The Spirit of WRI

by Brian Hitchon

The Working Group on Water-Rock Interaction (WRI) is the largest and one of the most active groups of IAGC, the International Association of Geochemistry and Cosmochemistry, the subject of a profile in the September 1986 issue of *Episodes*. Its main purpose is the organization of international symposia and the publication of proceedings and abstracts. However, as this "profile" explains, the success of such groups is often in the rather less tangible, but no less important, human dimension of its activities, encouraging the interchange of ideas and fostering communications internationally. (Ed.)

Tentative Beginnings

The concept for a Working Group on Water-Rock Interaction (WRI) within the International Association of Geochemistry and Cosmochemistry (IAGC) originated with the late Prof. Mikhail G. Valyashko (Fig. 1), who for many years held the Chair of Geochemistry at Lomonosov State University, Moscow. During the International Symposium on Hydrogeochemistry and Biogeochemistry (Tokyo, Japan, September 1970, co-sponsored by IAGC and the Science Council of Japan), he gathered together a small group of interested geochemists and proposed setting up six working groups, of which two are still active. He visualized WRI as "studying water-rock interaction under various temperature and pressure conditions, compiling key programs, developing methods, and determining transportation forms (of components)."

Figure 1: WRI Founding Fathers: left - late Mikhail G. Valyashko; right - Donald E. White (left) and Tomas Paces (Secretary General, WRI-1; right) discuss details of the field trip during WRI-1.

Donald E. White (U.S.A.) (Fig. 1) was appointed the first Chairman and by June 1971 had contacted more than 160 geochemists worldwide to ascertain their interests in a wide variety of topics under the broad heading "water-rock interaction." As a result, nine Interest Groups were created on the four PT environments in which water-rock interaction takes place, active geothermal systems, and on membrane filtration. Three additional groups were concerned with experimental and theoretical approaches. These Interest Groups were to serve WRI for more than a decade. Although each Interest Group chairman exchanged information with members of his group, contacts between Interest Groups were generally lacking, and WRI itself lacked cohesion and focus. It was Tomas Paces (Czechoslovakia) (Fig. 1) who put that focus into place.

Dr. White and the author called an informal meeting of WRI during the 24th IGC (Montreal, Canada), and on 23 August 1972, 16 people met to discuss the future of WRI, including Earl Ingerson (President, IAGC), Ken Sugawara (Secretary, IAGC) and M.G. Valyashko (U.S.S.R.). There was no agenda,

and this informality has been characteristic of WRI ever since. Discussions were held on the future directions of WRI, and on the desirability of a publication and the need for specialized meetings on hydrogeochemistry. Josef Cadek (Czechoslovakia) presented a proposal suggested by Paces to hold an international symposium on water-rock interaction in Prague. This would set the focus needed for the next two decades by launching a series of triennial symposia.

Achievements

The First International Symposium on Water-Rock Interaction (WRI-1, as it came to be known) was held in Prague in 1974, with Dr. Paces acting as Secretary General. Nearly 150 geochemists from 21 countries attended the four days of technical sessions, and close to 100 also visited thermal and mineral springs on the field trip to northwestern Bohemia. The combination of technical sessions, field trip and printed proceedings, together with the informality and easy communication among the participants, did much to ensure the continuation and expansion of WRI. As Dr. Paces has pointed out, WRI-1 was very successful "because it attracted many young high-spirited scientists at the beginning or top of their scientific careers," and "deep friendships developed between scientists from western and eastern countries."

For the nine years after the Prague meeting, WRI was under the guidance of the present writer as Chairman, with T. Paces as Vice-Chairman and Secretary for International Cooperation. By 1977 there were 400 members from 30 countries, a tenth Interest Group on soil-water interaction had been added, a system of National Contacts was in place, and several newsletters with compilations of member activities were being circulated.

WRI-2 was held in Strasbourg, France, in 1977, with Yves Tardy (France) as Secretary General (Fig. 2). WRI was the first organization to meet in the newly completed hall of the Conseil de l'Europe, with 235 delegates from 30 countries. The field trip visited mineral and thermal spas in

Figure 2: Yves Tardy (Secretary General, WRI-2) and Emanuel Mazar (Israel) enjoy a joke at Strasbourg.

Alsace, Vosges and Lorraine, and the spirit of WRI continued with the presentation to WRI by Dr. Tardy of a huge album to contain memorable photographs of WRI field trips. This now circulates from one host country to the next; it is the last 'duty' of a WRI Secretary General to add several pages of photographs of the field trip to the album.

By 1980, WRI membership was more than 650, drawn from 47 countries, with an important contribution from the developing countries, especially those in Africa, and Central and South America (Fig. 3). Another healthy trend was the increase, to almost 10% of membership of geochemists from the private sector.

WORLD DISTRIBUTION OF WRI MEMBERS

Projection: Azimuthal Equidistant centred on Edmonton, Alberta, Canada

Scale: 1:200,000,000

Legend:

- Less than 5 members
- 5 - 10 members
- 10 - 20 members
- 20 - 50 members
- more than 50 members

Figure 3: The world of WRI, as perceived by the Chairman (from a newsletter sent to members, 20 October 1981).

WRI-3, co-sponsored by IAGC and the Alberta Research Council, was held in 1980 in Edmonton, Canada, with the writer as Secretary General. In addition to the four days of technical sessions, the nearly 145 delegates were given the opportunity, in a pre-session field trip, to tour both open pit and in situ recovery plants extracting bitumen from the Athabasca oil sand deposit, and to visit a coal mine reclamation project, the 'Badlands', and the famous Banff hot springs.

