Notes

NATIONAL MEET ON HIMALAYAN GLACIOLOGY

5th June, 1989

Over the globe as a whole, there are estimated to be about 24 million cubic kilometers of glacier ice and this 'permanent ice' covers approximately 10% of earth's surface area. In the context of the Indian Sub-continent, Himalaya is the largest resevoir of snow and ice outside the Polar regions of the earth and nurtures a multitude of (over 5,000) glaciers. These glaciers are dynamic resources and act as natural reservoirs for the supply of water to all the major river systems of northern India. Although the economy and environment of this region is dominantly dependent on the melt-water flow from these snow fields and glaciers, we have very little information about the causes of the seasonal stream flow variations and the total volume of water being contributed by these sources. Apart from the benefits accruing from glacier melt-water flow to the agricultural economy, the glacier contributions from the upper reaches for cheap hydroelectric power generation could be substantial amounting to 1,00,000 MW.

Glaciology is comparatively a new field of Science and encompasses an inter-disciplinary approach, demanding close linkage of basic knowledge in the fields of Geology, Meteorology, Physics, Hydrology, Soil Sciences, and Mathematics.

During the International Geophysical Year 1957–58, the Geological Survey of India made significant contributions on Himalayan Glaciers. Since then, GSI has been actively engaged in studies related to glacier mass balance, thermal profiling of the ice body, glacier dynamics etc. A number of other agencies, such as, the Survey of India, the India Meteorological Department and the Central Water Commission have contributed, to some extent, to our knowledge of Himalayan Glaciers.

Considering the importance of Glaciology, the Department of Science and Technology initiated a coordinated programme on Himalayan Glaciology in 1986. The main objectives of the programme are to collect data on accumulation and melting of snow and ice in selected Himalayan glaciers by organising expeditions, in order to develop technical expertise and manpower, in the field and create necessary infrastructure to support sustained, observational/empirical efforts at the high altitude sites, as also to support efforts towards evolving and developing new strategies, techniques and technologies for carrying out long-term observational/analytical work in the cold, rarefied and hazardous environment. The research programme includes preparation of glacier inventory (database) on various parameters of scientific concern in the process of modelling glacial phenomena, mapping of snow-cover and glaciers, radiation and water-balance studies, geomorphological and bed-rock studies, interconnection with climate and its change, application of remote-sensing, satellite imagery and isotopic techniques and to support manpower development/training in the subject including laboratory studies on snow and ice samples.

As a result of successful completion of three Himalayan Glacier Expeditions to Chhota Shigri Glacier in Himachal Himalaya organised in 1986, 1987 and 1988,

which encompassed multi-disciplinary and multi-institutional approach, substantial amount of data has been collected and is in various phases of interpretation.

A national meet on Himalayan Glaciology was held on 5th June, 1989 in DST to bring out the overall focus in the studies carried out so far through the coordinated programme on Himalayan Glaciology and to discuss and deliberate on the different aspects of Himalayan Glaciology. The National Meet was attended by about 70 participants from different organisations. Aspects covered related to :

Glaciology—A general review, geomorphological, geological and physical aspects of Himalayan glaciers and remote sensing applications; Medical aspects pertaining to glaciological studies; Hydrological, hydrochemical, hydrometeorological and climatological aspects and Dynamical aspects including mass balance studies, isotope studies.

In the first session, the historical background to Himalayan Glaciological studies and its present status were discussed. During the second session, six papers dealing mostly with geomorphological aspects and applications of remote sensing were highlighted. Dr. Chaujar reported an observed loss of about 300 m in thickness of Chhota Shigri glacier. Col. S. S. Sharma explained the pilloring structures and measures taken to minimise pilloring. Dr. Dhanju appealed for a better understanding of Himalayan Glaciers using remote sensing techniques.

In the third session, Lt. Col. B. K. Singh highlighted the effects of high altitudes on human physiology and elaborated on measures to be taken to combat the high altitude sickness.

In the fourth session, seven papers were presented mostly on hydrochemical aspects of Himalayan Glaciology. Dr. Nijampurkar presented the results of isotopic studies of the Chhota Shigri glacier.

The fifth and last session of the meet had seven papers, mostly dealing with mass balance and glacier dynamics. Shri D. K. Rao gave the major and trace element chemistry of Chhota Shigri glacier.

A panel discussion under the chairmanship of Shri D. P. Dhoundial, was held on 6th June in which a selected group of experts participated. The panel made the following recommendations :

(i) Himalayan Glaciology should be identified as a thrust area of study and a long-term programme has to be evolved.

(ii) A Core Group should be constituted to formulate proposals for implementing the programme of glaciological studies.

(iii) The 8th and 9th Five Year Plan period should be declared as the Indian Glaciological Decade.

Considering the importance of glaciology in the Indian context, it will be worthwhile to work out a long-term strategy.

Department of Science and Technology
New Delhi

K. R. GUPTA
P. G. RAO

CHALLENGING AREAS IN EARTH SCIENCES—A REPORT ON NATIONAL SEMINAR ON THRUST AREAS IN EARTH SCIENCES

The Department of Science and Technology (DST), New Delhi, through its Science and Engineering Research Council (SERC) implements its programme of promoting research in newly emerging and frontier areas of science and engineering. During the Sixth Plan, DST had undertaken a national exercise for identifying thrust areas for different branches of science and engineering. The thrust areas thus identified were, not only funded by DST during the Sixth and Seventh Five-Year Plan periods in the form of projects, but also through other promotional mechanisms, such as, summer/winter schools, publication of technical reports, group monitoring workshops, identifying young scientists to take up research and development activities, and setting up of sophisticated instrumental facilities, etc.

