

Scientists for Global Responsibility

Newsletter No. 23

July 2001

Star Wars – Space Control and Domination

Philip Webber

An expanded version of a talk given at “No Star Wars: An International Conference to Keep Space for Peace”, Leeds, May 4-6th 2001

See page 16 for reviews of the conference and workshops

Let's remind ourselves where we are. ...We live on a blue green planet with a layer of atmosphere about 100 km thick (that's the thickness opaque to X rays). If we were living on an apple we'd be in the sheen on the skin, on a cricket ball in the dust on the surface. We are already polluting this fragile environment, the land the seas and the atmosphere – millions are already living in dire poverty or in various nasty regional conflicts. We already have a global nuclear overkill several tens of times over. We already have considerable offensive capability. Possibly the very last thing we need is to spend a few hundred billion on a new version of Star Wars.

As I said, space is only 100 km away. If you could drive there straight up it would only take you an hour – less distance than many travel each day. As I said we also live on a globe, a sphere. It's roughly 13,000 km in diameter. The net result of this and the fact that the earth spins daily, is that any effort to create a so-called missile defence system has to be global. An inter-continental ballistic missile travels about 90 degrees around the curve of the globe to reach its target taking some 25 to 30 minutes doing so.

There are many possible trajectories or paths round the curve of the earth so you need to be able to have ways of stopping missiles in several places.

For example, at the re-entry phase you need the Point defence or final layer defence of anti missile missiles. Then, as 30 minutes to disaster doesn't give much time to think, you also need a global surveillance system to see round the curve of the earth to the point at which the missile is launched. This is where the SBIRS high and low come in - that is, Space Based Infra Red (heat) Satellites in orbits of a few 100 km (low) and in 10,000 km (high) orbits (4 in geosynchronous orbits, 2 in elliptical orbits). Another element is new radar arrays and additional signal processing and communications requirements. This is where Menwith Hill (a relaying and signal processing station for SBIRS) and Fylingdales (early warning radar including X band radar with greater target resolution than currently possible) enter the picture.



Global surveillance gives rise to the idea of trying to hit missiles at launch. This in turn means that you need to be able to launch missiles or fire laser weapons from near to the launch site which in turn means a fleet of ships and/or a global array of bases with this quick response capability. A quick response capability is another way of saying pre-emptive strike or hair trigger response, and raises the likelihood of horrible accidents.

Something capable of shooting down a missile at launch – and a missile is designed to be robust – could mistakenly (or deliberately?) shoot down anything in the sky, any plane, military or civil.

In the old star wars system, it was envisaged that any quick response or automated anti missile launch system would mean that all civil and military planes would have to be grounded. Quite apart from the risk of inadvertent targeting of aircraft the sheer numbers of objects in the air already stretch air traffic controls to the limit. Adding the need to distinguish launch missiles within five minutes and to disable them creates a currently intractable processing task.

So, the very concept of NMD almost guarantees the need for a grotesque military system with a global array of bases, radar, ships, lasers, satellites and so on. Almost a licence to print money once the concept is supported. This is the US “Pork Barrel”: big money for big supporters of Bush's election campaign.

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News from SGR

A few words from the Chair..

Stuart Parkinson

I should perhaps start this column by pointing out that, after nine years as Chair of SGR (and one year as Chair of Scientists Against Nuclear Arms, SGR's predecessor), Phil Webber has decided to step down. So as from the AGM on 6th May, I have been the Chair of SGR. So I hope you'll join me in thanking Phil for doing such a good job in co-ordinating SGR/ SANA activities over this period. His contribution has been particularly impressive when you remember that the post is a voluntary one and he has managed to do it in parallel with his full-time job and raise a family as well! So thank you, Phil - you'll be a hard act to follow! Phil has agreed to stay on as Vice-Chair so we will still have the benefit of his valuable experience in the organisation.

And for those who haven't yet met me, please turn to page 4 for a short introduction!

I have several important items to report on here, in particular the Annual Report (enclosed), the AGM and the Conference. The Annual Report, of course, provides a review of SGR's activities over the year, and in this context I want to mention one item in particular. It is my sad duty to report the death, in February, of Alan Mayne one of our longest standing members of the National Co-ordinating Committee (NCC). An obituary appears opposite on page 3.

The main news from the AGM is that the NCC has three new members - Dr Eva Novotny, Dr Patrick Nicholson and Yunus Yasin - our largest new intake for some time. This brings the total number up to eight. In addition Jan Tari has agreed to take on the role of press officer. A full list of the new NCC, its assistants and their responsibilities are given on pages 4 and 5. We followed the AGM with a discussion on SGR activities, particular in relation to the main

issue of the conference, the USA's proposed National Missile Defence system. This discussion has helped to focus our lobbying in this area, and a position statement and press releases have been issued (see our web-site for details: <http://www.sgr.org.uk/>).

The Conference itself (see page 16 for a summary), a joint effort of the Global Network Against Weapons and Nuclear Power in Space, Yorkshire CND and ourselves, was a very successful event attracting over 200 attendees and wide range of speakers from around the world. Phil Webber spoke on behalf of SGR. His talk forms the lead article in this edition of the newsletter, which concentrates on Star Wars issues. Dave Webb's article on the space-based laser (page 10) is based on another presentation from the Conference.

Another important upcoming event is the launch of the booklet version of 'An Ethical Career in Science and Technology?', part of our 'Careers Which Don't Cost the Earth' project. This is being published as this newsletter goes to print. Copies will be available either electronically from our web-site at <http://www.sgr.org.uk/ethics.html>

or on paper from the SGR office.

And, of course, there is the impending resumption of the climate negotiations in Bonn on July 18th. Myself and Ben Matthews will again attend and lobby on behalf of SGR. (And yes, we will be travelling by train!)

Two particular aspects of SGR which we are looking to improve are to make better use of the expertise of our members and encourage more interaction between our members. A useful way of doing both (as mentioned in the 'Awayday' report) is to form a set of 'issue-based' groups, similar to the Population Consumption and Values group. These groups (which will mainly operate by email) could help the NCC by providing comments on SGR position statements, press releases, replies to government consultations, inquiries from the public etc. They could also facilitate contact and information exchange between members concerning the issue. Further details about the groups and how you can join are given on page 7. Hence, we hope that through these groups we can more effectively further SGR's aims.

<StuartP@sgr.org.uk>



Alan James Mayne: An Obituary

We are very sorry to report that Alan Mayne, a long-standing and active member of SGR and an indefatigable worker for many progressive projects, died on 17 February. He was 73.

Alan became a member of SGR in 1992, following the merger between Scientists for Global Responsibility and Electronics and Computing for Peace. He was co-opted to the SGR National Coordinating Committee in 1993 and served continuously from then onwards. Alan was a regular contributor to the SGR Newsletter and edited or co-edited several issues.

Alan was concerned about injustice and waste in the world and he devoted his great energy to doing what he could help build a better world. He did this by writing and by involvement in numerous organisations. At his funeral most present were surprised to discover, from talking to others, how many irons Alan had in the fire. Most of us knew of just a few of them.

To mention just the more science- and environment-related ones, there was the British Association for the Advancement of Science (here he

was also our BA liaison person), the Transport Research Laboratory, the British Association for the Club of Rome, and Green Link (Milton Keynes Environmental Newsletter).

Alan published many books and articles. Here we mention just those books known to us that relate most closely to SGR's concerns, together with some of his technical scientific works. His magnum opus must be 'From Politics Past to Politics Future', published by Praeger in 1999. This is an analysis of contemporary and future politics and government. Two other major works deserve special mention. 'Resources for the Future' (Greenwood 1993), a sourcebook of journals, books, CDs, software, networks, organisations, foundations and charities focused on the improvement of global prospects for the next century. The book section alone describes over 1200 items.

'Into the 21st Century: A Handbook for a Sustainable Future' (co-authored with Brian Burrows and Paul Newbury) was the first in the Adamantine Press series 'Adamantine Studies on the 21st Century'. Published in 1991, it

presents in detail (over 400 pages) three scenarios of sustainable development to 2100.

Other of Alan's books we will mention are 'The Videotex Revolution' (October Press, 1982; second edition, Marathon Videotex 1987), 'Introducing relational database' (co-authored with Michael Wood), NCC, 1983, and 'World Brain' (co-authored with Patrick Parrinder), Adamantine Press, 1993.

Alan had the ability to think about what might be, not inhibited by the status quo, or by those who say 'nice idea, but no-one will accept that'.

He was involved in internet research at an early stage, and he was in the vanguard in giving sustainability a high priority.

Alan's generous, philanthropic spirit is greatly missed. It was clear at his funeral, however, that many people drew inspiration from his qualities and achievements. His spirit lives on, in the memories of others and in his writings.

Alan Cottey and Philip Webber

Your Website

Alan Cottey

Ever since it had a website, SGR has appreciated the importance of regular work on updating it and checking its accuracy. We have a Web Group - which looks after such matters. The number of members rose to nine and this was found to be more than necessary - the traffic in emails became excessive. The NCC has reviewed the Web Group and its mode of operation. As a member of the new, slimmer Web group, I am reporting to the SGR membership on the new arrangements, and inviting you to help the Group keep our site up-to-date, accurate, and easy-to-use.

The Group now has five members. Stuart Parkinson and Phil Webber are Web Managers. Their role will in general be to take medium level

decisions about content, to advise the NCC about major policy matters and when necessary to negotiate with GreenNet.

The other members of the Group are Web Assistants. They are Patricia Hughes, Bob Kenyon and myself. We will share the work of keeping the site up-to-date and accurate, and will also take part in content and advising matters.

The NCC and the new Web Group invite all of you, SGR members, to take an interest in, and keep an eye on, your website. (Here I may say that we are aware that some older pages are in an old style, different from that of the most frequently used pages. We are in the middle of revising the site.

