

UK embryo research

Embryo protection bill resurfaces

IN an unprecedented attempt to use the complex rules of House of Commons procedures, supporters of Mr Enoch Powell's Unborn Children (Protection) Bill failed by only the narrowest of margins to reintroduce it into the legislative timetable last week.

The bill, which would effectively ban all experiments on human embryos, was given a second reading in the House of Commons earlier this year by a large majority of 172 (see *Nature* 313, 618; 1985). But, partly because of lack of official government support, the bill was "talked out" at its third reading on 3 May (see *Nature* 18 April p.573). Normally, a private member's bill would, at this stage, have no chance of further progress, so the government seemed set to proceed sedately with its own, comprehensive legislation on reproductive technology, based on the recommendations of the Warnock committee (see *Nature* 312, 389; 1984).

In an extraordinary fight back, however, Mr Andrew Bowden MP agreed to reintroduce Mr Powell's bill by exploiting his position at the head of the queue on private members' motions day, 7 June. He included the motion that the House of Lords should finish its scrutiny of the bill, if passed by the Commons, by 5 July, although such a request cannot be enforced.

Opponents of Mr Powell's bill, including the Archbishop of York, re-argued their case in the days leading up to the proposed debate. Dame Mary Warnock saw a "great tide of moral fundamentalism, sweeping across from America" as a genuine threat to proponents of licensed, controlled research. In fact the question was settled in parliament by procedural means. Mr Dennis Skinner MP found and made use of a rule that a motion to make a writ for a by-election (there is one outstanding) takes precedence over any other business, and ensured that the subsequent debate on the subject took hours rather than the usual few minutes. Only 16 minutes of time remained to debate Mr Powell's bill and this was ruled as inadequate to put the case for a debate, which otherwise might have lasted all weekend.

Meanwhile, the Medical Research Council and the Royal College of Obstetricians and Gynaecologists last week pressed ahead with their voluntary licensing authority for *in vitro* fertilization (IVF) and embryology techniques (see *Nature* 4 April, p.397) by publishing the authority's guidelines. These are based on the Warnock committee recommendations but each research programme will be licensed and projects will be considered individually. Programmes involving genetic manipulation or implantation of human embryos in other species will be refused licences. The conditions for receiving a licence include:

- Scientifically sound research on the pro-

cesses and products of IVF.

- Sound reasons why human, rather than animal, tissue is to be used.
- The aim of research must be clearly defined and relevant to clinical problems.
- Pre-embryos (dividing cells up to determination of the primitive streak) resulting from the research should not be transferred to a uterus except to establish a particular pregnancy.
- Signed consent for the use of ova and sperm to be obtained from both donors.
- Fertilized human ova not to be cultured *in situ* for more than 14 days.
- The means of embryo disposal to be specified at the outset.

Nuclear winter

Cautious support from SCOPE

INVESTIGATIONS into the environmental consequences of nuclear war by the International Council of Scientific Union's Scientific Committee on Problems of the Environment (SCOPE), whose report will be published in September, essentially confirm the results, and reflect the uncertainties, highlighted by the US National Academy of Sciences (NAS) last year (*Nature* 312, 683; 1985). The likelihood of a nuclear winter — a prolonged period of sub-zero temperatures in mid-northern latitudes following a major exchange of nuclear weapons — is thus given further support. This was the message that emerged at the 16th and final workshop of SCOPE-ENUWAR, held at the University of Essex this week and last week. But SCOPE has taken investigations a step further by considering the possible ecological consequences of the potential climatic effects.

Paul Crutzen, of the Max-Planck Institut für Chemie, a member of the steering committee, emphasized that the SCOPE study differs from its predecessors in that, instead of defining an exact war scenario as a starting point, such as the 6,500 megaton baseline case adopted by NAS, it has considered the destruction of a variety of proportions of the available combustible material and the injection of tonnages of smoke into the atmosphere consistent with a several thousand megaton nuclear war. Taken together with the improved general climatic models which now incorporate, in three dimensions, the interactive feedback between smoke plumes and winds, this should enhance the credibility of suggestions of a nuclear winter, according to S. Schneider of the US National Center for Atmospheric Research.

What has become clear, said Crutzen, is that the proportion of soot produced in urban and forest fires following a massive nuclear attack — the "blackness" of the smoke — is perhaps the most important factor. This in turn is dependent on the type

The voluntary guidelines are particularly appropriate now, as the government has announced that it will not introduce legislation in the next parliamentary session — that is, for at least a year. The popular support for Mr Powell's bill means that the government would be under considerable pressure to include his proposal in any legislation it seeks to introduce.

