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THE NEWSLETTER OF THE BRITISH HYDROLOGICAL SOCIETY

Circulation

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BHS AGM
Weatheroak Hill, Sunday 8th September

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Water 2003 — RGS conference,London
Follow in England's footsteps — IUGG Assembly in Sapporo, Japan

Diary of BHS and other events

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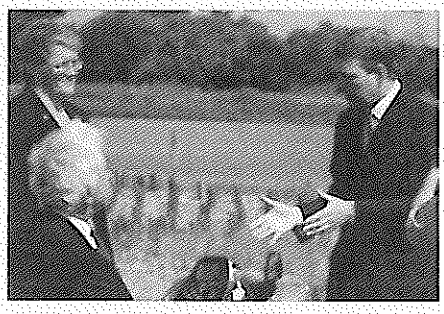
Duke of York opens the Jubilee River

At a time when the environmental impact of major river engineering schemes is closely monitored, it was appropriate that the singing of skylarks competed with the speeches of those involved in the Official Opening of the Jubilee River on 11th July.

"Jubilee River" is the name given to the major channel (11.6 km long) which has been constructed under the Maidenhead, Windsor and Eton Flood Alleviation Scheme, and the **Duke of York** (whose family has a home nearby — albeit above the floodplain) unveiled a plaque to commemorate the occasion.

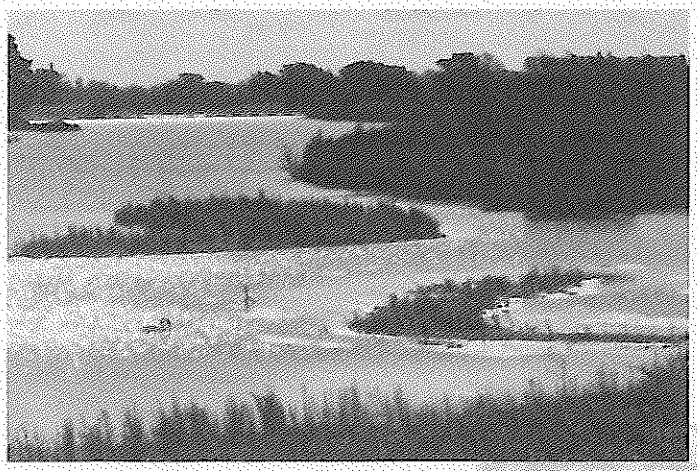
Jean Venables, Chairman of the Thames Regional Flood Defence Committee, and **Sir John Harman**, Chairman of the Environment Agency, also spoke during the ceremony, which 200 invited guests and members of the public attended. BHS members present included **Paul Holmes** and **Frank Law** (members of the Regional Flood Defence Committee), **Craig Woolhouse** (EA Thames Region Water Manager) and **Henry Gunston** (retired onlooker).

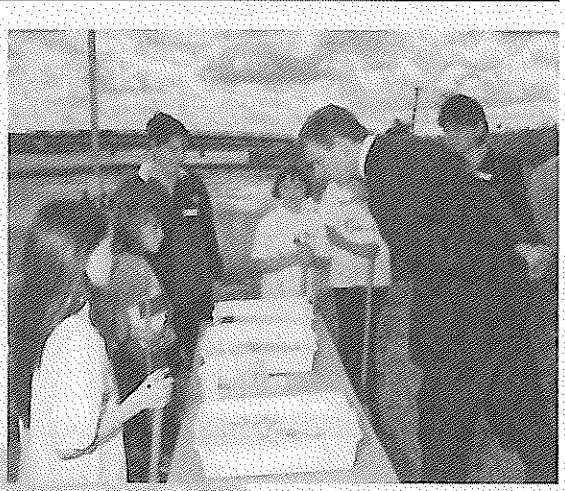
The ceremony took place at the top of a small artificial hill near the Dorney Wetlands area of the new river. Although not accompanied by the "ten



thousand men" mentioned in the childhood song linked to his title, the Duke did exchange some banter with a television crew that they were "neither up nor down". In his speech, he congratulated those who had been involved at the start of the project and created the concept, and also those who had had the drive to push the project through.

Jean Venables said that she was very proud of the project: not only did







it reduce flood risk, but it also provided leisure and recreational facilities and reintroduced habitats. She went on to say, "It is very hard to get the headlines for schemes which are successful, because people have expectations of us. So I hope that the only headlines we see are the return of the water vole or otter to Windsor and Maidenhead."

The Scheme itself (described in issues 43 and 70 of "Circulation") has the Jubilee River as its principal element. It takes off from the left bank of the Thames above Boulter's Lock and rejoins the main river below Windsor near to the Black Potts railway viaduct. The new channel has a maximum capacity of 215 cumec, and the main Thames channel and existing right bank flood channels can carry up to 300 cumec. The Agency predicts that the overall system channel capacity of 515 cumec will cope with a 1 in 65 year return period flood. [Frank Law adds: Channel hydraulics of the artificially braided river mean that the actual return period grades up to more than 100 years along its length.]

Significant effort has been put into generating wildlife habitats along the new channel, with a Braille bridge to explain the wildlife to visually impared visitors, plus footpaths, cycleways and car parks. There are four weirs (three fixed, one adjustable) to maintain levels. The upstream inlet gates at Taplow control flow into the Jubilee River, and a regular "sweetening" flow of 10 cumec will be maintained at all times when capacity to convey flood water is not required.

Henry Gunston
email: henry.gunston@virgin.net

President's piece

I am very pleased to start my column by reporting that **Michael Hamlin** has accepted the committee's invitation to become an Honorary Member. He has been a strong supporter of the Society since its conception at the IAHS meeting in Exeter and it is entirely fitting that we should mark this and his other contributions to hydrology in this way. A resume of his distinguished career appears elsewhere in this edition.

Can I remind you that *Circulation* exists for members to share their experiences with one another and offers a vehicle for debate? It doesn't just exist to pass on general news and report meetings, though this is an important role. Over the years BHS members have educated us all with some interesting and personal reports of journeys abroad and projects, and there have been a few debates. **John Griffin** does an excellent job as Editor and will always welcome your contributions of news and articles.

One of the committee's aspirations for the last year, and which remains high on our agenda, is the redevelopment of the web site. Unfortunately, we have made only limited progress and now need someone to manage the changes. This will involve firming up a specification, which exists in draft, and overseeing a contractor. Hands-on computer skills are not required and no programming work will be involved. Please contact me if you are able to help or suggest someone with the skills and time to undertake this important development.

In 1998, **Frank Law** and **Henry Gunston** initiated an Inland Waterways Hydrology Group, which held a very successful and interesting Saturday meeting at Wallingford. They have produced two newsletters, which will shortly appear on the BHS website. The committee has decided to support this voluntary venture by publishing future newsletters on the web and facilitating its distribution. If you are interested in receiving the newsletter or contributing to the group's activities, which inevitably have historic overtones, please contact Frank or Henry.

Data was the topic of a very successful National Meeting in July. One thing that emerged was the importance of hydrologists speaking out about the importance of data. We will need, as a profession, to consider what additional steps are required to ensure that the importance of data is fully recognised and data collection and archiving get sufficient resources.

