The LIP Reader

Newsletter of the Commission on Large-Volume Basaltic Provinces
International Association of Volcanology and Chemistry of the Earth's Interior *IAVCEI*

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This Issue...

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Newsletter Production

Judith Haller and Toni Lee Mitchell

Exciting new results from Ocean Drilling Program (ODP) work on the North Atlantic Tertiary flood basalts are described in this issue. Also, terrestrial and extraterrestrial LIPs (large igneous provinces) are compared, and major meetings are summarized. Interest in LIPs is growing, and this is paralleled by an increase in Commission membership—we now number 192 members. A Steering Committee has been formed to guide the Commission's activities; please feel free to contact any of the members listed below for suggestions, contributions, comments, etc. Yet again, we welcome your ideas, your input to *The LIP Reader*, and your recruiting of more scientists to join the Commission.

Commission News

Steering Committee

Members of the Steering Committee to date include:

Hans Barsczus (University of Montpellier, France)—barsczus@sajou.dstu.univ-montp2.fr
Mike Coffin (University of Texas, USA)—mikec@coffin.ig.utexas.edu
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Full addresses and contact numbers for the above are available over the internet, on diskette, or as hard copy (see below) from Mike Coffin.

Volume on Large Igneous Provinces

Planning continues for a volume or volumes, similar to the 1988 *Continental Flood Basalts*, edited by Doug Macdougall, which would provide review papers on all major LIPs, and on theoretical and modeling efforts. Please contact John Mahoney or Mike Coffin if you are interested in contributing a paper. A tentative table of contents will be published in the next issue of *The LIP Reader*.

Workshops/Short Courses/Special Meetings

The 1995 IUGG XXI General Assembly in Boulder, Colorado (see "Meetings Schedule" below), is a good target for the Commission's first short course or

workshop. If you are interested in organizing one on the topic of your choice, please contact any member of the Steering Committee. Special meetings on LIPs, such as GSAmerica's Penrose and AGU's Chapman, or NATO's Advanced Study Institutes, are also possibilities. These usually require a lead time of >1 year for funding applications and planning. Once again, please contact one of us if you would like to run or help organize a special meeting relevant to LIPs.

Recent Research Summaries

Ocean Drilling Program Leg 152 - North Atlantic Tertiary Province

The primary objective of Leg 152, located along a transect at 63°N, was to investigate the development the SE Greenland volcanic rifted margin. Six sites (914-919) were drilled; three of these (915, 917, and 918) drilled into the volcanic pile of the seaward-dipping reflector sequences (SDRS). Only a few meters of basalt were recovered at Site 915. Drilling at Site 917, however, located on the feather-edge of the SDRS only 50 km from the Greenland coast, achieved remarkable penetration (779 m) through the SDRS, and through a faulted contact into underlying sedimentary rock. The pre-SDRS sediment includes quartzose (fluviatile?) sandstone, below which are steeply inclined beds of siltstone and sandstone. Site 918 was located on the main subcrop of the SDRS, on the continental rise; 18 units of MORB-like tholeiite were cored for 122 meters. The majority of the lavas at both sites was erupted subaerially; all record reversed magnetic polarity.

The lava pile at Site 917 comprises at least 91 flow units, which have been grouped into Lower, Middle and Upper Series. Most of the lavas from the Lower and Middle Series, the oldest lavas recovered, are basalts; some, especially those of the Upper Series, are magnesian basalts and picrites. The Middle Series lavas are more evolved; some are dacites.

The samples recovered during Leg 152 show that there is a profound change in magma composition related to the evolution of the margin. The oldest lavas (Lower and Middle Series) at Site 917 show evidence of contamination by continental lithosphere. The picrites found in the Upper Series at Site 917 show no evidence of such contamination, despite their likely high eruption temperatures, suggesting that they represent rapid expulsion of the primitive magmas from the mantle to the surface. This may have been facilitated by continental separation. MORB-like basalts recovered at Site 918, the youngest part of the SDRS drilled during Leg 152, reflect the establishment of a steady-state oceanic magma system.

—contributed by Andy Saunders and the ODP Leg 152 Scientific Party

Summaries of recent research programs are invited—please send your contribution to Mike Coffin or John Mahoney.

Previous Meetings

The International Workshop on Intraplate Volcanism: The Polynesian Plume Province, Université Française du Pacfique/Tahiti (French Polynesia), 2-7 August 1993.

