positive results and false security to those with false-negative results. This would soon lead to possible disrepute and abandonment of what may with proper evaluation and refinement prove to be a most useful addition to antenatal care.—We are, etc.,

G. M. ADDISON
K. T. EVANS
BRYAN HIBBARD
K. M. LAURENCE
C. R. LOWE
C. J. ROBERTS

Welsh National School of Medicine, Cardiff

Alternatives to the Fluoridation of Water

SIR,—I was very disturbed by your leading article (8 March, p. 535). Though the opening sentence states that fluoridation of drinking water is "the most effective and practicable means of reducing dental caries," the remainder of the article manages to convey the impression that alternative methods of using fluorides might be almost as effective. This is extremely doubtful.

Estimates of caries prevention for a given method of prophylaxis are mainly based on short-term clinical trials. It is then commonly assumed that the percentage reduction observed over the period of the trial will apply throughout life. Such assumptions stem from an imperfect understanding of the natural history of dental caries. In many persons the first attack of dental caries occurs shortly after the eruption of deciduous teeth. Further attacks may then occur on the deciduous and then the permanent dentition throughout life, though attacks become very infrequent beyond the age of 40. The estimated average "ceiling" level of caries in English non-fluoride communities is about 24 attacked teeth, comprising seven deciduous and 17 permanent teeth. Genuine primary prevention of caries requires that this ceiling level of attack should be reduced permanently.

It is often claimed that fluoride dentifrices can reduce caries by up to 30%. The type of trial from which such claims are made is typically of three years' duration, involving children from the age of 11 through to 14. The normal increment of attacked teeth from 11 to 14 years of age is about three, and an average reduction of about one may be observed in treated populations. However, what happens after the age of 14 is unknown. The benefits of fluoridation of drinking water tend to fade with increasing age (though there is a substantial residuum of true primary prevention) and it seems likely that even if fluoride dentifrices, for example, are used throughout life the benefits observed during a short-term clinical trial will also fade. For all we know they might fade to zero.

Similar criticisms can be extended to those conclusions that have been drawn from trials of fluoride rinses, the topical application of fluoride, fluoridated school milk, and fluoridated drinking water in schools. Whereas the life-long benefits of fluoridation of drinking water are well established, those for alternative methods remain largely conjectural.

Some practical difficulties associated with these alternatives should also be emphasized. Whenever a public health scheme has involved the distribution of fluoride tablets it has had to be rapidly terminated because of lack of parental co-operation. Better discipline could probably be achieved in schools, but the problem of providing fluoride tablets to each child, every day, in every school, is so daunting that the efficacy of the method must be doubted. The same objections can be raised against the introduction in schools of fortnightly rinses with fluoride solutions. Costs are an important consideration these days. According to one estimate fluoride rinses would cost £4 per child per year. For 10m. children the costs would therefore be some £40m. per year, whereas fluoridation of the entire drinking water supplies in Britain would cost about £2·5m. per year.

In terms of economy, convenience, and efficacy the fluoridation of water supplies enjoys immense advantages; it has no serious rivals.—I am, etc.,

D. JACKSON

University Department of Child Dental Health, Leeds

Induction of Labour and Perinatal Mortality

SIR,—Termination of pregnancy is a positive contributing factor to dramatic falls in perinatal mortality (Mr. R. H. Tipton and Mr. B. V. Lewis, 15 February, p. 391). British[1 2] and American[3] experience reveals the close correlation existing between certain maternal factors and a high perinatal mortality. The groups in which high rates are found include those of low socioeconomic status, young women and those over 35 years of age, those receiving inadequate antenatal care, and the unmarried. In this last group Crellin[4] showed a 32% higher perinatal mortality rate than the average and a high number of low birth weights and dysmature infants.

