

# A Journey into No-man's Land

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## **Report of a British Association/COPUS Media Fellowship at the BBC World Service Science Unit 1995**

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### Summary

Traditionally scientists and journalists have had a relationship that has rarely risen above mutual distrust; it has frequently fallen to contempt. But as the government forces its scientists to sell their science in the open market, and journalists fight to fill the rapidly expanding universe of media, this relationship will inevitably move more towards mutual dependence. Perhaps, we can even look forward to a love affair. But, as every marriage guidance counsellor knows; a relationship will only work in the long term, if both sides make time to learn about the other's needs and desires. The British Association/COPUS media fellowships provides one opportunity to do this.

This is a report of my time as a British Association/COPUS Media Fellow at the BBC - World Service. During which, I learnt a lot about the media, and a bit about myself. I learnt that the media, can be understood as an industry. Ingesting certain raw materials, it processes, refines, packages and sells its product. Only the best raw materials can produce top quality products. To improve our media-share, it's clear that scientists must improve quality, quantity and delivery of our raw material. But the race is not just for quantity, we must take care to present science as rather more than an interesting hobby. Western society is founded on our understanding of nature - science. Every aspect of science has relevance to the real world or its future. To borrow a phrase, "Science isn't just a matter life and death, it's far more important than that!"

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*I began writing three separate reports; for the BA/COPUS, for my employers (British Antarctic Survey), and for my hosts (BBC World Service Science Unit). This single report emerged and is clearly more honest and more economic. I wish to thank all three of these organisations for the opportunity to participate in this scheme, and to the members of the BBC World Service Science Unit for making the experience so valuable and enjoyable.*

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## The Media Fellowship Scheme

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The Media Fellowship scheme has run for about 10 years and “aims to create greater awareness and understanding of the workings of the media among practising scientists and engineers”. In practise, the British Association simply chooses about seven scientists from a wide variety of backgrounds, and provides places for them to work within the media for between six and eight weeks. It is intended that, as nearly as possible, they should try to do the job of a journalist. Places are offered in television, radio and the print media. Who gets which, is decided behind closed doors and prospective fellows are not encouraged to express a preference, and I'm convinced this is no bad thing. None of the fellows I met were particularly unhappy with what they were offered.

Competition to get on the scheme is fierce, with hundreds of applications made in response to the advertisements that appear in the national press. I made two unsuccessful applications, before I was finally accepted. Writ large on the application form is the phrase “fellowships are not intended for people who wish to become journalists” and this may be the undoing of many applications, which may appear to come from scientists looking for a career change. Most of the successful applicants are established scientists with a proven record of media involvement, and who can show that they have a future in science. The BA does claim to be sympathetic to plight of short-term contract scientists in this respect, but it does not help for an applicant to be approaching the end of a contract.

The fellow's employer must undertake to pay wages during the fellowship, although the BA does give an adequate grant to cover the extra expenses of living away from home.

## The BBC World Service Science Unit

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My fellowship was with the BBC World Service Science Unit. Having spent around 20 months in the Antarctic, I had already spent many hours listening to the World Service. From the outset, I was a believer in its value and quality. Nevertheless, a part of me was a wee bit sad to have been offered the only media fellowship that would have no visibility within the UK. On reflection, it was the the best placement I could have hoped for.

The BBC World Service broadcasts to an estimated weekly audience of 130 million. It has a Science Unit of around 12 full-time staff, who produce around three hours of recorded programming in English each week. They also produce about 14 scripts each week for the use of the foreign language services of which there are more than 30 (see Appendix 2 for examples of scripts). In addition they are called upon to provide news dispatches and reports for news

programmes, as well as material for BBC World Service Television. This is a huge output for so small a group. For this reason, it appears that even untrained visitors, like myself, are welcomed. The benefits for me were obvious - I was given a great deal of freedom to propose and chase my own stories, but was always supported when my own inspiration failed. In my first week there were two Antarctic stories in which I had a professional interest, so at the end of the first week, and thereafter had a weekly fix of hearing my *stuff* on air (see Appendix 1).

The BBC takes great pride in its editorial independence. I certainly saw no evidence of a Big Aunty watching us. In fact, there was very little editorial control, and certainly no censorship, of the Science Unit output. The final arbiters of quality are the Science Unit Editors - who check all the scripts before they are issued, but do not appear to vet the English Language programmes before transmission. The programme producers have a very free hand.

I believe that the BBC World Service Science Unit is well ahead of the game in terms of programming policy. The science programmes cover a wide range of levels; from the easy (Pop-Science) to the relatively difficult (Discovery), and some are directed at narrow interest groups (Seeing Stars). This policy includes an element of "narrow-casting". This is the opposite of what can be described as lowest common denominator programming. Narrow-casting aims programmes at a small listenership, who will become committed and loyal. This may be one way that the established media will try to fight the rapidly rising number of TV channels and radio stations. Scientists may be able to look forward to, and perhaps demand, considerably better coverage, if narrow-casting becomes fashionable.

The sources of science stories were surprisingly broad - predictably, Nature, Science and the medical journals turn up a fair proportion, but many others come from press releases, agency wires, news items and personal contacts. Although, some stories seem to be compulsory, the producers and scriptwriters have a remarkably free choice, and several of my own ideas for pieces were warmly accepted.

### **British Association Annual Festival of Science**

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The British Association for the Advancement of Science Annual Festival of Science 1995 was held at Newcastle University, where I spent the week working out of the press office as part of the BBC World Service team. This was busy time for science journalists, many of whom use it to stock up on material and contacts for use over the coming year. The World Service produced one edition of the programme "Science in Action" at the meeting, and took many more miles of tape back to Bush House for later use. The pace of work was a step up from the norm at Bush House. Luckily, this was the last week of my fellowship, and so I was generally considered to be trained (or perhaps beyond

training) and I was allowed to get on with it. If the BA had come earlier in my fellowship I would not have enjoyed it nearly so much.

This was the only time that I came into contact with print journalists. Who seem unlike radio and television journalists. They are mostly male, and true to reputation appear to drink and smoke significantly more than the national norm. I never saw a newspaper journalist actually at a lecture. They seemed to operate exclusively within the press centre, where they hunt as a pack. They meet the speakers at the many press conferences held each day. During these, the journalists ask questions, which are often only obliquely related to the lecture the speaker intends to give. Afterwards, the journalists retire to the press room to discuss whether the story was worth "doing". Either from a sense of camaraderie, or from a fear of missing out, they generally plump for the same stories. Next day's papers end up containing the same fact, although each is strongly flavoured with that particular paper's seasoning. These are observations rather than criticisms because clearly, these working practises have been developed to cope with the demands of the job. All the journalists, I met at the festival worked very hard and were extremely well-informed.

## **Return to the trenches**

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The scheme aims to "create greater awareness and understanding of the workings of the media among practising scientists and engineers" - fairly modest aims, that cannot really fail to be achieved. The acid test of success must come when fellows return to their scientific employment. Whether what they do then is of value, is a difficult thing to determine, and so far hasn't been tried. What I intend to do is act as a sleeper, watching for potential stories; offer an in-house service to colleagues, practising interview techniques and advising on press releases; pursue my own ambitions towards popular science writing.

## **Scientists and the Media**

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My recent experience as a Media Fellow suggests that it is untrue that scientists cannot/will not talk to the media, and they are clearly interested in promoting a wider understanding of their work. Most scientists I interviewed were interesting and lucid. They are, however, worried about be shown to be wrong, with the result that the science presented the media, shows only its polished stories. We often appear to be lecturing, and know everything there is to know about our tiny field of expertise. In this format, our stories can be interesting, but rarely are they exciting! Scientists rarely put on show, the argument and debate, which is the really exciting aspect or what they do. In this respect other fields do much better. For example, Linford Christy can cover 100 metres only a few hundredths of a second quicker than the next guy, and yet every week the media laps it up. Why? Because he's our lad, but he can beat "The World", because he's dedicated and single-minded, and because

we see his race live, and you never quite know what will happen next! To me Science can be bit as exciting, and for all the same reasons.

It's has been my experience that the media will go for any story with the sniff of an argument or personality about it. So the problem isn't on the media side. Perhaps, the scientific community might think about showing a bit more leg, and try not shroud all its sexy bits. Invite a few journalists to attend real conferences and watch some real scientific debate.

## **Public Understanding of Science?**

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Maybe it's a growth industry, maybe I haven't looked very closely before - but there seem to be ever more organisations involved in the "public understanding of science". In general terms this is obviously good for Science. But some efforts seem to be simply aimed at getting tasty scientific morsels into the media. I would advise caution, and suggest that this approach doesn't increase the public understanding of Science in any real sense.

To win hearts and minds, I believe that Science shouldn't present itself as a quirky and mildly absorbing academic subject, it must be seen in the context of what it means to humanity. This is not impossible, and I would cite the rising interest in climate, not under the banner of Science but of Environmentalism. Let's get science in the newspapers, but let's get it out of the ghetto of the science page and put it where it belongs, on the front page.

For anyone preparing for a media fellowship - get ready for some hard work and an exciting ride. Put away your emotional baggage about science and The Media, just pack your enthusiasm. You can't expect to change anything in a couple of months - except perhaps yourself.

## **Postscript**

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In the last week of my fellowship, Professor Stephen Hawking was married in a registry office in Cambridge. The couple had not wanted any publicity, but after the wedding they posed for press photographs. I am glad they did. The photographs appeared large on the front of several national daily newspapers.

As a scientist Professor Hawking has broken the bonds of human frailty, and travelled further in space and time than most of us dream. His is a story to twang the heartstrings of a nation. For me, the fact that Professor Hawking's wedding warranted a place on the front page is major triumph for media coverage of science in Britain. Science needs heroes and it needs debate. British science has a wealth of both; we should cherish them all.

