orthopaedic clinics. The x ray facilities serving the clinics are limited to Northwick Park Hospital and to one other site, which provides services to the patients of general practitioners but is staffed and organised by the Northwick Park radiology department. Five patients out of 491 referred for radiography had a repeat x ray examination because of missing films: a repeat radiography rate of 1%. Furthermore, the Scottish authors expressed their 33% of repeat examinations as a percentage of all patients attending the orthopaedic clinic (whether sent for radiography or not)³; our equivalent figure for repeat radiography for all patients attending our orthopaedic clinics was substantially less than 1%.

The important message from the Scottish survey would seem to be that health centres that have x ray facilities may be associated with a high level of repeat x ray examinations in patients subsequently referred to hospital for an orthopaedic opinion. Clearly, that particular problem needs to be dealt with.

For understandable reasons of brevity the *BMJ* editorial failed to convey the particular background to the Scottish survey.⁴ When *BMJ* editorials, commentaries in the lay press,⁵ or indeed review articles such as Fiona Godlee's refer to unnecessary x irradiation in this particular context the authors might consider that it could be reassuring to their readers, as well as to patients, to note that a repeat rate of less than 1% has been shown to occur in the setting of a district hospital where local health centres do not have x ray facilities. At present this represents a more typical setting for the United Kingdom in general than do the arrangements existing in Scotland.

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Risk of Down's syndrome and amniocentesis rate

SIR,—Charlotte Fleming and David J Goldie observed that most women (60%) who were aware that their risk of bearing a fetus with Down's syndrome was at least 1:200 (derived from their age and serum α fetoprotein concentration) did not undergo amniocentesis.¹ They comment on the serious implications for the potential benefits of introducing population screening for Down's syndrome based on risk.

The national Down's syndrome cytogenetic register for England and Wales recorded 323 prenatal cases and 737 postnatal cases of the syndrome in 1989. After allowance for natural fetal loss, and in the absence of prenatal diagnosis, 973 affected infants would have been expected to be born, 602 to women aged under 35. Thus 236 cases of Down's syndrome were prevented by prenatal diagnosis.²

In the absence of biochemical screening the indications for offering karyotyping to women aged under 35 are a previously affected child, the presence of a balanced translocation, and abnormal findings on ultrasonography. In 1989, 38 cases of Down's syndrome (adjusted for spontaneous fetal

loss) were detected in this age group. Currently the most effective biochemical screening method is the triple test, which, using a cut off of 1:200, has the potential to detect 57% of cases surviving to birth for a false positive rate of 3.9%.³ Assuming that 40% of women with a risk of 1:200 or greater (1.56% of pregnant women) choose to have amniocentesis, then the expected number of cases detected in those aged under 35 would be 137 (0.4×0.57×602). Biochemical screening would have improved the overall detection rate from 24% to 34%, which, though not optimal, remains beneficial.

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Medical abortion

SIR,—Michael Heard and John Guillebaud's editorial on medical abortion avoids certain aspects of the problem.¹ An economic evaluation of the use of mifepristone has been made. Replying to a debate in the House of Commons, the under secretary of state for health, Stephen Dorrell, said, "I emphasise that we do not envisage the use of mifepristone as a cost saving exercise. Even if we did it would be arguable whether it would be a cost-saving approach."² Further evidence is provided by the British Pregnancy Advisory Service, which has announced that it cannot offer medical termination at the same price as early surgical termination. Treatment with mifepristone will cost £240, compared with £195 for early surgical termination.

Persisting pregnancies are reported as occurring in roughly 1% of cases in which the combined method is used.³ They may result either from the woman changing her mind after receiving mifepristone or from failure of the method. As severe teratogenic effects may occur after the drug is used this is extremely important. A particularly serious teratogenic manifestation is sirenomelia, or the mermaid syndrome, in which the legs are fused together. It has already been reported in France.^{4,5} The possibility of 1000 malformations resulting from 100 000 attempted abortions is daunting.

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SIR,—With regard to Michael Heard and John Guillebaud's editorial on medical abortion¹ I wish to draw attention to the Congenital Disabilities (Civil Liability) Act 1976. It was introduced after congenital abnormalities occurred with thalidomide and was designed to resolve the question of who was liable when a woman took a substance that proved to be teratogenic. It reads:

(1) If a child is born disabled as a result of such an occurrence before birth as is mentioned in subsection (2) below, and a person (other than the child's own mother) is under this section answerable to the child in respect of that occurrence, the child's disabilities are to be regarded as damage resulting from the wrongful act of that person and actionable accordingly at the suit of this child.

(2) An occurrence to which this section applies is one which: . . . b) affected the mother during her pregnancy, or affected her or the child in the course of its birth, so that the child is born with a disability which would not otherwise have been present.

Mifepristone is highly teratogenic in rabbits, producing skeletal abnormalities and abnormalities of the central nervous system, and Pons and Papiernik recently drew attention again to the circumstances in which a child with major skeletal deformities was born after exposure to it.²

Should a woman change her mind after taking mifepristone she would run the risk of having a deformed infant. Most women abort only after the second visit, when a gemeprost pessary is inserted; as a multicentre trial showed, 6% will still not abort.³ Women travel from their home districts to abortion centres, especially the privately licensed ones, and the risk of pregnancies continuing to term after exposure is real.

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The Hillsborough tragedy

SIR,—In the light of James Wardrope and colleagues' article on the tragedy at Hillsborough football stadium¹ we report on one of the survivors of the disaster who suffered isolated traumatic rupture of the mitral valve due to crushing of the chest.

A 45 year old man was in the section of Hillsborough football ground behind the goal when the crushing took place. He lost consciousness but recalls being pulled from the crowd and laid on the football pitch. He recovered rapidly and walked away from the stadium. He was aware of a small superficial scalp laceration and left sided chest pain but did not have bruising or evidence of external injury. He had previously been fit and did not have a history of rheumatic fever or hypertension. No cardiac murmurs had been detected during an employment medical examination four years earlier.

In the next week routine examination by his general practitioner showed a loud mitral regurgitant murmur, and he was referred for a cardiological opinion. An electrocardiogram showed broad P waves in leads I and II and slight increases in voltage in the left ventricular leads compatible with early left ventricular hypertrophy. A chest radiograph showed slight cardiac enlargement with a normal pulmonary vascular pattern. Echocardiographic study showed a prolapsing posterior mitral valve leaflet with moderate mitral regurgitation and good left ventricular contractility. Since then, electrocardiographic changes compatible with left ventricular hypertrophy have become more pronounced, but the patient has remained fit with a normal exercise tolerance.

Non-penetrating crush injury can cause myocardial contusion, valve disruption, and rupture of the great vessels or cardiac chambers. The right heart, being closer to the sternum, is more often affected than the left. Channer *et al* reported six cases of acute right heart strain in people crushed during the disaster at Hillsborough football