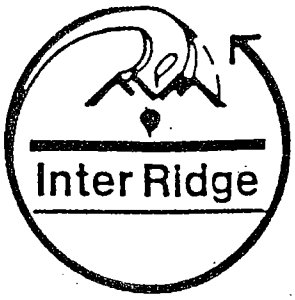

InterRidge

Meeting Report

InterRidge Meeting held at York, UK
Merchant Adventurers' Hall

March 11-13, 1992

Convenors: H. David Needham
John R. Delaney

Host: J. Cann
University of Leeds

InterRidge Meeting Report

INTRODUCTION

Representatives of ten InterRidge countries (Australia, Canada, France, Germany, Iceland, Japan, Portugal, Spain, United Kingdom, and United States) met in York, UK, on March 11-13, 1992. Representatives of other invited countries (Italy, Norway, Russia [C.I.S.], India, and South Korea) were unable to attend. N. Holm (Sweden; chair of SCOR WG 91 on chemical evolution and origin of life in marine hydrothermal systems) participated as a SCOR scientific liaison, and J. Bender as an ODP liaison (see Attachment 1). The meeting was hosted by J. Cann of the University of Leeds.

PURPOSES OF MEETING

The principal goal of the meeting was to reach agreement on a Program Plan for InterRidge, and to establish the framework for its implementation over the coming decade. Major items on the agenda (Attachment 2) were:

- Specific themes or projects, if any, on which InterRidge should concentrate its efforts during the first part of the decadal program;
- Levels of InterRidge coordination appropriate to these projects;
- Organization and administration of InterRidge;
- Schedules for program development and implementation.

The supporting document for the meeting was an updated version of the InterRidge Draft Program Plan. A previous version was widely circulated for comments in December 1991.

DEVELOPMENT OF DRAFT PROGRAM PLAN

Following recommendations made at the 1990 Brest meeting, the draft Program Plan was developed by the Interim InterRidge Steering Group (IIRSG) in consultation with National Correspondents and other colleagues. Members of the IIRSG met for discussions over the following year, and a full gathering was convened at the University of Cambridge, England, in May 1991. An InterRidge project meeting, charged with proposing guidelines and ideas for implementation of a Global Studies effort, was held at the Institut de Physique du Globe in Paris on 3-4 February, 1992 (Attachment 3).

The draft Program Plan was developed in consideration of several points:

(1) Although ridge studies concern many subjects, ranging from seismology to bacteriology, most ridge research concerns in one way or another the role of intra-planetary (mantle) processes, as opposed to processes driven by external (solar) energy.

(2) National resources devoted to ridge-related research are significant. Seagoing efforts alone currently involve more than 24 months (approximately $15 million) of ship time spent annually by InterRidge nations.

(3) The purpose of InterRidge cooperation is to make significant advances in knowledge of ridge dynamics through intelligent scientific and logistical integration of ridge research projects. InterRidge should focus particularly on problems that cannot be addressed as efficiently by nations acting alone.

(4) Although particular actions will be geographically or thematically restricted, InterRidge should be global in the overall scope of its objectives.

(5) InterRidge should be an intellectually and internationally open program for creative research by individual scientists, but for the program to constitute a

concerted effort, it must comprise a suitable level of organization and suitable financial contributions from participating member countries.

SPECIFIC INTERRIDGE THEMES

Three areas of research were retained by meeting participants as the basis for the InterRidge Program:

- Global-Scale Studies
- Meso-Scale Ridge Processes Studies
- Studies of Active Processes

The upgrading of Meso- (Regional-) scale studies to the status of an integrated InterRidge effort on a level with the other two research areas represented an important change from the preliminary draft of the Program Plan.

Global-Scale Studies

Rationale

There are a large number of fundamental problems that can be approached only from a planetary perspective: for instance, the nature and origin of isotopic provinces on the scale of an ocean basin; gradations in geochemical parameters over 2000 km of ridge; and mantle convection and mixing on scales of thousands of km. To address these problems, we must study the ridge on a global scale.

Recent research has confirmed the multi-dimensionality of ridge processes. We now recognize a number of controlling variables: mantle temperature, geometry of ridge orientation with respect to plate motions, water content. Definition of the controls on ridge characteristics requires construction of a matrix of forcing functions.

Almost every major section of ridge appears to be unique, with its own combination of controlling variables; each piece of ridge has its own interesting regional problems. We will never discover some of these without a reasonably homogeneous characterization of the entire global ridge system.

The whole of the ridge south of 40°S is practically unmapped using modern methods, and largely unsampled. Other important gaps in knowledge include the Indian Ocean and the far northern Atlantic.

