Acid rain research

Too late for Black Forest?

RESEARCH groups in Munich in the Federal Republic of Germany have formed a consortium to investigate how acid rain is destroying the Black Forest, a great stand of fir and spruce that covers the upper Rhine — and provides one of the major recreational areas of Europe. But the efforts are fifteen years too late, say some: the problem is already so bad that Germany "cannot afford to wait until the scientists have results" one candid member of the new consortium, Professor Peter Schütt, a botanist at the University of Munich, said last week.

According to Schütt the forests of South Germany are deteriorating rapidly. "I don't say they'll be dead in ten years, but by that time there will be effects that will be very noticeable and unpleasant." And the scientific problem is complex, Schütt believes, with no simple solution in view.

Dr Uwe Arndt, now of the University of Ulm, and others warned of possible damage by acid rain 15 years ago, but many German scientists were slow to react. There is no German environmental research council. And the country's major facility for experimentally exposing trees to gases, a regional laboratory near Essen in the Ruhr, has done almost no relevant research, say British observers. Essen's large chambers for the controlled exposure of trees to sulphur dioxide have not been used for four or five years, says one leading German botanist who would have dearly liked to use the equipment.

Research has thus been left largely to others, mainly in the regions of Munich, Karlsruhe and Freiburg, without the necessary large chambers. But this period is over, says the chairman of the new Munich-based consortium, Professor Hubert Ziegler of the Technical University of Munich.

The reason is that the German federal radiation and environmental research association (GSU) based at Neuherberg near Munich has found technical staff (after the closedown of a reactor) and a corner in its budget to support acid rain research. So, says GSU research director Professor H. W. Levi, by spring next year GSU will have working 16 chambers with volumes of 0.8 m³ to 25 m³ ("large enough to step inside and work"), in which it will be possible to control temperature, humidity, gas chemistry, light and draught. "There are similar things elsewhere", said Levi last week, "but we are going to look into the biochemical mechanisms — not just phenomenology." The chamber will be corrosion-resistant, and will be suitable for use with radioactive tracers. The cost will be DM 5.5 million (£1.4 million). "We are hoping for additional support from the Bavarian state government and the federal research ministry [BMFT]", says Levi.

Meanwhile the forest continues to decay, and for complicated reasons. A week ago, for example, Ziegler was surprised to discover that near the Tegensee, a lake a few kilometres south of Munich, dying trees also carried fast-growing lichens. These lichens are normally believed to grow only in the purest air, says Ziegler.

As for symptoms, honey production — a good gauge of the overall health of a forest — has failed catastrophically in the Black Forest, previously the main source of German honey. Old trees — over 100 years old — are the most dramatically affected, losing first their old needles and then their new ones. But young trees in the mixed-age, natural Bavarian forests are thus exposed

Die-back on a Black Forest conifer

to the light, and photo-oxidants may play a key part in the damage, Ziegler believes. Certainly young trees are dying near the tree-line, where they are exposed. Nitrogen oxides in a synergistic mixture with sulphur dioxide are probably the main culprits, together with secondary and tertiary biological effects such as the encouragement of acid-loving fungi, possibly affecting root hairs.

What can be done to counter the threat? Other than research to pin-point causes and suggest therapies (perhaps through key trace element fertilizers), there must be more control of sulphur dioxide and traffic emissions, says Ziegler. "It is most urgent to seek a Europe-wide agreement", he says — understandably, since at least half the pollution is believed to come from foreign sources, such as the French Rhone valley and Switzerland. To reach such an agreement, however, may take longer than the research needed to understand the scientific problem — which would be too late.

Robert Walgate

UK earth science research

SERC threatens new space laser

THE United Kingdom's new satellite geodesy facility — the Satellite Laser Ranger (SLR) at the Royal Greenwich Observatory in Sussex — is threatened with extinction soon after its completion. Its only hope seems to be a rescue by the National Environment Research Council (NERC). The SLR is high on the list of cuts that the Science and Engineering Research Council (SERC) is being forced to make following the recent decline in the value of sterling and the consequent increase in its foreign subscription commitments (see *Nature* 5 May, p.4).

