The Finance Committee Report presented a 1994 budget and forecast through 1996, to account for increased costs associated with a larger issue of *The Canadian Mineralogist*. The loss of a book rate for mailing back issues and short-course notes will increase postage costs. The proposed 1994 fee structure of $70 for Ordinary membership, $30 for Student and Retired members, $250 for a Corporate membership, including Libraries, and $575 for a Sustaining Membership in the Association was approved.

The Editor's Report, presented by Editor Robert F. Martin, previewed regular issues in June and September, with the December issue a regular-sized special one commemorating the Geological Survey of Canada's 150th Anniversary. At the time of the Edmonton meeting, reviewed and corrected manuscripts were being assembled for the March 1994 issue. Requests for consideration for future Special Issues should be formalized and sent through the Editor, for consideration by Council.

Future GAC–MAC Joint Annual meetings have been approved in Quebec City for 1998. André Lalonde, University of Ottawa, is Chairman for OTTAWA'97. The Fall meeting of MAC Council was held in Waterloo, Ontario, to preview the WATERLOO'94 program. The next Annual Business Meeting of the Mineralogical Association of Canada will be held as part of that GAC–MAC Joint Annual Meeting, in Waterloo, Ontario, May 16–18, 1994, on the campus of the University of Waterloo, with Alan Morgan, Chairman, and Gwilym Roberts, Vice-Chairman of the meeting. Complete minutes of the Annual Business Meeting and the MAC Council meeting may be obtained from the Secretary.

G.M. LeCheminant

THE HAWLEY MEDAL FOR 1993 TO SIMON JACKSON, HENRY LONGERICH, GREG DUNNING, AND BRIAN FRYER

It is my pleasure to present the 1993 Hawley Award for the best paper in *The Canadian Mineralogist* in 1992 to Simon Jackson, Henry Longerich, Greg Dunning and Brian Fryer of the Memorial University of Newfoundland. Their award-winning paper is titled "The application of laser-ablation microprobe – inductively coupled plasma – mass spectrometry (LAM–ICP–MS) to *in situ* trace-element determinations in minerals" (*Can. Mineral.* **30**, 1049-1064).

The major advances that are made in mineralogy and geochemistry are often dependent on the tools available to the geoscientist. The discovery of X rays and their use for mineral-structure determination and mineral identification laid the foundation for modern mineralogy. The introduction of emission spectrography and X-ray fluorescence allowed the mineralogist and geochemist to chemically characterize mineral separates of a few milligrams. The electron microprobe allowed mineralogists to not only chemically analyze single crystals for major and minor elements, but also to check on the homogeneity of the crystal at the micrometer level. Simon Jackson, Henry Longerich, Greg Dunning and Brian Fryer have taken the next step by helping to develop a technique to analyze minerals at a resolution of 20–40 micrometers for trace elements at ppm and ppb concentrations. They explain the basic technique of developing and focusing the laser beam on standard polished thin sections, and they discuss the interaction of the laser beam with various minerals. They compare the results obtained with the laser-ablation microprobe with those of other techniques on standard materials. The authors give a number of examples of how the technique can be used, but the most impressive was the quantitative measurement and demonstration of zoning of fourteen rare-earth elements at five different positions across a grain of manganese-rich garnet 250 μm in diameter from an alteration zone. The ability to measure rare-earth-element zoning for fourteen *REE* at the ppm and ppb level in a single crystal of garnet is heady and exciting stuff. The SEM photo of the resulting five tiny craters in the garnet crystal leave no doubt about the position of spots analyzed.

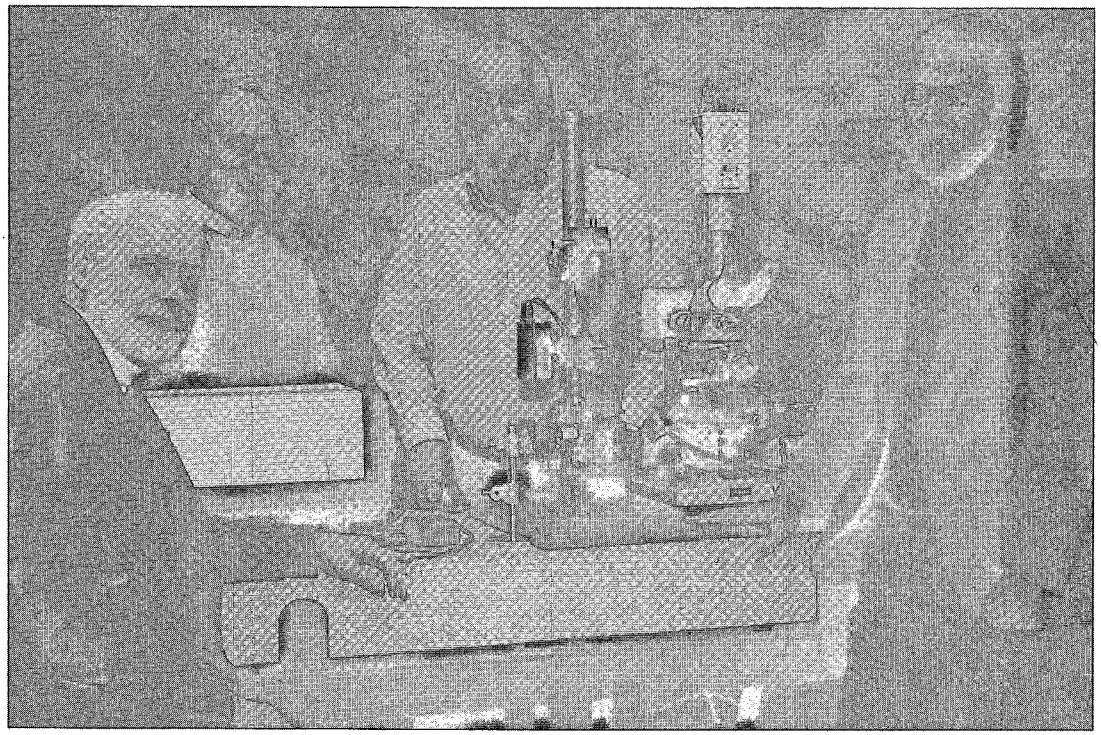
Professor Ed Hawley would have been excited to see this fine contribution made by the winners of this year's Hawley Award. One of Professor Hawley's major contributions was in setting up an emission spectrograph and X-ray fluorescence laboratory at Queen's University almost fifty years ago; he went on to use chemical analyses to help solve major problems in economic geology. Only the colleagues of Brian Fryer could confirm whether the parallels with Ed Hawley extend to Hawley's reputation among the students as hardness 11 on the Mohs scale of hardness.