Organized with support from CNRS (Centre Nationale de la Recherche Scientifique), CEA (Commissariat à l'Energie Atomique), ORSTOM (Institut Français de Recherche Scientifique pour le Développement en Coopération), CNES (Centre National d'Etudes Spatiales), and CLS/ARGOS, this workshop was attended by ~80 scientists, mainly from France and the US, but also from Japan, Canada, Australia, Germany, Netherlands, Belgium, UK, and Italy. Topical sessions included Plume Dynamics, Mantle Sources, Rare Gases, Volcanic Structure and Volcanic Processes, Lithospheric Structure and Dynamics, Low Temperature Processes, and Sea Level Changes - Natural Hazards. An introductory talk was given by C.J. Allègre (Géochimio-Dynamics), and invited talks were given by H. Staudigel (Seafloor Alteration-Induced Compositional Heterogeneity of the Altered Oceanic Crust), Y. Caristan (A Review of the Structure of Mururoa and Fangataufa Atolls), C. Chauvel (Isotopic Constraints on the Sources of Polynesian Basalts), J.-G. Schilling (Plume-Ridge Interactions and Dynamics), E. Bard (Sea Level Changes in the Past 20,000 Years), R.I. Tilling (Geologic Hazards on Basaltic Volcanic Islands), M.K. McNutt (Lithospheric Dynamics of the Polynesian Plume Province), and E.A. Okal (Seismological Studies of the Structure of the Polynesian Province: A Review). A special volume is planned to be published by the end of 1994 containing extended abstracts of workshop papers (contact: barsczus@dstu.univ-montp2.fr).

—contributed by Hans Barsczus

Lunar and Planetary Science 25th Annual Conference, Lunar and Planetary Institute, Houston, Texas, USA, 14-18 March 1994.

An abstract from this meeting, entitled "Large Igneous Provinces: A Planetary Perspective," by James W. Head III of Brown University, contrasts and

compares LIPs on the terrestrial planets: Large igneous provinces are common on other terrestrial planets and offer a potentially important perspective for LIPs on Earth. Exposure and preservation are excellent due primarily to fewer erosional agents, minimal erosional rates, and relatively stable lithospheres. Stable lithospheres also mean that longer time intervals are available for study; the majority of the surface of the Moon and Mars dates back to the first half of Solar System history. Terrestrial planetary bodies offer multiple examples for study in different places on one planet and between several planets. The terrestrial planets provide an opportunity to assess how different crustal and thermal structure might influence the formation of LIPs. The segmented, laterally moving, and constantly renewing terrestrial lithosphere both obscures the view of and insulates many mantle convection processes. The perspective offered by one-plate planets can reveal the long-term influences of mantle plumes and their variations under different thermal conditions in space and time. The planetary record can also help to reveal their relation to tectonic structure. Venus has tens of thousands of kilometers of exposed rift zones which display a wide variety of igneous centers, many of which are LIPs. The planetary record can be instructive in terms of the chronology and episodicity of large igneous events and provinces. The extended historical record permits an assessment of changes in the style of LIPs with time and the frequency at any given time. Finally, the planetary record can offer a complete perspective on many processes associated with LIPs; on Venus, the entire process of mantle plume emplacement can be studied and compared to Earth. In summary, the planetary record, in concert with the detailed examination of examples on Earth, can be of use in developing and testing models for the emplacement of LIPs, and in helping to distinguish plate tectonic influences from those linked to deeper interior processes.

—contributed by Jim Head

Synopses of recent meetings are welcomed—please send your ~200 word review to Mike Coffin or John Mahoney.

LIPs and ODP

LIPs are becoming a major focus within ODP, as attested to by the efforts on the East Greenland volcanic margin described above. The four thematic panels of JOIDES (Joint Oceanographic Institutions for Deep Earth Sampling)—Lithosphere, Tectonics, Ocean History, and Sedimentary & Geochemical Processes—each meet twice yearly to review drilling proposals. Part of the spring meetings is devoted to ranking all active proposals globally. LIPs fall under the Lithosphere Panel's mandate, and in that panel's Spring 1994 global evaluation, the Caribbean flood basalt province ranked #1 and giant LIPs (Ontong Java Plateau or Kerguelen Plateau-Broken Ridge) ranked #2. Such highly-ranked proposals are usually drilled, and the strong showing of LIPs in ODP is most encouraging.

The Ocean Drilling Program is proposal-driven, and anyone may submit a drilling proposal. Guidelines for writing and submitting proposals may be obtained until 30 September 1994 from: JOIDES Planning Office, School of Oceanography, University of Washington, WB-10, Seattle, WA 98195. Phone 1.206.543.2203. Facsimile 1.206.685.7652. Internet: joides@ocean.washington.edu. Information on ODP's long-range thematic plans can be obtained from the same address. From 1 October 1994, the JOIDES Planning Office will be located at: Dept. of Geology, University of Wales, Cardiff, PO Box 914, Cathays Park, Cardiff CF1 3YE, UK. Phone 44.222.874.830. Facsimile 44.222.874.326. Internet: sglrbk@cardiff.ac.uk.