Primary recommendations

- A workshop should be held in autumn 1992, to coordinate ship-time proposals in time for potential cruise proposers to meet national review deadlines for 1994 ship time. A call for letters of interest or intent should be circulated as soon as possible. The preliminary recommendations of the 1992 February meeting in Paris and the conclusions of the York meeting provide the framework for further planning around the idea of integrated investigations of unmapped portions of the mid-ocean ridge system.
- InterRidge should make known its global studies project to the next Ship Operators' Meeting to be held in Japan in October 1992, and should put forward recommendations.
- InterRidge should inform the European Space Agency of the importance, for InterRidge's global ridge studies program, of the high-resolution altimetry data that would be collected by the ERS-1 satellite if this project is maintained.
- The InterRidge global studies effort should seek to use aeromagnetic surveys (notably U.S. Naval Research Laboratory surveys) where possible.
- InterRidge representatives should emphasize to their national ship operators the need for flexibility to swap ship time on InterRidge research vessels to optimize the use of national assets for global mapping and sampling.

Meso-Scale Ridge Processes Studies

Rationale

Meso-scale ridge processes studies (tens to hundreds of km ridge length; up to ~5 Ma and more off axis) involve investigations on the scale of individual segments, a fundamental unit of crustal accretion. Meso-scale studies provide a vital link between global and detailed, site-specific research. The ongoing field project FARA (French-American Ridge Atlantic), for example, concerns the middle ground between the geological and biological characterization of a significant length of ridge crest, and the meaning of differences among individual segments, or groups of segments.

Certain critical spatial and temporal information is available only at the intermediate scale, and many tools needed for meso-scale research are readily available. Testable hypotheses concerning processes are generally further advanced at this scale than at other scales. Finally, there is a large international community involved with meso-scale research.

Primary recommendations

- InterRidge Meso-Scale Ridge Processes Studies should have as their long-term goals the identification of key variables that control mid-ocean ridge magmatic/hydrothermal/tectonic systems, and the development of quantitative, testable models of ridge-crest processes.
- Meso-Scale Ridge Processes Studies should focus on three themes:
  - Quantification of the nature and variability of segment-scale variations in fluxes;
  - Crustal accretion in back-arc settings.
  - Interplay between tectonism and magmatism in segmentation;
- A Meso-scale studies workshop should be held prior to the Global Studies workshop planned for autumn 1992, to produce a detailed, three-year plan, and to allow the Global workshop to build on discussions at the Meso-Scale workshop.

Active Processes

Rationale

Dynamics is the key to the science. Traditionally, we have deduced the dynamics of active processes from their products. New technologies in deep-sea research are now enabling us actually to observe some processes in real time. The information drawn from "snapshot" analysis of products of active processes is necessarily limited and oversimplified. Real-time observation of ridge processes on both very short-term (hours to years) and decadal or longer scales can yield critical information about system dynamics that is not available using any other approach. Much of the biological research (microbiology, physiology, ecology) associated with hydrothermal systems of the ridge is an integral part of the fine-scale study of active processes and their temporal variability.

Primary recommendations

- InterRidge can and should promote observation and measurement of active ridge processes using deep-sea instrumentation packages and through the development of seafloor observatory capability. Attention should be given to standardization and compatibility of instruments.
- Cooperative approaches to seafloor monitoring are complex, and will require further discussion to determine the best avenues for an integrated InterRidge effort. An InterRidge workshop should be held early in 1993 to develop plans for specific actions. Topics such as experimental strategies, instrument development, site selection, and data recovery must be addressed as a prelude to international cooperation in establishing one or more long-term seafloor observatories.
- InterRidge should have as one of its aims the development of means of detection for instantaneous, short-term seismic, volcanic, and hydrothermal events, and a

logistical capability to respond to them through a strategy for international cooperation.

- InterRidge should express its interest in being informed of events related to the meeting on scientific uses of undersea telephone cables held during the European Geophysical Society gathering in Edinburgh in April 1992.
- The next Ship Operators' Meeting, to be held in Japan in October 1992, should be made aware of the scientific aims of the InterRidge event detection and response project, and of the potential value of international ship response to detected events.

LEVELS OF INTERRIDGE COORDINATION

Several levels of InterRidge coordination are possible to facilitate achievement of the goals described above. At a minimum, for example, InterRidge could provide information exchange about where ships would be conducting ridge research in various sections of the global system. A newsletter could serve as the vehicle for dissemination of this and related information.