This task will take a while to complete, so bear with us on that one.)

Please email any one of the Web Assistants with comments, notification of errors or browser interpretation problems, and suggestions for copy (for minor or major edits or entire new pages). If any one Assistant cannot, for whatever reason, deal promptly with a suggestion, s/he will forward it to one of the others. The Web Assistants' email addresses are:

AlanC@sgr.org.uk

BobK@sgr.org.uk

PatriciaH@sgr.org.uk

Activity on Genetic Engineering of Crops

Eva Novotny

In our last issue, we reported on the status of the public hearing on Chardon LL, which is the first genetically engineered crop (a forage maize) that could be grown in the UK if granted final approval. The hearing was indefinitely adjourned in November 2000 (just before SGR was to have presented its evidence), owing to a technical oversight during the approval stage at the Ministry of Agriculture, Fisheries and Food. The hearing has not been resumed.

In April 2001, SGR responded to an appeal from the Royal Society to submit evidence regarding the safety of GM food. We supplied evidence from our own re-analyses of the two animal studies offered by Aventis, which developed the seed, in support of their claim that Chardon LL is a safe feed for cattle. In both cases, we concluded that the experiments had been poorly designed. Insofar as any trends were indicated, they were the opposite of the conclusions proclaimed in both studies: that the feeding of the GM protein to rats, in one study, and of GM maize to chickens, in the other, led to no harm and was quite as good as feeding non-GM maize. Our findings were in agreement with those of other

independent scientists who had testified at the Chardon hearing before it was adjourned. We also related anecdotal evidence that wild animals and farm animals have declined to eat GM crops and that farm animals given no alternative to GM feed have lost weight. An incident in 1989 was mentioned, in which 37 people died and 1,500 were permanently disabled when they consumed a highly toxic compound that had mysteriously appeared in a supplement of L-tryptophan. The manufacturer said that the supplement responsible for the damage had been produced from a GM source and that the toxic substance had never been found previously, when a non-GM source had been used.

In May 2001, SGR responded to an appeal from the Henry Doubleday Research Association, a long-established organisation. A farm-scale trial of GM maize had been planned at a site only 2.7 km away from the Association's Ryton Organic Gardens. GM maize, of the same variety that is the subject of the Chardon hearing, was to be tested. However, the Gardens grow organic maize and, moreover, have five beehives on the premises. Maize is

pollinated by wind and airflow, which can carry maize pollen for tens or even hundreds of miles. Research not yet published that will constitute part of SGR's evidence at the hearing reveals that patches of higher pollen density occur even at distances where the average pollen count is low. Barrier distances, officially declared, are grossly inadequate. It was very likely that the maize and honey at the Organic Gardens would be contaminated by the GM trial. The organic status of this research site was threatened. The situation was aggravated by the fact that the potential GM field was considerably larger than the plot at the Gardens and would thus have produced proportionately more pollen. The Department of the Environment, Transport and Regions conceded that cross-pollination might occur; and Michael Meacher, the Environment minister, wrote to those concerned to ask that the trial be stopped. The outcome of the campaign is that the trial has indeed been cancelled. This is a rare triumph for those who oppose GM crops.

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New SGR National Coordinating Committee

Introductory statements from members of the new NCC nominated at the AGM in Leeds on May 6th

CHAIR

Stuart Parkinson

I've been a member of the National Coordinating Committee since November 1997, and Vice-Chair for the last year. My main task during this time has been the co-ordination of the Ethical Careers Project which is now coming to fruition, but I have also been heavily involved in other SGR activities including editing the newsletter, managing the web site, press liaison, and the 'Awayday' process (SGR's internal review). My intention over the next year is to oversee the expansion of SGR's

activities and influence, as we put forward in the 'Awayday Report'.

My 'day job' is as a research fellow at the Centre for Environmental Strategy at the University of Surrey where my main research areas have been environmental systems modelling and Climate Change policy. I have provided advice on these issues to government, industry and environmental pressure groups.

StuartP@sgr.org.uk

VICE-CHAIR

Philip Webber

I am standing down as Chair due to personal pressures upon my time - as a result I haven't contributed as much to SGR as I would have wished. I intend to continue supporting SGR and the NCC achieve better overall funding for our work and the continuing process of updating our image to the wider world and potential new members.

After originally gaining a degree in Physics and a cross-disciplinary science PhD, I worked as a research officer at Imperial College, diversified into policy work advising the GLC

and then into a career in local government. I am currently employed by Kirklees Council as Head of Environment Unit with responsibility for biodiversity action planning, energy programmes, eco-management and audit system (EMAS) and Local Agenda 21.

PhilW@sgr.org.uk

TREASURER

Jenny Nelson

I work as a solar energy researcher at Imperial College, London. I have been a member of the NCC since 1987 and Treasurer since 1991. I am committed to improving access to science and the public understanding of science and its implications.

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SECRETARY

Tim Foxon

I am currently a Research Associate in Energy and Environmental Policy at Imperial College, London. I have been an active member of the NCC for the last five years, having previously been one of the organisers of the successful 'Science for the Earth' Forums in Cambridge. Whilst on the NCC, I have been involved in publications, the web site, writing SGR position statements and organising the 1998 Conference and other meetings. As Secretary, I would like to continue to contribute to SGR's range of activities.

TimF@sgr.org.uk



MEMBERS

Alan Cottley

I am a retired physicist, who has also taught 'science and ethics'. I want to help generally with SGR's work on the NCC, as during the last year. Areas in which I wish to (continue to) take a special interest are the Population, Consumption and Values Study Group, the Ethical

Careers Guide Project, and Publications. I also intend to continue work, in a personal capacity and as an SGR member, on the following projects: Open Science; Asset and Income Limits; Is That It? (what nuclear physics textbooks say, how they say it, and what they don't say). More about these projects can be seen on my UEA Personal Web Pages www.uea.ac.uk/~c013 and there is further, recently updated, material on Open Science, on the SGR web site www.sgr.org.uk

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Patrick Nicholson

I am a physicist working in the biomedical field. My wider interests include art/science collaborations and co-operatives as agents for social change. I am keen to be involved with newsletter preparation, publications, accounts, funding applications, and research projects. I would like to see a higher profile for organic vs. GM agriculture issues in SGR.

PatrickN@sgr.org.uk

Eva Novotny

I have prepared evidence on behalf of SGR against genetically engineered crops, for presentation to the MAFF hearing and also to the Royal Society. I have agreed to be the new convenor for the SGR group on GMOs. My primary interest is Education and Lobbying. I am a retired astrophysicist.

EvaN@sgr.org.uk



CO-OPTED MEMBER

Yunus Yasin

I must admit that I am rather new to Campaigning. I have been working at the grassroots level in my undergraduate days. I am currently a PhD student at Cambridge University. I am trying to make sense of the model of development we have chosen for ourselves, but have failed so far, and it does not look possible

that will understand this anytime soon. However, I know that the present course we are following is a recipe for disaster. I have also noticed that environmental NGOs have had little effect in recent years since the globe is still 'warming' and the rich-poor divide is still widening. Perhaps is because the 'other side' is getting more effective much quicker. However, the NGOs are also divided. I think it is high time we re-organise ourselves and try to synergise our efforts. I would like to help with this, if I can, in hope that this synergy will trickle down to civil society.

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PRESS OFFICER

Jan Tari

I'm a programmer working in industry, currently taking a break and so finding enough time to contribute to SGR.

I am currently learning the ropes as the SGR Press Officer. This is a job completely unlike anything I've had before so I have greatly appreciated (and needed) the considerable assistance given by other members of the NCC.

As a programmer who is aware of the deep pervasiveness of software in an increasingly technical culture and how flawed that software can be, I would like to deepen my knowledge about the basic limits of its production. This can be used to more realistically evaluate proposals such as NMD, systems for which very complex software is integral.

I am also personally very concerned about climate change. Even 'red in tooth and nail' the world is a beautiful place and I'd like to keep it that way.

And if that's just woolly sentiment, tough.

JanT@sgr.org.uk

(Jan has kindly stepped in as Press Officer but does not wish to be formally a member of the NCC at present - *Editor*)

Make Space for Cooperation

This public statement formed part of SGR's contribution to the Leeds "No Star Wars" conference and was issued as a press release on 12 June

Summary

As an organisation of scientists committed to the ethical use of science and technology, SGR calls for continued vigilance in protecting existing treaties and norms which defend space from selfish and warlike exploitation in the (misconceived) interests of special sections of humanity. Existing worldwide cooperative agreements should be extended, not rolled back.

Some recent proposals, if put into effect, would increase conflict between nations, and between rich and poor. Efforts to dominate the world, either commercially or militarily, by means of a monopoly of near-earth space, are in no-one's real interest. Those who seek such domination need to understand that, in a world that is tight-knit - economically, militarily, culturally and morally - such efforts will be counterproductive.

US National Missile Defence programme

SGR opposes the proposed programme on political, economic and technical grounds ...

- it creates a grave risk of re-igniting the global nuclear arms race, undermining international security

- it wastes resources which could be used to the benefit of the world's people and the environment. More would be gained by spending the money on, for example, renewable energy technologies (to reduce climate change and local air pollution) or on primary health care (in industrial and developing countries)

- its intended effectiveness against missile attacks is very questionable, especially considering how easy and cheap it would be to develop countermeasures

- it would not guard against other military and terrorist threats

Nuclear-powered spacecraft

Advocacy of nuclear reactors as the primary power source for spacecraft is

being revived [1]. SGR considers the dangers of such programmes far outweigh the possible benefits.

Pu238

A disturbing feature of Reichhart's article [1] is the claim that "Protests against the small amounts of onboard plutonium at the launch of NASA's Galileo mission to Jupiter in 1989 and the Cassini Saturn mission in 1997 have turned 'nuclear' into a forbidden word." This claim is also summarised in the caption to a photograph.