If you have still not returned your booking form for the Birmingham Symposium, there is still time to register, but be quick. There is, as usual, a wide range of papers and these cover some very interesting topics.

Finally, if there are any issues you want to raise with me directly please drop me line, but note that my e-mail address has changed from Compuserve to AOL, as the service I was using has been withdrawn.

Peter D Walsh
Email: walshpeter@aol.com

Letter to the editor

Snakes and ladders

Dear John,

Congratulations to **Prof. David Newsome** on his 'Snakes and ladders' history of water resource management in England and Wales (*Circulation 73*).

However, as regards the last 40 years or so, he tells only half the story – the National/Regional planning half. I have played a part in that half too, and of course it is important: how else could we separate the woods from the trees, let alone the snakes from the ladders!

But the other half is at grass roots, where River Authorities and their successors (now Environment Agency) have applied the abstraction licensing system to the job of meeting all the myriad water needs, human and environmental, which high level planning can only address in outline.

This 'game' has been continuous (one long, slow ladder?). It controls over 48 000 abstractions, with careful conditions, such that all can meet their needs without interfering with each other, or (with relatively few, though much-publicised, exceptions) with the environment.

It is planning from the top down *plus* the foundation of abstraction licensing which meets so many water needs in a small, sometimes dry, island with far more sustainability than many people appreciate.

Snakes and ladders is a great analogy, but for the unsung heroes (not me) at the sharp end of licensing it has always been more like a game of chess!

Yours sincerely,

David Evans
(Late of Essex RA, AWA & NRA)
23/6/02

Travel grants

Travel grants are available to help BHS members whose travel expenses are not met by an employer to attend scientific meetings. The amount will depend on the nature and location of the meeting and the case put forward.

Grants are mainly intended to help younger members, but are open to all. Successful applicants will be expected to write a short report for *Circulation*.

The Exeter Fund, looked after by BHS, pays grants to help British hydrologists take part in IAHS events.

To apply for a grant, please contact the Hon. Treasurer, **Steve Parsons**, Mott MacDonald Ltd, Demeter House, Station Road, Cambridge, CB1 2RS *(tel 01223 463926, email sbp@mm-camb.mottmac.com)*.

New members

A warm welcome to the following new members of the Society:

Luan S. Anderson	Halcrow Group Ltd, Leeds
Dr Agnete Berger	Risk Management Solutions Ltd, London
Rae L. Bethune	Environment Agency, Cheshire
Dr David Brown	Environment Agency, Worthing
Antony N. Clothier	London
Robert Dey	Scottish Water, Perth
Anna Ruth Field	Environment Agency, Worthing
Liam A. Foster	MWH, High Wycombe
Jayne L. Goodman	WS Atkins, Peterborough
Paul Harmer	Lewin Fryer & Partners, Hampton, Middlesex
Diana Holba	Environment Agency, Hatfield
Heather M. Jackson	University of Aberdeen
Robert Keirle	University of Wales, Bangor
Matthew Kilner	Leeds University
Dr Alexander Lee	BNFL, Manchester
Peter E. Mansell	Scott Wilson Kirkpatrick & Co. Ltd, Basingstoke
John Maziliauskas	Halliburton, Horsham, W. Sussex
Jennifer Miller	University of Newcastle upon Tyne
Rebecca Mockford	Babtie Group, Birmingham
Najmur R. Nawaz	Sheffield
Tim Norton	Environment Agency, Worthing
Richard O'Callaghan	Environment Agency, Purley, Surrey
Janice L. Paine	University of Dundee
Catherine N. Parker	Environment Agency, Hatfield
Curtis Paskett	Buckhurst Hill, Essex
Richard Phillips	Ewan Associates Ltd, Haywards Heath
Alexander T. Rouse	W S Atkins, Peterborough
Aimee Margaret Sayer	University of Wales, Swansea
Colum N. Scott	Oban
Dr Michael Steel	Environment Agency, Hatfield
Michael A. Timmins	Environment Agency, Newcastle upon Tyne
Dr Andrew Willia	University of Plymouth

National flood warning development in Scotland

The May edition of *Circulation* featured an article introducing SEPA's National Flood Warning Development Team. This article presents some of the key elements of the flood warning strategy that the team are involved in developing.

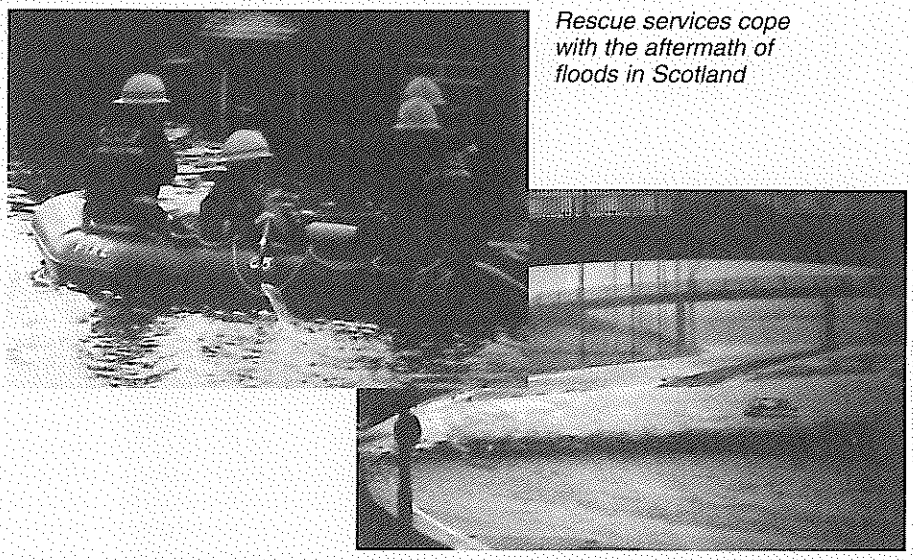
Hydrometric infrastructure and new flood warning schemes

SEPA operates 42 flood warning schemes in Scotland. As the first phase of a flood-warning network review we have been looking at these schemes in order to fill in network gaps and upgrade older instrumentation. This phase is now largely complete, as new infrastructure has been installed to support the existing schemes.

Several requests have been received for new flood warning schemes — in particular for the River Clyde, the Kelvin at Kirkintilloch and the Irvine at Kilmarnock. (We consider formal requests to develop and implement new flood warning schemes beyond areas that are presently served, and we reach our conclusions based on the application of our benefit-cost methodology.) We are currently carrying out feasibility and benefit-cost studies and reviewing the possibility of implementing these new schemes.

National review of flood forecasting

Our existing flood warning schemes use a range of types of flood forecasting model, for example the River Flow Forecasting System on the White Cart, and the transfer function methodology developed for the Nith at Dumfries. The Firth of Clyde model, developed by the Babtie Group, gives warnings of



Rescue services cope with the aftermath of floods in Scotland

tidal flooding for coastal communities from the Mull of Kintyre and the South Ayrshire coast right up to Glasgow. These models can potentially increase our forecast lead-time, enabling us to issue flood warnings in good time for recipients to respond effectively.

In the next year or so we plan to deliver a national review of flood forecasting models. We will be reviewing the models that we use against those currently available and identify the benefits that new models could bring to our existing and new flood warning schemes.