Membership in WRI reached nearly 1000 in 1983, and it has remained at about that level. Management was now required at a more international level by experienced members, and a reorganization took place at WRI-4, held at Misasa, Japan, in 1983, with Hitoshi Sakai (Japan) as Secretary General. For the visiting delegates (about 60% of the more than 200 registrants), this was probably the most memorable WRI symposium yet attended. Science, scenery, sake, sushi, sashimi and the sincerity of our hosts set the

scene. There was a large-format daily newspaper, the Misasa Messenger, a mid-session field trip to the Daisen Volcano, and a post-session field trip that included visits to the Ningyo-toge uranium mine, the Hakone and Fuji Volcanoes and a host of temples, shrines and spas (Fig. 4).

Reykjavik, Iceland, was the setting for WRI-5 in August 1986, with Halldor Armannsson as Secretary-General. Four days of technical sessions were attended by most of the nearly 240 delegates from 36 countries. The mid-session field trip was to the Reykjanes peninsula to see the Sudurnes District Heating Plant, and via the Nesjavellir high-temperature geothermal field then under development. Using both land and air transportation, the post-session field trip visited such features as the unique landscape of the Landmannalaugar area, the Vatnajökull glacier, the Krafla geothermal field with its recent volcanism (Fig. 5) and Lake Myvatn with its rich bird life. At the WRI business meeting, the writer was succeeded as Chairman by Dr. Sakai. WRI-6 was set for Malvern, England, in August 1989, and Michael Edmunds appointed Secretary General; the WRI advisory committee comprises six members.

WRI-6, to be held in Malvern, England, with Michael Edmunds as Secretary General, is still a few weeks away at the time of writing (Fig. 6). Will visits to the classic hydrothermal areas of Cornwall, an active tin mine, and the site of the British Hot Dry Rock Experiment be mixed with the right amount of cider and Devonshire cream?

Perspective

As noted by Dr. Armannsson, WRI's success is "to a great extent due to the interdisciplinary nature of the symposia and the relatively wide variety of topics covered without reducing demands for papers of the very highest scientific

Figure 4: A tori gate at the Tenjin Shrine and a drilling rig mix at the Tenjin-yu hot spring, Arima, Japan (WRI-4 field trip). The carbonated, iron-bearing, sodium chloride water issues naturally from fracture zones in Late Cretaceous rhyolite and granodiorite, but it is now being pumped from wells penetrating the fracture zones.

Figure 5: 'Dante's Inferno' - Leirhnjukur, part of the eruptive system near Krafla, Iceland (WRI-5 field trip).

standards. This has made it possible for scientists who would not normally be in contact with each other to establish links and take part in fruitful scientific discussions." The field trips are an essential part of the WRI symposia, each new venue providing a different perspective on the world of interaction between rocks and water.

SIXTH INTERNATIONAL SYMPOSIUM ON WATER-ROCK INTERACTION

Malvern (UK) 1989
3rd-8th August

Figure 6: The WRI-6 poster (August 1989).

Tentative plans now exist for WRI symposia to the year 2001, with the concept being to distribute symposia between the Occident and Orient in regions that offer the opportunity to visit various scenarios in which water-rock interaction takes place. The temperature of the water on the field trips has gradually increased from Czechoslovakia, via France, Canada and Japan to super-hot Iceland. This year it returns to low-temperature environments in England. Over the years, participation by scientists from developing countries has increased significantly. This is important not only in its own right but also because they can make interesting contributions concerning the special phenomena existing in their countries; this broadens the perspective of WRI in the international community.

The achievements of WRI are set out in print, but there is much more than hard copy. Scientists from around the world are brought together every three years to commune on a common theme. This, in itself, would describe any successful working group in any science. Participants of WRI, however, recognize the spirit of the organization. One can do no better than close this brief review by quoting the definition of that spirit by Yasue Oki (Japan) as 'water-rock-human interaction'.

Acknowledgements

The author owes special thanks to Don White, Tomas Paces, Yves Tardy, Hitoshi Sakai, Halldor Armannsson and Michael Edmunds who provided their personal views of WRI in the spirit of the organization.

Publications of WRI

First International Symposium on Water-Rock Interaction Prague, Czechoslovakia, 9-17 September 1974, Proceedings (edited by J. Cadek and T. Paces), 1976, 463p. Field Trip Guide: Springs of carbon-dioxide water in northwestern Bohemia (T. Paces), 1974, 82p. Geological Survey, Prague, Czechoslovakia.

Second International Symposium on Water-Rock Interaction Strasbourg, France, 17-25 August 1977, Proceedings (edited by H. Paquet and Y. Tardy), 1977, 3 vols., 810p. Field Trip Guide Book, 1977, 28p. Institut de Geologie, Universite Louis Pasteur, Strasbourg, France.

Third International Symposium on Water-Rock Interaction Edmonton, Alberta, Canada, 14-24 July 1980, Proceedings (edited by A.R. Campbell and B. Hitchon), 1980, 213p. Post-session Field Trip Guide Book (edited by E.I. Wallick), 1980, 46p. Alberta Research Council, Edmonton, Alberta, Canada.

Fourth International Symposium on Water-Rock Interaction Misasa, Japan, 29 August to 3 September 1983, Extended Abstracts (edited by Y. Seki), 1983, 593p. Institute for Thermal Spring Research, Okayama University, Misasa, Japan.

Fifth International Symposium on Water-Rock Interaction Reykjavik, Iceland, 8-17 August 1986, Extended Abstracts (edited by J. Olafsson and M. Olafsson), 1986, 692p. Field Guide, 1986, 64p. National Energy Authority, Reykjavik, Iceland.

Dr. Brian Hitchon is a Research Fellow with the Alberta Research Council (Box 8330, Station F, Edmonton, Alberta T6H 5X2, Canada), and in almost 32 years with them has written some 100 papers, articles and contract reports. He is presently Executive Editor of *Applied Geochemistry* and Secretary of IAGC.