SGR is concerned at what looks like a deceptive attempt to represent the protests as ill-founded and nuclear-powered spacecraft as marginalised by an unreasoned taboo. It is not explained that the plutonium referred to here is Pu238, whose activity per kilogram is approximately 270 times greater than that of the more generally known Pu 239. A comparison with depleted uranium (whose radioactivity is admittedly very small) is even more startling. The activity per kilogram of Pu238 is more than ten million times greater than that of DU.

Therefore, while the Pu238 onboard the Cassini craft is indeed "a small amount" in terms of mass - it is 23 kilograms - its radioactivity, which is the real focus of concern, is by no means a small amount. Its activity is over ten million billion Becquerels (nearly 400,000 Curies). This is the activity of more than six tonnes of Pu239, or of about 400,000 tonnes of DU.

Militarisation / commercialisation

The current trend of ever greater militarisation and commercialisation of space, as exposed in, for example, a recent survey by Grossman [2], is not in the general interest. This trend is threatening even those treaties and agreements - such as the Outer Space Treaty, the Moon Agreement and the Convention on International Liability for Damage Caused by Space Objects - which exist and protect the general interest. Instead of allowing such 'global interest' agreements to be

eroded, civil society should work for their reinforcement and extension.

Ethics and Space

SGR welcomes the fact that attention is given to this area by ESA (European Space Agency) and UNESCO. Short articles about the report 'The Ethics of Space Policy' have been published by Hoyle [3] and Castel [4]. The full ESA/UNESCO report will be available on the internet in the summer, at www.unesco.org.

Notes and References

[1] Tony Reichhardt, Breaking the Nuclear Taboo. *Nature*, vol 410, 5 April 2001, p 626

[2] Karl Grossman, DisgRace into Space. *The Ecologist*, vol 31, March 2001, pp 34 - 9

[3] Emma Hoyle, *Physics World*, vol 13, August 2000, p 6

[4] Frederic Castel, European Space Agency Report Raises Ethical Questions About Space Exploration http://www.space.com/news/spaceagencies/space_ethics_000714.html

For further information contact Alan Cottey <AlanC@sgr.org.uk>

The statement is available on the SGR website at http://www.sgr.org.uk/space_for_cooperation.html



Announcing SGR's Issue Groups

Stuart Parkinson

As part of SGR's internal review last year, the National Co-ordinating Committee (NCC) decided to set up a series of groups within SGR based around key issues of concern in science and technology. The aims of these 'Issue Groups' are twofold: to allow the NCC to better draw on the expertise within SGR in our research, education and lobbying activities; and to help provide a network for members to exchange information and provide support to each other. There are five issues covered by the groups:

1. Arms and Arms Control
2. Climate Change and Energy
3. Genetic Engineering
4. Science Policy
5. Population, Consumption and Values (PCV)

The PCV group has been operating successfully for a couple of years, under the co-ordination of Alan

Cottey, and we hope the others will function as well.

By joining the group or groups in which you have expertise, SGR members could help the NCC by, for example:

- Forwarding any relevant item of current news to the NCC. This hopefully will keep the NCC better informed and provide more opportunities for press releases and other lobbying opportunities
- Commenting on SGR position statements
- Commenting on, or even writing, SGR responses to UK Government or other consultation papers
- Responding to technical inquiries from other SGR members and the public

- Making suggestions for speakers for SGR public meetings/conferences

Each group has a co-ordinator. These are Phil Webber (Arms and Arms Control), Stuart Parkinson (Climate Change and Energy); Eva Novotny (Genetic Engineering), Alan Cottey (Science Policy) and Alan Cottey/Yunus Yasin (Population Consumption and Values).

In order to join a group, please contact either Kate at the SGR office (details on the back page) or email the group co-ordinator direct (these emails can be found on the NCC pages, p 4-5). The main method of contact will be email, but non-email users will still be able to take part.

<StuartP@sgr.org.uk>

Elsewhere in the news...

Missile defence "badly flawed" says Pentagon Report

A leaked Pentagon report dating from the final days of Clinton questions whether the "Son of Star Wars" missile defence system is ever going to work. The only successful test to date was effectively fixed by the Pentagon, with a global positioning device in the target warhead giving the interceptor information about where to fly. All three tests used balloons rather than realistic decoy warheads. The report ended with a call to accelerate the test programme!

Daily Telegraph (26/6/01)

US to offer Putin aid in return for Star Wars deal

The Bush administration may offer financial and other incentives to Moscow in an effort to persuade Russia to lift its objections to its "missile defence project". In addition to direct military aid, the US may

propose buying Russian S-300 surface-to-air missiles for use in a joint missile defence program to protect Russia and Europe.

Independent (29/5/01)

Bush backs BAE merger?

A senior source at Boeing claims that the Bush administration would back a merger with BAE systems if the companies could make a convincing business case. Meanwhile, Lockheed Martin's chairman, Vance Coffman, has called for the creation of a "single, integrated transatlantic defence marketplace" where "...governments would work together to define harmonised military requirements...".

Independent (19/6/01)

Blair opens way for nuclear revival

An energy review announced by Tony Blair on June 25th is likely to lead to a revival of nuclear power. The PM signalled the possibility of removing

the moratorium on nuclear power stations. The review will be chaired by Brian Wilson, the Industry and Energy minister and a nuclear power advocate. Greenpeace said that putting Wilson in charge of the review was "like putting the fox in charge of the hen-coop."

Independent (26/6/01)

Battle for world's crop genes

More than 150 governments were represented in Rome on June 22nd to determine whether the world's main crop genes remain public property. The majority opposed the patenting of germ plasm and pressed for an agreement governing the use of the genetic resources underpinning global food security. The US argued there should be no restrictions on the right to patent, and claimed the WTO has legal primacy rather than the UN.

Guardian (23/6/01)

Summaries by Patrick Nicholson

Star Wars.....

[continued from front page]

Ironically, SGR pointed out that whilst Bush was trashing the idea of climate change as anything we should concern ourselves about because of “doubts”, he was happy to accept an election result far less certain than the reality of climate change.

But I digress. So, what is needed apart from a global system? One vital ability is to actually see where the missiles ARE. And even more importantly to be able to HIT one. Previously the proponents of Star Wars advocated using nuclear warheads to wipe out incoming nukes. Whilst this would undoubtedly work this is rather like fishing with dynamite. You run the severe risk of blowing up your own boat, destroying the ecosystem – and of course stun an impressive number of fish which can then be literally picked up (if you have any remaining limbs). (My source is some one eyed / one armed fishermen in a little bar on the Greek island of Zakynthos some years ago).

So, using a nuke to destroy a nuke is not a good idea. So, what about

blowing up a conventional bomb near enough to it? Well, this doesn't work with any reliability as a warhead is designed to re-enter from space glowing red hot as it arrives at several times the speed of sound. It is tough and it isn't particularly bothered by nearby explosions. Also the experience of the US / Israelis trying to hit Scud Missiles is not particularly encouraging. Whilst the tracking system worked quite well the Scud didn't. They tended to break up in flight confusing the Patriot missile system.

So, the answer is not just to nearly hit a bullet, it is to hit a bullet with another bullet. And if that wasn't hard enough the bullet may have disguised itself inside a balloon until the last minute and is accompanied by other objects looking just like warheads (decoys) but not. Hence, the NMD assumes that 4 anti missiles will be needed to have a reasonable chance of hitting one incoming warhead.

This is why the cost of defence is vastly greater than the cost of more offence. The factor might be as large as 10:1 too, so it will generally be easier to build or buy more offence

than to build a defence.

And against who and what is all this thought and planning devoted?

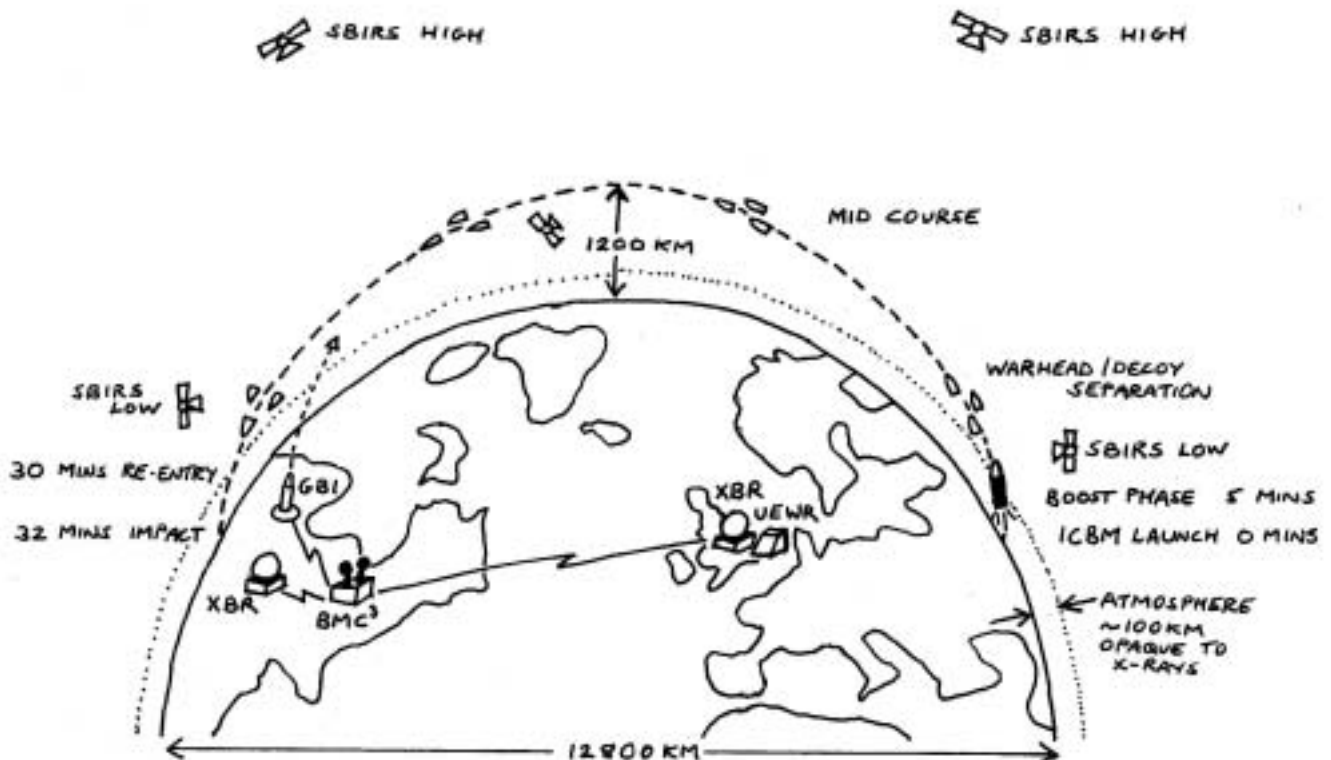
Even Bush's system envisages only the capability to stop a few tens of missiles. So, who could that possibly mean?