Enhanced floodplain mapping

We are progressing a national programme of floodplain mapping. A floodplain map for Scotland will be a powerful tool for us when considering flood risk or assessing and prioritising potential flood warning schemes.

Our programme will include collating existing flooding information, creating a consistent dataset for information and spatial data, additional hydrological and hydraulic modelling where required and producing a set of indicative floodplain maps.

Following major flood events, local authorities have often taken the initiative to commission flood studies and floodplain mapping, as after the Strathclyde floods of 1994. We have made contact with selected local authorities to establish whether such datasets can be incorporated into our indicative floodplain maps.

National review of high flow calibrations

The Bye Report identified the importance in flood forecasting and flood warning of maintaining accurate high flow calibrations. The reliability of our flood warnings is heavily dependent on the accuracy of our high flow calibrations. the number of gauged high flow measurements that we have been able to get in the last few years have unfortunately been reduced by health and safety restrictions, vandalism to cableways at gauging stations and the increased workload of hydrometric staff.

Our review of high flow calibrations will collate a Scottish national database of high flow gaugings, identify weak or missing data and produce an action plan to target sites where we lack recent accurate measurements. A continuing programme of high flow measurements will further improve our understanding of flooding within catchments and reduce the risks to our flood warning service. This review will also specifically aim to identify alternative methods of high flow calibration.

Operational requirements of weather radar

Unlike England and Wales, we do not have access to quantitative rainfall-radar data in Scotland. Flood monitoring and forecasting schemes have generally developed without the need for numerical rainfall-radar forecast input to models. Consequently our use of weather radar has been limited to the products available from the Meteorological Office's MIST system. We are reviewing our operational requirements for weather radar for flood warning purposes. This will allow us to assess potential improvements to flood forecasting and flood warning where our current standard of three hours lead-time is difficult to achieve.

For further information on the work of the team, contact **David Faichney**, Senior Hydrologist, SEPA National Flood Warning Development Team, 7 Whitefriars Crescent, Perth, PH2 0PA *(tel 01738 627989, fax 01738 630997, email david.faichney@sepa.org.uk).*

EPA hydrology water framework directive team

In preparation for the forthcoming Water Framework Directive (WFD), the Scottish Environment Protection Agency (SEPA) have set up a team specifically to deliver the hydrological requirements of the directive for SEPA.

The team has a national focus, reflected in the location of the staff at the Aberdeen (01224 248338), Dingwall (01349 862021), and Edinburgh (0131 449 7296) offices. The team is led by **Nigel Goody** (Aberdeen), who reports direct to **Tim Jolley**, the National Hydrology Manager. Nigel started work with Anglian Water in 1976, moved to Scotland in 1985, and has worked his way through field hydrometry, groundwater pumping tests and down-hole logging, to surface water flow analysis, water resource planning and modelling, into functional management. This diverse experience is proving useful as SEPA prepares to implement the WFD and its associated new regulatory regimes for abstraction, impoundment, and river engineering works.

Paul Copestake (Dingwall) has worked in Scottish hydrology since 1990, beginning with the former Highlands River Purification Board and since 1995 with SEPA. He is now working on the application of WFD principles to current proposals for water orders, hydropower schemes and a review of SEPA's hydrometric network.

Rachael Perryman (Dingwall) joins the team after completing an MSc in Environmental Management at Stirling University. Her tasks are to provide hydrological input to SEPA's WFD trial catchments project, assist in the hydrometric review, analyse the implications of the WFD for distilleries and develop a database of hydropower impoundments and inter-basin transfers.

Jim Pritchard (Edinburgh) began his hydrogeological career with the Environment Agency, working in the Shrewsbury and Leeds offices. His main areas of responsibility included groundwater abstraction licensing, remediation of contaminated land and assessment of new applications for quarrying and opencast coalmining, with special responsibility for scrutiny of minewater rebound in the abandoned coalmines of Yorkshire. He joined SEPA in 1999 and is now

spending half his time working on WFD issues, and the remainder on operational matters.

Elaine Simpson (Edinburgh), Hydrogeological Support Officer, recently joined the team from consultancy. She previously worked as an area hydrogeologist in the Environment Agency's North East Region, gaining experience in abstraction licensing, GIS and groundwater quality monitoring. Elaine will help to delineate, conceptualise and identify pressures on groundwater bodies.

Janine Hensman (Edinburgh) joined the team from consultancy last year. Her background is in hydrological modelling and GIS, gained in the private sector, at MLURI on the CHASM project and initially as a student in the Environment Agency's Water Resources Department, Leeds office. At SEPA, Janine leads on hydrological modelling and GIS, surface/groundwater interactions and abstractions.

Craig White (Edinburgh) served his hydrology apprenticeship at CEH Wallingford, gaining experience in field hydrology and hydrochemistry. He joined SEPA in 2000 as an area hydrologist for the Scottish Borders before transferring to the WFD team. He leads on the development of hydrological impact assessment tools and cross-functional hydromorphology issues.

Any member of the team will be pleased to field queries relating to their area of the hydrological or hydrogeological implications of the Water Framework Directive for Scotland, either on the telephone (numbers in the first paragraph) or by email: *firstname.lastname*@sepa.org.uk.

News from members

Ian Strangeways has advised us of the following new contact details:
Postal address: TerraData, 7 Cherwell Close, Thames Street, Wallingford, Oxfordshire, OX10 0HF
Telephone number: 01491 839398 (please ring if you want to send a fax).
Email: ian.strangeways@ntlworld.com

The Editor has been elected Chairman of South Oxfordshire District Council for the year to May 2003 — a role akin to a Mayor. No hydrological events so far, but as Vice-Chair last year I met some BHS stalwarts at a very good Environment Agency (Thames and Southern Regions) event in Croydon, and I attended a reception for the successful GB Olympic oarsmen and oarswomen at the River and Rowing Museum in Henley-on-Thames.

Third Inter-Celtic Colloquium

National University of Ireland, Galway
8-10 July 2002
Celtic water in a European framework: pointing the way to quality — reports by *Anthony Tollow* and *Corinna Abesser*

Once again the Inter-Celtic colloquium was one not to have been missed. It was an opportunity to meet colleagues from Brittany, Portugal and the rest of the Celtic world, plus guests this time from Poland and the Netherlands.

I have participated in all three Colloquia, and as usual the papers were of a very high standard and the meeting was very worthwhile. I have limited opportunities to meet colleagues from the rest of the world, and this was a very pleasant way of renewing contacts and making new ones. Probably the most illustrious participant was **James Dooge**, rapidly approaching his 80th birthday. The IAHS was represented well by **Pierre Hubert** (Secretary General). There was a good contingent from Rennes to liven up the proceedings with some papers in French, and this was the first such conference where the new Euro was in evidence, and Ireland was expensive.

Galway was a very apt setting for a water conference, between Galway Bay on one side and on the other the River Corrib, flowing past the University. **Professor Conleth Cunnane** and his team are to be congratulated on a very well organised, relaxed and extremely friendly conference. The papers were varied, presented in a well-appointed lecture theatre, in three- or four-paper segments with a nominal allocation of time but enough flexibility to allow for some overrun if needed. Conveniently there were no parallel sessions, so we all had the opportunity to listen to many different topics presented in the 34 papers and some supporting posters. Most papers were presented in English, or at least with English sub-titles.

