with neutrons it is very limited. Such treatment can be offered at Clatterbridge. With the advanced care available at Clatterbridge there is no reason to think that any patient will come to harm.

The second side of this story is the way in which the decision to fund the cyclotron at St Thomas's was made. This government is interested in value for money, as it has made clear time and time again in its pronouncements on the funding of research and on the health service. The 1987 white paper on higher education talked of "difficult choices having to be made . . . the obligation to selectivity . . . [and] yielding much increased value for money."[15] More colourfully, Robert Jackson, the junior minister with responsibility for higher education, recently told the Royal Society that the government wanted the "biggest bang for the buck" from its research.[16] The government gives just the same messages of selectivity and value for money to the health service.

Yet in this case the government has without any outside consultation or peer review handed over £6m—twice its yearly budget for the whole of cancer research—for the cyclotron. It will also meet 60% of the running costs, which are likely to be very high. The United Kingdom Coordinating Committee on Cancer Research was not consulted about the decision, and its chairman, Sir Raymond Hoffenberg, wrote to the Prime Minister protesting. She proposed a meeting with the minister for health, which should have taken place last week but was cancelled at the last minute.

How could such a seemingly extraordinary decision be made? It has not escaped attention that one of the members of the Cyclotron Trust, which has lobbied for the machine, is Mr Richard Packard, the ophthalmologist who operated on Mrs Thatcher in 1983. He might understandably use his influence with the Prime Minister to promote the project, but she of all people should be able to recognise a dangerous white elephant when she sees one. She recently told the Royal Society: "no nation has unlimited funds, and it will have even less if it wastes them. . . . So what projects to support? Politicians can't decide. . . ." Exactly, Mrs Thatcher. Turn again.

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A national ethics committee

To meet the growing public demand for candour

In 1984 the committee of inquiry of which I was chairman recommended as a matter of urgency that a statutory body should be set up to issue licences to those engaged in treating infertility, in "assisted reproduction," or in related research. Another recommendation was that an inspectorate should be established to ensure that work was not undertaken that had not been specifically licensed.[1]

I still believe that this should be done. But things have moved on since the report was published, and I now think that such a licensing body should be a scientific subcommittee of a larger and more general body, perhaps a permanent royal commission with a rolling membership like that of the Royal Commission on Environmental Pollution. This body should be concerned with a wider range of ethical problems, arising in both medical practice and research.

The public has strong views about medical problems in a growing number of topics, the use of fetal material for treating Parkinson's disease being an obvious case and the possibilities of gene identification and therapy another. For the public to be interested in such issues is not mere inquisitiveness: it is the result of their being generally better educated than they used to be, with many more sources of information. And so, increasingly, and I believe rightly, they think that they ought not to be deceived or kept in the dark. All scientists and especially those concerned with medicine have to take this new attitude into account. There is a growing demand for candour.

This, then, is the main advantage of a national ethics committee: it would be highly visible. Such a committee would have referred to it (or would ask to take up) new questions as they arose in practice or research. Hospital ethics committees as they exist at present are neither public enough nor sufficiently detached from the particular hospitals with which they are concerned. Their conclusions are not widely accessible to the public, neither are the considerations that led to the conclusions. And this is not surprising for they operate locally or regionally and there is no necessary consistency in their findings. They doubtless vary too in competence.

A national committee would be carefully selected to consist of people—some but not all would have a medical or biomedical background—who could understand the issues both of fact and of value. The chairman would be a "lay" person, perhaps a lawyer or a member of one of the now numerous university departments of medical ethics. They would not be experts: there is no such thing as an ethical expert. But they would be accustomed to weighing up arguments and to looking ahead, concerned with both principles and consequences.

The committee's membership would be announced; and it would be required to publish a yearly report, setting out its decisions and the reasons behind them. The public would no longer have to rely for information on brief often partial and scaremongering items in the press to form their opinions.

This consideration is the most important of all. The voice of an almost mediaeval obscurantism is increasingly to be heard—a hostility to science based on vague thoughts that

there are some things we should not know, but based more than anything on fear and ignorance. In such an atmosphere medicine and science will suffer. Research programmes will fail to find support, and parliament may be rushed into wholly restrictive legislation. A permanent open ethical committee with powers to advise on issuing and withdrawing licences (if only indirectly) could show that research can be regulated without being banned, that knowledge can be pursued without being put to morally intolerable uses. After the last war there was a cliché to the effect that man's scientific knowledge had outstripped his moral sense. At that time it was uttered in the context of the physical sciences. The bomb had, rightly, frightened us all. Now that same cliché is more and more to be heard in the context of the biological sciences. We must take it seriously. Only within an ethical framework widely seen to be secure and sensible can we continue, as we must, to push back the frontiers of science.

