

SEG Regional Vice President Lecture Tour 2004

Where Are Mineral Deposits Located?

Yasushi Watanabe

Mineral Resources Research Group, Institute for Geo-Resources and Environment, AIST

As the 2004 SEG Regional Vice President Lecturer, I tried to include tectonic and geologic implications practical for mineral deposit exploration in my each topic, because a metallic mineral exploration boom revived in Asia, where I reside and was supposed to give talks. I prepared four topics; (1) Presently evolving epithermal gold provinces in Kyushu, Japan, (2) Plate tectonic setting for porphyry copper deposits, (3) The Muine-Toyoha magmatic hydrothermal system, northern Japan, and (4) Hydrothermal alteration patterns over the El Salvador porphyry copper deposit, Chile.

In the first and second topics, I showed modern, contrasting examples of evolving metallogenic provinces of low sulfidation epithermal gold deposits and porphyry copper deposits, respectively, and emphasized that these type deposits formed during specific tectonic events, rather than during steady oceanic plate subduction. The third topic is a story of a mineralized magmatic hydrothermal system in a calc-alkaline volcanic field, implicating how to differentiate mineralized systems from barren ones in slightly eroded volcanic fields. In the fourth topic, I showed lateral and vertical hydrothermal mineral zoning as well as temporal relationship among hydrothermal minerals in the phyllic alteration zone above the El Salvador porphyry copper deposit. This can be utilized to know the center of a hydrothermal system.



Fig. 1 SEG banner appeared in Peking University

I started my tours at Korea Institute of Geoscience and Mineral Resources in April, 2004, followed by the visits to Peking University (Fig. 1) and Institute of Mineral Resources, CAGS, in China, and Hanoi University of Mining and Geology, Research Institute of Geology and Mineral Resources, and Department of Geology and Mineral Resources of Vietnam in May. In June, the Society of Resource Geology organized a workshop on porphyry copper deposits at Kawasaki, Japan, which I was involved, and then I visited Mongolia,

where economic geologists were excited with the successful exploration of porphyry copper-gold deposits at Oyu Tolgoi by the Ivanhoe Mines (Fig. 2). I finished my lecture tours in the Philippines, visiting University of the Philippines (Fig. 3) and Mineral and Geoscience Bureau in December, 2004.



Fig. 2 A talk given in a ger (Mongolian tent) at the Oyu Tolgoi exploration camp



Fig. 3 Principal participants in the lecture at University of the Philippines

I benefited greatly from these lecture tours; they were good opportunity to revise my ideas through discussions, to visit world-class deposits such as Oyu Tolgoi and Nui Phao, and to see my friends in each country. The toughest job I had during the tours was a special request to give a lecture for undergraduate students in the Faculty of Economy of Peking University. I was supposed to talk something about mineral economics, which I was not familiar with. Anyway, I struggled to explain why I am a geologist and am interested in geneses and exploration of mineral deposits.

Finally, I would like to express my sincere thanks to Drs. Sang Mo Koh, Yongfeng Zhu, Tran Thanh Hai, Sereenen Jargalan, Jun Yumul, and Carla Dimalanta who kindly invited me and arranged my lectures in individual countries, and Christine Horrigan, SEG Traveling Lecturers Secretary, who led my lecture tours successfully.