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## Reversible Sterilization in the Female

SIR,—Increasing numbers of women are being sterilized by diathermy cautery under laparoscopy control. This new technique offers many advantages when employed properly, but there are dangerous complications when it is inexpertly performed.

A disadvantage that appears to be discounted or at least accepted with equanimity is that it may destroy a very large portion of the oviduct, so that if the patient should later wish the operation reversed there would be little prospect of success. Yet it is possible to sterilize women effectively by removing only 5 mm of fallopian tube at a point near to the uterus and securing the medial cut end behind the round ligament and the lateral end in front of it.

In the unusual event that the lady changes her mind, there is, after an operation of this nature, an excellent prospect of restoring tubal patency by anastomosis and a considerable likelihood of conception.

While patients must accept that sterilizing operations cannot be later reversed with certainty, it is comforting to the young to know that tubal anastomosis offers a possibility of success if there should be a change of mind. There remains, however, a great need for simple effective temporary sterilization which no present technique well provides.—I am, etc.,

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## Solar Flares and the Concorde

SIR,—Your leading article on "Solar Flares and the Concorde" (16 October, p. 127) misinterprets Molton's review of "The Protection of Astronauts against Solar Flares"[1] in several respects. Molton's statement on *Micrococcus radiodurans* refers to the capacity of this organism to survive irradiation, and not to any selective absorption of radiation by it. "Biological shielding . . . by a layer of *Micrococcus radiodurans* should thus be no more effective than by an equally thick layer of water or clothing, and such low density materials have little effect against the high energy radiations involved.

You quote the annual dose limit of 0·5 rem which is regarded by the International Commission on Radiological Protection as the maximum exposure permissible for a member of the general public. You do not note also Molton's reference to the limit of 5 rem per year that the Commission recommends, and which is widely adopted, as the corresponding limit permissible for those occupationally exposed to radiation.[2] On the figures which you give, the pilot's average annual exposure to the galactic component of cosmic radiation and to solar flares would be considerably below this "occupational" limit. The same conclusion was reached in a report entitled "Radiobiological Aspects of Supersonic Transport"[3] which estimated that "even if an annual crew exposure of 500 hours at [60,000 to 80,000 ft on polar routes] were assumed, an individual crew member would be unlikely to receive more than 2 rem/yr, which can be compared with the Commission's recommended maximum permissible dose of an average of 5 rem/yr for radiation workers." Very occasionally, descent to lower altitudes would be necessitated by major solar flares which might otherwise involve doses of up to 5 rem within an hour, although such rates would probably only be reached once or twice within an 11-year solar cycle and then only during flights at 80,000 ft (24,400 m) and at polar latitudes at which exposures are greatest. For this reason, however, instruments are being carried in Concorde to detect any such major rise in radiation levels at an early stage so that a deliberate descent can be made before any substantial exposure has occurred.—I am, etc.,

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1 Molton, P. M., *Spaceflight*, 1971, **13**, 220.
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3 *Health Physics*, 1966, **12**, 209.

## Alcohol and Glibenclamide

SIR,—We were surprised by the comments made by Dr. E. N. Wardle and Dr. G. O. Richardson (31 July, p. 309) on the frequency of flushing after alcohol in patients taking glibenclamide. In our opinion, freedom from this side effect is the one clear clinical advantage of this drug compared with chlorpropamide.

We have treated 85 patients with glibenclamide and none have complained of any adverse symptoms after drinking alcohol. Direct questions have been put to 75 of the patients and none of the 55 who said they had drunk alcohol had appreciated any disturbing sequel (apart from a woman aged 63 who said that after a glass of beer she felt tired and went weak at the knees). These patients included nine who developed flushing, with other symptoms of varying severity, when receiving chlorpropamide.

The studies reported at the conference on glibenclamide[1] have been continued, and we have now questioned 77 diabetics currently receiving chlorpropamide about their alcohol intake and any untoward consequences. Of 47 who acknowledged that they had taken alcohol while receiving this treatment 20 (42%) had suffered from flushing. Several of those who took alcohol only occasionally had, while realizing that their response to it had altered, failed to associate the change with the start of chlorpropamide therapy.

The visible flush is usually accompanied by a sensation of unpleasant heat over the head and upper trunk. This is often only one feature of the reaction, which may be extremely distressing with malaise, headache, retrosternal oppression, palpitations, fatigue, and faintness. The changes become apparent within a few minutes and are maximal after about 15-30 minutes. It may be several hours before the malaise has fully passed off. The speed and severity of reaction are often striking: "I cannot take even a sip of whisky"; "I could not finish the drink." The disturbance is similar to that which occurs when alcohol is taken by those receiving disulfiram (Antabuse) and Royer *et al.*[2] have considered chlorpropamide as an alternative to this drug in the treatment of alcoholism.

Diabetic patients have to accept many restrictions and it seems unjustifiable to add to them unnecessarily. We feel that, if the use of one of the more potent sulphonylurea drugs is being considered for a patient who is in the habit of taking alcohol, glibenclamide should be used initially rather than chlorpropamide despite the somewhat greater cost.—We are, etc.,

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1 Galbraith, H.-J.B., *Postgraduate Medical Journal*, 1970, **46** (December Supplement), 95.
2 Royer, P., Royer, R., Tonnel, M., and Mabille, P., *Annales Médicales de Nancy*, 1964, **3**, 887.

## Amniotic Cell Culture

SIR,—The observations of Mr. M. E. Ferguson-Smith and others (9 October, p. 69) that cultures of amniotic fluid cells are most easily obtained from specimens taken between 14 and 30 weeks after the last menstrual period can be correlated with the presence of two morphologically distinct types of cell in the fluid.[1] Though the marked increase in the number of cells which occurs during the fourth month of pregnancy[2] is probably largely due to the detachment of cells from the surface of the fetal epidermis, in specimens obtained during the fifth month phagocytic cells can also be identified in the fluid.[3] These can be equated with the smaller of the two types of cell described by Van Leeuwen *et al.*[1] and are probably much easier to grow in vitro than the cells shed from the surface of the epidermis.

The source of the phagocytic cells has not yet been fully established, but it has been suggested that they are formed from clumps of cells which become detached from the amniotic epithelium.[3] The cells of this epithelium are formed from the inner cell mass and also from the trophoblast[4] and probably possess the same genetic characteristics as those of the fetus. The derivation of the cells which can be cultured from specimens obtained by amniocentesis from this epithelium would therefore be unlikely to affect the validity of this method of approach to the determination of the sex of the fetus and to the detection of chromosomal abnormalities such as those associated with Down's syndrome. However, polyploid cells are very common in the amniotic epithelium,[5] and it is possible that the tetraploidy found in one of Mr. Ferguson-Smith's cultures and in other studies[6 7] was due to the amniotic origin of the cultured cells rather than to the occurrence of this kind of abnormality in the skin or other tissues of the fetus.—I am, etc.,

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6 Kohn, G., and Robinson, A., *Lancet*, 1970, **22**, 778.
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