The sociological characteristics of women presenting for termination are similar to those associated with increased perinatal mortality. The number of social class 4 and 5 women in Beard's[5] termination clinic was nearly double that expected and 56% were single. Seventeen per cent. of all women undergoing termination in England and Wales in 1971 were over 35 years of age.[6] It is therefore not surprising that a fall in perinatal mortality should occur as a result of the temporary exclusion from reproduction of women and girls who contribute disproportionately to this rate. Rovinsky[7] in New York reported significant falls within two years of the introduction of an extremely liberal abortion programme in the rates for perinatal mortality (29%), maternal mortality (28%), prematurity, spontaneous miscarriage, and delivery with inadequate antenatal care. The increasing use of sterilization is another contributing factor to this fall. It further removes from future "poor" reproduction the young and grand multipara and women with recurring unsatisfactory obstetric performance.

Liberal sterilization and abortion policies may, as well as reducing perinatal mortality, influence the present alarming escalation in juvenile crime. It is estimated that 5000 hardened criminals under age 15 exist in London alone. Sociologists[8 9] studying the family backgrounds of these young offenders conclude that many of their mothers possess the behavioural and cultural characteristics mentioned above in relation to perinatal mortality. These mothers constitute an increasing proportion of applicants for sterilization and termination[5 6]—that is, young unmarried and "older" multiparous women. In the Magdalen Approved Schools[9] 23% of young women were illegitimate, two-thirds lived with only one parent, and a staggering 38% had some definite evidence of maternal deprivation. Nearly two-thirds of mothers of illegitimate children have full-time jobs during the child's pre-school years, while the illegitimate child faces frequent changes of home and subjection to overcrowding and is stifled in its intellectual and social attainments.[10] Is it any surprise that delinquency and crime result?

It can be no great intellectual revelation that children born illegitimate, from large families, and of mothers refused termination[11] make up a large proportion of today's juvenile and adolescent delinquents.[9-11] One can only speculate that with curtailment of fecundity in some of these married and unmarried mothers a decrease in or stabilization of the present daunting situation à propos juvenile crime may occur.—We are, etc.,

ALBERT SINGER
IAN D. COOKE

University Department of Obstetrics and Gynaecology, Jessop Hospital for Women, Sheffild

1 Baird, D., *New England Journal of Medicine*, 1952, **246**, 561.
2 Butler, N. R., and Alberman, E., eds. *Perinatal Problems*. London, Livingstone, 1969.
3 Naeye, R. L., and Blanc, W., *New England Journal of Medicine*, 1970, **283**, 555.
4 Crellin, E., Pringle, M., and West, P., *Born Illegitimate*, p. 53. Slough, National Foundation for Educational Research in England and Wales, 1971.
5 Beard, R. W., *et al.*, *British Medical Journal*, 1974, **1**, 418.
6 *Report of the Committee on the Working of the Abortion Act*. Ed. E. Lane, vol. 1, p. 81. Cmd. 5579. London, H.M.S.O., 1974.
7 Rovinsky, J. J., *Obstetrics and Gynecology*, 1973, **41**, 781.
8 Giallombardo, R., *The Social World of Imprisoned Girls*, p. 47. New York, Wiley-Interscience Publications, 1974.
9 Cowie, J., Cowie, V., and Slater, E., *Delinquency in Girls*, p. 91. London, Heinemann Educational, 1968.
10 Crellin, E., Pringle, M., and West, P., *Born Illegitimate*, pp. 61, 64, 86. Slough, National Foundation for Educational Research in England and Wales, 1971.
11 Forssman, H., and Thuwe, I., *Acta Psychiatrica Scandinavica*, 1966, **42**, 71.

Dangers of Silent Gall Stones

SIR,—The logic of your leading article (22 February, p. 415) is open to criticism. It is true that about 1000 out of 100 000 malignancy deaths per year are ascribed to the gall bladder and biliary passages. Of these the Registrar General[1] tabulates 183 as occurring below the age of 60, 91 in men and 92 in women. As the incidence of gall stones in women is twice that in men it is at least possible that the association between stones and malignancy is not a causal one.

In 1965 some 250 000 men in England and Wales reached their 60th birthday. Let us assume that half of those going to develop gall stones are recognized and that 25 000 or 10% have a cholecystectomy, with 360 postoperative deaths. Instead of 21 860 of these 25 000 reaching their 65th birthday (Registrar General's Life Tables, 1965[1]) 21 500+100 lives saved will survive so that there is a net loss of about 1% of lives. In subsequent decades, possibly less valuable as regards the enjoyment of life, the balance