## Appendix 1 - List of activity during Media Fellowship

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### Foreign language service

Deepening ozone hole in Antarctica - Script  
Ancient ice fuels greenhouse debate - Script  
What drives the helix of Hurricane Felix - Script  
Medical briefs: Multivits and harelips- Script  
Oldest Hominid - New old man of Europe - Script  
What are they doing on Mururoa Atoll?- Script  
Cooking up a smog in Mexico City - Script  
Dismantling the Greenhouse - Script  
Seabirds sniff around the oceans - Script  
Solution to Slow-start Cats - Script  
Euronaut to fly to MIR- Script  
Sealice Lured by Bright Lights - Script  
Deep Stirrings in the Mediterranean - Script  
Albatrosses, Seals and Penguins - All Wired Up - Script  
Englishman, Briton or European? - Script  
Improving the "Nee-Naa" Siren - Script  
Power Generation for the Next Generation - Script  
Should We Wipe the Slate Clean? - Script

### English Language Service

Deepening ozone hole in Antarctica Science in Action 31  
Ancient ice fuels greenhouse debate - Science in Action 31  
Waterworld: science review - Science in Action week 32  
Roswell Aliens: the need to believe - Science in Action 33  
Interview on Antarctic climate change - Global Concerns 32  
Interview on low-level vs. high-level ozone - Global Concerns 33  
Benign vertigo and Flight Simulation - Health Matters ???  
Greenhouse technofixes - Global concerns  
Seabirds sniff around the oceans - Science in Action Newsletter 34  
EUROMIR and Space Endurance - Science in Action Week 35  
Mururoa - Despatch for News Hour  
Hurtful exercise- Science in Action Week 36  
Acid Pollution and Buildings - Science in Action Week 37  
Sealice in salmon farms - New ideas week Edition 547  
Improving the "Nee-Naa" Siren - New Ideas Week ???  
Mediterranean Deep Sea Flip - Discovery 12/9/95  
Buckyballs in the Classroom - Science in Action Week 38  
Albatrosses and longlines - Global Concerns Week 39

### Other

What are they doing on Mururoa Atoll - WSTV 16/8/95  
EUROMIR launch - WSTV NEWS voice over 3/9/95

## Appendix 2 - Scripts for World Service foreign language services

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Id; SC By; DAVID VAUGHAN Ext; 232 Rdy; NOW VERSION 1 Aug 3 15:2  
Title; DEEPENING OZONE HOLE OVER ANTARCTICA Dur'n: 3:3 Lang: SIM

*TAPE INSERTS ON TAC 95 31 144*

S 215

*CUE*

In 1985 researchers from the British Antarctic Survey made an announcement that surprised the world and showed, once and for all, that human activities were doing lasting damage to the Earth's atmosphere. Their discovery was a thinning - in fact such thinning as to make a hole - in the ozone layer high in the sky. This week in the science journal 'Nature' they have reported that the hole is getting deeper and wider. David Vaughan from our science unit sends this report:

*NARR*

The ozone layer surrounds the Earth more than 10 km above the surface. It protects all living things from ultra-violet light in the sun's rays. But the chemicals that humans have put into the atmosphere are now removing the ozone layer above Antarctica. The British Antarctic Survey has monitored ozone levels in the Antarctic daily since the 1950s. Ten years ago Jonathan Shanklin was the first to notice the change.

*TAPE BAND 1*

**"The original discovery was a bit of a surprise in many ways, because I was expecting to show that there was nothing there. I was preparing for an open day and I thought it would be nice to reassure people that the ozone layer was okay. And when we plotted the graphs for that particular year it showed lower values over the spring. We followed that up and demonstrated that each year the values were getting lower."**

*NARR*

Scientists immediately set to work and showed that the hole covered all of Antarctica. After 10 years of silence the British Antarctic Survey has published again, so what have they got to say now?

*TAPE BAND 2*

**"First of all the ozone values are continuing to drop during the spring time with seemingly little halt in the decline and for the first time we are also see ozone depletion during the Antarctic summer months. Last spring the hole became elongated and for the first time it covered parts of South America and the Falkland Islands and this has had direct effects on the people living there. There have been several cases of quite severe sunburn in the Falkland Islands. They've taken the issue so seriously that they have installed monitoring equipment to measure ultra-violet light levels and will issue health warnings when they exceed a certain limit."**

NARR

Scientists are certain that the ozone hole is caused by chlorofluorocarbons (or CFCs) that do not occur naturally, but escape into the atmosphere from refrigeration systems and aerosols. But why is it that these gases only cause an ozone hole over Antarctica. Jonathan Shanklin again:

TAPE BAND 3

**"These are gases that we manufactured ourselves. They are mostly produced in the northern hemisphere and diffuse up into the atmosphere and in the tropical atmosphere they're broken down into their constituent parts. And then transport processes move chlorine and bromine to both poles. But it is only in the Antarctic that temperatures are low enough to regularly form the stratospheric clouds to create the ozone hole."**

NARR

In signing an agreement known as the Montreal Protocol, most nations have already agreed to reduce the emission of ozone depleting chlorofluorocarbons, but will this be enough?

TAPE BAND 4

**"We expect Chlorine levels to peak at the end of this decade and thereafter there will be a slow and steady decline in chlorine. It will probably take until the middle of next century before the ozone layer is back at the level of the 1970s."**

NARR

So although the rate of release of these gases is reducing, there is little doubt that we will have to live with the ozone hole for some time to come.

TAPE BAND 5

**"Exposure to ultra-violet light today may not manifest itself in skin-cancer and cataracts for perhaps twenty or thirty years. And that's one of the reasons why it's very important for people to take protection against the effects of ultra-violet light on the skin. [So, down in the Antarctic, I always make quite certain that I put on sunblock cream and lip-salve.]"**

#### **NOTE TO SECTIONS**

*The ozone layer referred to here, and which protects us from ultraviolet rays from the Sun, is in the stratosphere, between 11 and 35 kilometres up in the sky. There is virtually no mixing between this layer and the troposphere in which we live. Ozone in the troposphere, from exhaust fumes etc, is a pollutant and can cause breathing difficulties. But ozone in city pollution does nothing to help the stratospheric ozone hole. Ozone is also **not** connected to global warming and climate change.*

END

Source: Nature 03/08, BAS press release



*File Pollution - Ozone MR*

Id; SC By; DAVID VAUGHAN Ext; 232 Rdy; 14:0 version 1 Aug 2 14:5  
Title; ANCIENT ICE FUELS GREENHOUSE DEBATE Dur'n: 3:0 Lang: SIM

*TAPE INSERTS ON TAC 95 31 111*

S 209

**EMBARGO: DO NOT BROADCAST UNTIL 00:01 BST Thursday 03/08**

*CUE*

Whilst most of Europe is breaking records for summer temperatures, it's hard to believe that there is place on Earth that's always cold: cold enough to keep ice frozen for the past 8 million years. Research published in this week's edition [3/8/95] of the scientific journal 'Nature' argues that this ice has major implications for how the world might look after global warming. This report from David Vaughan of our science unit.

*NARR*

Together with colleagues from the US, Professor David Sugden of Edinburgh University in Britain has been looking at samples of ice brought back from the icy wastes of Antarctica. One particular chunk came from an Antarctic mountain range, 1 500 metres high.

*BAND 1*

**"This mountain range is surrounded by ice flowing from the East Antarctic Ice Sheet. We found it in a boulder-strewn valley and underneath the boulders you can find glacier ice. And that's where it was and we think it's at least 8.1 million years old. It's at a depth of about half a metre and, if you scrape away these boulders and the debris on the surface, you find this smooth ice surface. And when we took that ice and looked at it we could see that it was old glacier ice, with all the characteristics of proper glacier ice."**

*NARR*

It's probably the oldest ice cube ever found in the world. But what does it mean for the history of the Antarctic Ice Sheet?

*BAND 2*

**"We can show that the ice came from the ice sheet because it pushed up the valley, bringing rocks which don't occur in that local mountain range. So we know that it's a big ice mass that produced the ice. What it shows is that the ice sheet was in existence over 8 million years ago. And also, because it has been preserved for so long with such a thin cover of debris, it shows that the conditions must have remained cold and polar for the same length of time."**

*NARR*

Antarctica seems permanently frozen today, but it comes as a surprise to many climatologists to find that the continent may have remained so cold for so long. Professor Sugden again.

*BAND 3*

**"This bears on a current controversy, about the behaviour of the ice sheet during the Pliocene; that's a period of about 3 million years ago when conditions in the world were warmer than they are today. This has been used as an analogy for any future enhanced global warming. Obviously, if we are trying to argue that ice has survived under cold polar conditions for 8 million years, that is difficult to reconcile with the idea that the conditions were very much warmer 3 million years ago."**

*NARR*

This debate has been going on now for about ten years. So does Professor Sugden think there's any prospect that we'll see an answer in the near future?

*BAND 4*

**"I think so, eventually. If evidence like this ancient piece of ice survives and is found to be a solid piece of evidence as we think it is then, gradually, this is narrowing the options."**

*NARR*

Sugden's findings are unlikely to alter the predictions of global warming, but they certainly question predictions of how much of the Antarctic Ice Sheet will melt and likely rise in sea level that could result.

*END*

*SOURCE: Nature 03/08, own interview  
File: Antarctic; Climate - global warming.  
MR*

Id; SC By; DAVID VAUGHAN Ext; 232 Rdy; NOW VERSION 1 Aug 15 14:2  
Title; WHAT DRIVES THE HELIX OF HURRICANE FELIX Dur'n: 4:1 Lang: SIM

*TAPE INSERTS ON TAC 9533 074*

S 238

*CUE*

It seems that the spiral of wind and rain around Hurricane Felix has now passed Bermuda without the massive damage that was feared. Even the referendum may have been saved. But how long is it until the next hurricane is born? David Vaughan of our Science Unit has been trying to find out just what was driving the helix of Hurricane Felix?