The tortuous progress of Mr Powell's bill contrasts strikingly with the smooth passage of Mr Norman Fowler's emergency bill to ban commercial surrogacy, which received three readings in the House of Commons between 28 March and 13 May. It is due for a second reading the House of Lords on June 14. The bill bans commercial surrogacy agencies and advertising of and for surrogacy services.

Maxine Clarke

of fires foreseen, with urban and industrial areas being more significant than forest fires. At the end of the day, SCOPE's "baseline case" of an attack on 30 per cent of the combustible material in the developed world produces less smoke than the 6,500 megaton borderline case of NAS, but it is blacker, so the resulting effective optical depth is about the same (4.5 for SCOPE, 5.2 for NAS).

The most important unknowns in this estimate are the nature of the smoke from burning oil stocks, and the physical and chemical processes that could affect particles in individual smoke plumes. Little is known of what happens when an oil pool is set on fire, although experiments with pools up to 50m across suggest that the degree of ventilation is the crucial factor in determining the relative proportions of incompletely burnt hydrocarbons, elemental carbon and gaseous oxides, that is, how dirty the smoke will be.

The NAS and SCOPE studies both highlight the lack of knowledge of processes operating in discrete plumes (up to 50 km across). If mesoscale processes tend to cause particles to agglomerate, this will clearly increase the rate of removal by gravity ("rainout") and may affect the optical properties of smoke plumes. Discussions at the workshop focused on two possibly opposed effects. First, the interaction of the plume with local weather conditions may produce more precipitation than is usually foreseen, which could wash the particles out or cause agglomeration, thereby decreasing the amount of smoke reaching the stratosphere. On the other hand, meso and microscale processes within plumes may increase the lofting of smoke, thus putting more particles into the upper atmosphere.

As Barrie Pittcock of CSIRO Atmospheric Research, Australia, stressed, escape of soot into the stratosphere could cause marked climatic effects in the

Southern Hemisphere, especially if the war occurred in July rather than January. In particular, interactive climatic modelling suggests a lowering of tropopause (the boundary between the troposphere and the overlying stratosphere) from its present heights of roughly 9 km in high latitudes and 20 km over the tropics to about 4 km over the North Pole and 10 km in the Southern Hemisphere. This, in turn, would mean that a considerable amount of smoke, perhaps 60 million tonnes, enters the stratosphere where it has two climatic effects. First with an optical thickness of 0.1 to 0.5, the smoke results in concomitant reduction in global insolation of roughly 20 per cent. Second, a July war would cause some smoke to drift into the Southern Hemisphere, with the general consequence of reduced global precipitation. In particular, cooling over the Tibet plateau turns off the southwest monsoon. But it has to be emphasized that there remain significant uncertainties in such calculations because the models do not take account of the potential effects of precipitation.

Although much more research is needed into the implications of these climatic changes for both natural ecosystems and agriculture, the results give cause for concern. The areas likely to suffer the worst effects of nuclear winter, the tundra and boreal forests, are the best equipped to cope, noted T.C. Hutchinson of the University of Toronto, because they are naturally adapted to extremes of climate. But the tropical mangrove and evergreen rain forests have no such protection and are very vulnerable to damage by sub-zero temperatures lasting only a few days or weeks.

The effects on agriculture could be even worse, said M.A. Harwell (of Cornell University). What emerges is that although a July war would have more severe immediate and short-term climatic effects than one fought in January, the precise timing may be important. For example the occurrence of just one or two nights with temperatures below 15°C at a critical period in the growing season could wipe out an entire rice harvest. And perhaps as little as a 3°C fall in temperature would be sufficient almost to eliminate Canadian wheat production. This loss of production, combined with the likely absence of imports, would be disastrous for most of the surviving world population. For example, on loss of imports alone, even assuming 100 per cent of present production, Japan could only feed half of its present population. And most underdeveloped countries appear to have only about four months supply of stored food. If the climatic effects of a nuclear winter in July lie towards the colder end of the range physicists consider plausible, the ensuing lack of food may have a greater impact on the global population than the immediate effects of the nuclear attacks.