The opening speeches were by the University President, Dr I G O'Muircheartaigh, and the Mayor of Galway, who had both come from other meetings and had to return to there. Then followed two "keynote papers". The first was on the topical "Implementation of the Water Framework Directive in the Netherlands" by **Geert Janssen** and colleagues from FUGRO, who do consulting work in Ireland. The second was on "Water Quality in Ireland 1998-2000" by **Martin McGarrigle** of the Environmental Protection Agency, Dublin. We adjourned for the conference lunch and were supplied freely with the local beverage (water).

The afternoon session was entitled "Water quality – pressures and responses – past, present and future"and started with an overview of Celtic groundwater and then there was a very apt link comparing groundwater quality in Celtic and Viking aquifers, which made me feel very much at home. We then looked at surface water, with a very interesting (French) paper (presented in English) on blue-green algae, a very serious problem worldwide. A paper on nitrates was followed by an interesting presentation in English by a participant from INRA-ENSAR at Rennes on the landscape buffering capacity of rural catchments (against pollution). This section provided a very useful insight into aspects that may still be overlooked and I found it very valuable indeed. The conference reception in the evening went all too quickly, since there were so many colleagues whom I had last seen in Aberystwyth, or more recently at the IAHS Symposium in Maastricht.

The next morning started with "Integrated river basin management – planning for the future". My paper, "An alternative approach to the management of water resources" was the first of a very varied group of six, going on to look at more detailed means of identifying the sources of water and then managing them for multiple use. A paper on the means of controlling abstraction in Scotland highlighted some of the problems in what is generally thought of, mistakenly, as a wet area. However, there was a need to control spray irrigation, mainly of potatoes, and the difficulties caused by modern legislation were highlighted.

The three papers after morning coffee were very different. The first highlighted the effects of the Cornish mining industry on the water resources of the area. The second looked at soil pipes in upland catchments, while the

third looked at housing developments in karst topography, with the resulting risk of flooding — a good introduction to the topic of the study tour.

The afternoon saw the start of the section on "The scientific support for management: hydrological processes and models — limitations and uncertainties". This had the largest number of contributions, spanning four sessions: the first concentrated on flood control and flood alleviation planning, with an addition of the problems caused by multiple moderate floods of average return period resulting in higher than expected runoff. We were introduced to the lower Feale catchment and the methods used in modelling it, a "virtual water world".

The second session highlighted the differences encountered in the rainfall-runoff modelling of two very different Irish catchments. Then the emphasis progressed to groundwater protection, firstly from Portugal with a new methodology for delineating wellhead protection areas. A paper looking at the flow characteristics of natural soil liners for the containment of landfill leachate and agricultural slurries reported results of laboratory tests on Irish soils and included investigation of the sealing effect of agricultural slurry. The last paper introduced the poster on the Galway River Flow Forecasting System (GFFS).

The conference dinner opened to the accompaniment of the Irish Harp in the very grand setting of the "Aula", the University's Hall, with a menu based on delectable local dishes accompanied by South African wines.



Professor Conleth Cunnane, Anthony Tollow and the Irish harpist



A"turlough" that had almost emptied and was almost ready for cattle

The next morning a continuation of the previous afternoon's session began with the results of investigations into the quality of "interflow" and groundwater flow. The piezometers installed in a small part of the Plynlimon study area were sealed using novel techniques. The collection of data had been hampered by the Foot and Mouth Disease outbreak in 2001, but there were very useful findings nevertheless. A contribution from Brittany reported on the effectiveness of sediment traps in the barrage de Kerne Uhel on the River Blavet, comparing the results with bathymetry, and Professor Hubert then gave a very lively presentation on "fractals" that looked at "multifractal analysis of river flows" on the same river over a period of 52 years.

Two papers in French focussed on catchment protection in Brittany (Massif Armoricain), including classifications of the need for and effectiveness of protection, and the application of sediment traps and a comparison between sediment loads in Brittany and central France (Limoges). A study of the development of "salt marshes" in five selected Scottish sea lochs, with their key role in linking terrestrial and marine communities, showed the need for active conservation measures. The final paper of the session was on "Planning in a Virtual Water World", part B of the presentation on the Lower Feale Catchment. Evaluation of different degrees of engineering intervention suggested that pumping was essential, but questions were posed: What source of energy should be used — wind, electricity, peat, diesel? What should the water levels be? What will be the impact? These questions would be addressed in a follow-up study.

The afternoon concentrated on "Risk assessment, perception and management; extreme rainfalls, floods, droughts and climate change", including an investigation of actual "flood-duration-frequency" analysis for 100 French catchments and the assessment of climate change in the Rhone basin, and a complementary paper on the representation of climate change in flood frequency estimation. One paper looked at communicating flood hazard to the public, starting in Ireland but considering different climate zones (North America, South Africa, Tasmania, England and Wales). A paper on the use of "partial L-moments" to analyse censored flood samples suggested that they would be a valid replacement for probability weighted moments.

Disappointingly, there were no contributors for the session planned on "Social History of Water Use in Celtic Lands". The Colloquium closed with an agreement that **Professor Lobo-Ferriera** would be principal convenor for the next Inter-Celtic Colloquium to be held in Portugal in 2005.

The next day was devoted to a very interesting field trip to the karst topography south of Galway, including some very interesting features known as "turloughs". These are ephemeral depressions that fill in winter both from surface and groundwater and are emptied in summer through an interconnecting set of swallow holes and naturally formed underground pipes. The final discharges were under water in Galway Bay, and some turloughs even rise and fall with the tide, so that at one site in Galway Bay the locals used to collect fresh water apparently from the sea.

A very good guide showed the geology of Ireland as well as the area being visited, and it included measure-



The study tour in the karst scenery of western Ireland

ments of the variations in water level and flow. It really was a good example of groundwater flow that did not obey "Darcy's Law", and to model the system, pipe flow equations and routines were needed. This is one of the few areas in the world where cattle are driven down in the summer to these very green pastures that are covered by water in the winter. Some of the problems associated with housing development in the Irish countryside were also observed.

This was a very good ending to an outstanding Conference. I am sure Professor Cunnane has some copies of the proceedings for sale for those interested in the full papers.

Anthony J. Tollow

The susceptibility of the Celtic lands to environmental and societal pressures had been recognised and discussed during the first and second Inter-Celtic Colloquia, in Rennes (1996) and Aberystwyth (2000), stressing the need to protect and manage the water resources in these regions. Since then, problems related to climate change, water quality, environmental protection and restoration have become increasingly apparent in the Celtic region as in the whole of Europe, as has the gap between water supply and demand.

Many of these problems, together with future requirements of protection and conservation of water resources, have now been encapsulated into the new European Union Water Framework Directive (EUWFD) progressing from the identification of these problems to an unambiguous deadline by which the water quality of all surface and ground waters must, through a combination of planning, treatment and remediation be returned to their original pristine state.

This challenging target was directly addressed by the theme of the colloquium' *Celtic Water in a European Framework: Pointing the Way to Quality*' providing an excellent background for presenting and discussing issues of water quality and water management in the Celtic region.

Thanks to the support of BHS travel grant I was able to attend the conference and to present some of the results from my PhD research.