*NARR*

The destructive power of a large hurricane is often likened to a small nuclear bomb going off every minute, and we are all aware of their destructive capabilities. In 1969, Hurricane Camille killed 256 and in 1979, Hurricane David killed more than 1000 people. And in 1988, Hurricane Gilbert, the most violent storm of the century, devastated Jamaica, Mexico and parts of the US. But what causes them and when is a hurricane, actually a typhoon or a cyclone? Derek Hardy, from the UK Meteorological Office:

*TAPE BAND 1*

**"Well, hurricanes, typhoons, and indeed cyclones are all the same kind of animals. They all depend on very warm sea temperatures. The sea temperature itself underneath them must be at least 26 degrees Celsius. [*Considerably warmer than around the UK or Europe. So that's why we don't get them.*] They really only occur within the tropics and sub-tropics. As well as high sea temperatures, they need plenty of moisture which comes from the sea. The third factor is the Coriolis Force, which is a factor due to the spin of the Earth. The Coriolis Force is nil on the equator, which is why we never get these things on the equator. We get quite a lot of typhoons over Hong Kong but you never hear of one over Singapore."**

*NARR*

Over the last twenty years, satellites have been able to track the paths of hurricanes and to monitor their evolution. But, although the general patterns are known, predicting the potential destructive power of any particular embryonic cyclone is not yet possible. Derek Hardy explains

*TAPE BAND 2*

**"The ones that affect the Caribbean usually form off the west coast, the bulge of Africa; off the Cape Verde Islands, as, did Hurricane Felix some eight days ago. And it has been monitored ever since. What determines whether they will develop or not depends on conditions in the upper atmosphere. Conditions have got to be right through all the depths of the atmosphere as well as underneath at the surface. Only about one-in-ten will make a full hurricane. About three-in-ten will become tropical storms which are half-way between a hurricane and an ordinary storm. The majority**

**will just fizzle out after two or three days as just a swirl of cloud."**

*NARR*

Hurricane Felix has now passed Bermuda causing much less damage than was originally feared, so how does it rate in comparison to its brothers and sisters.

*TAPE BAND 3*

**"It's just a good average hurricane size, in terms of its strength. On the five grade scale, five being the most intense, two days ago it was a category three but currently its a category two. Just to compare, the hurricane that two weeks ago affected Florida and the Bahamas, which was called Erin, just about made one. It was a minimum hurricane. This one is an average one."**

*NARR*

There seems to be some debate as to where Felix will go next. It may well continue north-west towards the United States but then it may head off into the North Atlantic and eventually help build an anticyclone and, perversely, help maintain the good weather in Europe. Alternatively, it may linger between Bermuda and the US and cause a few more days of trouble before it eventually dies out. But even after Felix is gone, the Caribbean cannot rest entirely. Derek Hardy again:

*TAPE BAND 4*

**"The hurricane season continues until the middle of December. It lasts from June until December, so there's plenty of opportunity for others. This is in fact the sixth this year. Which has been, probably, the busiest season for hurricanes since 1933."**

*NARR*

So what for the future? If hurricanes are dependent on sea temperatures, and sea temperatures were to rise either as a result of a natural climatic fluctuation or as a result of human activity, will that mean more hurricanes? A final word from Derek Hardy...

*TAPE BAND 5*

**"As you extend the area of sufficient warmth in the sea, that does extend the possible breeding ground of these things. And also means that they can be sustained further north or south, in either hemisphere. Maybe places that currently do not normally get them, for instance Sidney in Australia, might be on the route for one in twenty or thirty years time, if, IF!, global warming does take place."**

*SOURCE: INTERVIEW WITH DEREK HARDY, THE GENERAL ENQUIRIES OFFICER AT THE UK METEOROLOGICAL OFFICE IN BERKSHIRE FILE: Disasters - natural MR*

Id; SC By; DAVID VAUGHAN Ext; 232 Rdy; NOW VERSION 1 Aug 14 16:1  
Title; MED BRF: MOSTLY PREVENTION OF BABY ILLNESS Dur'n: 3:2 Lang: SIM

#### Folic Acid may prevent cleft lip and cleft palate

Over the past twenty years scientists have collected considerable evidence that a mother who takes supplements of folic acid in the form of multi-vitamins, in the weeks around conception will help prevent spinal abnormalities such as spina bifida in her baby. Dr Gary Shaw and colleagues reviewed the histories of mothers and babies born in California between 1987 and 1989 and report that babies born to mothers who took multivitamins, had between 25 and 50 percent fewer facial deformities, including cleft lip [*often called harelip*] and cleft palate. Both abnormalities are common, causing feeding problems for infants, and speech difficulties and more frequent ear infections for adults. The critical period for mothers to taken vitamins appears to be from one month born before conception until two months into the pregnancy. By this time development of the foetus' lip and palate is usually complete. Unfortunately, there were too few women in the test, taking multivitamins that did not contain folic acid, to determine conclude that it is the folic acid that is beneficial, and not some other component of the multivitamin cocktail.

*Source: The Lancet 12/8/95*

#### Vitamin-A supplements may help AIDS babies

Vitamin A might be an inexpensive way to ease the illnesses suffered by infants with the AIDS virus. According to researchers from the University of Natal, in South Africa, found that moderately large doses of Vitamin A, helped babies carrying the AIDS virus to fight off some AIDS-related illnesses, ranging from rashes and respiratory infections to diarrhoea, a major killer of these babies. The vitamin supplements made no difference to babies who did not carry the AIDS-virus.

#### SOURCE

#### Clue to heart defects in Babies with Down's Syndrome

Down's syndrome affects around 1 in a thousand babies making it the most common major genetic problem in newborn babies. The problem occurs where a baby inherits an extra copy of their 21st chromosome. Almost half of all children with Down's Syndrome are born with a heart defect, which can require major surgery to put right. Dr. Anna Kresling has studied 58 families of children with Down's Syndrome and 113 unaffected families. They have isolated the gene that seems to be giving rise to the heart defect, and it would appear that neither the information from the mother nor father is particularly to blame, but that certain combinations of information from mother and father are the problem.

*Source British Heart Foundation Press Release.*

#### Kidney transplants from spouses more successful

A study in the New England Journal of Medicine has found the kidney transplants \_from a spouse are more likely to succeed than those from a blood relative such as a parent or from a compatible dead donor. The results disagree with the conventional wisdom, that donors should be chosen solely on the basis of immune factors. It will also force the medical community to begin the debate regarding the legitimacy of transplanting kidneys from emotionally or genetically related donors.

*SOURCE Reuters*

Coughing cats can kill

Cats are thought to be resistant to infection to the tuberculosis bacteria, but a letter in this week's Lancet suggests that this may not be the case. Dr J. Wynne Jones and Dr P A Jenkins of the UK Public Health Laboratory Service describe two domestic cats that became ill and were shown to have been infected with variants of the TB bacteria. Although, no humans have yet been shown to have contracted TB from a cat, the authors suggest that close contact with an infected pet could allow transmission of the disease. In countries that have TB in cattle under control, pets may be the animals most likely to transmit the disease to humans.

*SOURCE The Lancet 12/8/95*

Id; SC By; DAVID VAUGHAN Ext; 232 Rdy; NOW VERSION 1 Aug 11 07:4  
Title; OLDEST HOMINID - NEW OLD MAN OF EUROPE Dur'n: 3:1 Lang: SIM

ACTUALITY ON TAC 95 32 179

S 230

*CUE*

Most experts believe that Modern man (Homo Sapiens) first entered Europe around 40 000 years ago. But we were not the first inhabitants. Spanish researchers excavating a old railway cutting have uncovered fossils that they claim are the remains of Hominids, man-like apes living Northern Spain more than 750 000 years ago. David Vaughan of our science unit has been unearthing the story

*NARR*

This week's edition of the journal **Science** carries a report from a team of Spanish palaeontologists suggesting that man, or at least his distant relatives have been living in Europe for around a quarter of a million years longer than we had thought. The new remains were uncovered in the mountains around Atapuerca. Dr Antonio Rosas of the Madrid's Natural History Museum, described the scene at the dig in mid-1994 when the new fossils were uncovered.

*BAND 1*

**"All of us were very excited and some of us were crying, and jumping up and down. We were very happy, because we realised immediately that we were dealing with very very old remains. We had found remains of at least four individuals. These individuals are represented by some pieces of skull, some teeth, small jaw fragments and some long bones."**

*NARR*

The remains appear to have come from at least four individuals. Dr Rosas, who specialises in the study of human jaw bones, quickly identified the remains as from a human-like ape. The difficult part of the work, however, came in trying to date the remains. This involved relating the magnetic fields of the rock surrounding the fossils to known changes in the Earth's magnetic field over geological time. The results place these hominids more than a quarter of a million years before the previous oldest found in Europe, a fragment of jaw found in gravel-pit near Heidelberg. But how important are these finds? And do they represent a new species or simply a different race? Dr Rosas again...

*BAND 2*

**"We don't have a taxonomic name [formal classification] for these hominids because we consider that we don't have enough information at the moment to define a new species. What we have said is that these hominids don't fit perfectly in any of the known Homo species. If we are lucky and in the future find more remains, then we may have enough to define, what could be a new human species. But at the moment we prefer to be a little prudent."**



*NARR*

Dr. Rosas and his colleagues believe that these are not our direct ancestors, but represent a step on the evolutionary road towards Neanderthal man, which occupied Europe until around 100 000 years ago, but then died out completely. They were replaced by our own ancestors who had been evolving separately in Africa and journeyed into Europe a mere 40 000 years ago. But what's now known about the earlier humans and how they lived?

*BAND 3*

**These hominids were completely bipedal and they were making a primitive assemblage of stone tools but of course they had produced a some kind of culture.**

*NARR*

The scientists return to the site later this year to look for more and perhaps even earlier remains. But in the meantime we are left in the strange position of knowing that Homo sapiens - ourselves - have not been the first human resident in Europe. Nor have we been the longest. Neanderthal Man and his forebears were in residence around twenty times longer than we ourselves have managed so far.