The only country which has the technical capability right now to hit the US with a “few tens” of missiles is China. North Korea has renounced nukes and in any case doesn't have the rockets with enough range. India and Pakistan only have regional capability as does Israel. The rather obvious thing for China to do is to deploy double the number of missile warheads plus some additional decoys to negate the NMD capability.

The US talk of wanting to defend against a “rogue state”. The only rogue state I can see from this analysis with any real nuclear capability is the US itself. Along with force projection presumably we also have psychological projection – seeing ones own attributes “projected” in others. A dangerous way for a dominant state already heavily armed to take decisions.

(continued on page 9)

SCHEMATIC OVERVIEW OF “MISSILE DEFENCE”: XBR X-Band Radar; UEWR Upgraded Early Warning Radar; GBI Ground Based Interceptor; SBIRS LOW and HIGH Space-Based Infra Red System in low earth orbit and high (geostationary) orbit; BMC³ Battle Management, Command, Control and Communications *[drawing by Patrick Nicholson]*



(from previous page)

The other concept to knock on the head at this stage is the idea of defence. Richard M Nixon (tricky dicky) himself put it rather well when he said "If you have a shield it is easier to use the sword". The US military already has a considerable sword. NMD would add a modest shield to this capability. The overall US stance is one of considerable offensive capability.

The other states with the capability to hit the US are France and the UK. We already could swamp NMD. Additionally, submarine launched weapons can be launched with depressed trajectories. This doesn't mean sad, depressed missiles somehow gruffly climbing out the of submarine rather like Marvin the paranoid android – although we might feel that the whole thing is a sorry travesty – it means trajectories which deliberately do not go into space (or very briefly) by being depressed in the sense of being lower, which makes the job of an anti-missile missile that much harder, as they are designed to hit their targets in space at high altitude.

This does rather beg the question as to what else NMD or BMD won't protect against. This is another rather alarming list:

- SLBMs with depressed trajectories (as above)
- Bombers
- Cruise weapons (and who has all of those??)
- A terrorist bomb (assembled in the US)
- A terrorist weapon in a ship or a car
- Biological and chemical weapons (these are not deployed on ICBMs)

So, NMD cannot protect against most nuclear states (except China) and it cannot protect against some very feasible terrorist and cheap military threats (i.e. chemical or biological weapons).

So what on earth (or space) is it for?

The only answer which makes any sense to me is "Bush's corporate sponsors".

Bush scraped into office through a corrupt electoral process and funded by multi-million donations from the

arms industry (Boeing, Lockheed, McDonnell Douglas, etc.) as well as people like Microsoft et al.

This is very well documented and is the subject of another presentation.

NMD is payback time. It is as simple as that. NMD also panders to an isolationist, global dominance and technical fix model of the world which is strongly held by the US administration and many US politicians and citizens. We can see a consistent picture. Rather than reduce energy consumption already standing several times per head than any other country in the globe, the US plan to drill for more oil, to burn more carbon, to "buy" their way out the problem. To increase their consumption! In the course of doing this they are literally taking the rest of us as environmental and military hostages. Without our permission and against our advice and the advice of their own scientists they are polluting our planet, damaging our common space, and planning to control all military movements around the globe.

Perhaps our best approach here in Europe might be to really focus on denying the US military access to our

local bases such as Menwith Hill and Fylingdales – not forgetting the base in East Anglia - and the other local stations needed for NMD. Another state with strong anti-military and anti-nuclear leanings is Denmark who are technically in charge of Greenland which contains the Thule military base and warning station.

As SGR we can point out the technical superiority of offence (i.e. the ICBM) against anti-missiles (in value for money terms). We can point out how spending this type of money on military destabilisation is an aberration in a world which needs investment in so many things to foster greater security, equality and fairer shares of the world environment and resources.

All these approaches taken together are important and can have a real impact. We are taking our own global approach to combat this rogue state the USA. And the other presentations at this meeting give us a flavour of the immense implications of what is going on for our world, our environment, and the future.

<PhilW@sgr.org.uk>

Some Internet Resources on Missile Defence

Ballistic Missile Defence Organisation	www.acq.osd.mil/bmdolink/html//bmdolink.html
British American Security Information Council	www.basicint.org
Campaign for the Accountability of American Bases	www.caab.org.uk
CND	www.cnduk.org
Federation of American Scientists	www.fas.org
Global Network Against Weapons and Nuclear Power in Space	www.space4peace.org
International Security Information Service	www.isisuk.demon.co.uk
Space-Based Infra Red System	www.laafb.af.mil/SMC/MT/sbirs.htm
Union of Concerned Scientists	www.ucsusa.org
US Space Command	www.spacecom.af.mil/usspace/
Yorkshire CND	www.cndyorks.org.uk

Patrick Nicholson

Star Wars - The Next Generation

The Space Based Laser

Dave Webb on this key military technology and the background to its development

On Tuesday April 24 at 7pm Global Network (GN, Global Network against Weapons and Nuclear Power in Space) members and supporters gathered at the Continuing Education Building of the University of New Mexico to protest. Just a few days previously the campus paper had announced the award of a 'defence' grant to its Electrical and Computer Engineering department for work on a super laser weapon project. Also, just a few blocks away at UNM's Institute for Space and Nuclear Studies, work is being carried out on nuclear power supplies for space vehicles and platforms. What have these two projects in common? The answer lies in the Space-Based Laser Integrated Flight Experiment, which forms what George Bush calls the "next generation weaponry"¹ and is at the heart of our campaign against "weapons and nuclear power in space". Part of the 'experiment' is to build a Space-Based Laser Readiness Demonstrator - this is a scaled down version (at an estimated cost of \$1.5 billion) of the proposed weapon system which would eventually be deployed for theater ballistic missile defense and as an anti-satellite weapon².

If the SBL IFX is successful, the US Department of Defense will decide whether to deploy a fully operational network of 20-30 laser battle stations giving global coverage. The first launch of an operational system could occur in 2020 and it could take several years to launch the full constellation of spacecraft around Earth. The Pentagon estimates that the total SBL program will cost \$30 billion.

Why the nuclear connection? Any space-based laser will require tremendous amounts of power and, as a study commissioned by the US Congress³ notes "nuclear reactors thus remain the only known long-lived, compact source able to supply military space forces with electric power" ... nuclear reactors "could meet multimegawatt needs of space-

based lasers, neutral particle beams, mass drivers, and railguns."

Also - New World Vistas: Air And Space Power For The 21st Century⁴, states: "In the next two decades, new technologies will allow the fielding of space-based weapons of devastating effectiveness ... These advances will enable lasers with reasonable mass and cost to effect very many kills." But "power limitations ... currently make large space-based radars and space-based weapons relatively unfeasible ... A natural technology to enable high power is nuclear power in space." This is the reason why nuclear power is being developed for use in outer space.

So - the development of a SBL is already well underway - and forms a major part of the US Space Command plans to "dominate" and "master" space⁵. As international weapons expert John Pike has said:

"Whoever controls space has control of Earth ... the United States is unable to resist it. If the U.S. is in a position

to control Earth from outer space, there's nothing to stop us. Of course we're going to do it."

In January this year- US Defense Secretary Donald Rumsfeld spoke of a "space Pearl Harbor" and a commission he formerly headed unveiled a report calling for tighter security for American space systems. "The US ... needs to take seriously the possibility of an attack on US space systems," said the report "... The US is more dependent on space than any other nation" and the report called for a 'technological push' to foil threats from foreign nations or terrorists⁶.

However, as reported in the Spring 2001 GN Newsletter, the environmental assessment for the SBL refers to the possibility of a catastrophic explosion that could result in a sudden release of a large quantity of toxic materials and/or destruction of surrounding structures with additional environmental consequences - although no reason for such an assessment of risk is given.

SPACE BASED LASER INTEGRATED FLIGHT EXPERIMENT

(SBL IFX)

In February 1999, a joint \$4 billion venture between the U.S. Air Force and Lockheed Martin (Sunnyvale, California), Boeing (Canoga Park, California) and TRW (El Segundo, California) formed the SBL IFX. The program is funded by the U.S. Air Force and the Ballistic Missile Defense Organization and managed by the U.S. Air Force's Space and Missile Systems Center (SMC) in Los Angeles California.

"The program's objective is to conduct a research effort to advance and assess the feasibility of the Space Based Laser (SBL) concept and its technologies, culminating in an SBL ballistic missile defense (BMD) demonstration in space, as well as an assessment of non-BMD mission utility."