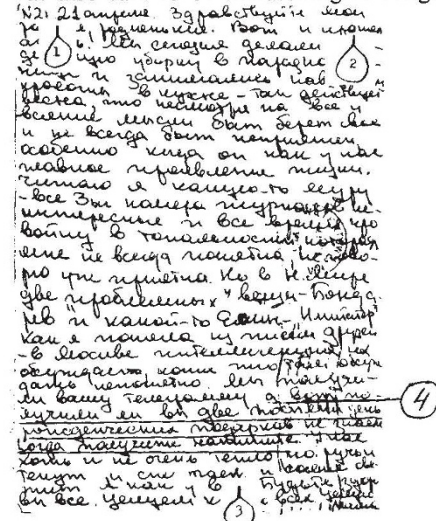
Peter Gambles

Sakharov

Mystery on the cards

RELATIVES of Academician Andrei Sakharov living in the United States are becoming increasingly concerned about his whereabouts and well-being. They know of nobody who has seen either Sakharov or his wife, Elena Bonner, in their Gor'kii exile, since February. During April, they received reports that Sakharov had begun another protest fast, and that he was conveyed to hospital for forced feeding on 21 April. A postcard signed by the couple (see illustration) also apparently dated 21 April, which represents them as commencing their spring-cleaning on that date, now proves to have been tampered with in transmission to conceal an original date of 1 April.

During the past two months, there have been many conflicting reports about the Sakharovs, including rumours that they were to be released to the West under an amnesty to mark the 40th anniversary of the end of the Second World War in Europe, and even that they had already arrived in Zurich. (These rumours may have emanated from Soviet official sources, in order to defuse international tensions before the Ottawa Human Rights "Helsinki Review" meeting.) Sakharov was also said to be threatening to resign



The 1 April or 21 April card.

from the Academy of Sciences in protest at the passivity of his fellow academicians regarding his plight and that of his wife, who has been refused permission to travel to the West for eye surgery. The arrival on 25 May of the "21 April" postcard initially led the relatives in Boston to have "serious doubts" about the protest fast, and to be more optimistic.

Closer examination, however, revealed a number of anomalies. Because mail from the Soviet Union frequently fails to arrive, Mrs Bonner numbers all postcards (the couple are apparently not allowed to write letters). The card dated "21 April" was numbered 21, but the family had previously received cards numbered 22 (dated 3 April) and 26 (dated 17 April). The latter took two

weeks to arrive, while card number 21 apparently took 34 days. Moreover, on card no. 21 Mrs Bonner asked if the family had received the birthday presents that she had sent [marked "4" in illustration] while card 22 (3 April) says: "the day before yesterday we received a card from mother saying that the birthday presents for Sasha and Tanya have arrived".

Furthermore, card 21 contains an odd sentence (with a grammatical error in the verb-form) which seems to imply that the snow had melted (past tense) [3] and the gutters were now running with water (present tense). In card 22 (3 April), Mrs Bonner had reported the snow almost all gone, and according to the *Pravda* weather reports there was no snow in the Gor'kii area during the last ten days of April.

The relatives therefore took the postcard, and the thirteen other cards received from the Sakharovs this year, to Charles Gershin, a certified master graphoanalyst in Massachusetts. Gershin knows no Russian, but the Russian cursive script, unlike printed Cyrillic, is based on the Latin alphabet. Examination under high-power magnification, therefore, made it possible for Gershin to detect interference. He found that on card 21:

- A "2" had been inserted before the date [1] which had originally read 1 April.
- The alteration of a single letter in line 2 had changed an original "April has gone" [2] (somewhat premature if written on the 21st) to "April has come".
- Similarly the alteration of one letter in the sentence about the snow changes an original "is melting" to "has melted" (with an unavoidable grammatical error).

The implication, therefore, is that the card number was tampered with in order to give the impression that the Sakharovs were leading their "normal" lives on 21 April, from which the logical conclusion would be that something untoward must have occurred. The unconfirmed reports of Sakharov's alleged fast state that he began it on 16 April, so how would the "tamperers" have had to hand the card mailed on 1 April? One possibility is that, for some reason, the censors had decided to withhold this card anyway, and then, when the story of forced-feeding broke on 15 May, the security authorities quickly looked through their stock of recent cards for anything that could be doctored.

The relatives in Boston are now unwilling to commit themselves on any report about Sakharovs, even whether they are alive or dead. According to Dr Efrem Yankelevich, Mrs Bonner's son-in-law, several friends in Moscow apparently received messages from the Sakharovs on 20 May (the eve of Dr Sakharov's birthday), but these were sent by facsimile, which, he says bitterly, "are even easier to forge than a postcard".

Vera Rich