*SOURCES: SCIENCE, Interview with Dr ROSAS*

*FILE: GEOLOGY: PALAEOLOGY*

*JW*

Id; SC By; DAVID VAUGHAN Ext; 232 Rdy; NOW VERSION 1 Aug 11 14:5  
Title; WHAT ARE THEY DOING ON MURUROA ATOLL? Dur'n: 2:5 Lang: SIM

### CUE

President Jacques Chirac's announcement in June that France was to resume the testing of nuclear weapons on Mururoa Atoll has brought a storm of objection; from environmental groups who have fundamental objections to testing, and from the governments of Australia and New Zealand who feel that the tests are being conducted on their doorstep. The fact that the start of testing is so close to the fiftieth anniversary of the dropping of the first nuclear bombs, seems to have made things worse. The French authorities must have been aware of the publicity this timing would generate. So why are the tests needed right now and what exactly is it that the French authorities hope to achieve? David Vaughan of our Science Unit reports on the science behind the tests.

### NARR:

*[Next year, a treaty to ban all nuclear tests is due to be signed in Geneva by 40 nations attending the Conference on Disarmament. And yet, last month, President Jacques Chirac, announced that France would resume nuclear testing on the South Pacific atoll of Mururoa. Defending the decision, Chirac said that, since 1956, France had put considerable effort into nuclear testing and were hoping to reap the fruits of this long effort, before signing the test ban treaty. It seems clear that the French authorities had thought long and hard and decided that the potential results of the tests outweighed the inevitable storm of international protest.]*

Mururoa is one of thousands of coral atolls in the South Pacific, built up over thousands of years from the accumulated skeletons of the coral inhabitants. Although often said to be an island, Mururoa is actually just a coral reef surrounding a central lagoon. It's within this lagoon that the tests will be carried out. And, although the future of the tests may be in doubt, preparations are continuing.

Large barges anchored in the lagoon are currently drilling 1.5 metre diameter holes, into the seabed. These holes go between 600 and 1 000 metres into the basalt bedrock beneath the coral. Metal cylinders containing nuclear charges and measuring devices will be loaded into the holes. Finally, the holes will each be packed with around 1 000 tonnes of concrete before the charges are fired. The intense heat generated during the explosion itself should cause the rock around the borehole to melt and then solidify into a impervious glass. The French scientists say that this vitrification should seal the borehole and prevent the escape of radioactive materials into the environment. The question of whether they are right and the geological conditions beneath the atoll will contain the radioactivity from the tests is a major point of argument.

In total France has conducted around 200 nuclear tests since 1956, and at most eight tests are planned in the present series. The first *[test will be for the final certification of a [TN 75] warhead that may enter service in next year. The second and third tests will be to verify the performance of a nuclear trigger. So these first]* three tests have relatively routine objectives and can be seen as a hurried completion of the programme of work, before the test ban treaty is signed.

It is the final four or five tests that are the most interesting. These are reported to be aimed

at calibrating a scheme for designing new nuclear weapons without live tests. *[The scheme, known as PALEN, will use a combination of computer simulations and laboratory measurements. According to a report written by American scientists, France is planning to spend a total of two billion dollars on the development of PALEN. Although, it is generally unclear whether the all parts of the French Military agree that it is feasible to replace live tests by Virtual Nuclear Tests. However,]* France's decision [yesterday/10th August] to support a complete ban of nuclear testing, rather than partial ban of tests above a certain limit, appears to support the idea that this may be a real possibility. Then, France will be able to join the test ban treaty from a position of strength.

But if such 'virtual' computer models work, then the test ban treaty may not halt development of new weapons. Nations such as France, with data to test and calibrate their simulations, will be ahead in the virtual arms race. Perhaps next year's Conference on Disarmament should include a clause in its treaty that will outlaw virtual nuclear testing as well.

*END MR*

Id; SC By; DAVID VAUGHAN Ext; 232 Rdy; NOW VERSION 1 Aug 18 08:0  
Title; COOKING UP A SMOG IN MEXICO CITY Dur'n: 3:4 Lang: SIM

ACTUALITY ON TAC 95 33 160

S 247

*CUE:*

Mexico City is one of the most polluted cities in the world. In 1992 the city's own health limits for ozone were exceeded on 98 per cent of days. Until now the main source of the pollution was thought to be exhaust fumes from cars and trucks. But according to research published in this week's issue of "**Science**", the residents of Mexico City are actually cooking up the smog in their own homes. David Vaughan of our Science unit has details

*NARR:*

By any standards Mexico City is a dirty place to live. And for its 15 million inhabitants things are getting worse every year. The most serious problem is smog, a mixture of smoke and fog generated by pollution, that hangs over the city for days on end. One of the dangerous components of the smog is ozone, which causes a long list of health problems including coughing, choking, loss of lung function, headaches and eye irritation. Over the past two decades the problem has got much worse. Mexico City's own ozone limit was exceeded on 71 per cent on days in 1986, but in 1992 this had risen to 98 per cent.

Professor Sherwood Rowland of the University of California has spent more than 20 years studying the chemical reactions that lead to the production and destruction of ozone in the atmosphere. And now he's turned his attention to the very particular problems of Mexico City.

*TAPE BAND 1*

**"Mexico City exists in a high valley, that is, at high altitude.. around 7 000 feet [just over 2 000 metres]. It's a tropical area, so it gets sunlight all year round. And it's surrounded by mountains so that the air stays there, trapped in a bowl and it is very susceptible to high smog conditions. Urban smog requires three things: one is sunlight, another is nitrogen oxides and the other components are the hydrocarbons. The sunlight causes a reaction in the hydrocarbons, the hydrocarbons react with the nitrogen dioxide and that produces ozone which is a major component of urban smog."**

*NARR:*

Professor Rowland and his colleagues took samples of the air from various locations in the city and analysed the "fingerprint" of the hydrocarbons present. This piece of chemical detective work led to a surprising result.

*TAPE BAND 2*

**"The hydrocarbons in Mexico City had been believed, for quite some time, to be coming predominantly from automobiles, as is the case in Los Angeles, for example.**

**And secondarily from industry. Our analyses of the hydrocarbon content in Mexico City indicate that there is another major component and that is the leakage of what is known as liquefied petroleum gas (LPG)"**

*NARR:*

In most cities where gas is used in homes, the supply which is mostly methane, comes in by pipe from a central source. But Mexico City is in an earthquake zone and for safety reasons has no piped supply. Each home has its own canister of gas. LPG is easier to store than methane and so LPG is used in Mexico City. But although LPG is now seen to be one of the main culprits in causing air pollution, these latest findings - according to Sherwood Rowland - don't exonerate traditional polluters.

*TAPE BAND 3*

**"The industry and automotive contributions are important too! We estimate that the automotive and the LPG contributions are roughly the same. We wouldn't know which was the larger or smaller because you need a lot of measurements over a very long period of time to see how that would work out. But our point is that LPG is a major player and needs to be considered. If they could tighten up on leaks and if they could change the composition of the gas then they might make progress towards having lower ozone."**

*NARR*

Although the geographical setting of Mexico City is unique and makes things worse, there are very many other cities around the world that use a lot of LPG, such as Taipei, Yerevan, and Athens. The lessons learned in Mexico City will undoubtedly apply in many other places.

*SOURCE: Science 18/8/95, Interview with Prof F. Sherwood Rowland JW*

Id; SC By; DAVID VAUGHAN Ext; 232 Rdy; NOW VERSION 1 Aug 24 10:3  
Title; DISMANTLING THE GREENHOUSE Dur'n: 4:5 Lang: SIM

ACTUALITY ON TAC 95 34 140

S 259

*CUE:*

A group of 240 scientists, industrialists and political analysts from 39 countries have been meeting in London. Their agenda was to discuss what can be done to help us survive the worst environmental threat that the world has ever faced: global warming. *[To put the participants in the right mood, the organisers decided to surround them with tropical plants and animals: the meeting was held at London Zoo.]* We sent David Vaughan of our Science Unit:

*NARR*

Is the Earth warming up? And if it is, is humanity to blame? Or is it simply a natural fluctuation in the climate system? This is a major question facing scientists. The natural greenhouse effect has kept the Earth warm for millions of years, though many people fear this will get out of control as we continue to pollute our atmosphere. There are many greenhouse gases, such as methane, nitrous oxide, and chlorofluorocarbons, but the most important is carbon dioxide. This is produced by all forms of combustion, from cars in America to cooking fires in Tibet. So carbon dioxide has been the focus of the London meeting.

