NEWS IN BRIEF

IUGS SCOPE PORTRAYED

■ In October 1986 the IUGS Secretariat distributed an 87 page bound document containing the Minutes of the 29th IUGS Executive Committee meeting held in Washington, February 18-21, 1986. This not only records the deliberations and decisions of the Committee, but also contains summaries of the annual reports for 1985 from most of the Union's constituent bodies. The document clearly portrays the very broad scope of IUGS activities and programs, under headings such as Policy Matters, Cooperative Enterprises (IGC, IGCP, ICL, GARS and Mineral Deposit Modelling), and Important Emerging Issues (Circum-Atlantic Project, Sedimentary Basin Program, International Geological Hazards Project, Global Change). A limited number of copies are still available from the IUGS Secretary General at the address on the inside front cover of this issue.

SIERRA LEONE DIAMOND PARADOX RESOLVED?

■ In some countries the supply of alluvial diamonds appears to exceed by far the volumes of kimberlite presently exposed. A new study from Sierra Leone by F. Hubbard (University of Dundee, Scotland) suggests a solution to this problem. Writing in the *Journal of African Earth Sciences* (vol. 5, 1986, p. 599-605), he shows the basement granites of the main diamond-producing kimberlite region in eastern Sierra Leone were once overlain by Lower Palaeozoic sediments and early Mesozoic volcanics, now virtually all removed by erosion.

The (Cretaceous) kimberlites exposed in the Koidu region today appear to represent high levels of exposure rather than deeply eroded remnants of vertical pipes. Hubbard argues that there could have been "significant sill/sheet intrusion of kimberlite magma" both along the basement-unconformity and within the stratified cover. This would have provided upon erosion a much more voluminous source for the diamonds than indicated by the kimberlite diatremes now exposed. Hubbard suggests that a similar emplacement model for kimberlites may also apply in other diamond-producing regions.

ODP AT THE COSTA RICA RIFT

■ From August to October 1986 the JOIDES Resolution reoccupied an old drill site in the eastern equatorial Pacific at the Costa Rica Rift. This had been drilled to 1,350 m during the earlier Deep Sea Drilling Program and

was then the deepest hole in the oceanic crust. ODP Leg 111 reoccupied hole 504b, which had intersected 275 m of sediment, 575 m of pillow lava, 200 m of transitional rocks and 300 m of the underlying sheeted basalt dikes. Despite tough drilling conditions, the hole has now been extended to 1,562.3 m, with all of the added 212 m penetrating slightly altered olivine tholeiite basalt from massive dike units.

The pattern of secondary minerals in veins and cracks indicates that alteration probably occurred in three stages: reactions with sea water at the spreading axis (temperature to 300°C), circulation of more evolved axial hydrothermal fluids, and lower temperature hydrothermal circulation during crustal cooling, this last stage possibly still continuing today. Data from nearby holes show gradients in concentrations of Ca, Mg, and SO₄ in the pore waters. These indicate slow convection through the sediments at rates of a few millimetres per year, much less vigorous than within the uppermost 100-200 m of basalt immediately below the sediments.

USGS SUMMARIZES OCEAN MINING POTENTIAL

■ According to a report recently issued by the U.S. Geological Survey, metal-rich Mn nodules of the equatorial Pacific, cobalt-rich Mn encrustations of the central Pacific, and metalliferous sulphide muds of the Red Sea are the only deep sea deposits that seem to have the potential for commercial production in the remainder of this century. However, recovery of these resources is not likely until mineral prices rise, more effective recovery techniques are developed, and legal and environmental questions are resolved.

V.E. McKelvey, author of "Subsea Mineral Resources" (USGS Bulletin 1689-A, 1986) states that for practical reasons "Mn crusts are closer to being commercially recoverable than the Mn nodules." In some parts of the Pacific Ocean, "the crusts are so weakly bonded to bedrock that they can be scraped off easily and, because they occur in much shallower water they may pose less difficult problems for mining than do the nodules."

