redistributed in 1991 on the basis of 20% to general operations (from 10% previously), and 80% to *The Canadian Mineralogist*. The financial statement reflects a net loss for the year of $4,827.

The Finance Committee, chaired by N. Halden, presented the ten-year trend in income and expenditures of the Association, which indicates losses that exceed the interest income and results in the erosion of the Treasury Reserve Fund as noted above. The objectives of the proposed budget are to arrest this decline, with fee revenue balancing expenses. In order to achieve this, the Association must raise fees. The fee structure approved at MAC Council will bring the Ordinary Membership to $60, Students $25, Corporations $190, and Sustaining Members $550 for 1993.

Two changes approved in Council will impact on the budget. A change in Abstracts policy that has been adopted will offset the printing and distribution costs associated with the Program and Abstracts Volume. Starting in 1993, the Program and Abstracts Volume will be a separate item on the Dues Notice and Publications Order Form. Those members who wish to receive it will be asked to order it. The cost for the Program and Abstracts Volume will be commensurate with the fee charged by GAC for the same item. Corporate and Sustaining members will continue to receive the Program and Abstracts Volume with their Journal subscription. Members were reminded that for the EDMONTON'92 GAC–MAC, the Abstract deadline has been moved up to December 1st, as part of Edmonton's proposed changes in the issue of Circulars. It has also been agreed in principle to increase the page length of *The Canadian Mineralogist* to reduce the time between acceptance of an article and publication. Fall Council will consider the effect such increased page charges would have on the adopted budget, which allows for up to 1200 pages per issue. The Editor's Report, prepared by Editor Robert F. Martin, indicated that the next two issues after the Special Issue on Quantitative Methods in Petrology (December 1991) were regular issues, with a Special Issue on Granite Pegmatites planned for the September issue. Another thematic issue, commemorating the 150th Anniversary of the Geological Survey, will be published in Volume 31. The Special Issues contribute to the delay in publishing articles in regular issues of the journal, and their influence will be considered along with the effect of increased number of pages.

Council has approved the sponsorship of a timely and interesting Short Course proposal for WATERLOO'94, from D. Blowes and Gwilim Roberts, University of Waterloo, and C.M. Alpers, U.S. Geological Survey, on "Environmental Geochemistry of Sulphide Mine Tailings". The proceedings of the course will be published in our Short Course series. The VICTORIA'95 meeting will be chaired by Chris Barnes (GAC) and E. Van de Flier-Keller (MAC); WINNIPEG'96, chaired by George Clark with Frank Hawthorne as Vice-Chairman. The Steering Committee for OTTAWA'97 is seeking members to lead the Organizing Committee.

The next Annual Business Meeting of the Mineralogical Association of Canada will be held as part of the program for the EDMONTON'93 GAC–MAC, May 17–19, 1993, on the University of Alberta Campus, Edmonton, Alberta (John Kramers, Chairman, and Ron Burwash, Vice-Chairman). Complete minutes of the Annual Business Meeting and the MAC Council meeting may be obtained from the Secretary.

G.M. LeCheminant
Secretary

THE HAWLEY MEDAL FOR 1992 TO GEORGE SKIPPEN AND DAN MARSHALL

The Hawley Award of the Mineralogical Association of Canada is presented annually to the authors who are judged to have published the best paper in the previous year's volume of *The Canadian Mineralogist*. It is my pleasure to present the Hawley Award for 1992 to George Skippen and Dan Marshall of Carleton University for their paper entitled "The Metamorphism of Granulites and Devolatilization of the Lithosphere" (volume **29**, pages 693-705).

The process whereby generally hydrous supracrustal rocks become dominated by anhydrous mineral assemblages during prograde metamorphism is a fundamental geological problem. Previous explanations for the reduction in the activity of water implicit in granulite-facies metamorphism have included the dissolution of water in and extraction of a partial melt, and the invasion of the lower crust by carbon dioxide from the upper mantle. Skippen and Marshall, on the other hand, demonstrate that devolatilization would be an expected result of the pressure – temperature – time path typical of the tectonic evolution of the lower crust.

On the basis of homogeneous equilibria among gaseous species, and reasonable mineralogical constraints on the fugacities of hydrogen and oxygen and the activity of carbon, they show that calculated fluid pressure exceeds lithostatic pressure at elevated temperatures. The mechanical stability of the rocks could not be maintained under these circumstances, and outgassing would occur. Devolatilization would continue as long as heat is added or until either hydrogen or

carbon is entirely consumed. The authors also point out that outgassing from the zone of mechanical instability could promote deformation in overlying zones of ductile deformation and could be implicated in the movement of dissolved metals to higher crustal levels.

George Skippen and Dan Marshall have made a compelling case for the importance of tectonically driven internal processes in the generation of large granulitic terranes. They have presented their argument in a concise and clearly written text, which should be at once provocative for the metamorphic petrologist and understandable to the non-specialist. Their paper is a worthy addition to the roster of outstanding contributions that have been recognized by our Association's Hawley Award.