Many scientists fear that, although there's still no hard proof that human activity is enhancing global warming, it may already be too late to do anything about it. Dr Paul Freund says that action is necessary now - a belief widely shared by environmentalists:

*TAPE BAND 1 - Paul Freund*

**"Today there's a strong possibility that the world is warming up. And many governments believe it is necessary to improve the efficiency with which they use energy, and to use fuels that generate fewer greenhouse gases. Natural gases for instance produce less carbon dioxide than coal. In future there may be other technologies that governments will encourage, for example solar energy or increased use of nuclear power. They don't emit any greenhouse gases. What we're exploring are ways that we could continue to use fossil fuels - coal, oil and gas - but in ways that are climate-friendly."**

*NARR*

Basically there are three possible strategies: reducing emissions, capturing emissions at source and removing the greenhouse gases from the atmosphere. Dr Eric Lindeberg explains:

*TAPE BAND 2 - Eric Lindeberg*

**"Where we have the greatest capability today is the direct reduction of emissions. This can be achieved through improved efficiency, gas clean up, removing the carbon dioxide and other greenhouse gases from the exhaust gases, and using fuel that does not emit carbon dioxide."**

*NARR*

Some of the participants at the London meeting were industrialists, with more than an academic interest in producing energy. They are eager to develop an early solution that will satisfy both governments and users that their product is not damaging the environment. Thomas Schwarzkopf works for RWE, a major energy production and distribution company in Germany:

*TAPE BAND 3 - Thomas Schwarzkopf*

**"Our favoured short-term option is to improve the energy efficiency of fossil fuel power stations, because at the moment, we think this will have the greatest effect. In the long-term there could be other technologies or other options. In addition, there's something everyone can do now, and that is energy saving."**

*NARR*

Cynics might say that a company like RWE is interested in global warming primarily to placate Germany's highly vocal and politically powerful green movement. Not so, says Thomas Schwarzkopf:

*TAPE BAND 4 - Thomas Schwarzkopf*

**"To prove that we are serious, we have a programme with a budget of 20 billion Deutschmarks for the next twenty years, where we invest in new power stations, energy saving programmes, and into research and development in renewable energies. And this is a very substantial commitment by the company. In the end we hope that we will succeed in reducing the emissions from our company by 25 or 30 percent."**

*NARR*

Reducing emissions may be a short term option, but it won't solve the problem entirely. Eric Lindeberg is working on an alternative approach, that of storing carbon dioxide:

*TAPE BAND 4 - Eric Lindeberg*

**"There's a great opportunity for disposing of carbon dioxide in the ocean or underground. The largest potential underground reservoir is aquifers. We must start at a power plant, remove the carbon dioxide and transport it by pipeline to the aquifers and inject it in, like an inverted oil well. And when we have injected for 25 or 100 or 150 years, depending on the capacity of the site, we can seal off the well. This will provide safe storage for at least as long as other *[natural]* climate changes take."**

*NARR*

The technology required to do this is already available, though it could increase the cost of energy by around 70 percent. But, as was pointed out at the London meeting, that sort of

price rise occurred during the OPEC oil crisis of 1973 without causing a major economic collapse. Dr Lindeberg says that practical projects are already getting under way.

*TAPE BAND 5 - Eric Lindeberg*

**"One full-scale project will start next year when the operator of a Norwegian gas field will begin injecting about one million tonnes of carbon dioxide per year into a relatively shallow aquifer, to provide a permanent disposal of 3 or 4 percent of the Norwegian carbon dioxide emissions. This aquifer will be used for about 18 years, and will provide safe storage place, contributing to an overall reduction of Norwegian emissions."**

*NARR*

A glimmer of hope to counterbalance the doom and gloom with which we have become so familiar. And if the mood of the London meeting of global warming experts was anything to go by, perhaps we really can look forward to a "technofix" for global warming in the near future.

*ENDS*

*JW*



Id; SC By; DAVID VAUGHAN Ext; 232 Rdy; NOW VERSION 1 Aug 25 08:4  
Title; SEABIRDS SNIFF ROUND THE SOUTH ATLANTIC Dur'n: 3:3 Lang: SIM

ACTUALITY ON TAC 95 34 174

S 261

*CUE:*

The Southern Ocean produces some of the most savage storms in the entire world, so you have to be tough to survive there. Sailors who navigate those waters are renowned as tough and self-reliant, but they've come to revere the birds that share their world and manage to survive in the turbulent skies above the Southern Ocean. Legend has it that to kill an albatross is to bring bad luck on a ship. In fact the habitat is so remote and so severe, that the lives of these birds are relatively undocumented. But this week's **Nature** carries news of some research that will help us understand a little bit more about these remarkable species. David Vaughan of our Science Unit reports.

*NARR:*

Gabrielle Nevitt and her colleagues from the University of California spent several months last year in a ship in the South Atlantic trying to find out how petrels and albatrosses can survive in these hostile conditions and, in particular, how they find their food...

*TAPE BAND 1*

**"The birds are presented with a difficult problem in that their prey is distributed in patches. [So finding it is much like trying to find a needle in a haystack.] For a bird to survive in that environment it not reasonable to think that it would wander round haphazardly hoping that food might bump into it, or that it might bump into food. Some of the elegant satellite tracking that has recently been done by the British Antarctic Survey has shown that black-browed albatrosses may travel thousands of kilometres on a single foraging expedition. To retrieve one meal for a chick on the nest they may have to travel thousands of kilometres, and that's quite a way to be searching for prey haphazardly."**

*NARR*

From the analysis of stomach contents we know that these birds feed on zooplankton [*animal plankton*] such as krill. Overall these are not plentiful, but they do tend to congregate in swarms to feed on phytoplankton [*plant plankton*]. The birds must attempt to locate these areas, but when such great distances are involved, how can they do it, especially as they are well below the water...Gabrielle Nevitt thinks she has found the answer...

*TAPE BAND 2*

**"We think that one way they do it is use their sense of smell to locate areas where ocean productivity is high. Dimethyl sulphide gas is given off by phytoplankton, when they are eaten by zooplankton. We speculate that seabirds may be able to smell these odour emissions and could use these odours as a cue in their foraging. We did**

**two sets of experiments. In one set we deployed scented vegetable oilslicks [from the ship]. So we presented the birds with scent of dimethyl sulphide on the water and we compared the response of the birds to these scented oilslicks with their response to slicks that were not scented. We found that many species were more responsive to the scented oilslicks. The other thing we did was to present birds with aerosol plumes [a cloud of the scent sprayed into the air]. Then we monitored how the birds were able to follow the odour plumes. We found that some species were much more responsive than others"**

NARR

What it so surprising is that the birds are not sniffing out the scent of their prey but that of their prey's prey. For a species to depend, so entirely, on such an unusual mechanism is remarkable in itself. But Dr. Nevitt and her colleagues take the idea further. They suggest that the birds may also be using this highly-developed sense of smell to navigate. In the same way that we can find our way around in a landscape of hills and valleys, they suggest that albatrosses and petrels may be navigating though a landscape of smell. Semi-permanent hills and valleys in the smell-landscape may guide them round the ocean. The idea may sound far-fetched, but remember that many long-distance sailors claim that they can smell land a hundred miles away!

PACKAGE COULD END HERE OR...

NARR:

*Now any smell, any perfume, worth flying a thousand kilometres for, is obviously very attractive, at least to the birds! And I was thinking that such a powerful attractant could be very useful if it would work on other animals. I suggested to Gabrielle Nevitt that perhaps dimethyl sulphide could might also be useful for attracting humans. Sadly, I couldn't have been more wrong...*

TAPE BAND 3

*"Unfortunately, humans can smell it and [to humans] it's not the most pleasant smell. Some even find it nauseating. It's a smell that's associated with the sea, a bit like oysters or rotting seaweed."*

SOURCES. NATURE, INT with GABRIELLE NEVITT  
JW

Id; SC By; DAVID VAUGHAN Ext; 232 Rdy; NOW VERSION 1 Aug 25 13:4  
Title; SOLUTION TO SLOW START CATS Dur'n: 2:3 Lang: SIM

*CUE:*

Fitting a catalytic converter to your car will radically reduce the levels of some of the pollutants that it gives off. But only if you drive far enough! In the first five minutes after starting normal catalytic converters haven't warmed up enough to do their job. And since most journeys are only a few miles, many cars are driving with ineffective converters. But now a company in USA has developed a catalytic converter that heats up to a working temperature of 350 degrees Celsius in less than 5 seconds. Philip Burghart explained the problem to David Vaughan of our science unit.

*TAPE BAND 1*

**"At present when you start your car it takes at least two minutes for the exhaust to heat up enough to ignite or start the catalytic converter. Catalytic converters are very efficient devices for reducing pollution, but about eighty percent of the pollution that will be released in a days driving will be released in that first two minutes. So the idea we have, is to get the catalyst going in a matter of seconds rather than minutes. In order to do that, we have to provide a heating source that will do it, quickly, safely, reliably and repeatedly over the life of the catalyst and the automobile. ERGENICS has invented a device that has done this practically and simply."**

*NARR*

The ERGENICS invention, is called a Hydride Cold Start Heater, and works by exploiting a chemical reaction between hydrogen gas and two metal hydrides. When the car is started up a small switch allows the hydrogen to pass from a storage container to a reaction bed, where the reaction generating the heat takes place. When the engine warms up to its working temperature the reaction is reversed and the hydrogen regenerated and the storage container filled, ready for the next start. Philip Burghart explains the advantages of this system over it rivals...

*TAPE BAND 2*

**"The competition for us thus far, is an electrically heated catalyst. The drawbacks of it is that it requires, enormous consumption of electric power and probably battery and a specially upgraded alternator and power cables and additional convertor, and all these things add to the cost. So we believe that we have a considerable economic advantage over that electrically heated catalyst approach. This is exceedingly important for cleaning up the world and it can be easily done using our device that is not expensive and works very well."**

*NARR* Another major advantage of the Hydride Cold Start Heater can be added to the car after manufacture, and so could be fitted to cars already on the road. ERGENICS is currently looking for a business partner who will invest the money required to turn their prototype into something we could buy in the shops.

Id; SC By; DAVID VAUGHAN Ext; 232 Rdy; NOW VERSION 1 Aug 31 11:1  
Title; EURO-NAUT TO FLY TO MIR Dur'n: 2:3 Lang: SIM

ACTUALITY ON TAC 95 35 165

S 272

**CUE:**

At the Baikonur Cosmodrome [*launch site*] in Kazakhstan, final preparations are now underway for Sunday's launch of EUROMIR 95. This is a joint space-mission, planned to last 135-days which brings together Russian expertise and hardware and European money. Launch will be from the same launch pad that was used by Yuri Gagarin in 1961 for the first manned space flight. This time two Russian cosmonauts and one German will take-off. They will link up with the Russian orbiting complex Mir, replacing its current crew of two cosmonauts. David Vaughan of our Science Unit has been finding out what they will be doing in the next four months.