At the other extreme, InterRidge could take on a strongly proactive role in initiating joint research projects among scientists from InterRidge countries, mount interdisciplinary, cooperative efforts at sea, develop standardized instrumentation for certain deep-sea experiments, create international databases, and take on other ambitious and complex projects. Intermediate levels of coordination were also considered.

Representatives of the various nations at the meeting decided to adopt a moderately proactive stance in the near term, noting that each of the integrated efforts agreed on (Global, Meso-Scale Ridge Processes and Active Processes studies) may not proceed at the same pace, and could draw different types of benefit from direct InterRidge involvement as the program proceeds.

Meeting participants acknowledged the value of an InterRidge role in creating an effective, broadly international context for ridge research, in providing information exchange (including a data catalogue and cruise trackline/station information), and in organizing general meetings and workshops. It was recognized that these functions require the operation of a proactive, adequately supported InterRidge Office.

InterRidge will establish standing working groups and panels as necessary and ensure integration among them. The number of these groups should be kept as low as possible, at least in the early phase of the program (see Working Groups, below).

Discussion of a potential InterRidge-coordinated effort at sea, proposed in the draft Program Plan, was deferred until later in the program.

INTERRIDGE ADMINISTRATION AND ORGANIZATION

Membership

There was objection at the meeting to the suggestion made in the draft Program Plan under discussion (page 25) that there be three categories of membership in InterRidge, linked essentially to the volume of seagoing research conducted in various nations. Participants thought that a simpler, less-restrictive approach should be adopted, and supported the idea of the level of financial contribution to InterRidge operating costs as a suitable criterion, with the corollary that there would be no international pooling of funds for seagoing or other major activities under InterRidge administration during the first part of the program. Contributions would be used to support operating costs of the InterRidge Office (see below) not covered by the host country, to provide for associated travel funds and, where possible, to support other activities related to the organization and administration of InterRidge.

There was general consensus that a simple, two-choice approach would reasonably allow a country to decide on the level of the contribution it can make to InterRidge, and of

the return benefits that it wanted to receive from InterRidge as a society of nations with a common commitment to ridge research.

The "Associate" level of membership could, for example, entitle a country to receive all InterRidge information and mailings, to attend InterRidge meetings, to obtain access to an InterRidge Data Catalogue, and to propose projects for consideration by InterRidge. Associate members would be expected to keep InterRidge informed about their activities related to ridge research.

The "Principal" level of membership would carry additional responsibilities and benefits. It would allow a country to have a direct influence on how projects under the InterRidge program are defined and conducted, and on how InterRidge evolves. This level of membership could, for example, entitle a country to occupy a position on the InterRidge Steering Committee and on at least some Working Groups (see below), to have access, and responsibility for contributing, to InterRidge databases when they are established.

There was general agreement at the meeting that US$20,000 would be a reasonable minimum for membership at the Principal level in 1992, and that the fee at the Associate level should be significantly lower.

Representation

Nations electing to join InterRidge will be asked to confirm the name of their present national representative or name another person who will fulfill this role. Countries will also be asked to give the name of an alternate who could be consulted in the case of the representative's absence. Pending any changes stemming from the specific membership of countries electing to join InterRidge, the interim Steering Group will act as the InterRidge Steering Committee, and present national correspondents as National Representatives (see Attachment 4).

Working Groups

It was agreed that, initially, three InterRidge Working Groups should be established: (1) Global; (2) Meso-scale ridge processes; (3) Active processes. Each of these groups should convene a workshop in the next 12 months to develop detailed plans in its area of research. The suggestion made in the preliminary draft Plan (page 26) that there be a separate workshop for biological efforts in InterRidge was not considered timely. Biological studies, at least for the present, should be incorporated in the three Working Groups currently established.

The number of standing committees proposed in the draft Plan (page 26) was considered excessive at this stage of InterRidge. However, it was recommended that a standing subcommittee be created in 1993 to examine questions of general interest to InterRidge concerning technological development and standardization, databases and ship logistics. Ad hoc committees will be developed as necessary.

InterRidge Office

Meeting participants agreed that an InterRidge Office should be established, and should rotate approximately every 3 years. The office, currently supported only by U.S. NSF funds, should move from the U.S. in 12-18 months to the home institution of a non-US InterRidge Co-Chair. An offer to host the next InterRidge Office was extended by the United Kingdom. Other countries should be given the opportunity to make offers before any decision is taken. The cost of InterRidge Office operations over and above that supported by the host country will depend on the level of its activity. Approximate projected annual costs for the current minimal office are estimated to be at least $100,000.