The SLR was developed by Professor S. Ramsden and colleagues in the applied physics and electronics departments of the University of Hull. It can fire 150 ps pulses of green laser light at a rate of ten pulses per second. These are reflected from a satellite (such as the Laser Geodynamic Satellite "Lageos"), received on the ground by a 50 cm reflector and timed from emission to reception with an accuracy of 100 ps. The angular position is measurable to within 25 microradians. For Lageos, orbiting at a height of 6,000 km, the range of the satellite can be determined to within 5 cm.

The system has only recently been installed and tested at the Royal Greenwich Observatory, under the direction of Dr G. A. Wilkins, and the tests have included successful ranging measurements during both night and day (the latter being more difficult to achieve owing to photon contamination from the sky). Initial results have been reported in the bulletin of laser ranging data prepared by the Center for Space Research at the University of Texas, and the precision is of quality comparable with that of other leading facilities such as that situated at the Goddard Space Flight Center, Maryland.

The proponents of the system argue that its data are of value in many disparate fields. Satellite orbits can be used to monitor short-period changes in the Earth's rotation, which can be related to processes in the Earth's atmosphere and in the Earth's interior. They can also be used to provide precise positions of observing stations, allowing continental drift to be monitored. Laser ranging also permits the mapping of the Earth's complex gravitational field, which reflects the distribution of material on and beneath the Earth's surface. Plans for the SLR include participation in two international programmes.

The wide-ranging scope of geodetic data may provide the solution for the SLR's problems. The technical development of the facility has been funded by SERC but much of the present interest in such data stems from solid earth geophysics, which is supported by NERC. The running cost is estimated by SERC to be £85,000 a year,

and the council's Solar System committee has decided that this cannot be afforded given the current financial stringencies.

The final decision, as far as SERC is concerned, rests with its Astronomy, Space and Radio Board. No formal approach has yet been made to NERC about the SLR, although NERC is "aware of the problem" and may reach a formal decision by the autumn. The impression given by an SERC spokesman at a recent Royal Society meeting was that, unless a more coherent geodesy/geophysics programme is put forward in the near future, SERC is reluctantly, ready to wash its hands of its investment. The only other way in which SERC may continue to fund the project is if the consultative committee (involving the Treasury, the Department of Education and Science and SERC) recommends, and the Treasury agrees, that SERC can be reimbursed for the extra money that has had to be spent on foreign subscriptions.

Philip Campbell

Aids for AIDS

Washington

A NEW medical journal devoted to basic research and clinical observation on the acquired immunodeficiency syndrome (AIDS) is to start publication in the United States next month. Its publisher, Mary Ann Liebert, has promised to contribute 20 per cent of the profit from the journal to AIDS research and treatment.

The contribution from *AIDS Research* will take the form of an unrestricted grant to the AIDS Medical Foundation in New York, a non-profit organization set up in May to augment government funding for research on the disease. Dr Joseph Sonnabend, a virologist and microbiologist with a private medical practice in Manhattan, is to be editor of the new journal and chief medical officer of the foundation. Nobel laureate David Baltimore is expected to become a trustee for the foundation.

Dr Mathilde Krim, the foundation's chairman and a member of the Sloan-Kettering Institute for Cancer Research, said the organization intended to raise money from government, private individuals and corporate donors. She said the foundation would keep overheads to a minimum so that most of the contributions received would go directly to research. A spokesman for the foundation said it had received between \$20,000 and \$30,000 towards starting up costs from the Mathilde and Arthur B. Krim Foundation. The Hoffman-La Roche and Schering foundations had also promised to contribute.

The initial priorities of the foundation include the establishment of a repository of biological specimens obtained from volunteer patients and the creation of an AIDS clinic offering free outpatient treatment and counselling. Peter David

UK university research

Industrial links urged

THE British Government should spend at least £15 million a year to encourage universities and other institutes of higher education to forge better links with industry says a new report (Improving Research Links between Higher Education and Industry) commissioned by the Prime Minister, Margaret Thatcher. The report, undertaken by the Advisory Council for Applied Research and Development (ACARD) in collaboration with the Advisory Board for the Research Councils (ABRC), says that the initiative must lie with the universities but that industry must respond.

