Canada. *Canadian Journal of Earth Sciences*, 29: 2695-2705.
- Stockmal, G.S. and Waldron, J.W. 1993. Structural and tectonic evolution of the Humber Zone, western Newfoundland. 1) Implications of balanced cross-sections through the Appalachian structural front. *Tectonics*, 12: 1056-1075.
- Struik, L.C. 1993. Intersecting intracontinental Tertiary transform fault systems in the North American Cordillera. *Canadian Journal of Earth Sciences*, 30: 1262-1274.
- Toft, P.B., Taylor, P.T., Arkani-Hamed J. and Haggerty, S.E. 1992. Interpretation of satellite magnetic anomalies over the West African Craton. *Tectonophysics*, 212: 21-43.
- Tomek, C., and Hall, J. 1993. Subducted continental margin imaged in the Carpathians of Czechoslovakia. *Geology*, 21: 535-538.
- Trudel, C. et Malo, M. 1993. Analyses des contraintes par m_ethodes graphiques dans une zone de coulissage: exemple de la r_gion de Matap_dia, Gasp_sie, Appalaches du Qu_bec. *Canadian Journal of Earth Sciences*, 30: 591-602.
- Varsek, J.L., Cook, F.A., Clowes, R.M., Journeay, J.M., Monger, J.W.H., Parrish, R.R., Kanasewich, E.R. and Spencer, C.S. 1993. Lithoprobe crustal reflection structure of the southern Canadian Cordillera 2. Coast Mountains transect. *Tectonics*, 12: 334-360 .
- Walcott, D. 1993. Neogene tectonics and kinematics of western N. America. *Tectonics*, 12: 326-333.
- White, D. J., Milkereit, B., Salisbury, M. H. and Percival, J. A. 1992. Crystalline lithology across the Kapuskasing Uplift determined using in situ Poisson's ratio from seismic tomography. *Journal of Geophysical Research*, 97: 19993-20006.
- Willett, S., Beaumont, C., and Fullsack: 1993. Mechanical model for the tectonics of doubly vergent compressional orogens. *Geology*, 21: 371-374.
- Wu, J. and Mereu, R. F. 1992. Crustal structure of the Kapuskasing Uplift from lithoprobe near-vertical/wide angle seismic reflection data. *Journal of Geophysical Research*, 97: 17441-17444.
- Yin, Z. M. and Ranalli, G. 1993. Determination of tectonic stress field from fault slip data: toward a probabilistic model. *Journal of Geophysical Research*, 98: 12165-12176.