Commission Products and Services

LIPs on Internet

LIPs has an internet presence, accessible via standard Internet tools. The Commission's LIP bibliography, directory of members, and digital database of LIP areas are available, as well as the calendar of events and text versions of *The LIP Reader*. The internet site is currently set up as a Gopher server, which allows users to log in with anonymous ftp or World Wide Web (WWW) tools, such as NCSA Mosaic. As time allows, the site will be enhanced for WWW users. Ideas on how the site could improved or made more useful are most welcome. For a copies of materials on Macintosh diskette, please send a blank 3.5 inch diskette to Mike.

Anonymous FTP

With ftp, open ftp.cc.utexas.edu, use the login name anonymous and your email address as a password. Then change directory to /pub/lips.

Gopher

Using your Gopher client software, open gopherhost.cc.utexas.utexas.edu. Navigate to UT Computation Center/Departments and Projects/ Institute for Geophysics.

World Wide Web

The Universal Resource Locator (URL) is gopher://gopherhost.cc.utexas.edu:3003/11/pub/lips

Upcoming Meetings

1994

5-11 June: **Eighth International Conference on Geochronology, Cosmochronology and Isotope Geology, Berkeley, California, USA.**

Information: Paul Renne, Geochronology Center, Institute of Human Origins, 2453 Ridge Rd., Berkeley, California 94709, USA. Telephone: 1.510.644.1350. Facsimile: 1.510.845.9453.

4-8 July: **The Icelandic Plume and its Influence on the Evolution of the NE Atlantic, Arthur Holmes European Research Conference, Reykjavik, Iceland.**

Information: Heidie Gould, The Conference Dept., The Geological Society, Burlington House, Piccadilly, London W1V 0JU, UK. Telephone: 44.71.4349944. Facsimile: 44.71.4398975.

14-19 August: **International Symposium on the Physics and Chemistry of the Upper Mantle, São Paulo, Brazil.**

Information: Prof. Wilson Teixeira, Instituto de Geosciências - Universidade de São Paulo, PO Box 20899, 01498-970 São Paulo, Brazil. Telephone: 55.11.8138777, extension 3987. Facsimile: 55.11.2104958. Internet: brenha@iag.usp.br

28 Aug-2 Sept: **V.M. Goldschmidt Conference, Edinburgh, Scotland.**

Information: Ben Harte or Peter Symms, V.M. Goldschmidt Conference 1994, Dept. of Geology and Geophysics, University of Edinburgh, Grant Institute, West Mains Road, Edinburgh EH9 3JW, Scotland, UK. Facsimile: 44.31.6508522.

12-16 September: **International Volcanological Congress, IAVCEI, Ankara, Turkey.**

Information: Dr. Ayla Tankut, Organizing Secretary, International Volcanological Congress, IAVCEI Ankara 1994, Dept. of Geological Engineering, Middle East Technical University, 06531 Ankara, Turkey. Telephone: 90.312.2101000, extension 2682-2679. Facsimile: 90.312.2101263. Internet: atankut@trmetu.bitnet

24-27 October: **Geological Society of America Annual Meeting, Seattle, WA, USA.**

Abstract deadline: 6 July 1994. Information: GSA Meetings Dept., P.O. Box 9140, Boulder, CO 80301, USA. Telephone 1.303.4472020. Facsimile: 1.303.4471133. A premeeting field trip, "Vents and Basalt Flows of the Columbia River Basalt Group," is scheduled for 21-23 October at a cost of $260. For further information, contact trip leader Stephen P. Reidel, Geosciences, Westinghouse Hanford Company, MSIN H6-06, PO Box 1970, Richland, WA 99352 USA. Telephone 1.509.3769932. Terry L. Tolan and Melvin H. Beeson will co-lead the trip.

5-9 December: **American Geophysical Union Fall Meeting, San Francisco, California, USA.**

Abstract deadline: September 1994. Information: AGU-Meetings Dept., 2000 Florida Ave., N.W., Washington, D.C. 20009, USA. Telephone: 1.202.4626900. Facsimile: 1.202.3280566. Internet: sbell@kosmos.agu.org

1995

2-14 July 1995: **International Union of Geodesy and Geophysics XXI General Assembly, Boulder, Colorado, USA.**

Abstract deadline: 1 February 1995. Information: IUGG XXI General Assembly, c/o American Geophysical Union, 2000 Florida Ave., NW, Washington, DC 20009, USA. Note IAVCEI Symposium V1, "Origin of Large Igneous Provinces," convened by M. Coffin, N. Arndt, and J. Ludden.

4-8 September 1995: **Third International Dyke Conference, Jerusalem, Israel.**

Paper deadline: 31 December 1994; abstract deadline: 31 May 1995. Information: Organizing Committee IDC-3 (Dr. A. Heimann), Geological Survey of Israel, 30 Malkhe Yisrael St., Jerusalem 95501, Israel. Facsimile: 972.2.380688. Internet: dikeconf@vms.gsi.gov.il

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