To review and update the impact of its thrust area programmes in Earth Sciences undertaken earlier, and to identify 'New Challenging Areas', DST organised a National Seminar at the Wadia Institute of Himalayan Geology (WIHG), Dehra Dun from 4–6 August, 1989.

The Base Paper prepared by Programme Advisory Committee on Earth Sciences was circulated two months in advance to active scientists and their comments were invited. A document giving a summary of the detailed comments of individual scientists was distributed. In addition, a copy of the proceedings of the Workshop 'Goals for Earth Science Activities in the Nineties' held on 17–18 June, 1989 at Bangalore, organised by DST in cooperation with the Geological Society of India, was also distributed.

The Seminar was attended by more than 100 earth scientists from the various universities, the Institutes of Technology, National Research Organisations, as well as Government agencies/departments like the Geological Survey of India, the Department of Space, the Department of Atomic Energy, the India Meteorological Department, the Survey of India, the Department of Coal, the Oil and Natural Gas Commission, the Ministry of Water Resources, etc. The National Seminar was chaired by Shri. D. P. Dhoundial, Direcor-General, Geological Survey of India and Member, SERC.

The Seminar started on 4th August morning with a welcome address by Dr. V. C. Thakur, Director WIHG followed by introductory remarks by Dr. H. N. Srivastava, Director (ESS), DST. The inaugural address was given by Shri D. P. Dhoundial. The inaugural function ended with a vote of thanks by Prof. K. K. Sharma (WIHG), Coordinator of the Seminar.

Based on the Base Paper prepared by an expert group and the comments on the Base Paper by Earth Scientists, the deliberations of the Seminar were divided into the following five Working Groups.

Working Group I

(i) Coastal Geomorphology and Dynamics in relation to predicted sea level changes.

(ii) Bengal and Nicobar Fans.

Working Group II

(i) Earthquake Processes.

(ii) Theory and Application of Electromagnetic induction in Earth.

Working Group III

(i) Neogene/Quaternary (N/Q) Stratigraphy including the glacial and inter-glacial record.

(ii) Major stratigraphic boundaries high resolution, facies controlled integrated programme.

Working Group IV

(i) Eruptive style, composition, geochemistry, basement, source and duration of Deccan Trap activity.

(ii) Tropical weathering of rocks and mineral deposits and their geochemical behaviour in time and space.

Working Group V

(i) Integrated Geotraverses across the shield and the Himalaya.

(ii) Correlation and Geodynamic of major Precambrian shield areas with special emphasis of Madhya Pradesh-Andhra Pradesh-Maharashtra sector.

NEW CHALLENGING AREAS

After a thorough discussions by the participating scientists, the following nine 'Challenging Areas' were identified and the Earth Science community encouraged to take up R and D programmes coordinated by DST.

(1) Coastal geomorphology and dynamics in relation to predicted sea-level changes.

(2) Bengal and Nicobar Fans.

(3) Neogene/Quaternary (N/Q) stratigraphy including the study of fluvial and glacial systems.

(4) Major stratigraphic boundaries: High resolution, facies controlled integrated programme.

(5) Tropical weathering of rocks and mineral deposits and their geochemical behaviour in time and space.

(6) Eruptive style, composition, geochemistry, basement, source and duration of Deccan Trap activity.

(7) Earthquake Processes.

(8) Theory and application of electromagnetic induction in Earth.

(9) Integrated geotraverses across the shield and the Himalaya.

It was clarified that the identification and support for 'Challenging Areas in Earth Sciences' is not at the cost of or exclusion of support for other worthwhile, relevant frontier areas of science and technology or other outstanding programmes/ projects not included under the category of Challenging Areas.

In addition to identifying the 'Challenging Areas' in Earth Sciences, the scientific community also deliberated on the manpower development in Earth Sciences as well as on the training programmes and augmentation of geoscientific instrumental facilities. Dr. K. R. Gupta of the Department of Science and Technology who was the Convenor of the Seminar, informed the assembled scientists that a detailed document of these Challenging Areas will be published shortly and widely circulated among the geoscientific community. He also mentioned that DST would welcome funding of the summer and winter school proposals in newly emerging areas of the Earth Sciences as well as training programmes in geoscientific instrumentation.

Though the number of participants was large, the discussions and interaction between them in the five Working Groups was commendable. It is hoped that support to the 'Challenging Areas' Identified for funding during the 8th Five Year Plan will go a long way in the development of Earth Sciences research in the country.

K. R. GUPTA
Dept. Science and Technology
New Delhi

K. K. SHARMA
Wadia Inst. Himalayan Geology
Dehra Dun

CORRECTION

Rb, Sr and Y contents in Table I, p. 388 of the current issue (paper by Saleem Ahmed Khan and A. S. Janardhan) has got interchanged. The correct results should be:

Wt %	Charnockite	Biotite gneiss
(in ppm)		
Rb	>10	56
Sr	375	336
Y	<10	<10