lack of ion guns delivering high intensities in micron-size probes. The work of Slodzian and his coworkers has brought secondary ion microscopy to the point where it becomes possible to get in a few seconds distribution images of any element or isotope with a spatial resolution much better than one micron. The instrument is especially convenient for the examination of minerals, where the ionic bonds enhance the emission of secondary ions very strongly. In the hands of mineralogists, it has made it possible to visualize exsolutions and zoned structures with component elements whose average concentration is less than 100 ppm, in images of a striking beauty. That is indeed another reason why I feel indebted to your fascinating science, much more than it is indebted to me.

Mr. President, I am much honored to have been adopted so kindly by the community of mineralogists, and I accept this Medal with deep thanks to the Mineralogical Society of America.

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Presentation of the Mineralogical Society of America Award for 1977 to J. G. Liou

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Mr. President, Members of the Society, and Guests:

It is an honor and a privilege for me to introduce the MSA Award Recipient for 1977, J. G. Liou, of Stanford University.

Louie entered UCLA as a beginning graduate student in 1965 and, after a brief period of adjustment, embarked on a remarkable course of geochemical studies and experimental research which set the pace in our laboratories for the next decade. The current crop of grad students surely has grown weary of my regaling them with how much Louie accomplished in just *four years*. Not only was he phenomenally adroit at p-chem and thermo, but he coaxed equilibrium phase assemblages from some of the most recalcitrant chemical systems known to man: *P–T* diagrams were cranked out for wairakite, laumontite, lawsonite + quartz, prehnite and analcime. Unlike some of my own work, his phase diagrams seem to have withstood the test of time. During 1970–72 at NASA-Houston, Louie focused his attention on such well-recognized extraterrestrial problems as the stability relations of epidote and of andradite + quartz, and he experimentally modeled the greenschist → epidote amphibolite facies *P–T* transition zone in a natural basaltic system. Louie evidently was too busy finding out about the Earth to look up. He has continued broadening his laboratory studies since joining the Stanford faculty in 1972, but at the same time has turned to the field + petrochemical investigation of the lower grades of metamorphism as developed in Vancouver Island, western California and the Coastal Range of Taiwan; in addition, Louie has undertaken a comprehensive and definitive petrochemical study of the East Taiwan ophiolite.

This latter work represents part of a U.S.–Republic of China project in which John Suppe of Princeton and I are coinvestigators. We have been continually astonished at the scientific drive, creativity and incredible productivity of Louie. John and I live in constant fear of receiving phone calls from him; these invariably begin with a modest recitation of his latest burst of data collection, followed by a communication that we are soon to be sent a first draft manuscript of eighty pages (single spaced), and conclude with an ever-so-mild reminder to please try to finish up our small parts. I now appreciate the meaning of being "killed with kindness."

The MSA Award is meant to call attention to the significant accomplishments of a young mineralogically-oriented researcher, and to encourage his further activities. I am not sure whether the U.S.–Republic of China project—never mind the mineralogical world—is ready for increased productivity from Louie. Nevertheless, Mr. President, it is with the greatest pride and admiration that I give you our current MSA Award Recipient, J. G. Liou. Try not to encourage him too much!

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