A total of 32 papers were presented orally during the three days of the conference, covering four major themes: (I) Water quality: pressures and responses — past, present and future, (II) Integrated river basin management — planning for the future, (III) Scientific support for management: hydrological processes and models — limitations and uncertainties, (IV) Risk assessment, perception and management: extreme rainfalls, floods, droughts and climate change. These were supplemented by a small number of poster presentations.

The opening lecture by **Geert Janssen** (FUGRO, Netherlands) gave a good introduction into the conference theme by introducing "the way The Netherlands are dealing with the implementation of the WFD". This provided a solid basis for the following presentations, many of which directly or indirectly addressed different aspects of the WFD as well as questions and problems faced by individual countries.

Very fascinating for me, the overall aim of the WFD to "return all water bodies to their original pristine state", leads to the question: "What is the 'pristine' or 'natural' state of a particular water body or system?" Working in a remote and anthropogenically 'unpolluted' catchment in the Scottish uplands, I have learned that problems may occur where waters contain concentrations of elements that, although naturally derived, exceed drinking water standards. Therefore, I was especially interested in what **Paul Shand** (BGS) had to say, in particular the concept of chemical baseline, which allows the discrimination between these 'natural' inputs and anthropogenic pollution. With regards to the WFD, this may be particularly useful to set limits on the extent to which remedial measures are necessary (or indeed possible) for certain ground or surface water bodies.

The implementation of the Water Framework Directive will, in some countries like Scotland and Ireland, also involve introducing abstraction licensing, a subject addressed by several speakers. Very memorable on the subject of abstraction licensing was **Sarah Dunn** (Macaulay Institute), who highlighted some of the problems and management issues relating to the development of abstraction control policies in Scotland. Her presentation clearly demonstrated the importance of considering the temporal and spatial variability within and between individual catchments when selecting abstraction control mechanisms.

My PhD work is closely related to water quality issues in a Scottish Upland reservoir and its surrounding catchment area, so the session on 'Scientific support for management issues' was of particular relevance and interest for me. It was useful to find out about the research undertaken in other parts of the Celtic world dealing with similar reservoir/lake systems and catchments and to hear their results and findings. I was very interested in the research undertaken by **Alain Jigorel** (GRGC, Rennes) using different techniques to determine the rate of sedimentation in the Kerne Uhel reservoir in Brittany. Unfortunately, my French let me down and I had to miss out on some of the details.

However, very inspiring for my work were the presentations by **Atul Haria** (CEH) and **Anthony Jones** (University of Wales, Aberystwyth), dealing with different processes of runoff generation in upland catchments. Both presentations clearly showed the complexity of these processes, stressing the need for more intensive studies and a critical re-assessment of the conceptual processes related to runoff generation in upland areas. These papers reminded us that sustainable management of water resources still requires a detailed understanding of fundamental hydrological processes.

Altogether I found the three days of the colloquium very informative and thought-provoking. I would like to thank BHS for making my participation possible.

Corinna Abesser
University of St Andrews

Publications

HSJ contents listing

IAHS's *Hydrological Sciences Journal* (***Vol. 47 No. 3, June 2002***) contains the following scientific papers:

O. Seidou, J. Rousselle, M. Lefebvre, N. Lauzon & J. Ribeiro: *Modélisation de l'incertitude sur les séquences futures de débits en rivière*

Betty Richards-Pecou: *Scale invariance analysis of channel network width function and possible implications for flood behaviour*

Bellie Sivakumar & A.W. Jayawardena: *An investigation of the presence of low-dimensional chaotic behaviour in the sediment transport phenomenon*

Tómas Jóhannesson: *Propagation of a subglacial flood wave during the initiation of a jökulhlaup*

B. Panigrahi, Sudhindra Nath Panda & R. Mull: *Prediction of hydrological events for planning rainfed rice*

G. Boulet, Y. Kerr, A. Chehbouni & J.D. Kalma: *Deriving catchment-scale water and energy balance parameters using data assimilation based on extended Kalman filtering*

Benoît Fourcade, Anne Coudrain-Ribstein & Claude Martin: *What can be deduced from chemical measurement in an open-field raingauge? An example in the Maures Massif, southeastern France*

Laurent Pfister, Jean-François Iffly, Lucien Hoffmann & Joël Humbert: *Use of regionalized stormflow coefficients with a view to hydroclimatological hazard mapping*

Tenalem Ayenew: *Recent changes in the level of Lake Abiyata, central main Ethiopian Rift*

Francis H.S. Chiew & Thomas A. McMahon: *Global ENSO–streamflow teleconnection, streamflow forecasting and interannual variability*

Discussion: Bellie Sivakumar: Discussion of *"Analysis of cross-correlated chaotic streamflows"* and reply by Amin Elshorbagy, Umed S. Panu & Slobodan P. Simonovic

Book reviews: *Optimal Management of Flow in Groundwater Systems* by David P. Ahlfeld & Ann E. Mulligan

Remote Sensing in Hydrology and Water Management edited by Gert A. Schultz & Edwin T. Engman

Vol. 47 No. 4 (August 2002) includes the following papers:

Vishwa Nath Sharda & Jagir Singh Samra: *Hydrological simulation of a conservation bench terrace system in a subhumid climate*

Yann L'Hôte, Gil Mahé, Bonaventure Somé & Jean Pierre Triboulet: *Analysis of a Sahelian annual rainfall index from 1896 to 2000; the drought continues*

Demetris Koutsoyiannis: *The Hurst phenomenon and fractional Gaussian noise made easy*

Irina Krasovskaia & Lars Gottschalk: *River flow regimes in a changing climate*

Kireet Kumar, M.S. Miral, V. Joshi & Y. S. Panda: *Discharge and suspended sediment in the meltwater of Gangotri Glacier, Garhwal Himalaya, India*

Lihua Xiong & K.M. O'Connor: *Comparison of four updating models for real-time river flow forecasting*

Ekkehard Holzbecher: *Advective flow in sediments under the influence of compaction*

John Harbison & Malcolm Cox: *Hydrological characteristics of groundwater in a subtropical coastal plain with large variations in salinity: Pimpama, Queensland, Australia.*

Contents of the special issue of *HSJ* (***Vol. 47S, August 2002***) entitled *Towards integrated water resources management for sustainable development:*

Bhupendra Soni & Zbigniew W. Kundzewicz: *Introduction*

Guna N. Paudyal: *Forecasting and warning of water-related disasters in a complex hydraulic setting: the case of Bangladesh*

U.S. Panu & T.C. Sharma: *Challenges in drought research: some perspectives and future directions*

R.P. Pandey & K.S. Ramasastri: *Incidence of droughts in different climatic regions*

Rm. P. Nachiappan, Bhishm Kumar & Rm. Manickavasagam: *Estimation of subsurface components in the water balance of Lake Nainital (Kumaun Himalaya, India) using environmental isotopes*

P.K. Majumdar, N.C. Ghosh & B. Chakravorty: *Analysis of arsenic-contaminated groundwater domain in the Nadia district of West Bengal (India)*

A. Ghosh Bobba: *Numerical modelling of salt-water intrusion due to human activities and sea-level change in the Godavari Delta, India*