It suggests two principal ways in which the extra £15 million should be spent. The first it calls a pump-priming fund. The fund of £5 million a year would be used to build up the infrastructure needed for effective cooperation with industry in those institutes of higher education that lack it. The money might, for example, pay for an industrial liaison officer or measures to promote an exchange of staff with industry.

Secondly, there should be an industrial seed corn fund to act as a further incentive to institutes that already collaborate fruitfully with industry and to support their extra collaborative efforts. The seed corn fund, half of which should come from the Department of Industry, would operate on the Matthew principle that to those who already have, more shall be given. Each institute would receive a sum from the fund equal to 25 per cent of that which it earned in the previous year through contracts and consultancies from the private sector and the public trading sector. From figures submitted in evidence the councils estimate that the total sum earned by institutes in that way is currently £40 million a year (an average of £600,000 per university and £80,000 per polytechnic). Within five years, in part through the measures proposed in the report, the councils estimate that the figure will have risen to £100 million.

The report also repeats the oft-heard (from ACARD, the universities and others) call for the British Technology Group to lose its right of first refusal on inventions made at universities with funds from the research councils. The British Technology Group might instead provide professional advice to the institutes on how to exploit their inventions. Other measures to aid exploitation should include the compilation and publication of a comprehensive list of the expertise, services and research programmes available at the institutes and a network of brokers to act on the institutes' behalf.

As to current research in universities and polytechnics, the report says: "We have no desire to undermine excellent research and scholarship of any kind . . . But it must be

admitted that some work may be of less urgency, importance and even interest." So, the report concludes, the institutes need to replace research in "worked-out" areas by areas of greater potential that are also "likely to benefit from the stimulus of applied research allied to them".

In addition, the University Grants Committee should insist that individual universities decide on the proportion of its funds and time it wishes to devote to research (an average of 30 per cent is suggested) so that the committee can allocate an appropriate and identified sum for research to each university and ensure that the sum is used for that.

With the statement that "many academics expressed regret that much of their industrial work was for foreign companies", the report exhorts British industrialists to initiate more links with universities and polytechnics. Its most concrete suggestion in that direction is that bodies on which there is a high level representation of industry should urge firms to establish and maintain such links. It proposes that interested industries might club together in various groups, fostered by the Royal Society for the Encouragement of Arts, Manufactures and Commerce, better, but misleadingly in the context, known as the Royal Society of Arts.

Peter Newmark

A NEWS MAGAZINE FOR INDUSTRY & COMMERCE FROM THE UNIVERSITY OF BIRMINGHAM
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UNIVERSITY & INDUSTRY

THIS MAY NOT HELP YOU AT ALL

But on the other hand it may just give you one or two ideas

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U&I—short for University and Industry—is a new magazine published by the University of Birmingham. It will appear three or four times a year, and its aim is to tell managers in industry and commerce something about the ways in which university collaboration might be able to help them. We shall report on case histories of successful collaboration and on services offered by the University, which companies have found helpful. We shall also give glimpses of some of the advanced research going on at the University which may point the way for long-range planning. We want to show that there are ways in which the University can help. This is good for the University too, because working with industry and commerce on immediate and tangible problems can only enhance the quality of teaching and research at the University. This first edition of U&I aims to introduce some of the ways we can help. If you have any comments on this issue, or on what you would like to see in future editions, we want to hear from you. Please telephone or write to Frank Allwright, Editor, U&I, University of Birmingham, P.O. Box 363, Birmingham B15 2TT. Telephone: 021-471 1380 extension 3566.

BIRMINGHAM University's news magazine *University & Industry* is an attempt to interest a wider section of industry in what is going on at the university. The 8-page magazine is to be distributed three or four times a year with most of the 15,000 copies going to businesses in the East Midlands area. The main difference between *University & Industry* and other information sheets for industry issued in the past is the "popular" style of presentation and the efforts being put into extracting readable stories from the university's departments.