**NARR:**

During the 135-day EUROMIR flight, Thomas Reiter a former Tornado jet-fighter pilot from Germany will be the European representative on Mir. But he will be much more than a passenger! He's the flight engineer, and it's planned that on 20th October, Reiter will step outside of the space station for a five-hour space walk. Whilst outside the space station he will install some experimental equipment to the outside of Mir.

The EUROMIR project is costing the European Space Agency some 50 million pounds sterling, and the main goal of the flight is to accomplish around 50 research projects. These have been designed by scientists from all over Europe, particularly to exploit the weightless conditions that they cannot reproduce on Earth. The experiments range from the preparation of new composite materials, to detecting micrometeorites and space-trash orbiting the Earth. The most intensive research will, however, be on the human occupants. Almost every aspect of physiology will be studied from breathing patterns and heart rate, to the effects of weightlessness on bone density.

*Optional Paragraph:*

*Since early on in the history of manned space flights it has been well known that the human body suffers many changes in weightless conditions, one of the most important being a serious reduction in density and strength of the weight-bearing bones of the legs. This can be up to 2% per month. This rate of loss could be highly significant, for example, over the three years it would take to fly to Mars. Two experiments will be testing new counter-measures designed to reduce this bone loss. The first uses a tourniquet to increase blood pressure in one of the cosmonaut's feet. The second, will use a specially designed exercise bicycle that will strike one heel of Thomas Reiter 500 times in 10 minutes in an attempt to simulate walking. When the pair return, scientists will compare treated with untreated feet and look for evidence that the stimulation has prevented bone loss.*

But the experiments being done on EUROMIR are not just of academic interest, and they are not being done simply in the hope of paving the way to Mars. Dr Heinz Oser from European Space Agency explains that the experiments are actually much more of

terrestrial interest.

*TAPE BAND -*

**"There are definitely some spin-offs coming. Once you understand how the bones and muscles deteriorate with the lack of mechanical stimulation... once you understand the mechanism behind it, you can easily employ this in designing therapeutical measures to the benefit of all people who suffer from diseases causing muscle weakening or bone brittleness, say osteoporosis. The second goal is that Europe gains first hand experience in long term space flight"**

*NARR:*

The crew will be celebrating Christmas and New Year in space, but a new crew will arrive to replace them on January the 10th. Shortly after, Reiter and his colleagues will have the usual hard landing, in the steppes of Kazakhstan, only to begin a gruelling set of post-mission tests back at Moscow..

*SOURCE: AGENCIES*

JW

Id; SC By; DAVID VAUGHAN Ext; 232 Rdy; NOW VERSION 1 Sep 6 09:4  
Title; SEA LICE LURED BY BRIGHT LIGHTS Dur'n: 3:1 Lang: SIM

*TAPE INSERTS ON TAC 9536 155*

S 283

*CUE:*

For 30 years the sea lochs [*inlets*] of Scotland have seen the growth of a massive industry, salmon farming. But in recent years the industry seems to be suffering from a very unwelcome visitor, the sea-louse. David Vaughan of our Science Unit has been investigating.

*NARR:*

Scotland produces some 60 000 tons of farmed salmon per year, but the industry is now threatened not by overseas competition but by an undersea invasion. The invaders are around 5 millimetres long and are related to shrimps and prawns. Salmon have always suffered from these small crustacean parasites called sea-lice, but, in the crowded conditions of the farms, the problem can infect an entire farm. Infection isn't fatal but it does cause unsightly abrasions on the salmon's skins, making them susceptible to infections and reducing their market value.

Until now, salmon farmers have protected their shoals by transferring them into holding tanks and washing them with a chemical disinfectant. These are expensive, and are eventually released into the environment. Disinfecting is difficult for the farmers and very stressful for the fish. Worst of all the sea-lice seem to be getting immune to the disinfectant.

But now, a Glasgow company has answered the plea of the salmon farmers and hit on an idea for removing the sea-lice without chemicals and without disturbing the fish. Baxter Binnie from Terecos [*Ter-ray-cos*] explains how they go about it:

*TAPE BAND 1*

**"We have a solution to the problem, which is to use a sea-lice lure. We can attract the free swimming larval stages of the sea-lice and subsequently trap them, so that the sea-lice cannot get to the salmon and cannot develop to maturity. Therefore we break into the lifecycle of the sea-lice and reduce the number of sea lice that infest the salmon farms. By using a system of lights that can be pulsed or flickering, the sea-lice are attracted closer to the lure and congregate in ever-increasing numbers. Giving us the opportunity to pump them from the sea and filter them through a plankton net. We don't know very much about the behaviour of the sea-lice but it is my feeling that they are attracted to the lure because it simulates the light reflected from the skin of the salmon, or the way a shoal of salmon can break up the light."**

*NARR*

The new invention uses no chemicals and there's no need to move the fish. About ten sea-lice traps are required, set around each fish farm. The traps cost about £2 500 each. The

first fully equipped farm will make quite a spectacle because each trap resembles a flashing christmas decoration more than half a metre across. Baxter Binnie explains...

*TAPE BAND 2*

**"The sea-lice lure consists of two concentric spheres *[one inside the other]* made of transparent PVC. The luring surface is the inside sphere and the sea-lice are attached towards it. The outside sphere is perforated and they can swim into the gap between the spheres. A tube fitted to the top of the sphere allows the water to be sucked out from the gap between the spheres, the sea-lice trapped in this gap are pumped out."**

*NARR*

The invention may also be of interest to salmon farmers in Chile and Norway, who produce even more farmed salmon than Scottish farmers do. It could also be used to catch other fish parasites. *[The Scottish Development Agency was so impressed at the new invention that they have nominated it for this year's John Logie Baird Award. This is a prestigious technology award, whose previous winners have included a so-called "magic-eye", that is now used for judging the bounce of the ball in tennis tournaments.*

*But back at the fish farm...]* having been lured into the trap by the flashing lights, then sucked up to in an undersea vacuum cleaner; the final indignity still awaits the sea-lice. Being a good source of protein, the dried sea-lice make an ideal food for turbot and halibut in other fish farms.

*END*

*SOURCE: Agencies, Scottish Development Agency, Own interview.*

*File: Agric - fisheries.*

*MR*

Id; SC By; DAVID VAUGHAN Ext; 232 Rdy; FRI VERSION 1 Sep 7 17:5  
Title; DEEP STIRRINGS IN THE MEDITERRANEAN Dur'n: 3:4 Lang: SIM

*CUE:*

Palaeoclimatologists say they must have happened, and ocean modellers have predicted them but we never seen one, at least not a big one, what are they? Changes in the deep circulation systems in the oceans. David Vaughan of our science unit has been talking to a group of oceanographers who have spotted the first stirrings of the deep oceans...

*NARR:*

More than a thousand metres below the waves, there lies a dark and silent kingdom. Unexplored and generally barren of life, very little is known about the deep oceans of the world, except that very little happens there. Currents are slow but not static, driven along defined routes by differences in temperature and saltiness [*the so-called thermohaline circulation*]. Earlier this year oceanographers aboard the germany research vessel Meteor, led by a team from the University of Bremen, found evidence that the deep ocean may be more active than we thought...Dr Birgit Klein was on the cruise...

*TAPE BAND 1*

**"We found that the deep circulation in the Mediterranean had changed. The water mass had changed in a very large way. The water had got warmer by 0.5 degree celsius and saltier. We found that most of the deep water in the deep Mediterranean was affected by this change. So we are talking about a very large area. Previously, this area received its water from a single source in the Adriatic Sea and that corresponded to a very homogenous [*constant*] deep water mass. Now we think that the Aegean Sea also produces deep water and the deep water that comes out of the Aegean is much warmer and saltier than the old deep water. Actually, I recall when we took the first measurement in the Mediterranean, we had an idea what the profile should look like and it turned out so much warmer and saltier, we thought our instrument wasn't functioning properly. So we did a lot of profiles before we believed that this was real and affecting a large area.**

*NARR*

The result came as such a big shock, because since the beginning of the century samples taken from the deep Mediterranean have always been similar. The change seems to have taken hold since the last set of measurements in 1988. Now for those of you swimming off on the beaches of Europe, don't worry, you won't be aware of the changes spotted by the oceanographers because this deep water, is really deep, more than 1500 metres. So, how could it be important? Birgit Klein again...

*TAPE BAND 2*

**The significance of the result is that a lot of our theories of deep water formation assume that this is a very stable process. The formation sites are long-established**



**and it is a steady process. To see it change is a unique result. There have been other findings in the Arctic , for example, that show the formation of deep water suspended for a couple years. But, to see a new formation site established, and sea-water properties change, is a very interesting finding. Now we have to figure out what is responsible for this change.**

*NARR*

Candidates for the mechanism causing the flip are, changing patterns of evaporation, related to changing climate, or the damming of rivers feeding the Mediterranean Sea. But, at present the scientists cannot rule out a natural flip from one stable state to another.

On the global scale, the patterns of surface and deep water circulation in the oceans is a fundamental control on the climate of the Earth. For example, without the current called the Gulf Stream, western Europe would be around 10 degrees Celsius colder than it is today. During the ice ages we believe that another current, the North Atlantic Conveyor, stopped abruptly causing and rapidly dropped the temperature over Europe and North America. No-one is suggesting that the present flip will produce anything but small environmental changes but for oceanographers used to the idea that the deep oceans have been asleep for thousand of years, these stirrings will begin a new era of observation and debate.

*SOURCES: NEW SCIENTIST 2/9/95, TEL. interview.*

Id; SCI By; DAVID VAUGHAN Ext; 2471 Rdy; NO VERSION 1 Sep 12 10:4  
W

Title; ALBATROSSES,SEALS,PENGUINS-ALL WIRED UP Dur'n: 4:3 Lang: SIM R

**FROM THE BRITISH ASSOCIATION IN NEWCASTLE** S 301  
*ACTUALITY ON TAC 95 37 097*  
*CUE*

Imagine the shock of lying down on the beach for a quiet doze in the sun and waking up to find a radio transmitter and antenna glued very solidly to your head. It may sound like a nightmare, but apparently seals and birds don't seem to mind very much. David Vaughan has been to the British Association for the Advancement of Science meeting in Newcastle this week to find out more.