— SBL IFX Fact Sheet(emphasis added)

It is supposed to intercept enemy ballistic missiles and kill hostile satellites from space. It is due to go into orbit in 2012 and carry out tests for about three years. However, if Congress votes to accelerate funding it could be space-based and ready to test by 2010.

SBL IFX has included programs such as Mid-Infrared Advanced Chemical Laser (MIRACL), High Energy Laser System Test Facility (HELSTF), Alpha, Large Optics Demonstration Experiment (LODE), Large Advanced Mirror Program (LAMP), Alpha-LAMP Integration (ALI), Talon Gold, Zenith Star and Airborne Laser (ABL).

Just another reason why the SBL is nicknamed "Death Star". It is a frighteningly ambitious component of Star Wars to be used as a boost-phase missile interceptor and satellite destroyer

Boost-Phase Missile Interception⁷

Lasers are very attractive to the military because they travel so fast - at the speed of light. Therefore they are being seriously considered for intercepting missiles during their boost-phase. Apart from the SBL, two other methods of achieving this with lasers are currently being funded - airborne and ground based High Energy Laser systems.

Of course, one major difficulty with this approach (apart from the fact that it might be technically difficult - if not impossible - and extremely expensive) is that boost-phase defences would break the ABM Treaty (if it still exists at the time of this presentation!). However - as we know - a number of influential US generals and politicians believe that the laser weapon provides such a valuable defense that it is worth abrogating the treaty⁹.

The stated advantages of a boost-phase system for Ballistic Missile Defence Systems are that it would:

- * provide another tier of missile defence;
- * remove the problem of debris falling over the target area (as occurs with "terminal intercept");
- * prevent the deployment of multiple warheads;
- * does not require the ability to differentiate between war-heads and decoys;
- * would deter the use of payloads through threat of "country of origin impact of debris".

It also, of course, enhances the US first strike capability and its ability to knock out other nation's space hardware. The SBL can also be used for NMD as well as TMD - in fact strategic missiles would be more vulnerable to laser attack in boost phase than theatre missiles because of their longer boost times. They also have higher burn-out altitudes which reduces the atmospheric effects that

The Contractors

Boeing - leader of the Team Airborne Laser (ABL) (with Lockheed and TRW). Responsible for the weapon system integration and supplying the 747-400F aircraft and battle management, command, control, communications, computers and intelligence.

Lockheed Martin - supply the Beam Control/Fire Control system that points and fires the weapon with sufficient energy to destroy the target. Provides the acquisition, tracking and beam control expertise, as well as significant spacecraft integration skills for the Space-Based Laser (SBL) program.

TRW - design and development of the system's COIL laser and providing ground support. (Lynne Cheney recently resigned from the board of Lockheed Martin, Dick Cheney has been a member of the board of TRW.)

would interfere with laser beam propagation from space.

An alternative space based system would incorporate fewer SBL platforms (perhaps 3) with a number of orbiting relay mirrors (perhaps 24) to direct the beams. A number of configurations are possible⁸ and this type of configuration is favoured by many military⁹.



Military Lasers

The Air Force, Army and Navy all started working on lasers in the mid-1960s, and the idea of a SBL has been around since 1977. Initial tests involve a megawatt-class chemical laser with a large, multi-segmented mirror that unfurls and locks into place to create a 13-foot (4-meter) diameter reflecting surface. The entire spacecraft would weigh between 45,000 and 50,000 pounds (20,455 and 22,700 kilograms). The competing lasers are hydrogen fluoride (HF), deuterium fluoride (DF), and chemical oxygen iodine (COIL)¹⁰.

The HF laser uses atomic fluorine and molecular hydrogen to produce excited hydrogen fluorine molecules producing several simultaneous wavelengths in the range of 2.7 - 2.9 microns. At these wavelengths the beam is mostly absorbed by the earth's atmosphere and can only be used above the earth's atmosphere e.g. for the SBL. A HF laser has been test fired at the TRW San Juan Capistrano test facility in California¹¹.

The DF laser uses deuterium (an isotope of hydrogen) and atomic fluorine. Longer wavelength laser light than for HF lasers is produced (3.5 - 4 microns), giving better transmission through the atmosphere but requiring larger optical surfaces to shape and focus the beam.

The Chemical Oxygen Iodine Laser (COIL) was developed at the Air Force Research Laboratory in Albuquerque in 1977. It is the basis of the \$1.2 billion Air Force Airborne Laser Attack Aircraft - scheduled for anti-missile tests in 2003.

In October 1997 the Pentagon conducted a "laser dazzler" test against one of its satellites using the Army's MIRACL DF laser (Mid-Infrared Advanced Chemical Laser) based at White Sands Missile Range, N.M. In 1996 a MIRACL laser shot down a rocket at the same site¹².

A new, lightweight, "all gas" Iodine Laser, or AGIL has also been developed by the Air Force Research Lab. This laser uses nitrogen chloride and iodine which are mixed in a vacuum chamber. AGIL has a better atmospheric transmission, which is important for a laser weapon required to reach targets in the atmosphere or even near the surface of the Earth. A basic weapon-size AGIL laser will take at least until 2003 to develop, demonstrate and test.

The Army's Tactical High Energy Laser (THEL) system is designed by a team led by TRW Corp. After the war in Lebanon in April 1996, Israel was promised by the Clinton administration that the U.S. would help develop a laser-based anti-missile system capable of destroying incoming Katyusha rockets. The US

Army and the Israeli Ministry of Defense paid weapons contractor TRW \$200 million to build a HF laser to generate a powerful infrared beam that can pass through the atmosphere.

On 6 June 2000 the THEL intercepted and destroyed an armed Russian made Katyusha rocket at White Sands Missile Range, N.M. and on Aug. 28 and Sept 14 the demonstrator shot down two rockets launched in succession. The system detected the 10 foot long, 5 inch diameter rocket with its radar before shooting it down. THEL has a range of about 12 miles and costs about \$3,000 per destroyed rocket to use.

The U.S. military's first high energy weapon is likely to be the Airborne Laser mounted on a Boeing 747, it is being designed to acquire, track, and destroy theatre ballistic missiles¹³. The system is expected to be deployed in 10 years. The Air Force has proposed spending \$11 billion to develop a fleet of seven airborne lasers that could be used for battlefield anti-missile defense at a cost of about \$10,000 per shot, based on the price of the laser fuel.

Last month Raytheon Electronic Systems, a subcontractor to Lockheed Martin Space Systems, carried out a 'first light' test of the Track Illuminator Laser (TILL) at the High Energy Laser Centre in El Segundo in California. The TILL is part of the Beam Control/Fire Control system for the US Air Force's Airborne Laser (ABL) programme, which will aim and fire a high-energy laser at a target missile in its boost phase.

However, also last month Nathan Kopeika of Ben-Gurion University told a conference in Florida that he believes engineers working on the Airborne Laser (ABL) project have overlooked the effect of tiny dust particles in the atmosphere, called aerosols. These could scatter and weaken the laser beam, making it incapable of destroying incoming missiles. "We found that, after a propagation of 100 kilometres, aerosols can widen a laser beam up to a cross section one kilometre wide--several orders of magnitude worse than optical turbulence," he said¹⁴.

The Space Based Laser represents the ultimate in current military thinking about space weaponry and demonstrates the extent to which the US Space Command is prepared to go to realize their vision of domination. We must continue to bring these issues to the attention of the citizens of the world - this is no way to spend our limited resources, no way to increase global security, no way to take our first steps outside our own planet. We must strive to keep space for peace.



On 21 December, 2000, the Stennis Space Center, Mississippi, was selected as the site of the SBL performance test facility. Local people will be holding a vigil at the site on 12 May and on 13 October there will be an action at Stennis as part of the GN International Day of Action.

More information and links on the SBL can be obtained from the Federation of American Scientists' web-site - <http://www.fas.org>

More details about the continuing campaign against weapons in space from the Global Network web-site - <http://space4peace.org>

Notes

1. "Missile defense to include laser weapons - Bush Pentagon envisions 'space force' as new branch of military" by Jon Dougherty, World Net Daily, 29 March 2001
2. Joseph C. Anselmo, "New Funding Spurs Space Laser Efforts," Aviation Week and Space Technology, 14 October 1996, 67
3. "Military Space Forces: The Next 50 Years", by John Collins
4. A 15 volume U.S. Air Force board report commissioned in 1996.

5. As set out in the US Space Command's "Vision 2020" and "Long Range Plan"

6. Rumsfeld Commission Warns Against "Space Pearl Harbor" by Jean-Michel Stoullig, Associated Press, 11 Jan 2001

7. See Vincent T. Kiernan, "What is the Future of Space-Based Laser Weapons?" Laser Focus World, June 1997, 75.

8. "Laser Options for National Missile Defense" by Steven G. Leonard, Major, USAF, Air Command and Staff College, Air University, Maxwell Air Force Base, Alabama, April 1998

9. "Lasers and Missile Defense: New Concepts for Space-based and Ground-based Laser Weapons" by William H. Pospel, Lt Col, USAF, July 1998, Occasional Paper No. 5, Center for Strategy and Technology, Air War College, Air University, Maxwell Air Force Base, Alabama

10. Ibid

11. Joseph C. Anselmo, "New Funding Spurs Space Laser Efforts," Aviation Week and Space Technology, 14 October 1996, 67.

12. Geoffrey E. Forden, "The Airborne Laser," IEEE Spectrum, September 1997, 46.

13. Suzann Chapman, "The Airborne Laser," Air Force Magazine, January 1996, 54-55.

14. See: "Firing blanks? Airborne Laser Could Have Serious Flaws" by David Cohen, New Scientist, April 19, 2001 and "Blind spot? A little dust could make flying laser cannons worse than useless", by David Cohen, New Scientist, April 24, 2001

Dave Webb is a Reader in the School of Engineering at Leeds Metropolitan University, a member of SGR, Yorkshire CND and a Director of the Global Network Against Weapons and Nuclear Power in Space.