Although the means of economic recovery have not yet been developed, there is speculation that a technically viable operation on the Gorda Ridge off Oregon and California could produce a total of 30 million tons of sulphide ore over 20 years at \$348 per ton (1982 prices). Construction minerals such as sand, gravel and lime in

various forms, account for the largest volume of non-fuel mineral production offshore. This is because land sources of these materials near the coastal cities are becoming depleted.

MONEY SEDIMENTATION

■ An intriguing example of clastic deposition was presented by W.R. Danner (University of British Columbia, Canada) at the November meeting of the Geological Society of America in San Antonio. He notes that the accidental deposition of coins on the UBC parking lots is "essentially a dropstone phenomena" controlled by the seasons and the weather. The highest sedimentation rate is "in midwinter when with short daylight hours people can't see their dropped coins, during snow falls when coins disappear in the snow, and on very cold and rainy days when people just don't bother to look for their coins."

A nude beach nearby receives the "greatest sedimentation during the summer months when the coins drop out of pants pockets when the pants are removed or carried." But when bus fares increased to one dollar and paper money or tickets were used the money sedimentation rate declined. On very windy days, Danner points out "coins form lag gravels on sand beaches above high tide level and concentrate in the heavy mineral fractions below high tide level." In a superb example of the value of research results, Danner reported that "four years of study has netted \$507.74."

NEWS FROM ILP

■ The mandate of the Inter-Union Commission on the Lithosphere (ICL), which runs the International Lithosphere Program (ILP) has now been extended. This was decided by the General Assembly of the International Council of Scientific Unions, in Berne, Switzerland, September 1986, "subject to acceptance by IUGG, IUGS and ICSU of five-yearly reviews of the Commission."

The ILP Newsletter for 1986, an impressive 114 page report, has recently been issued by the ICL Secretariat (for address see last page this issue). Several recent changes of ICL officers are reported. New Chairman for CC-1 (Coordinating Committee on Environmental Geology and Geophysics) is G.A. Kiersch (U.S.A.), for CC-2 (Mineral and Energy Resources) P. Stokke (Norway), for CC-6 (National Representatives) M.J. Berry (Canada), for Subcommittee 3 of CC-6 (Andean Region) U. Cordani (Brazil), and for CC-7 (Global Geoscience Tran-

sects) J.W. Monger (Canada). The new ILP logo, reproduced on the front page of Monger's article in this issue is an "L" for lithosphere placed inside the Earth and also representing rifting of a continent or two subduction zones.

AN ACCRETIONARY WEDGE REVEALED

■ The results of ODP drilling across an accretionary complex where the Caribbean plate overrides the Atlantic plate were briefly reported in the last issue of *Episodes* (v. 9, no. 3, p. 175). Structural styles in another accretionary wedge, at the western end of the Timor trough, have recently been described by N.A. Breen, and E.A. Silver (University of California and Santa Cruz) and D.M. Hussong (University of Hawaii). Writing in the October issue of the *Geological Society of America Bulletin* (v. 97, p. 1250-61), they present some remarkably informative Sea MARC II side scan images, bathymetry and seismic reflection profiles across the convergent margin where the Australian continental shelf sediments are being actively accreted to the Sunda island arc.

Deformation is concentrated on the lower slope of the accretionary wedge within 15-25 km of the thrust front. This takes several forms in different places; fold and thrust belts, mud volcanoes and mud ridges parallel to the thrust front, a décollement extending 10-15 km from the thrust front, and more homogenous deformation resulting mainly from closely spaced faulting (thrusts and conjugate strike-slip). Mud volcanoes near the deformation front together with estimates of basal pore-pressure indicate very high fluid pressures that may assist in the development of the décollement by horizontal hydrofracture.

OFF-RIDGE METHANE PLUMES

■ Hydrothermal vents have been widely reported along the East Pacific Rise through detection of ^3He , methane and manganese in effluent plumes. Y. Horibe (University of Toyko), K.-R. Kim and H. Craig (Scripps Institution, U.S.A.) now report large plumes of methane-enriched water in the Mariana Trough back-arc basin and above the summit crater of the Loihi Seamount in the present Hawaiian hot spot. The latter plumes are enriched both in ^3He and methane, but the Mariana vents are unusual in that they show no enrichment in helium (*Nature*, 13 November, p. 131-133, 1986), suggesting significant differences in the chemistry of the mantle sources here or in the water-rock interactions.