The winners of this year's award should not only be complimented on the quality of the science in their contribution, but on the very readable manner in which their results were presented. It is with great pleasure that I present the 1993 Hawley Award to Simon Jackson, Henry Longerich, Greg Dunning and Brian Fryer.

Peter L. Roeder

Dear fellow mineralogists and colleagues,

On behalf of myself and my coauthors, it is a very great pleasure and honour to accept the Hawley Medal for our paper on the analysis of minerals at trace-element levels using a Laser-Ablation Microprobe coupled with an Inductively Coupled Plasma – Mass Spectrometer. At this point, I would like to acknowledge the roles of Dr. David Strong, now president of the University of Victoria, and my coauthor Henry Longerich, who had the foresight to recognize the potential of, first, the ICP–MS and, later, the laser as a sampling device, and then the courage to solicit funds for each, long before either technology was proven. I also wish to thank all those who contributed to making this award possible, especially the scientists at SCIEX, a Canadian company that played such a major role in the development of the revolutionary technique of ICP–MS. We would like to extend our thanks to Robert Martin for his meticulous editorial handling of the manuscript. We would also like to thank the selection committee and acknowledge it for recognizing, I suspect, not so much our science, but the birth of an exceptionally powerful new technique. Its speed, flexibility and relative ease of calibration give it the



HENRY P. LONGERICH, GREG R. DUNNING, BRIAN J. FRYER AND SIMON E. JACKSON

potential to greatly advance our "knowledge" of mineral chemistry at trace- element concentrations.

Notice that I used the word "knowledge", rather than "understanding". For, with every new project, we discover extraordinary variations and complexities in mineral chemistry at the trace-element level. Almost every month, we update the largest within-grain variation in concentration of an element, the record currently standing at approximately 1000. Some of these variations will be described, but not all explained, in talks this afternoon by Brian, myself, and my colleague Dan Kontak, who has the hapless task of presenting results on hydrothermal carbonates that are a long way from being adequately explained.

Other studies to which we have already applied this technique include the determination of partition coefficients for trace elements in high-temperature and high-pressure run products, trace- element signatures of zircon and titanite, salmon scales and morphological zones of ichthyoliths, iron oxide coatings on stream pebbles, and numerous ore minerals such as uraninite, fluorite and various sulfides, including some from the Sudbury deposits, of which James E. Hawley, himself, would surely have had a keen interest.

Each of these studies has resulted in some exciting and often seemingly uninterpretable results, to all of which we, for now, ascribe the obligingly vague explanation of "kinetic effects". After the initial ignorance, however, I am confident that such data will, in time, lead to a greater understanding of the thermochemical processes that control mineral genesis and chemistry.

The future is even more exciting than the progress made to date. We have been funded in the 1993 NSERC competition to purchase a new ultrahigh-sensitivity ICP–MS, which will be approximately 500 times more sensitive than our present 1984-generation instrument. This, and our recent development of a UV-laser-based microprobe, which has overcome most of the ablation problems that we originally encountered, will give us an instrument capable of analysis at ppb levels or down to a spatial resolution of 10 μm, or in other words, a microprobe with unique capabilities.

Thus, at the MAC annual meeting next year, we expect to be showing you mineral chemistry with a new level of complexity and, of course, seeming inexplicability.....

Thank you!

Simon E. Jackson

Ladies and Gentlemen,

I wish to echo Simon's thanks to MAC for the significant honour that it has given to the Memorial Laser ICP–MS group, through the award of the Hawley Medal. One often wonders, as a researcher in an applied discipline, at the relative merits of expending much time, money and energy on developing new techniques rather than applying existing technology to geological and mineralogical problems. There are "cultural" disagreements within the earth science community regarding this point, but this year's award of the Hawley Medal, I think, recognizes the validity of both approaches.

Although it is generally recognized that our group has led the development of microbeam techniques in ICP–MS, our advances are in large part due to the efforts of earlier workers. In particular, the development of our laser system started off from Kurt Kyser's laser sampling design for stable isotope analysis. Our more rapid advance on this front than Kurt's, I think, is due to the more tractable nature of laser microbeam sampling in tandem with ICP–MS, than for stable isotope work.

In closing I must admit that none of the awardees would classify themselves as a mineralogist. However, our science has focussed our attention down to and within the individual mineral. To our considerable consternation, we are being forced into relearning principles of mineralogy and crystal chemistry, but such is life.

Bryan J. Fryer