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Slugs and snails against sugar and spice

Changes in the ratios of boys and girls might have profound consequences

What are little boys made of?
Slugs and snails and puppy dogs' tails.
What are little girls made of?
Sugar and spice and all things nice.

This early nineteenth century nursery rhyme is not as far fetched as it might seem. Scientists in France and Canada have claimed a high success rate in prescribing diets for women who wish to choose the sex of their offspring. Women who want boys are given diets rich in sodium and potassium (meat and salt), while those hoping for a girl eat diets rich in calcium and magnesium (milk and milk products).[1]

This idea of being able to conceive a child of the desired sex is not new.[2] The early Greeks believed that the spermatozoa that determined the different sexes were stored in different testicles and that tying off the left testicle would produce boys. Even in the eighteenth century French noblemen were told that removing the left testicle would guarantee a male heir.

In most populations with reliable systems of registration of births more boys are born than girls. In Europe and North America the sex ratio of babies at birth is about 105—that is, 105 boys to every 100 girls. Other countries have higher ratios—for example, Hong Kong (109), Greece (113), and Korea and the Gambia (116). Populations with lower sex ratios—that is, a smaller majority of males—are the people of Chile (103) and the Asian people of South Africa (101).[3] Many reports suggest that black populations have consistently lower sex ratios than non-black populations,[4] but in a north Nigerian province where good records are kept the Hausa people have a sex ratio of births of 107.[5]

For any population the sex ratio at birth is usually fairly stable from year to year, but temporary changes are sometimes recorded. For example, in 1978 the sex ratio of births in the Republic of Ireland fell to 104 (the lowest for 20 years) and in Northern Ireland to 101 (the lowest so far recorded).[6] The reason for these changes remains a mystery. In some countries the ratio at birth varies seasonally,[7] which could be related to changes in diet throughout the year or to temperature: sexual activity may be less frequent when the temperature soars.

The proportions of male births have increased during and immediately after wars,[8] and again the change in diet caused by food rationing and the release from stress on coming home could have had effects. Indeed, the wives of men in occupations of high stress—such as fighter pilots, astronauts,[9] and the abalone divers in Australia[10]—bear more girls than boys. Some other occupations may affect the workers and the general population by exposing them to pollution. A survey of male anaesthetists showed that they had more girls than boys,[11] while in two steel towns in Scotland with high air pollution male births were significantly raised shortly before the onset of lung cancer epidemics.[12,13] Fishing communities in Scotland have shown high sex ratios more often than expected, which might be explained by chance or by a high fish diet.[14] People working in the alcohol trade have more daughters than sons[15]; and butchers had more daughters in the 1960s and early 1970s when cattle were given oestrogens but more sons when androgens were being used.[16]

The stress of disease may affect the sex ratio—for example, women with schizophrenia produce more girls than boys,[17] whereas women with multiple sclerosis tend to have more boys.[18] In two west African populations a large excess of male births came from conceptions the year after an epidemic of measles,[19] and patients who develop prostatic cancer have more sons than daughters.[20]

It is hard to see the connection between all these changes in the sex ratios of births, but the key may lie in the study of hormones. Insemination on different days of the menstrual cycle leads to variation in sex ratios, and there is a small but significant excess of girls after hormonal induction of ovulation for fertility problems in women. Men attending a Hungarian fertility clinic were treated with three different drugs and their wives produced 44 boys to nine girls, 62 boys to 30 girls, and 17 boys to 27 girls.[21] Diet, stress, and disease might have indirect hormonal effects and change sex ratios in the offspring.[22,23]

Sex preselection before conception is becoming possible,[24,25] and "gender choice" kits have been produced by an American pharmaceutical company.[26] There may be important medical, social, and demographic results. In families at risk for linked diseases it would be better to opt for a girl rather than have selectively to abort males. More families stop having children after a boy is born than after the birth of a girl, and sex preselection might thus lower the birth rate, but in most families with one child the offspring would be a boy. In less developed countries sons are the providers for old age, and there are reports of the termination of pregnancies in which the fetus is of the unwanted sex. In China, where the government is encouraging families with one child, the sex ratio of the population is rising to over 115—perhaps because of infanticide of girls.[27] Recently Asian women have been reported to abort female fetuses because of the dowry problem, and the state of Maharastra has introduced legislation to ban amniocentesis except for detecting genetic disorders. About 78 000 female fetuses were aborted in India between 1978 and 1982.[28]

There might be profound social changes if the sex ratio of