How should UK science be funded?

Stuart Parkinson on the increasing reliance of science on commercial funding and some possible solutions

The problem

In December, the University of Nottingham accepted £3.8 million from British American Tobacco to contribute towards the setting up of an International Centre for Corporate Social Responsibility. Given the questionable ethical record of this company, one wonders how its sponsorship will affect the direction of research that the centre takes.

This case highlights the growing problem that scientists in the UK (and elsewhere) face: that they increasingly have to rely on funding from or linked to commercial sources with narrow economic interests. One of the main drivers of this is the drop in UK Government funding for scientific research and development, which fell by 17% between 1987 and 1999¹. Whilst Government funding is set to increase over the next few years, it is conditional on greater involvement of the private sector, as stated in the recent White Paper on science and technology². Indeed, in 1995 the Government's Office of Science and Technology (OST) was moved from the Cabinet Office to the Department of Trade and Industry to facilitate this closer collaboration.

It could be argued that the 22% of government funding for UK science which is directed through the seven research councils (MRC, EPSRC, BBSRC, NERC, ESRC, AFRC, PPARC) can be thought of as an 'independent' funding source for scientists since each council has its own steering committee which does not have to justify itself to the government. However, membership of these panels increasingly includes large numbers of industrialists. The justification for this is that science and technology should be directed towards applied goals. However, if such goals are defined in narrow commercial terms, they can compromise other social and environmental needs of society.

And private companies are not the only powerful vested interest which funds science and technology in the UK. Another important one is the

military. According to latest figures from the OST³, one-third of UK government funding for science, engineering and technology comes from the Ministry of Defence. This amounts to £2.1 billion a year. In comparison, the Dept of Environment, Transport and the Regions is responsible for less than 3% of government funding of science and technology.

The significant presence of such vested interests strongly influences the direction of science and technology. A recent study of the funding of UK universities⁴ found that five times more funding went to projects involving oil and gas production than on those involving renewable energy. Further, the government has recently admitted that in 1999 it spent £52 million on research into the agricultural applications of genetic engineering - thirty times that spent on research on organic farming methods⁵. Meanwhile, the UK arms industry continues to be a major source of export earnings: currently about £5 billion a year⁶.

Military, commercial and even government aims often do not coincide with the important aims in which SGR believes, i.e. social justice and environmental sustainability. Is the international arms trade consistent with social justice? Is the continued large-scale combustion of fossil fuels consistent with environmental sustainability? And hence, should we rely on science and technology funded mainly from these sources?

Possible solutions?

Science and technology needs to contribute to building social justice and environmental sustainability. The funding of science needs to be set up to ensure this.

One solution is to increase the funding of the UK research councils (so that commercial science is not as dominant) and make the steering committees more 'balanced', ie include scientist and lay representatives from social/

environmental non-governmental organisations.

Another possible solution is to 'redirect' some of the research funding of commercial organisations to more explicitly fulfill social and environmental goals. This could be done by some form of taxation, the proceeds of which are placed in charitable trusts administered by social/ environmental organisations.

In conclusion, I am not arguing that there should not be any funding for science and technology from commercial or military sources. I am simply arguing that, as it stands, the system is heavily weighted towards these interests and hence the scientific knowledge produced will often not be geared towards the best interests of society and the wider environment. More 'balance' in science would, I believe, be achieved by a much greater input and influence from social and environmental non-governmental organisations.

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1. OST (2000a) Science, Engineering and Technology Statistics 2000. Office of Science and Technology, DTI(<http://www.dti.gov.uk/ost/setstats/index.htm>).
2. OST (2000b) Science and Innovation. White Paper. July. Office of Science and Technology, DTI.
3. as [1]
4. G. Muttitt, C. Grimshaw (2000) Degrees of Involvement: An examination of the the relationship between the upstream oil and gas industry and UK higher education institutions. CorporateWatch.
5. p275 of G. Monbiot (2000) Captive State: The Corporate Takeover of Britain. Macmillan.
6. DESO (2001) Why Export Defence Goods and Services? Defence Export Services Organisation, Ministry of Defence(<http://www.deso.mod.uk/deso/policy>).

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Book Reviews

Pugwash Workshop on Nuclear Stability and Missile Defense

Held at Sigtuna Sweden 26-28 October 2000

Pugwash Occasional Papers, Vol 2, No 2, March 2001

A collection of 8 essays. This is a very comprehensive coverage of the technical, and political aspects of the various plans for NMD or BMD from US, Russian and several European perspectives including the UK. The essayists are varyingly sceptical. George Rathjens, Pugwash General Secretary since 1997, sums it all up in these words:

"a US decision to proceed with NMD should be viewed not so much as economically wasteful and otherwise unwise *military decision*, but rather as a monumental *political blunder* that will exacerbate mistrust and tensions, particularly among the great powers, the probable result being an increase in the frequency and long term seriousness of crises that could lead us where nobody wants or intends to go."

This could take a medal of some kind for compressing so many criticisms into one sentence.

Another quote from Sverre Lodgaard (director of the Norwegian Institute of International Affairs):

"The US Space Command says it is developing the capacity to track all major military activities, to attack them rapidly and precisely at any time, and to deny corresponding military capabilities to anybody else. The NMD must be seen in conjunction with that ambition. What emerges is a US military profile that seeks to erect a shield whilst strengthening the sword. As President Nixon noted at the time of the ABM Treaty, it is easier to use the sword if you have a shield. Today, this is precisely the concern of many actors around the globe."

Philip Webber

The UK and Star Wars

Dave Webb

Yorkshire CND, January 2001. 50p.

A useful 20 page leaflet containing no less than 65 references and suggestions for further reading.

Covers: Can NMD work? (short technical assessment); Is it necessary? (the politics); Fylingdales, Menwith Hill (the main UK bases involved).

Philip Webber



Pushing the limits: The Decision of National Missile Defense

Stephen W Young

Coalition to Reduce Nuclear Dangers / Council for a Liveable World Education Fund. USA, 60 pp, April 2000.

This - as one might expect - concentrates more on the US perspectives on NMD and gives extensive details of the US decision process, and likely costs. There is an extensive section on technical feasibility, missile tests etc. Also covered are the various treaties which would be breached and the politics. The report is available on line at www.crnd.org and at www.clw.org/ef/index.html

Philip Webber

ISIS Briefings on NMD

Missile Defence Policy: Strident Voices and Perilous Choices. Dr Gordon R Mitchell.

Theatre Missile Defence: Deployment Prospects and Impact on Europe. General Sir Hugh Beach.

National Missile Defence: Implications for UK Security. Dr S Pullinger.

National Missile Defence: the Role of RAF Fylingdales and Menwith Hill. Dr David Wright.

These Briefings from the International Security Information Service on NMD are all a commendable 8 pages long and are designed specifically to influence (hopefully) those in a hurry (i.e. MPs. Press etc). They are very readable. All can be found online along with about a hundred others on various security topics.

All available from Dr Stephen Pullinger, Executive Director, ISIS, Strand Bridge House 138-142 The Strand, London WC2 1RH on line at www.isisuk.demon.co.uk

Philip Webber

The Carbon War - Global Warming and the End of the Oil Era

Jeremy Leggett

1999 (Epilogue, 2000)

342pp ISBN 0-14-028494-X

The Carbon War is a personal chronology providing a perspective on the political wrangling surrounding the negotiations of the Climate Change Convention and the Kyoto Protocol from 1989 to 1997. During this time Leggett was first scientific director of Greenpeace UK and then director of his own solar energy company 'Solar Century'.

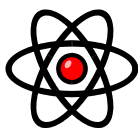
The book is an excellent read, alternating first-hand descriptions of

many of the key negotiating sessions with discussions of the science of climate change and technologies which will help to deal with the problem. Leggett manages to keep balance right between giving enough detail so that the reader can understand the intricacies of this complex issue without becoming bogged down. He also does well in imparting both the frustration when the fossil fuel lobby gets the upper hand and the relief, and at times delight, when groundbreaking agreements are made.

Whilst the aim of the book is not to give a full account of the issues, it nevertheless serves as an important chronicle of the behind-the-scenes lobbying by the vested interests involved in environmental negotiations. Leggett obviously gives an environmentalist's perspective on events, but even allowing for that, there is no disputing the intense pressure wielded by the multi-national fossil fuel industry during this time. One only has to look at the current policies of the Bush administration to see that their power still holds sway in some key areas.

Any environmental scientists who still doubt whether powerful lobby groups shape how scientific research is framed and interpreted by decision-makers should read this book.

Stuart Parkinson



Radioactive Scrap Metals

Nuclear Free Local Authorities briefing, 28pp, December 2000

Nuclear Free Local Authorities Secretariat, Environment and Development, Manchester City Council, PO Box 463, Town Hall, Manchester, M60 3NY

Tel: + 44 161 234 3244

E-mail: nfznc@gn.apc.org

Web Site:

<http://www.gn.apc.org/nfznc/>

This report surveys recent history of radioactive sources ending up in scrap metal. Caesium 137 and Cobalt 60 isotopes in steel seem to be the most common, and scrapped radiotherapy equipment currently the most lethal. The demolition of 814 newly built houses struck me as the most environmentally dramatic. The houses contained concrete which contained steel reinforcing bars which contained Cobalt 60.

I was surprised by the extent to which radioactivity monitoring equipment is already in place. The British Metals Federation says that about half of UK scrap metal merchants have monitoring equipment and the incidents of discovery of radioactivity describe equipment at weighbridges, ports, on railways at national borders and possibly on bridges passing over motorways. Apparently no or very little radioactivity has been first discovered at its final destination in consumer products or construction materials. Rather, it has been discovered at an earlier stage in a smelter etc. and tracing the destinations of previous output has led to the discovery of radioactivity in buildings, tables etc..