*NARR*

For 10 years the British Antarctic Survey has been electronically tagging the seals, penguins and albatrosses, that roam the Southern Ocean. Monitoring the signals provides the scientists with a record of their movement and body functions. The transmitters are not so large that they hamper the animals as they search for food, and the ones that are tagged may well be helping their entire species to survive. In the last few seasons Dr John Croxall has been tagging and tracking some of the world's largest flying birds.

*TAPE BAND 1*

**"The most remarkable species is the Wandering Albatross. We have tracked these three-quarters of the way from South Georgia to Australia. That's a journey of 25 000 kilometres done in less than a month. And Wanderers routinely forage away on trips of seven to ten thousand kilometres travelling at 80 kilometres an hour. So they are astonishing ocean wanderers as their name implies."**

*NARR*

These are obviously very robust birds, capable of surviving in a most hostile environment. But is the species as a whole robust? And can they adapt to sharing the southern oceans with man?

*TAPE BAND 2*

**"They are fairly robust in the sense that they cover great distances quickly, but the whole of their breeding strategies and adaptations are geared to very long delays. They don't become sexually mature until they are 10 years old and then breed only once every two years. So they have very low reproductive rates. Of course, to balance the equation they have to have very high survival. And what we're finding is that, in the last decade, their survival rates have taken a real tumble. They've shown significantly reduced adult and juvenile survival rates. As a result, their numbers have dropped quite markedly and will go on declining. And because of the low juvenile survival rate, it will remain low for at least another decade."**

*NARR*

Dr. Croxall and his colleagues have calculated that around 40 000 birds per year are being lost from South Georgia alone. But where are they going? This has been the puzzle for some time. But using the data from the tagging, the scientists have found out where the albatrosses are coming to grief...

*TAPE BAND 3*

**"They're being caught on what are known as long-lines. This is a particular fishing technique where long lines have baited hooks attached to them. The bait on the hooks are fish and squid, which tend to be Albatrosses' favourite food...a single deployment will involve tens of thousands of hooks and several kilometres of line, being launched into the ocean. And because these lines don't sink immediately - they take time to sink astern of the ship - the albatrosses attempt to take bait off the hooks. They are often successful, but sometimes the hooks successfully catch the albatrosses. They are dragged underwater and drowned. A proportion of them are retrieved when the line is hauled in."**

*NARR*

The fishing vessels involved generally belong to Japanese Companies and occupy the waters off Uruguay and Argentina and off the south-west coast of the Africa. But now that the scientists have identified the problem, is there anything that can be done?

*TAPE BAND 4*

**"The single most effective measure is not to set [launch] the nets during the hours of daylight. However, in many long-line fisheries this is either not practical, or at least not popular. The second most useful thing they can do is to use streamer lines on the ends of poles, and these work by whipping around behind the ship in a way that the albatrosses cannot easily get through this curtain [formed by the streamers] to reach the baiter hooks...Some of the Japanese fishing masters, who first developed the streamer technique, developed their own methods to try and reduce the catch of albatrosses and increase the catch of fish. So these techniques are, in fact, compatible with good fishing practice. The problem is persuading entire fleets to adopt the techniques, to use them effectively and to monitor the reduction in albatross mortality that this causes."**

*NARR*

Sadly, even if all of Dr. Croxall's precautions were adopted immediately, the albatrosses won't recover for more than a decade. But, having sorted out the mystery of what happens to them, Dr. Croxall and his team are now putting together all their transmitter data, including that from seals and penguins, to locate the ecologically sensitive areas in the South Atlantic. These are areas on which many species depend for their survival, and which Dr. Croxall believes must be well-managed to ensure the survival of these creatures.

ENDS JW

Id; SCI By; DAVID VAUGHAN Ext; 2471 Rdy; NO VERSION 1 Sep 14 12:2  
W

Title; ENGLISHMAN, BRITON OR Dur'n: 4:1 Lang: SIM R  
EUROPEAN

**FROM THE BRITISH ASSOCIATION IN NEWCASTLE** S 312  
*ACTUALITY ON TAC 96 37 190*

*CUE*

What does it mean to be British, or French, or a Londoner or a Parisian [*or whatever*]? Does it matter? Can governments change the way we feel about our national identity? David Vaughan of our Science Unit has been watching the debate at the British Association for the Advancement of Science, in Newcastle.

*NARR*

In recent times the European Union has tried to engender a sense of "European-ness" that transcends its citizens' sense of national identity. Indeed, enshrined in the treaty of Rome there is the goal of forging an "ever closer union among the peoples of Europe". At the same time Europe is experiencing a resurgence of extreme nationalism and political parties on the extreme right of the political spectrum.

A sense of group identity is something we all have, and it seems to be essential if we are not to feel isolated in a frighteningly vast world-community. But as Dr Cris Shore of London University pointed out, it isn't easy to implant in most people the sense of belonging to a "global village".

*TAPE BAND - 1 Cris Shore*

**"We belong to a local community, and certain associations, and beyond that, we belong to a regional entity, and beyond that, a national entity, and possibly a European one. But the problem is that the further out you go, the more general and the weaker that sense of identity becomes."**

*NARR*

*But the strong sense of national identity that most of us have isn't something we're born with. So where does it come from? Dr Martin Barret of the University of Surrey has been investigating how and when children develop a national identity*

*TAPE BAND 2 Barret*

*"There is no straightforward answer to that, because the process of acquiring a national identity is stretched out over several years of a child's development. The evidence that we have so far suggests that, before the age of five, children have very little awareness of their own country or national group. And it's only from this age onwards that they home in on the attributes of the national group and that they themselves are members of that national group in which they live. However, they still may not have a preference for their own*

*national group for another two to four years. And so this preference only develops at seven to nine years. During the period from five to ten years of age children are in the process of acquiring substantial amounts of knowledge about the national group. For example, national emblems and symbols... currency.. flags.. acquiring knowledge of the customs and institutions that symbolise the national group. So in the case of English children, acquiring a knowledge of the Royal family, of Big Ben, of cream teas and fish and chips. Things that distil the essence of Englishness"*

NARR

*For the researchers it is a relatively simple matter to measure a child's development. What is more difficult is to determine the factors that influence them. I asked Martin Barret where children get the cues and information that go to form their national identity.*

TAPE BAND 3: Barret

*"The obvious answer to that question, one might think, is from their parents, that it's parental attitudes, and possibly the way that parents bring their children up that shapes and moulds their children's national feelings. Although that's superficially a very plausible idea, the evidence is much more ambivalent. There's no direct evidence on the relationship between parents' and children's national attitudes. But there is some evidence, collected in several studies on the relationship of parents attitudes to members of other races and their children's racial attitudes. And this evidence is much more ambivalent than one might think! Some studies have failed to find any relationship and other only a modest correlation. So, I think that there are other sources of information which are much more salient and have a much greater impact than parents themselves."*

NARR

*These other sources of information that affect us and our children were described by Dr Mick Billig of the University of Loughborough. He's been looking at how symbols, or "flags" of national identity pervade our society. He suggests that these symbols are everywhere, on television and in the newspapers. Sport is reported in national terms, weather forecasts are given in national terms and even references to "The Prime Minister" implies an entirely British outlook. It seems likely that this pervasive "flagging" of national identity may actually be one of the most important source of information that children acquire in the course of their development.*

*Dr Cris Shore explains that, by changing some of the cues that generate our sense of national identity, the European Union hopes to spawn a new generation of Europeans...*

TAPE BAND 4 - Cris Shore

**Since 1985, and 1986 there has been a conscious attempt on behalf of the European community to invent the symbols for a new European order. We've seen the creation of the European flag, the European passport, the European anthem, an emblem, number plates, and so on. The assumption is that these will become the symbolic carriers that will help to germinate an embryonic culture and identity. The project, so far as the European Community is concerned, is not simply to create a greater consciousness of Europe among the citizens but, much more ambitiously, to create a new kind of European consciousness, to change people's subjectivity, to make Europeans of us all"**

NARR

This is not however a simple process, and even if successful it could, ultimately be very dangerous...

*TAPE BAND 5 Cris Shore*

**"One of the cardinal tenets of anthropology, is that identities tend to be formed in opposition. We tend to define ourselves and our collective identity, not in terms of who we are, but primarily in terms of who we are not. English identity is formed in contrast to French identity or protestant identity is very much contingent upon there being an oppositional catholic identity. And as a result, in order to reinforce a collective European identity, there has to be a stronger non-European other, whose presence can galvanise us into realising our collective, shared cultural values. In the [distant] past it was Islam that provided a tangible and identifiable opposition. During the Cold War it was the Soviets and the Eastern bloc. With the collapse of the Cold War and the ending of the division of Europe there are fears that the new "other" is likely to be Muslim fundamentalists, or just non-Europeans. And as the boundaries within Europe come down, the walls that separate Europe from non-Europe grow ever taller and sharper."**

NARR

So has the policy of Europeanisation been successful? Are there yet, any citizens of planet Earth who consider themselves, first and foremost, as Europeans. Dr Shore thinks so...