Zhou Gangyan, N.K. Goel & V.K. Bhatt: *Stochastic modelling of the sediment load of the upper Yangtze River (China)*

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Papers in the next volume of HESS

The forthcoming issue of *Hydrology & Earth System Sciences* (***Volume 6 No. 4, August 2002***) contains the following papers:

Special section on neural networks:

Dawson, C.W., Harpham, C., Wilby, R.L. & Chen, Y.: *Evaluation of artificial neural network techniques for flow forecasting in the River Yangtze, China*

Brath, A., Montanari, A. & Toth, E.: *Neural networks and non-parametric methods for improving real-time flood forecasting through conceptual hydrological models.*

Ochoa-Rivera, J.C., García-Bartual, R. & Andreu, J.: *Multivariate stochastic generation of monthly streamflow series using artificial neural networks.*

Abrahart, R.A. & See, L.: *Multi-model data fusion for river flow forecasting: an evaluation of six alternative methods based on two contrasting catchments*

Shamseldin, A.Y., Ahmed, A.E.N. & O'Connor, K.M.: *Comparison of different forms of the multi-layer feed-forward neural network method used for river flow forecasting*

Hall, M.J., Minns, A.W. & Ashrafuzzaman, A.K.M.: *The application of data mining techniques for the regionalisation of hydrological variables*

Regular papers:

Pathirana, A. & Herath, S.: *Multifractal modelling and simulation of rain fields exhibiting spatial heterogeneity*

Holmes, M.G.R., Young, A.R., Gustard, A. & Grew, R.: *A new approach to estimating mean flow in the UK*

Holmes, M.G.R., Young, A.R., Gustard, A. & Grew, R.: *A region of influence approach to predicting flow duration curves within ungauged catchments*

Zaidman, M.D., Rees, H.G. & Young, A.R.: *Spatio-temporal development of streamflow droughts in north-west Europe.Spatio-temporal development of streamflow droughts in north-west Europe*

López-Moreno, J.I., Beguería, S. & García-Ruiz, J.M.: *Influence of the Yesa reservoir on floods of the Aragón River, central Spanish Pyrenees*

Cho, H. & de Rooij, G.H.: *Pressure head distribution during unstable flows in relation to the formation and dissipation of fingers*

Laudon, H., Clair, T.A. & Hemond, H.F.: *Long-term response in episodic acidification to declining SO_4^{2-} deposition in two streams in Nova Scotia*

Branfireun, B.A. & Roulet, N.T.: *Controls on the fate and transport of methylmercury in a boreal headwater catchment, northwestern Ontario, Canada*

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Members interested in consulting any of these publications may contact the National Hydro-Sciences Library at CEH Wallingford *(tel 01491 692266).*

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CEH Broad Scale Modelling report on the EA website

A major project report by CEH Wallingford, *'Scoping the Broad Scale Modelling Hydrology Programme'* (February 2002), is now on the web — contact *beth .greenaway@defra.gsi.gov.uk* for its location.

It presents a strategic vision for the hydrological programme of the Broad Scale Modelling Theme of the DEFRA / Environment Agency Flood Management Research Programme over a five- to ten-year time span and can be read in conjunction with the 'Hydrology Vision' statement (Calver & Anderson, 2002), a succinct outline framework for hydrological flood management R&D across all DEFRA / Environment Agency themes.

FRIEND 2002

4th International Conference on FRIEND
Cape Town, South Africa
18-22 March 2002

This conference marked the end of the fourth phase (1998-2001) of Flow Regimes from International Experimental and Network Data (FRIEND). FRIEND began in 1984 and has involved scientists from over 100 countries. It aims to develop better understanding of hydrological variability in order to improve the management of water resources, through the exchange of knowledge, data and techniques. Conference delegates were drawn from 36 countries in each of the eight regional FRIEND groups.

Hugo Maaren (Water Research Commission, South Africa) opened the conference and gave a warm welcome to all of the delegates, describing the history and current position of FRIEND.

Alan Gustard (CEH, Wallingford, UK) followed on, warning of increasing pressures on water resources in the future. Alan outlined the key role that FRIEND could play in increasing cooperation between the researcher and the practitioner, allowing the implementation of knowledge.

Denis Hughes (Rhodes University, South Africa) then introduced a proposed study of regional water resource assessments in the South African Development Community (SADC) region. This addressed the increasing need for both integrated management and environmentally sustainable development of the region's water resources.

Parallel sessions followed, with papers on a diverse range of topics in five broad categories:

1) Hydrological data – policy, international rivers, databases, real time and dissemination.
2) Managing hydrological risk – floods, surface and groundwater droughts.
3) Water scarcity – overexploitation and poverty reduction.
4) Sustaining water-related ecosystems – definitions, methodology and operation.
5) Continental hydrology – regimes, water sharing, tele-connections, snow, ice and international basins.

This, my first FRIEND conference, gave me an opportunity to mix with fellow hydrologists from a broad range of specialisms working in a range of different environments and to discuss research in a FRIENDly atmosphere. It was also an excellent platform to present and discuss some of my PhD research on the spatial and temporal variability of UK river flow regimes (**Donna Bower** and **David M. Hannah**). This paper proposes a novel, multivariate statistical classification of annual flow regimes. This technique was used (a) to regionalise long-term average regimes at 35 UK stations, and (b) to establish inter-annual variability (stability) in regimes at stations and within regions across the UK. The results were discussed in relation to the large-scale UK climate and climatic variability.

The closing session began with **Jörg Ringletaube** (Ministry for Environmental Protection, Germany) speaking about the European Water Framework Directive, and the need for Member States to cooperate across national borders to address the problems of water policy and water management successfully. **Suresh Chalise** (ICIMOD, Nepal) spoke about the problems of year-round water availability in the remote and inaccessible Hindu-Kush Himalaya region and the urgent need to redirect policy and investment in order to reduce poverty.

Mike Bonnell (UNESCO) reviewed the FRIEND programme from the perspective of the International Hydrological Programme (IHP), suggesting some new directions. He encouraged FRIEND groups to become involved with the water policy of national governments, to overcome the weakness of poor communication and ultimately to help bridge the gap between research and practice. He identified the need to interface with other IHP projects, in particular those on groundwater and ecohydrology.

Eric Servat (Institut de Recherche pour le Développement, France) closed the conference by summarising the issues discussed, highlighting the need for more collaboration between FRIEND groups and encouraging FRIEND to remain accessible and attractive to young scientists.

All the papers presented have been compiled into an IAHS Red Book edited by **Henny A.J. van Lanen** (Wageningen University, Netherlands) and **Siegfried Demuth** (Freiburg University, Germany): FRIEND 2002 – Regional Hydrology Bridging the Gap between Research and Practice, IAHS Pub. No. 274 (see *Circulation* 73, p.10).

I would like to thank the British Hydrological Society, the Natural Environment Research Council and the British Geomorphological Research Group for providing the funding that enabled me to attend this conference.



Donna Bower
University of Birmingham
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Interactions between sediment and water

9th IASWS symposium
Banff Springs Hotel, Banff, Canada
5-10 May 2002

The 9th International Symposium on the interactions between sediment and water brought together 140 researchers from 34 different countries at various stages of their careers: 12 were from the UK and I was fortunate to be among them thanks to the generous support of a BHS bursary. The previous International Association of Sediment Water Science (IASWS) symposium was held in Beijing, China, in September 1999.