The problem is currently getting worse as decommissioning of nuclear reactors, weapons and submarines gathers pace. "Approximately 10,000 tonnes per year of 'clearable' [i.e. metal sufficiently lightly contaminated that it can be reused in consumer goods] ferrous scrap is expected to arise from within the European Union through to about 2015 when volumes are predicted to rise sharply peaking at around 40,000 tonnes per year in 2020."

There are commercial pressures from the nuclear industry to weaken these 'clearance' levels. An author quoted in the report says "At Berkeley power station we have dismantled the large-diameter gas ductwork....much of this material has been decontaminated for free release (clearance) but tritium had diffused into the steel giving a specific activity of up to 100 Bq/g. Free release in the UK is defined as 0.4 Bq/g and is not isotope-specific. The result has been that we have had to treat the steel to release the tritium before we can send it for smelting.

The proposed free release level for steel in the EU directive (96/29) is 106 Bq/g!"

There are also proposals for creating a new category of 'authorised' uses of more radioactive scrap. Bridges are often quoted as a possible use (presumably on the grounds that people don't spend much time on them). The worry is that if it becomes normal for radioactive material to circulate through the metal supply system, it will become harder to prevent weakening standards and dumping, fraud and smuggling.

Recommendations include: more contaminated scrap detection methods for scrap in transit; money for scrap metal merchants to install radioactivity detectors; compensation to manufacturers and scrap metal merchants who suffer contamination.

The last recommendation worries me: we have just seen the running total of Foot and Mouth Disease compensation to farmers rise over one billion pounds together with anecdotes of farmers infecting their animals to claim compensation. Within any general scheme for compensation there are bound to be individual cases where contamination and compensation is highly advantageous to a trader.

I would prefer to see a scheme of help for buying radioactivity detection equipment, together with an automatic electronic link to an independent monitoring organisation, together with a system of anonymous unannounced spot checks to make sure that the equipment works, is switched on and the modem phone isn't off the hook. Presumably if this equipment can be safely calibrated, there can't be too many Health and Safety issues with carrying out checks with material just over the radioactive threshold.

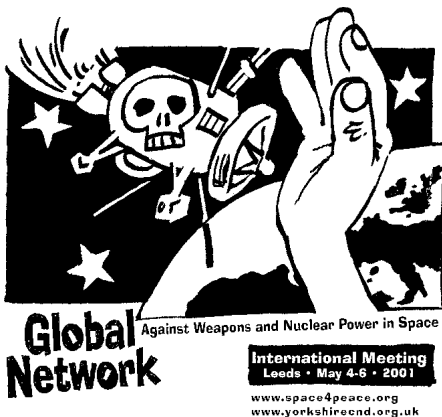
Bob Kenyon is an Information Technology specialist and a member of SGR. In his own words, he has "just a layman's knowledge of radioactivity".

Conference Reviews

No Star Wars: An International Conference to Keep Space for Peace

This conference, which took place in Leeds on May 4-6th, was the latest in a series of meetings of the Global Network Against Weapons and Nuclear Power in Space. Yorkshire CND were the (very able) hosts, and SGR was pleased to co-sponsor the meeting.

The Global Network has been meeting every year since its founding in 1992, bringing together activists working on space issues. The organisation aims to be a clearing-house for information, and to facilitate the building of an international citizens' movement.



Traditionally GN meetings have included a public demonstration of some kind. The Leeds conference was no different, beginning on Friday May 4th with a coach trip to the radomes of Menwith Hill guided by Lindis Percy of the Campaign for the Accountability of American Bases. A well attended and colourful demonstration then took place in Leeds city centre.

The next day saw 200 delegates from 20 countries gathering at Leeds University for the main conference programme.

Following introductory comments from Bruce Gagnon of GN and Dave Webb of Yorkshire CND, the first session entitled "Space Control and

Domination" commenced with a packed auditorium. Professor Karl Grossman, fresh from speaking to British MPs, concentrated on an analysis of recent US military documents explicitly detailing out plans for the wider militarisation of space over the next 20 years. Bahig Nasser suggested that Star Wars could be seen as essentially a shield for capitalism, and that thought should be given to linking up with the anti-globalisation protestors of Seattle. Dave Webb gave a lucid presentation on the Space Based Laser. Finally, Philip Webber of SGR spoke on the problems and prospects for 'BMD'. These last two presentations are reproduced elsewhere in this newsletter.

The second morning session dealt with "Global Responses to 'Missile Defense'". Delegates from as far afield as Ghana and Australia spoke about concerns in their respective countries. Alla Yaroshinskaya (Russia) posed the hypothetical question of whether the US would agree to a Russian missile defence system covering Alaska. Professor Atsushi Fujioka (Japan) described the pressures being applied to encourage Japan to participate in Theater Missile Defence. Lindis Percy (UK) described how the nature of the two recent Space Based Infra Red System radomes at Menwith Hill was only uncovered through a chance discovery at the Planning Office. She suggested that democracy has gone out of the window in favour of the US-UK "special relationship". Stacy Fritz (USA) outlined the way in which Alaska is being increasingly militarised in the push for NMD and Star Wars.

Half a dozen workshops were run during the afternoon, and reports from two of these in which SGR was represented follow immediately after this review.

The final session dealt with "Alternatives to War in Space". Dave Knight of CND considered some alternative visions of security including reform of the UN and the need for regional solutions to deliver regional security. He spelt out some

unilateral steps that the US could take now to increase security including ratifying the CTBT, cutting warhead numbers, withdrawing tactical nuclear weapon from Europe, and signing up to the Chemical Weapons Convention. Carolyn Lucas MEP suggested that around a quarter of the \$800 billion currently spent worldwide on arms could solve our main health and poverty problems. Bruce Kent gave a hugely entertaining talk combining humour and insight. on "Overcoming the Obstacles". Finally, Bruce Gagnon of GN drew proceedings to a rousing end with a review of the day and a call to further action.

A Saturday evening social took place with inspiring music from *Seize the Day*, and the conference wound up on Sunday May 6th with the AGMs of the Global Network and of SGR.

For further information on the conference and to take part in the ongoing discussion see the conference website at www.peacevision.org

Patrick Nicholson

Workshop on Globalisation and Corporate Involvement

The strong current concern about this topic was reflected in the number of workshop participants - more than 40. Themes which recurred in the many contributions to discussion included:

- the manner in which lobbying and donations by large corporations undermine democracy
- the lack of a basic structure for democratic accountability in the UK, where Parliament and even the Cabinet is not involved in important military ('defence') policy decisions
- the continued erosion of traditional academic values in universities in favour of the economic and military agenda of the largest corporations and the most powerful nations
- the injustices caused by rapid transfers of capital, by lack of wealth redistribution, and by unfair trade relations between the economically strong and the economically weak. The new 'Star Wars' programme is, in

essence, the military 'defense' of this indefensible situation.

Some suggested actions, which can be made by individuals, small groups or large groups, include:

- invite retired astronauts to come out in favour of space for peace
- support the few journalists who do expose militarisation of space and related moves toward global domination
- support alternative news media
- deconstruct the crafted language (Missile Defense; stewardship; rogue state; security; deter; threat; ...) put out by the proponents of Star Wars and related programmes
- embarrass corporations implicated in militarisation of space, by publicising their activities
- prevent company AGMs from turning a blind eye to their disreputable activities and connections.

Alan Cottey and Yunus Yasin

Workshop on Space Research and Ethics

This workshop began with a discussion of the "Make Space for Peace" statement from SGR and the "Criteria for the Assessment of Future Space Projects" produced by the Darmstädter Friedensforum. The common ground between the two was explored, but there was insufficient time available to achieve any new synthesis.

Subsequent discussion was broad, and included:

- the European Space Agency and military space projects
- European arms companies involvement in NMD/BMD
- differences in perceived target audiences (scientists, lawmakers, faithcommunities, etc) for information about space research ethics
- the need to build contacts with UK space scientists

Some specific ideas which came out of the discussion were:

- that production of a summary of the key points from the Darmstadter document would be useful

- some examples of "good" and "bad" space research (weather, verification, solar panels etc. on the "good" side) would show that we weren't totally opposed to all development in space

- our emotional relationship with the stars is important; this is how most people relate to the stars; many react to the idea of war in space with a feeling of desecration of "the heavens"

- that it could be a useful course of action for SGR to engage scientists working at the European Space Agency (ESA) as this institution now had a new role in relation to military systems (Galileo, Geo Positional Systems of Russia, USA and Europe)

- to work with Ghanian Govt for a new Outer Space Treaty (via Edward Appiah-Brafah)

Clearly if this work is to be carried forward even in part there is a need for coordination of effort and time commitment from various people to undertaking various tasks.

Patrick Nicholson and Philip Webber

Not Disarming and Disarming

Public discussion meeting 'Nuclear Weapons: Britain's Commitment to Disarm', organised by the British Pugwash Group, London, 18 April

The advertised speaker called off. Evidently Defence Studies academics are sometimes urgently required nearer the sharp end. BPG and all present were indebted to Prof John Garnett, Chair of the Board of the Centre for Defence Studies, Kings College, London, who stood in.

Prof Garnett opened by saying that his talk would have three parts, the first being the history of Britain's nuclear weapons, with emphasis on Trident. The second was on Britain's stated commitment to nuclear disarmament and what that means in practical terms. For the third part he would be devil's advocate, presenting the case for the Britain's stated and actual policies and for the difference between them. Those in favour of

nuclear disarmament were told that they would have to refute the devil's arguments.

I was pleased to hear this. In the absence of Mephistopheles in person, his advocate is useful, permitting, in the best discussions, a meaningful confrontation of opposing views. In this case, however, one prop was needed - a pair of horns - because it was impossible to tell when Prof Garnett was in role. Leaving aside his academic information about factual material, his own value-laden judgements (on validity and relevance and his choice of language) seemed to me very close to the diabolical advocacy.