*TAPE BAND 6 Chris Shore* **"There is a growing phenomenon, the growth of a new class or cadre of European citizens. Those are people who primarily work in international organisations or within the institutions of the European community itself, who rub shoulders on a daily basis with other nationals and are conversant with two, three, maybe four, or more European languages, whose whole experience and therefore mind-set [outlook] has been shifted. They have come to see themselves first and foremost as Europeans and only secondly as nationals. I think this colours the perception of the European Community and gives it a great optimism about the possibility of inculcating the rest a similar sense of European identity in the rest of the population."**

NARR

Perhaps those Euro-minded inhabitants of in Brussels will turn out to be models for the rest of the citizens of Europe. But the Anthropologists speaking in Newcastle seem agreed that the path will be both difficult and treacherous. In trying to create a generation in their own likeness, the denizens of Europe.. these would-be engineers of supra-national sentiment, should be careful not to create a monster.

ends

*FILE ANTHROPOLOGY*

JW

Id; SCI By; DAVID VAUGHAN Ext; 2471 Rdy; NO VERSION 1 Sep 14 14:2  
W

Title; IMPROVING THE "NEE-NAA" SIREN Dur'n: 1:4 Lang: SIM R

**FROM THE BRITISH ASSOCIATION IN NEWCASTLE** S 314  
*ACTUALITY ON TAC 95 37 204*

*CUE*

Have you ever sat in a car, almost deafened by an ambulance siren, but totally unable to work out where it's coming from. Well this could soon be a thing of the past. David Vaughan of our Science Unit went to the British Association for the Advancement of Science meeting in Newcastle to find out why the sound of the city may be about to change forever.

*TAPE BAND 1 - old siren*

**NEE-NAA-NEE-NAA...[FADE UNDER...]**

*NARR*

The sound of an ambulance speeding to the scene of an accident. You can certainly hear it coming...but from which direction? Deborah Withington of the company Sound Alert Ltd. explains the problem...

*TAPE BAND 2 - Deborah Withington*

**"A siren sound should fulfil two functions: it should alert you to the presence of an emergency vehicle and it should tell you which direction the emergency vehicle is coming from. All existing sirens - and the NEE-NAA-NEE-NAA is just one example - fulfil the first function. They alert you to the ambulance, fire-engine or police car, but the don't tell you where it's coming from"**

*NARR*

Existing sirens don't contain enough sound frequencies to allow our ears and brains to locate the sound with any degree of accuracy. The sound needs to be more complex. Simply making it louder wouldn't improve matters - it would just cause more disturbance.

*TAPE BAND 3 - Deborah Withington*

**"On theoretical grounds the best sound would be white noise, a sound like static... ssssssh. But although, that would be good for location, because it contains all frequencies, is doesn't alert people. So we have created a sound that contains an alerting component and a localising component. We've come up with a sound like this..."**

*[SEGUE]*

*TAPE BAND - new siren*

**wack-wack-wack-phhht wack-wack-wack-phhht**

*NARR*

Deborah Withington's two-phase sound is about to begin road-tests with the ambulance service in the UK, and may be on sale within six months. So if you're out on the road and you hear this sound...

*TAPE BAND - new siren*

**wack-wack-wack-phhht wack-wack-wack-phhht**

*NARR*

...get off the road and out of the way!

ENDS

JW



Id; SCI By; DAVID VAUGHAN Ext; 2471 Rdy; NO VERSION 1 Sep 15 13:1  
W

Title; POWER GENERATION FOR THE NEXT Dur'n: 3:5 Lang: SIM R  
GENERATION

**FROM THE BRITISH ASSOCIATION IN NEWCASTLE** S 316  
*ACTUALITY ON TAC 95 37 238*

*CUE*

Human desire for energy seems insatiable. In the developed world each of us consumes, the equivalent of, between 4 and 8 tonnes of oil every year. David Vaughan reports from the British Association for the Advancement of Science where Prof. Ian Fells looks forward to the near and distant future of power global power. His message? In the short term don't give up on nuclear power; it's probably the only option. And in the long term - look beyond the stars to black holes!"

*TAPE BAND 1*

**"We're not really short of oil, gas and coal, at the moment, we think that it might last a hundred years or so. But we're going to be using more energy as the World population doubles over the next 30 or 40 years, and as people in the developing world feel that they want more energy, as they industrialize. So I'm looking to the middle of the next century and by that time, we are going need all the sources of energy available. And that includes nuclear energy, which provides about one fifth of the world's electricity at the moment, and it does that cleanly without producing carbon dioxide, which is a greenhouse gas. The big question is can we make nuclear fusion work, this is where we take atoms of hydrogen and squeeze them together to generate energy, just as it happens in the Sun. The future as I see it, involves using all the various sources: renewable, fossil fuel and nuclear sources. There is no way that renewables for instance are going to replace nuclear power."**

*NARR*

Professor Ian Fells argues that we should take the long view when considering which sources of energy should be developed to power the lives of future generations. Contrary to some currently fashionable "Green" outlooks, Professor Fells cannot envisage a future where advanced technology doesn't play the greatest part. Sustainable natural energy resources, he says, just couldn't cope with the demand...

*TAPE BAND 2*

**Let's take the popular renewable source, which is wind power. If you add up all the wind generators in the world. And there are parts of California and Denmark and Southern Spain where we have huge wind farms with hundreds of wind generators. If you add it all up, it comes to about 4 000 MegaWatts, that's the same as one large power station...so you can see you can't replace nuclear power with it. It's a valuable addition because its clean. There's more potential in wave power if we can make it**

**work, but the engineering turns out to be very difficult.**

*NARR*

Professor Fells won't rule out a plentiful source of energy hidden on Earth, but pushed to look further into the future, he imagines a solution from space.

*TAPE BAND 3*

**"If I really look ahead a couple of hundred years or thereabouts, we will be able to control gravitational waves. We very good with electromagnetic waves, we can really control them, we understand the science, we can build amplifiers. We known almost nothing about gravitational waves. But maybe in a hundred years or so we will be able to build a gravitational amplifier, and that way we'll be able to develop generators that will see us through for 10 million years or so."**

*NARR*

The gravitational waves described by Ian Fells were predicted by Einstein's theory of General Relativity. Several research groups around the World are racing to be the first to observe gravitational waves. Although theoreticians are convinced they must exist - spreading out through the Universe from rapidly rotating star systems - Professor Fells envisages a controllable source of gravitational waves in the form of a very small black-hole, perhaps as small as an atom, but as heavy as a mountain. But this is a long way in the future and in the short-term he warns against discounting any option...

*TAPE BAND 4*

**"The big mistake would be to say, that we'll abandon the nuclear option. That would be a very dangerous thing to do. I think we're going to need all the nuclear power, all the coal, all the oil and gas, and all the renewables that we can get, and then maybe we can get fusion to work. But ultimately, perhaps the gravitational generator would be the way ahead."**

*END*

*SOURCE Interview at BAAS meeting JW*

Id; SCI By; DAVID VAUGHAN Ext; 2471 Rdy; NO VERSION 1 Sep 13 10:5  
W

Title; SHOULD WE WIPE THE SLATE CLEAN Dur'n: 3:5 Lang: SIM R

**FROM THE BRITISH ASSOCIATION IN NEWCASTLE** S 307  
*ACTUALITY ON TAC 95 37 148*

*CUE*

It seems that almost any subject is open for discussion at the British Association for the Advancement of Science meeting in Newcastle this week. David Vaughan has been talking to one speaker who has some very unusual ideas about conservation... ideas to keep Europe looking dirty!

*NARR*

Here in Newcastle the science isn't locked away in the lecture halls of the University; you can see it all around. Dr Bernie Smith of the University of Belfast dragged me out into the busy city centre to show me some of the buildings that interest him...

*TAPE BAND 1*

**"We've literally come across the road from the University to Saint Thomas' Church which is typical of many of the sandstone churches that were built in this part of northern England from local sandstone. And I think that you'd agree that the outstanding feature of this church is that about 90 percent of it is black. The only bits that aren't black are the bits that have been replaced recently; giving a nasty patchwork effect to the church. This blackness is a consequence of pollution. It's not pollution itself but a reaction between the pollution in the atmosphere and components of the sandstone, especially the mortar which are rich in lime, eventually producing gypsum, or calcium sulphate which is salt that grows on the surface as a black encrustation. But also gets into the stonework, and by expanding and contracting as it gets wet and dry, causes physical breakdown of the sandstone. It's not just the blackness that we should be looking at, because especially at ground level the stone is flaking away quite seriously.**

*NARR*

Different types of stone react quite differently to the same levels of pollution. And the problem is complicated by the amount of rainwater and sunlight falling on any particular part of the building. But the lessons learned by Dr Smith in the UK may be of value elsewhere...

*TAPE BAND 2*

**"We're part of a European network looking at the effects of acid pollution on buildings throughout the European Union and Eastern Europe [including Budapest and Venice]. The things that we are particularly interested in are the effects of legislation on**

**buildings. Most of Europe is covered by legislation preventing atmospheric pollution, mostly restricting the burning of coal and oil from domestic sources and power stations. But the problem with these buildings, certainly the church we're looking at, is that the pollution that's causing the damage was released before the legislation was enacted and, of course, unless it's removed it will continue to have a deleterious effect on the stonework. Certainly the salts that were produced many tens if not hundreds of years ago will continue to act long after legislation has been enacted within this area."**

*NARR*

The cleaning of buildings can be useful in some cases, but in others the removal of the crust can expose a softer surface and increase the rate of the decay. Dr Smith cites many examples of mismanaged cleaning projects that have led to more problems than they have solved. He suggests a different and somewhat radical approach..

*TAPE BAND 3*

**"Speaking as someone who works in a University, I think the key to this is education. I think we have to educate people to appreciate that buildings are not things that remain clean and white forever. They do mature with age, they do change. Perhaps, this is sometimes due to pollution; often it's just a natural process of decay. So people should come to accept that the black crusts that we see on buildings are in a product of that building's history and are as valid a part of the architecture as the original design of the building. We have to remember that while to some people these black crusts are an eyesore, to others they are an interesting testament to the history of the building."**

*NARR*

If Dr Smith's idea gain acceptance, perhaps we could imagine a time, in the not too distant future, when city planners enact legislation to prevent the cleaning of buildings, in an attempt to preserve the black crust...a relic of that interesting and dirty period the late twentieth century.

ends

*SOURCE: BRITISH ASSOCIATION MEETING  
JW*