The meeting's multi-disciplinary approach to sediment-based research explored issues concerning both freshwater and marine environments and their sediments. In order to satisfy the diversity of interests, the conference was organised around three concurrent sessions: 1. Assessing and/or restoring disturbed watersheds; 2. Sediment-water linkages in terrestrial and aquatic environments and 3. Evaluating change in saline and/or freshwater habitats. Each of these principal themes was sub-divided into ten distinct, yet interrelated, sessions, with 112 oral papers and 27 poster presentations altogether.

There were also three plenary lectures, one addressing each of the main themes. Dr Gordon Grant talked on *'The emerging issues for water sediment and rivers: an international cross-cultural comparison'*, Professor Olav Slaymaker on *'The sediment budget as a conceptual framework and as an integrating watershed management tool: strengths and weaknesses'*, and Dr Marcus Heuttel on *'Hydrodynamic impacts on biogeochemical processes in aquatic habitats'*. Each was extremely wide-ranging and thought provoking, giving me an excellent opportunity to learn more about current research in different fields of sediment-water science, complementing my own research.

I presented a paper including the results of work undertaken during my PhD project. The opportunity to present a paper at an international symposium, whilst somewhat nerve-racking, was extremely valuable and generated interesting and very useful feedback, giving new perspectives on my work from a range of disciplines.

Among the wide range of subjects presented and discussed, several sessions were particularly relevant to my research interests. These included papers on suspended sediment properties presented in the sediment budget sessions, and also some that, although not directly related, complemented my own sediment-based study, including some from sessions on sediment-associated contaminant and nutrient transfers.

As weel as the scientific interchange, the meeting offered an opportunity to meet fellow postgraduates and researchers from around the globe and make some useful contacts. This was undoubtedly helped by the social events in the symposium programme. A day excursion in the middle of the conference took delegates to see sites of interest including Lake Louise and Yoho National park. White-water rafting down the Kananaskis River was available for those wanting a 'more exciting mountain experience', and despite the heavy snow and freezing temperatures, I chose this. The symposium banquet ('A taste of Canada') was greatly enjoyed by all and gave the non-vegetarians among us an opportunity to sample Caribou. It was followed by a spectacular demonstration of Indian hoop dancing.

Banff and the Rocky Mountains proved to be a most appropriate venue for a sediment and water symposium, with its spectacular vistas of sedimentary mountains and glacier-fed lakes and rivers, very different from those many of us are familiar with.

This symposium gave me a valuable opportunity to increase my knowledge of sediment-water science and to develop a more holistic perspective on my research, as well as to see a country with diverse hydrological and geomorphological features. I am extremely grateful to the BHS for the financial support that enabled me to attend.

Claire Ankers
Department of Geography,
The University of Exeter

64th EAGE Conference and technical exhibition

Florence, Italy
27-30 May 2002

Thanks to a BHS Travel grant, I was able to attend the European Association of Geoscientists and Engineers (EAGE) conference.

I delivered a paper and a poster presentation based on my PhD project. The content was similar, but the audience for the oral presentation was mainly students, while the poster presentation was given on the technical exhibition floor.

My research starts from the fact that leakage from the clean water network can be as high as 30%. Rapid detection and fixing of leaks is therefore paramount if the present level of service is to be maintained. A frequency domain electromagnetic (EM) survey was carried out in the Hanworth Park area, Feltham, west London, in order to evaluate the potential application of the EM method to the problem of leaks from water pipes. The targets were three previously discovered leaks on a 42" (107cm) diameter cast iron water main. A Geonics EM-38 ground conductivity meter was used, readings were taken every 25cm and the survey lines were 0.5m apart. The data were simply gridded and then displayed as colour contour plots, which allowed the identification of several 'plume' like conductivity high features in the areas around the suspected leak positions. These features have been interpreted as the plumes of water emanating from the leaking pipe, but other anomalies have been observed: the causes of them are not known as the ground truth was

not conclusive. Building on this work, other case studies will test the instrument under different conditions, and could lead to a fast, reliable method of water leak location and thereby reducing water wastage.

EAGE is a diverse organisation, and the presentations were subdivided, with several of the most interesting papers being given in the 'Non seismic' or 'Near Surface Potential Fields Methods' sessions. Of greatest interest to me were the sessions on the EM method, since this is often used to measure groundwater content. Although they might not have the same impact as an oral presentation, poster sessions on the technical floor are a lot more relaxed and informal, often leading to a much more lively discussion after the presentation. This was certainly the case with several of the poster deliveries in Florence.

Alex Manstein reported on work in Western Siberia, where the target of investigation was the Cicah-1 settlement. An interesting new EM instrument had been developed, working at a different frequency to 'off the shelf' instruments. Discussions had led to a planned comparison of several instruments to include both the ground conductivity and ground resistivity instruments available on the market, and this should provide a suitable evaluation of the new EM instrument.

Cho *et al.* presented work on the modelling and inversion of 3-D EM data, where using a Green's tensor integration algorithm in the wavenumber domain reduced the computation time significantly. This PC-based software should provide quicker evaluation of EM data, making the data interpretation easier. Fast and reliable 3-D forward modelling methods will facilitate better EM survey design.

Discussions were not confined to the presentation arena: often very fruitful discussions were held with the many assembled industrial exhibitors, and several of these have led to strong links developing in the past between the academic department and industry: this year was no exception.

My visit to Florence was beneficial in forging new links and reaffirming old ones, only leaving me to build on them over the coming months. I would like to express my thanks to BHS for partially funding my visit, and I acknowledge too the help given to me by the EAGE itself.

Aaron Lockwood
University of Leeds
(a.lockwood@geog.leeds.ac.uk)

Prof. Michael Hamlin CBE

Past President **Michael Hamlin** has accepted the committee's invitation to become an Honorary Member of BHS.

After graduating at Bristol in Civil Engineering, Michael was in practice in South Africa before being appointed a lecturer at the University of the Witwatersrand, Johannesburg. There he was part of the fabled Midgley team but focussed more on the Public Health aspects of Water Engineering.

Michael was appointed to a lectureship in the Department of Civil Engineering at the University of Birmingham in February 1961, and he remained for twenty-six and a half years, successively as a Senior Lecturer, the first Professor of Water Engineering, Head of Department, Vice-Principal and lastly Acting Vice Chancellor. Many students were introduced to hydrology through his undergraduate and MSc teaching during his time at Birmingham, and he also supervised a wide range of post-graduate research. Data generation and water resource systems featured strongly in the 1970s.

In 1987 he was appointed Principal and Vice Chancellor of the University of Dundee. Upon retirement from Dundee in August 1994 he was awarded the CBE, and was invited to serve as BHS President from 1995-97. As a Fellow of both the Royal Academy of Engineering and the Royal Society of Edinburgh he continued to contribute to hydrology. Michael was also elected Fellow of the Royal College of Physicians and Surgeons of Glasgow and the Royal College of General Practitioners of London for services to Water Engineering in developing countries. He has been awarded Honorary Doctorates from the Universities of St. Andrews, Birmingham, Dundee and Bristol.