My problem with this was not so much the judgements. Indeed, I think that those who present views contrary to those held by the majority of an audience perform a useful service. The difficulty was that the discussion lacked clarity. Discussants were frequently unsure whether they were engaging with the devil's advocate or with Prof Garnett.

The discussion meeting was followed by some actual nuclear disarmament - an amusingly self-deprecating soft-sell at the launch of Hugh Beach and Nadine Gurr's book 'Flattering the Passions. Or, the Bomb and Britain's Bid for a World Role'.

Alan Cottey

Sustainable Approaches to Climate Change

This one-day symposium, held on 2 July, was billed as exploring solutions to climate change from the diversity of research at the Norwich Research Park. Culled from the programme, the phrases 'managing climate change', 'slowing the pace', 'anticipating the risks', 'ocean sequestration', 'microbial carbon fixation', 'plant-based polymers', 'vegetable oils', 'plants as biofactories', 'products from agricultural waste', 'planned and spontaneous adaptation to climate', indicate the focus of the meeting.

I found it remarkable how far thinking on climate change has moved in just a few years. What was conceived of solely as a threat is now seen also as a

business opportunity. Simon Gerrard, a Business Innovation Manager at UEA, expressed this point of view emphatically.

Technological (and expensive!) programmes of research are indeed necessary. But, if society does not question the imperative of economic growth, improvements in efficiency will merely buy us time - and

probably only a couple of decades at that.

It is predictable that a research park displaying its wares would focus on income opportunities. Still, the chosen title did include the phrase 'sustainable approaches', so *some* discussion of economic growth was called for. For natural scientists, as for

business people, that is, however, largely a no-go area.

There is a great need for more analysis and education on economic growth from organisations like SGR that are not (chance would be a fine thing?) so dependent on huge cash flows.

Alan Cottey

Communicating with SGR

Electronic Communications

SGR 'Web-board'

SGR has recently set-up a 'web-board' forum to facilitate discussion between members (and non-members) on ethical issues in science and technology. The web-board can be found at:

<http://mattasp.ewebcity.com/db/sgrforum/>

To view the discussions simply go to the web-site and click on the subjects which interest you. If you would like to contribute to the discussions, you will need to click on 'register' first and follow the instructions. If, when you've gone to front page of a Forum, it says 'No Topics Found', you need to adjust the setting of the 'Show Topics from last [time interval]' box, which is near the top right of the screen. A

Topic is an initial message and all the responses to it. If you have any problems, please email Phil Webber on PhilW@sgr.org.uk.

The advantages of the web-board over email are that the entirety of any discussion can be viewed easily (rather than just the latest message), and that those who do not want to be involved in the discussion do not get large numbers of unwanted emails.

Email-list

Meanwhile, our email-list (which currently has about 150 SGR members on it) will continue as a conduit for passing on items of news to other SGR members.

Currently this is also called 'sgrforum'. However, to avoid confusion with the web-board, we will be changing this name in the near future. To minimise disruption, this will be timed to coincide with a software upgrade by

our internet service provider (Greenet) which will result in changes to the procedure for sending messages and subscribing to the list. Current subscribers will be informed when this is to happen. New subscribers should contact the SGR office on:

sgr@gn.apc.org

Until the changes happen, please continue to use the old procedures. For sending messages, send an email to:

sgrforum@gn.apc.org

To subscribe to the list (if you are not already on it), send an email to:

listproc@gn.apc.org

with the following text:

```
subscribe sgrforum <firstname>
<lastname>
End
```

The subject line should be left blank.

Other email contact

SGR has a number of specialist email addresses to use to contact particular people within SGR or for particular issues. These can be found on our web-site: <http://www.sgr.org.uk/>

Letters

Letters for inclusion in the Newsletter should be sent either by conventional mail to 'The Newsletter Editor' at the SGR address given on the back page, or by email to newsletter@sgr.org.uk with 'SGR Letters page' in the title. Letters may be edited in the interests of clarity or brevity.



Events

Every Saturday

Vigil Calling for the Release of Mordechai Vanunu

Noon - 2.00 p.m., outside Israeli Embassy in London (junction of Kensington High Street and Kensington Court). Organised by and further info from the Campaign to Free Vanunu and for a Nuclear Free Middle East.

Tel: 020 7378 9324

Email:

campaign@vanunu.freeserve.co.uk

Website: www.vanunu.freeserve.co.uk

Fourth Tuesday of each month

London CND monthly vigil against Star Wars

Parliament Square, 2- 6 pm

16 July - 6 August

Walk for the World

Dave Knight, Chair of CND and Bruce Kent, CND Vice President are walking 300 miles from Faslane, the Trident nuclear submarine base, to Fylingdales in North Yorkshire where part of the British collaboration with the US Star Wars system is planned.

Tel: 020 7700 2393

Email: enquiries@cnduk.org

Website: www.cnduk.org

3 - 9 August

World Conference Against Atomic and Hydrogen Bombs

Contact: The Organising Committee World Conference against H & A Bombs

2-2-2 Yushima, Bunkyo-ku

Tokyo 103-0034

Tel: +81 3 5482 6034

Fax: 5482 6033

Email: antiatom@twics.com

6 August

Hiroshima Day

Event with speakers at 12 noon, Tavistock Square, London. Organised by Camden CND. Dave Knight and

Bruce Kent will be joining the commemoration before walking to Downing St to deliver all the messages and cards collected along the walk (see above).

3 - 7 September

Science and Society: the BA Festival of Science at the University of Glasgow

Further info. from Eluned Hughes at the British Association for the Advancement of Science.

Tel.: 020 7973 3062

Email:

eluned.hughes@britassoc.org.uk

Website: www.the-ba.net

11 - 14 September

Festival for Life against Death: Disarm the Arms Traders

"Defence Systems and Equipment" exhibition and conference, Docklands, London

Disarm DSEi, PO Box 9656, London N4 4JY

Tel. Jo on 020 7281 0297

Email: disarm@hushmail.com

Website: www.disarm-trade.org

20 September

Revitalising Communities in a Globalising World

International Conference with Vandana Shiva and Anita Roddick at The Guildhall, Southampton.

Further info. from Professor Lena Dominelli/Dr Parves Khan at the Dept of Social Work Studies, University of Southampton.

Tel: 023 8059 6891.

Email: pk2@socsci.soton.ac.uk

Website: www.ciscocodev.soton.ac.uk

1 October

Nuclear Weapons States International Abolition Day

Citizens inspections and actions on anniversary of Nuremberg Principles.

Mother Earth International

Maria Hendrikaplein 5-6
9000 Gent, Belgium

Tel: +32 9 242 8752

Fax: +32 9 242 8751

Email: international@motherearth.org

13 October

International Day of Action against weapons in space.

Actions at US bases and military establishments in Britain.

Tel: 020 7700 2393 for more info.

30 October

Public Meeting on the Use of GMOs

Public meeting held by the Advisory Committee on Genetic Modification on use of GMOs in labs and factories.

1.00pm Health and Safety Executive, Rose Court, 2 Southwark Bridge, London SE1 9HS.

Tickets/details: John Richardson

Tel: 020 7717 6278

Fax: 020 7717 6199

Email:

john.richardson@hse.gsi.gov.uk

14-15 November

European Space Agency council meeting in Edinburgh

Action jointly organised by Scottish and British CND.

Tel: 020 7700 2393 for info.

If you are attending any of these events, don't forget to take along a few SGR leaflets etc.

Join SGR - as a Member or an Associate

You can become a member of SGR if you are a scientist in the broad meaning of the word. Our members include biologists, chemists, engineers, geographers, mathematicians, physicists, psychologists, sociologists, students, teachers and people working in electronics and computing.

If you agree with SGR's aims and want to support our work, but are not a scientist, you are invited to become an associate member.

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Missile Defence Early Day Motions

Parliamentary Early Day Motion 23 on Missile Defence, proposed by Malcolm Savidge MP, has attracted a tremendous 276 signatories (as of July 24). In addition, EDM 196 proposed more recently by Alice Mahon MP voices similar concerns. Both are reproduced below:

EDM 23 MISSILE DEFENCE (20/6/01)

That this House expresses concern at President Bush's intention to move beyond the constraints of the Anti-Ballistic Missile Treaty in developing missile defence; and endorses the unanimous conclusions of the Foreign Affairs Select Committee, which recommended that the Government voice the grave doubts about NMD in the UK, questioned whether US plans to deploy NMD represent an appropriate response to the proliferation problems faced by the international community and recommended that the Government encourage the USA to explore all ways of reducing the threat it perceives.

EDM 196 BRITISH INVOLVEMENT IN US NATIONAL MISSILE DEFENCE (19/7/01)

That this House, mindful of the safety of the people of Britain and fearing that the use of facilities in Britain such as those at Fylingdales and Menwith Hill in Yorkshire for the United States National Missile Defence programme might make the United Kingdom a prime target in any future military conflict, calls on Her Majesty's Government to raise with President George Bush the grave concerns expressed by its Foreign Affairs Select Committee and many other honourable Members about Britain's potential involvement in the NMD programme and to make a public statement about its attitude towards the use of such facilities.

For online details of those MPs who have signed up see:

<http://edm.ais.co.uk/weblink/html/motion.html/ref=23>

<http://edm.ais.co.uk/weblink/html/motion.html/ref=196>

If your MP has not signed up to both these EDMs

This edition of the Newsletter was edited by Patrick Nicholson. The opinions expressed do not necessarily represent those of SGR.

Where unattributed, graphics in this edition come from the image archive of the Global Network Against Weapons and Nuclear Power in Space (www.space4peace.org).

Articles for the next Newsletter are welcomed from both members and non-members. Please send articles (preferably in Word 97) to newsletter@sgr.org.uk or the postal address for SGR: see left.