NEW GEOPHYSICAL EXPLORATION TECHNIQUES

■ Several new methods of geophysical exploration are reported in the November 1986 issue of *First Break*. Russian scientists at the O.V. Schmidt Institute of Earth Physics have recorded radio pulses from complex ores associated with piezoelectric minerals. These are generated by near-by explosions and detected by monitoring the entire frequency range (especially higher than 100 kHz). Elastic shock waves set off high frequency oscillations whose amplitude spectrum is related to the type of mineral present. Analysis of the signals from several explorations can yield the distance to the deposit.

A highly sensitive gold prospecting tool, the "Goldspear" is being produced by Terra Probe International of Sweden. This consists of a hard, metal-tipped probe that when pushed into the soil senses the electro-potential of gold and displays this electronically. The instrument has already been used to locate new deposits.

NEW COUNCIL OF GEOSTATISTICS FORMED

■ The first issue of *Geostatistics: An Interdisciplinary Geostatistics Newsletter* was issued in late 1986 on behalf of the newly formed North American Council on Geostatistics (NACG). The Council was proposed in 1983 at a NATO Advanced Studies Institute in the U.S.A. to promote communication among those involved in geostatistics work in "all applicable scientific and engineering disciplines". It also aims to encourage related education at all levels and to promote and disseminate the results of theoretical and applied research in geostatistics. The newsletter is to be published quarterly and is free to "active professionals in the field." The editor is R. Barnes, Civil and Mineral Engineering, University of Minnesota, 500 Pillsbury Drive S.E., Minneapolis, MN 55455, U.S.A.

TYUMEN SUPER-DEEP WELL

■ Another super-deep well is soon to be started in the Soviet Union. Special facilities are under construction and a drill rig capable of reaching depths of 15,000 m has been delivered to the site in the Tyumen region. This part of western Siberia is the main oil and gas producing region of the U.S.S.R. Very high formational pressures and temperatures up to 250°C are expected in this sedimentary basin. The Tyumen well will join the

other ultra-deep holes at Kola (now down to over 12,000 m) and at Saatly in the SE Caucasus (now at more than 9,000 m) in a nation-wide program of super-deep wells to investigate the oil, gas and mineral potential of the deep crust of the Soviet Union.

7th FIVE YEAR PLAN FOR GSI

■ One of the largest and oldest surveys in the world, the Geological Survey of India (GSI), recently released its plans for 1985-1990. With a scientific staff of about 2,500, some 14,000 support personnel and nearly 3,000 temporary field workers, the GSI has already mapped 64% of the total land area of India at 1:50,000 and will increase this to nearly 90% by the end of 1990. Nearly half of the country's Exclusive Economic Zone of 2,000,000 km² will be surveyed, as well as some 84,000 km² of territorial waters.

Regional mineral assessment continues to be a priority and a total of 700,000 m of drilling is being planned for metals and energy and industrial minerals in short supply. Environmental and land use studies are increasing in importance, as are geotechnical surveys for major construction projects. Geothermal investigations are being planned, as well as glaciological studies in the Himalayas and geological research in Queen Maude Land, the Trans-Antarctic mountains and the Antarctic Peninsula. An integrated national project underway since 1978 investigating linear zones of the Central Indian Shield will also be continued under the euphonious acronym CRUMANSO-NATA - the Crust-Mantle Study of the Son-Narmada-Tapi Lineament.

MASS EXTINCTION AHEAD?

■ According to many biologists we face a global crisis of monumental proportions through the potential imminent extinction of perhaps 50% of the world's species due largely to tropical deforestation. The biological diversity of the tropics remains unknown, but according to a report in *Science* (3 October 1986, p. 14) estimates are that the 1.7 million species so far described constitute no more than 35% or perhaps as little as 6% of the total number extant. The World Bank calculates that the tropical forest will be virtually destroyed by the year 2135, when the global population will also peak at 11 billion. This collapse in biodiversity, would be comparable, according to D. Raup (University of Chicago, U.S.A.) to the Cretaceous/Tertiary mass extinction.