EDITORIAL

The Mission for Earth Sciences?

As this is being written, Hurricane Gilbert is tracing its path of destruction across the Gulf of Mexico as one of the most violent storms ever seen in the region. Record-breaking heat and droughts in North America, floods in the Sudan and Bangladesh, and reports in the media of greenhouse Domsday scenarios - no one needs reminding these days of the way weather affects our lives. The warnings of warnings given by scientists are now beginning to be taken seriously, even by governments. Indeed, at a conference on The Changing Atmosphere held in Toronto this June, the many high-level officials present from around the world agreed that the most far-reaching impacts will be due to global rises in temperatures and sea levels.

This is where earth scientists come in. One of the most important challenges for the next few decades will be to understand changes in the recent - and even the distant - past as one essential key to understanding the present. In order to unravel natural versus anthropogenic influences and to understand their interactions, information on Holocene sea levels, climates, wind patterns and atmospheric composition, for example, will be required as base-line data for calibrating new global circulation and climate models.

The recently published COHMAP (Cooperative Holocene Mapping Project) report on climatic changes over the past 18,000 years is the kind of study that is needed (*Science*, 26 August 1988). However, the location map of sites where paleoclimatic data was collected in this study for analyses of pollen, lake levels, middens and marine plankton shows many gaps, especially in South America, Africa, Asia and the polar regions. Not only should this geographic coverage be extended, but there should also be much more detail at individual sites and areas, for example from archaeological records, tree-rings, ice cores and other "proxies."

It would be very useful to integrate studies of past climates with on-going experiments at the same locations to monitor current water and air chemistry, erosion rates and neotectonic movements. This is presumably the kind of activity to be encouraged by ICSU's new Global Change program under their Geosphere-Biosphere Observatory concept. For this purpose good use may be made of national parks and wildlife reserves located in key areas (coastlines, mountains, high Arctic, etc.), where administrative stability is assured and where trained personnel on hand can help to collect data. Such a link would benefit these preserves by supplying them with key information required in order to protect and conserve their environments. It would also provide excellent opportunities to explain to the general public what science is doing to understand global change and how each region of the Earth must be seen now in a global climate and environmental context.

This is an opportune time to reassess the goals of geoscience research, for IUGS as well as for other organizations. How should regular on-going activities and programs be balanced with input to the Global Change program or to another major international effort now beginning, the International Decade of Natural Hazards Reduction? Geoscientists should not miss the opportunity provided by these global challenges and initiatives and by the growing interest in interdisciplinary work to reflect on the importance to the well-being of our planet of what we now do. Is it not time to re-align our priorities and to join the "Mission to the Planet Earth?"

ABOUT THIS ISSUE

On the occasion of the 7th Latin American Geological Congress, to be held in Belem, Brazil, in early November, *Episodes* presents a series of reviews on key aspects of the geology of South America. These articles provide - across an obvious language barrier - a sampling of the vigorous research being carried out in South America today and the rapid development of ideas on its geological evolution. Among the topics of much more than local significance are the Mesozoic marginal basins and the coastal Quaternary of Brazil, the one part of a now classic passive margin (Chang and others) and the other a major piece in the rapidly improving global picture we have of sea-level variations over the past 100,000 years or so (Suguio and co-workers).

The role of far-travelled accretionary terranes, sutures and subduction complexes in the evolution of the Andean chain is being increasingly recognized, as demonstrated at opposite ends of the Andes by Restrepo and Toussaint for Colombia and Hervé for southern Chile. A regional overview of the southern part of South America by Ramos demonstrates the role of magmatism and tectonics in the late Precambrian to early Paleozoic evolution of the southwestern margin of Gondwanaland, where subduction complexes, mobile belts and magmatism have all left their imprint.

Rapela and Kay show how the geochemistry and geochronology of a part of this region, northern Patagonia, contribute to an understanding of its late Paleozoic to Recent evolution. It is important to note that these last four articles are products in one way or another of projects on Andean magmatism and collage tectonics organized by the International Geological Correlation Programme, which continues to play a key role in facilitating regional and international cooperation.

Reviews of the mineral industry and hydrogeology of Brazil by Ribeiro and others and by Rebouças demonstrate the contribution of geoscientists to aspects of economic and social development, where the challenges to science - and to society - are very considerable.

The papers in this special issue were coordinated by U.G. Cordani, IUGS President and Director of one of the real centers of excellence in South America, the Institute of Geosciences at the University of São Paulo. Cordani and his colleagues complete this special issue by reviewing a huge volume of geochronological data, many hitherto unpublished, as a basis for calculating a new crustal growth curve for the Precambrian core of South America.

FORTHCOMING ARTICLES

Rio de la Plata Craton of SW Gondwanaland

Stone Technology

Lithospheric Geotraverses in Eastern Europe

Seas Under the Deserts

The Paleozoic-Mesozoic Boundary