Peter L. Roeder
President

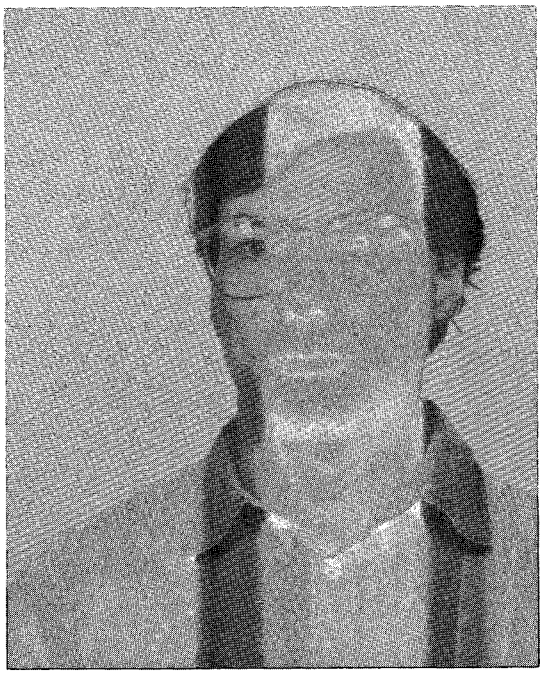
Dear fellow mineralogists and colleagues,

It is a very happy experience to appear before you today with my friend, Dan Marshall, to receive the Hawley Medal for our paper on the origin of tectonic granulites. Dan and I understand how fortunate we are to have been selected as the recipients of this award when so many excellent papers appeared in Volume 29. We thank the selection committee for considering our work, and we also thank the Editor of *The Canadian Mineralogist*, Robert Martin, for his exceptional dedication to the journal and for his patience and perceptiveness in dealing with authors.

This paper had a long gestation period and finally forced its way onto the written page in response to the Symposium in Honor of Hugh Greenwood. I thank Terry Gordon for his efforts in organizing this symposium and provoking Dan and I into organizing our thoughts on those enigmatic but very beautiful rocks, *the granulites*.

My first serious encounter with granulites came while I was a graduate student at McMaster University and working for the Geological Survey as a field assistant to Ron Emslie in the Grenville Province of

George B. Skippen



Dan Marshall

Quebec. I recall one late summer afternoon when Ron, Tony Lecheminant and I emerged from the bush around the Morin Anorthosite to be engulfed in a dust cloud generated by a fast-moving truck with a GSC emblem on the door. At the wheel was Wade Reinhardt, representing the Grenville mapping project led by Hugh Wynne-Edwards. That dusty encounter led to several late evenings of discussion on granulites, charnockites and anorthosites, and also to my respect and friendship for Wade Reinhardt, who patiently taught me about the subtleties of granulite petrology over the following decade.

My interest in granulites was helped by a very fortunate opportunity to work as a doctoral candidate under the supervision of Hans Eugster. Hans showed his students the importance of fluids as a factor in understanding mineral development in metamorphic rocks; his own pioneering work on the oxygen reservoir in the Earth helped David Wones and Bevin French to develop new ideas on the hydrogen and carbon reservoirs.

Dan Marshall and I have used the approach of these earlier workers on mineralogy as an indicator of fluid chemistry. I must tell you, however, of my concern that we have not yet achieved an adequate understanding of the carbon reservoir in petrological processes. The use of graphite as an indicator of carbon chemistry certainly is helpful, but calculations using carbonate–silicate pairs suggest a different pattern of fluid evolution in metamorphic processes. I plan to turn off my computer for a while and to go back to the field to look for insight into the complexities of the carbon reservoir. I hope to look not only at the role of carbon in the form of carbon dioxide at higher metamorphic grade, but also at the possible importance of methane in fluid evolution and metal transport during greenschist-facies metamorphism. As is often the case, I hope that mineral chemistry will be the key to understanding petrology.

I would also like to thank my colleagues at Carleton University and elsewhere for their help and support in my research. I have benefitted from discussions with many of these colleagues, and particularly David Watkinson and Ian Jonasson, both of whom are economic geologists with an interest in minerals that goes beyond metallic luster and the geochemistry of sulfur.

Finally, may I thank the Mineralogical Association of Canada for making it possible for researchers such as Dan and myself to experience such a happy occasion.

George B. Skippen

Ladies and Gentlemen,

I would like to echo some of George's thanks to the MAC; it certainly is a very great honor to receive this award. Furthermore, I would like to thank the Institute of Mineralogy and Petrology at the University of Lausanne in Switzerland for kindly providing the financial support for me to be here today. I also acknowledge Carleton University for providing me with a place to work, the facilities to do so, many good friends and an education along the way.

I would like to quote a few words from the speech of one of the 1986 Hawley Medal winners, Judith Moody. "The innovation in my life related to the Hawley Medal started at least 12 years ago in my Ph.D. defense at McGill University, when I had to respond to the questions raised by the external examiner.... In his questions, why did I do the petrological laboratory experiments that I did, he provided me with a challenge, by stating that if I wanted to continue to do experimental petrology, then I should carry out a very careful experimental design before I started the experiments." Today I share the Hawley Medal with that external examiner. I certainly have benefitted from similar questions from George during my undergraduate and Masters degrees, at Carleton, very few of which I had the answers to. Therefore, finally I wish to thank my friend and mentor, George B. Skippen, for the opportunity to be here.

Dan Marshall

THE PAST PRESIDENTS' MEDAL FOR 1992 TO ROBERT W. BOYLE

Bob Boyle's contributions to the geochemistry and geology of mineral deposits during his 40-year career at the Geological Survey of Canada have made him one of the most widely recognized Canadian geoscientists. On joining the GSC in 1953, Bob started his work on the Keno Hill district of the Yukon, and it was there that his interest in surficial geochemistry blossomed. He was the first to show that geochemistry is a viable tool for exploration in permafrost environments, and this marked the beginning of research in exploration geochemistry at the GSC. The first public-domain regional geochemical surveys in Canada were done in the Maritime Provinces, beginning in 1956, and resulted in a number of important discoveries.