the 1960s. Access was given to the employ- ees’ roll although employment details during the war were virtually non-existent. We think that the information gathering process when taken together with the records of the coroner and the histopathology review was as detailed as any other similar study in exis- tence.

As the “non-exposed” group was classi- fied as such by history it is obvious to most readers that we are unable to state how they acquired excessive amounts of amphibole fibres within their lung tissues. If these eight cases with high amphibole concentrations are deducted the rate of mesothelioma becomes 1-6 million a year which is similar to the generally estimated background rate.

Greenberg seems to be unaware that high aspect ratio amphibole fibres have been found in the pleura. By contrast with ani- mal studies, which rely on the administra- tion of enormous doses and overload of the respiratory defences, human studies have been remarkably consistent in showing a strong association between amphibole expo- sure and mesothelioma whereas dust from chrysotile has been weak or non-existent.1 Even in chrysotile miners and millers, in whom there have been few mesotheliomas, the evidence indicates that they were related to transmigrated rather than chrysotile dust expo- sure.14 To the best of our knowledge the forthcoming review of chrysotile by the International Programme on Chemical Safety will not present any new evidence although it might give a different opinion. Other reviews conclude that amphibole fibres have a much greater potency than chrysotile for producing mesothelioma.14

ng emergency, depending on whether log to the base 10 or natural log is used, respec- tively. This number seems to be very low compared with that given in many studies which are usually in the range of > 1000 ng/mg creatinine.15 It will be helpful if Ong et al could provide an explanation for this apparent discrepancy.

ERIC S JOHNSON
School of Public Health and Tropical Medicine, Tulane University Medical Centre, New Orleans, Louisiana, USA

1 Ong CN, Kok PW, Ong HY, Shi CY, Lee BL, Phoon WH, Tan KT. Biomarkers of expo- sure to low concentrations of benzene: a field assessment. Occup Environ Med 1996;53:
328-33.

Author’s reply — The overall objective of our article1 was to evaluate the usefulness of five commonly used biomarkers at low levels (0.5-2 ppb) of benzene exposure and to stip- ulate in the conclusion all the biomarkers were unable to provide sufficient specificity for biomonitoring at the low concentration range. All data are interpreted that the biomarkers are not to be used for estimation of exposure to low level environmental exposure to ben- zene, particularly < 0.25 ppb. Our earlier data1 showed that urinary trans-muconic acid could be useful for environmental exposure to benzene > 0.5 ppb; with a calculated exposure to 1 ppm benzene, about 0.9-1.7 mg/g creatinine would be expected at the end of eight hours of exposure.

CHOON-NAM ONG
Department of Community, Occupational, and Environmental Medicine, National University of Singapore


Offspring sex ratios and reproductive hazards

Editor—Weijin and Olsen write: "A con- ception closely associated with ovulation has been suggested to result in more boys". There seems to be an error here because to substantiate this statement, these authors cite France et al who write: "The birth sex ratio favored males when intercourse pre- ceded ovulation/fertilization by two days or longer". Indeed the data of France et al give some corroboration to the conclusion of Gray who, after a meta-analysis of human data, suggested that the regression of offspring sex ratio (proportion male) on time of insemination within the cycle is U shaped.

I have cited evidence that:

(1) There is a positive relation between offspring sex ratio and parental coital rate in several mammalian species (including humans).

(2) Under some models, coital rate would determine the time of fertilisation within the cycle.

(3) Distributions of the sexes within litters of several mammalian species suggest that Fsex (the probability that a zygote is male) varies from one zygote to another within litters.

Interpretation of the data is not estab- lished, but it seems likely that the variation of Fsex with time across the female cycle is partially controlled by the varying female hormone concentrations during that time. In particular such an interpretation can be con- structed to explain Weijin and Olsen’s report of a significant decline of offspring sex ratio with waiting time to pregnancy. This confirms the data of Renkonen and may be caused by the different mean times of fertilisation within the cycle associated with differ- ent coital rates (which decline very rapidly during the first year of marriage16).

If I am right, the sexes of mammalian (including human) offspring are partially controlled by the hormone concentrations of both parents throughout the menstrual or pre-ovulatory cycle of maternal reproduction.17 Such a scheme is consistent with the known cycle day of conception and sex ratio of off- spring. Hum Reprod 1995;10:2529-31.


James WH. Evidence that mammalian sex ratios at birth are partially controlled by parental hormone levels at the time of con- ception. J Theor Biol 1996;180:271-86.

BOOK REVIEWS

Book review editor: R. L. Maynard

If you wish to order, or require further infor- mation regarding the titles reviewed here, please write or telephone the BMJ Bookshop, PO Box 295, London W1H 9TE. Tel: 0171 383 6244. Fax: 0171 383 6662. Books are supplied post free in the UK and for British Forces Posted Overseas addresses. Overseas customers should take 15% for postage and packing. Payment can...