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# EDITORIAL

## Science in Asia

"A journey begins with a single step," said Confucius many years ago. In this issue of *Science* we visit Asia, where the journey to become a major contributor in international science has gone well beyond the first step. Scientists are already aware of the many contributions of Japan, which were a focus of a special issue of *Science* last year. This year's report on the East Asia area reveals an explosive growth of which many Western scientists may be unaware. Any contact of Western scientists with students and scientists of the East Asia countries makes it apparent that those countries have the talent and the energy to do world-class science. What was lacking was the governmental support and the climate of encouragement needed to provide fertile soil for those scientific talents. As can be seen from this sweeping coverage of the area from Singapore to Korea, a highly intelligent and purposeful effort is now being made in almost every country in that area to support basic and applied science.

In our Perspectives section, several prominent scientists from the area report on their research. Chin Ha Chung of Seoul National University in Korea studies how cells remove abnormal polypeptides by means of the "clean-up" proteases. Ding-Shinn Chen of National Taiwan University describes lessons learned from research on viral hepatitis, a disease that is particularly prevalent in Asian-Pacific countries. Eiji Ito of Okayama University in Japan discusses the chemistry and physics of Earth's interior. Zhipeng Zheng of the Institute of Higher Physics, Beijing, China, discusses particle physics in his country and high-precision measurements on the tau lepton. Cun-Hao Zhang and Guo-He Sha of the Dalian Institute of Chemical Physics in China discuss a variant of double resonance spectroscopy called ion dip spectroscopy to study short-lived, low molecular weight species with lifetimes on the order of $10^{-13}$ seconds. Y. T. Tan of the National University of Singapore studies the yin and yang of regulatory pathways, the kinases and phosphatases of cytokine signaling systems. Zhangliang Chen and Hongya Gu of Beijing University describe plant biotechnology in China, a field of great interest to a country that must feed 20% of the world's population on 7% of its cultivable land. Louis H. Y. Chen of the National University of Singapore describes a means for bounding the discrepancy between the distribution of the number of events and the Poisson distribution. Chen-Lu Tsou discusses the importance of conformational integrity in the understanding of protein function.

Our news section, which was edited by free-lance journalist June Kinoshita, Colin Norman, and Jeff Mervis, gives a view of the sophisticated efforts to overcome past years of neglect in the support of science in East Asian countries. A policy forum by Chang-Lin Tien, Chancellor of the University of California at Berkeley, the first Asian-American to head a major university in the United States, points out the great opportunities for exchange of ideas and personnel between Western and Asian universities. He rightly urges that there be a two-way street, a recommendation that will require work on both sides, but one which will certainly be advantageous to all in the long run.

An outsider's impression of the entire panoramic view is that it will not be long before the East Asian scientists will be highly visible contributors to international meetings and will be more frequent participants in international exchanges of speakers and laboratories. Confucius also said, "Learn as if you were following someone whom you could not catch, as though it were someone you were frightened of losing." Asian science seems to be following that advice. In some ways Asian science outside of Japan has an easier task than Western science. It is starting to catch up and to acquire the expertise in a wide variety of areas that have proven fruitful in Western laboratories. Western science is in a more fragile phase, trying to maintain leadership and trying to interpret vague terms like "strategic plans" from friendly governments that often have difficulty understanding that research that plunges into the uncharted frontier cannot predict the future perfectly.

One of the great attractions of science is that its biggest revolutions ultimately come from "little science" in which individual investigators can show their resourcefulness. Supporting that "little scientist" is more expensive today than it was in Isaac Newton's day, but it is within the range that small but dedicated countries can achieve in reasonable time. Scientists basically enjoy seeing other scientists succeeding and solving problems, and therefore help from international colleagues is part of the culture. It is hoped that all international scientists will walk abreast in the broad march of science.

**Daniel E. Koshland Jr.**