

NOTES

31st INTERNATIONAL GEOLOGICAL CONGRESS, RIO DE JANEIRO, BRAZIL, AUGUST 6-17, 2000

The thirty-first International Geological Congress held in Rio de Janeiro, Brazil, has been most memorable. Rio is an incomparably beautiful city with a population of about 6 million. The landscape is dominated by beautiful beaches and huge granite tors, which stand out as gigantic *shiva lingas* (incidentally the U-Pb SHRIMP age of the Sugar Loaf and Corcovado granites is 560 Ma). In Portuguese, Rio de Janeiro means January River. Actually, there is no such river in Rio. When the Portuguese saw this area in January 1502, they mistook a bay in the area as a large river. They therefore named the place as Rio de Janeiro. The friendly and fun-loving residents of the city are known as "cariocas". The city is famous for the annual carnival of Samba dancing.

The Rio Congress has several firsts to its credit: it is the first congress to be held in the third millennium, the first in the continent of South America, and the first to issue the Abstracts volume in the form of CD-ROM. The Congress is dedicated to the theme, "Geology and Sustainable Development: Challenges for the Third Millennium". Prof. Umberto Cordani, the distinguished Brazilian geochronologist, presided over the Congress. The Riocentro, which is the venue of the Congress, has five big pavilions with a total area of 100,000 m² (10 hectares)! It was originally built for the Earth Summit on Environment in 1992. The elegant auditorium in Pavilion 5 is so vast, that even the few thousand participants who attended the Opening Ceremony of the Congress on August 6, 2000 could hardly fill it!

The Congress comprised four kinds of activities: colloquia (9), special lectures (4), special symposia of invited papers which were orally presented (11 themes, involving 74 sessions), and poster presentations (28 themes involving 160 topics). All accepted abstracts (a record number of 5458) were included for poster presentation, while some from among them were chosen for oral presentation. An unfortunate consequence of the plethora of sessions and their highly specialized topics was that some sessions had just two or three papers, and barely a dozen attendees. The forenoon sessions invariably began late because the participants were held up in traffic jams.

The Special Symposia covered the following themes: Origin and evolution of the earth; Geosciences and human survival, environment and natural hazards; Global change and future environment; Structure of the lithosphere, deep processes and lithospheric motions; Global tectonic zones; Metallogeny; Basin analysis; Energy and mineral resources for the 21st century; New technologies for geosciences; and Progress of international geoscience projects.

The following summary is a subjective account of the Congress.

In his lecture on the "Role of geology for a sustainable society", Cordani explained how the sustainability of the human societies is going to be dependent upon the monitoring of the earth system processes, ecologically-sound use of the resources of minerals, energy, water and agricultural soils, disaster reduction, etc. In the ensuing discussion, the role that geology could play in the improvement of quality of life of the people, and the need for reorientation of geological education in order to enable geology to perform the new tasks, was highlighted.

Claude Allegre (Minister of Education of France) gave a visionary lecture on "The Earth Sciences: central role in the 21st century", which is easily the highlight of the Congress. He described six revolutionary developments in geology during the last fifty years: three *conceptual* revolutions related to the unity of the earth (plate tectonics, planetary exploration and environmental problems including global change) and three *technical* revolutions which aided the quantification of

geological processes (computers – imaging; satellites – global observations; mass spectrometry – dating). As it often happens in science, the availability of a new technique leads to a better understanding of a concept, and a new concept triggers the development of a new technique. He said that whatever a geologist studies should be aimed at the unity of the Earth. He emphasised that in the new millennium, geology would have to address the following issues: *Earth system processes* (volcanism, climate, role of bacteria), *Climate* (greenhouse effect, water cycle-biosphere and high-resolution Quaternary studies), *Early earth* (extinct radioactivity, Mars studies, oldest crustal rocks and crater mapping), *Biogeology* (Gaia hypothesis, carbon dioxide systematics, biodiversity of soils and biogeochemistry of erosion), *Water geology* (harvesting of rainwater, water cycle and climate and economics of water), *Natural disasters* (earthquakes, volcanism, landslides and floods) and *Earth's surface and subsurface* (soils, subsurface geology of cities and waste disposal). If geology is to accomplish these tasks, it is necessary for the geological surveys to restructure and retrain their personnel, and geological education has to be revamped in the light of these new tasks.

The representation from India has been minimal. Perhaps for the first time in the history of the geological congresses, Geological Survey of India (GSI) went unrepresented. Time was when the Director General of GSI used to head the Indian delegation, and there used to be get-together of delegates from India, as well as delegates of Indian origin. In contrast, China sent a big delegation, which included Mr. Teng Fengshan, Chinese Minister of Land and Resources. The message from Rio to the geological fraternity in India is loud and clear. Business-as-usual is definitely not a viable option. A sensible way for both the geoscience educational institutions and the GSI to adapt themselves to the emerging situation is to mount a large programme of retraining of the existing personnel, as advocated by Claude Allegre.

Geological education can no longer be based on rote learning of subject disciplines like petrology, mineralogy and stratigraphy. It has to be an interactive, computer-based, earth system science, focused on the ecologically sustainable development of water, soil and mineral resources and linked to cognate subjects like agriculture, hydrology, meteorology, etc. After GSI stopped recruiting officers through competitive examinations, there is hardly any demand for traditionally trained geologists, and the admission to geology courses in the colleges and universities has plummeted. On the other hand, India would be needing an army of water and soil technicians, who would be either privately employed, self-employed, or employed by NGOs. Such a development would have profound technological, socio-economic, and administrative implications, mainly in terms of teaching geology, recruitment of geologists and change in office procedures.

The ongoing process of globalization of technologies, personnel, investment, etc. is irreversible. Institutions all over the world are struggling hard to adapt themselves to the emerging situations. The new slogan is: Adapt or Perish. A few years ago, even a venerable institution like the US Geological Survey with a long history of meritorious service to the country, was on the point of being scrapped and it survived only by a thorough reorganization. The Geological Survey of India (GSI) offers geological services to investors, but has now to compete with the private sector by providing more efficient technology, cutting down red-tape and eliminating feather-bedding.

“Progress is a nice word. But change is its motivator, and change has its enemies “

- Robert Kennedy

*Adviser on Environment and Technology
C.P. 1947, Maputo, Mozambique
anarayan@zebra.uem.mz*

U. ASWATHANARAYANA