The InterRidge Office should incorporate several functions:

- Produce a semiannual newsletter; the precursor to this newsletter already exists in the form of an InterRidge section in *RIDGE Events*.
- Compile an international catalogue of principal ridge-crest data (tracklines, station locations);
- Assist in arrangement of general meetings, workshops, and working-group meetings; produce and distribute related reports;
- Collect and disseminate other information as required, including lists of programmed cruises and summary data on the planned locations of major national vessels and submersibles working on or near ridge crests.

AFFILIATIONS WITH OTHER ORGANIZATIONS

The consensus of the National Correspondents and other participants present was that affiliation with the Scientific Committee on Ocean Research (SCOR) would have many advantages for InterRidge. An InterRidge pre-proposal, submitted by N. McCave on behalf of InterRidge to the Executive Committee of SCOR in 1991, received positive comments. There was agreement that contacts between InterRidge and SCOR continue to be pursued and that an updated, full proposal be submitted in late August 1992 for consideration by the next SCOR executive meeting.

INTERRIDGE PROGRAM PLAN

In conclusion, meeting participants unanimously endorsed the InterRidge Program Plan with amendments made at the meeting. The final draft of the Program Plan will be circulated in late June or early July 1992 to National Representatives and all other participants in the meeting. It was agreed that the Plan itself should be stripped of excessive detail concerning the implementation of the different components of the program and that these, together with summaries of national resources, should appear as supporting documents subject to periodic updating.

CALENDAR

Working groups (see above) should be created in Spring 1992 when their initial planning efforts will begin. Meeting attendees recognized that some interdisciplinary and international balance would have to be sought in forming these groups. Some suggestions for membership were made by task groups at the York meeting. Workshops for Global and Meso-Scale Ridge Processes Studies will be convened in summer-autumn 1992 (in time to meet some countries' deadlines for cruise proposals), and a workshop convened by the Active Processes Working Group will be held before spring 1993.

Meeting participants agreed that the present interim InterRidge Office at the University of Washington, Seattle, will act as the InterRidge Office until transfer to another country before the end of 1993. A letter of invitation for countries to join InterRidge and to host the next InterRidge Office should be sent to National Representatives in April-May 1992 for discussion with the relevant committees and national agencies in their countries, and for reply; an early answer would be highly desirable.

NEXT GENERAL INTERRIDGE MEETING

A decision will be made in autumn 1992 concerning precise dates and venue for the next (1993) general InterRidge assembly. An invitation was extended by H.-U. Schmincke for Germany to host the meeting.

Note

The InterRidge Steering Group met briefly after the general meeting ended. K. Tamaki and R. Detrick were invited to join the committee as members.

Attachment 1

InterRidge meeting participants, York, March 11-13, 1992

InterRidge meeting participants
March 11-13, York, UK

AUSTRALIA	Trevor Falloon/U. Tasmania
CANADA	John Malpas/U. Newfoundland
FRANCE	David Needham/IFREMER
	Catherine Mével/PARIS 6
	Jean Francheteau/IPG Paris
	Daniel Desbruyères/IFREMER
	Jean-Marie Auzende/IFREMER
	José Honnorez/U. Louis Pasteur
	R. Louat/Orstom
	Daniel Prieur/Stat. Biol. Roscoff
	M. Munschy/IPG Strasbourg
	Annie Cazenave/CNES
	Félix Avedik/IFREMER
GERMANY	Hans-Ulrich Schmincke/GEOMAR
	Róland Rihm/GEOMAR
ICELAND	Karl Gronvold/Nordic Volc. Inst.
JAPAN	Kensaku Tamaki/U. Tokyo
	Hiromi Fujimoto/U. Tokyo
	Hajimu Kinoshita/U. Tokyo
	Tetsuro Urabe/GSJ
	Hitoshi Hotta/JAMSTEC
	Kantaro Fujioka/JAMSTEC
PORTUGAL	J. Miguel Miranda/U. Lisbon
SPAIN	J. Acosta/IEO
SWEDEN	Nils Holm/U. Stockholm (SCOR representative)
USA	Roger Buck/LDGO
	David Epp/NSF
	Horst Felbeck/SIO
	Jeff Fox/URI
	Steve Hammond/NOAA-PMEL
	Don Heinrichs/NSF
	Charlie Langmuir/LDGO
	John Lupton/NOAA-PMEL
	Lauren Mullineaux/WHOI
	J.-C. Sempéré/U. Washington
	Brian Taylor/U. Hawaii
	RIDGE:
	Bob Detrick/WHOI
	Susan Humphris/WHOI

cont.