Over the years Michael has been involved in the International Association of Hydrological Sciences, holding the post of President of their International Commission on Water Resources Systems from 1983 to 1987, during which period he was also UK National Representative for the IAHS.

He had also served on the BHS committee in its early years, and has also been heavily involved in the International Union of Geodesy and Geophysics (IAHS's parent union), having been a member of its Council and the UK representative for the IUGG. These positions indicate his active role in hydrology internationally and the high regard in which Michael is held, not only within the UK, but also by the whole international hydrological community.

Peter Walsh
(assisted by a number of contributors)

Discount book offer

Henry Gunston has been advised by the publishers of his book, *"Field Hydrology in Tropical Countries"* of a special promotion offer, under which copies of the book will be available at £3.90 (plus post and packing) instead of at the normal price of £12.95 (+p&p).

The book, which has been well received by "hands-on" hydrometry and hydrology practitioners in tropical countries, is based on Henry's 30 years of experience in field hydrology overseas whilst working with the Institute of Hydrology (now CEH Wallingford). It describes the general principles of working with observers, field teams and road vehicles, as well as methods of measuring rainfall, streamflow and evaporation.

The book contains 108 pages and is illustrated with diagrams of equipment and photographs of field hydrology (both equipment and teams in action) in Ecuador, Kenya, Saint Helena, Sri Lanka and other overseas locations. It is specially targeted at those with academic qualifications in hydrology who are moving towards involvement with hydrology in the field.

As we go to press, we have not yet received final details of this offer, but if you are interested, please contact Henry Gunston at 6 Clement Close, Wantage, Oxon, OX12 7ED *(email: henry.gunston@virgin.net)*.

Honorary Members

The Honorary Members of the British Hydrological Society are:

Mike Mansell-Moullin
Dr Jim McCulloch
Prof. Peter Wolf
Prof. John Rodda
Prof. Jim Dooge
Dr John Sutcliffe
Prof. George Fleming
Prof. Michael Hamlin

New officers

Dr Andrew Black (University of Dundee) has been nominated for the post of Hon. Secretary and we welcome Andrew back onto the Committee.
Prof. Bruce Webb (Exeter University) will become President-Elect.

Forthcoming events

BHS AGM

British Hydrological Society Annual General Meeting at the Coach and Horses, Weatheroak Hill, Alvechurch at 7.15 p.m. on Sunday 8th September 2002

The Annual General Meeting will be held at the *Coach and Horses* at Weatheroak Hill, Alvechurch, south of Birmingham, on *Sunday 8th September*, at the start of the 8th National Hydrology Symposium. Transport will leave Chamberlain Hall, University of Birmingham, Edgbaston, at 18.30, or members may travel direct — contact Tim Jolley or John Griffin for a map and directions — the grid reference is SP057741. The AGM will start at 19.15.

Meeting

RGS/Institute of British Geographers
A one-day conference
WATER 2003 —
WHAT SHOULD BE DONE?
Thursday 31st October 2002
Royal Geographical Society
Kensington Gore, London, UK

The aim of this one-day conference, convened by **Professor John Rodda** and **Professor Julian Hunt** for the RGS-IBG, is to inform and influence the UK's input to the 'Third World Water Forum' (Kyoto, March 2003).

It will be an important opportunity for the UK's institutions and industries, and invited international experts, to present their proposals for progress. It has also been timed to build on early outcomes from the 'World Summit on Sustainable Development' (Johannesburg, August 2002), where water issues are high on the agenda.

Themes will include governance and partnerships, social dimensions of water, intergovernmental and regulatory arrangements, mobilising financial resources and the environment.

The keynote speaker will be **The Rt. Hon. Clare Short MP**, Secretary of State for International Development.

The day will begin at 10.00 a.m. at the RGS, 1 Kensington Gore, London SW7 2AR. The cost is £55 for academics or non-profit making organisations, £25 for postgraduate students, £10 for undergraduates (no lunch), £95 for all others. Please telephone 'RGS Events' on 0207 591 3100 to register or to receive the full programme details, or email *events@rgs.org*.

Follow in England's footsteps in Sapporo

The International Association of Hydrological Sciences (IAHS) will be mounting a range of symposia, workshops and events with other Associations at the next General Assembly of the International Union of Geodesy and Geophysics. This is being held in Sapporo, Japan in July 2003.

A wide range of hydrological topics will be covered and full details of IAHS activities at Sapporo are on the website *(http://www.cig.ensmp.fr/~iahs/)*.

The IAHS meetings at Sapporo will attract hydrologists from throughout the world and will provide UK scientists with an international forum for their work and also an opportunity to meet hydrologists from a wide range of countries. Through the 'Exeter Fund', the BHS is able to provide some financial support to UK hydrologists attending IAHS events. Details of the application procedure will appear in *Circulation* in due course.

Prof. Bruce Webb
UK Representative for the IAHS
Email B.W.Webb@exeter.ac.uk

Copy deadline for *Circulation* No. 75 4th October 2002

Diary

2nd–6th September 2002
5-day conference on "Quantitative precipitation forecasting"
Venue: Reading University
Contact: Royal Meteorological Society, 104 Oxford Road, Reading RG1 7LL *(website http://www.met.rdg.ac.uk/qpf, email execsec@royal-met-soc.org.uk)*

8th–11th September 2002
BHS 8th National Symposium
"Water extremes & water stress: science, policy & practice" — including ***Postgraduate Symposium & AGM***
Venue: University of Birmingham
Contact: Sue Lane *(tel 0121 414 7455, fax 0121 414 5528, email lanes@is-fs10.bham.ac.uk)*

16th October 2002
BHS National meeting + Roy. Met. Soc.
"Meteorology and hydrology — towards closer collaboration"
Venue: ICE, London
Time: 2.00 p.m.
Contact: Murray Dale *(tel 01344 854896, fax 01344 854156, email murray.dale@meto.gov.uk)*

30th October 2002
BHS South West Section meeting
"Recent advances in understanding river nutrients"
Venue: Exeter University
Time: 2.00 p.m.
Contact: Prof. Bruce Webb, Department of Geography, University of Exeter, Amory Building, Rennes Drive, Exeter, EX4 4RJ *(Tel* 01392 263334, *Fax* 01392 263342, *email* B.W.Webb@exeter.ac.uk*)*

31st October 2002
ICE, CIWEM & SWIE
"Learning to live with flooding in Wales"
Venue: Cardiff Time: 9.00 a.m.
Contact: Eileen Taylor *(tel* 029 2063 0561, *email eileentaylor@constructionplus.net)*

*** 20th November 2002 —* ***Cancelled*** ****
The planned BHS National Meeting on low flows will not now take place.

12th March 2003
BHS National Meeting + Roy. Met. Soc.
"Hydrology for the Weather"
Venue: ICE, London
Contact: Murray Dale *(see above)* or Ian Strangeways *(see page 5)*.

Advance notice — July 2004
BHS International Conference on "Hydrology: science and practice for the 21st century"
Venue: Imperial College, London
Contact: Dr Adrian Butler, Dept of Civil & Environ. Engineering, Imperial College, London SW7 2BU *(Tel 0207 594 6122, Fax 0207 594 6124, email a.butler@ic.ac.uk)*