relationship between water hardness and cardiovascular mortality.

The efficiency of absorption of lipid from the gut is partly dependent on the bile salts. Increasing concentrations of calcium may interfere with the detergent action of the bile salts and with micelle formation. Oral calcium is known to reduce serum lipids¹ and increase faecal bile acid and faecal total fat excretion.² Total intake of calcium in hard-water areas may be as much as 20% higher than intake in soft-water areas.

This could explain the observations of Stitt³ and Elwood⁴ that calcium concentrations in water supplies are negatively correlated with cholesterol levels and cardiovascular mortality.

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¹ Yacowitz, H, *et al*, *British Medical Journal*, 1965, **1**, 1352.

² Mitchell, W D, *et al*, *Journal of Atherosclerosis Research*, 1968, **8**, 913.

³ Stitt, F W, *et al*, *Lancet*, 1973, **1**, 122.

⁴ Elwood, P C, *et al*, *British Journal of Preventive and Social Medicine*, 1977, **31**, 178.

Schistosomiasis, metrifonate, cholinesterase, and suxamethonium

SIR,—The organophosphorus drug metrifonate is very suitable for the large-scale treatment of urinary schistosomiasis since it is highly effective,¹⁻⁵ well tolerated, suitable for oral dosing, and cheap.⁶ The only side effect of note is the depression of blood cholinesterase activity.³ It was found by Pleština *et al*⁷ that the degree of depression and the rate of recovery of activity depended on whether the enzymes were of plasma or erythrocytic origin. Plasma cholinesterase appeared to be more sensitive: activity levels were depressed to 5% of pretreatment values within six hours of dosing. However, recovery of activity was particularly rapid during the early stages and pretreatment levels were reached in four to six weeks.

Recent work⁸ has shown that metrifonate is also effective as a prophylactic against urinary schistosomiasis; monthly doses of 7.5 mg/kg body weight conferred virtually complete protection on children in an area having a natural prevalence rate of 80%. In this trial the general nature of depression of plasma cholinesterase activity was confirmed, but it was also shown that the effect was not cumulative, even after monthly dosing for one year.

The only point remaining at issue is the significance of the depression of cholinesterase activity, particularly in the surgical context. Since there is evidence of increasing interest in the use of metrifonate for the treatment and prophylaxis of urinary schistosomiasis it seems desirable to summarise the evidence and to offer some guidelines for those likely to be involved with patients treated with the drug.

As is usual with organophosphorus compounds, symptoms of acute metrifonate poisoning are cholinergic, and it is generally agreed that the symptoms are due to accumulation of excessive amounts of acetylcholine in effector organs.⁹ Depressed levels of cholinesterase activity (either in genetic variants, in those with liver disease, or as a result of treatment with drugs such as metrifonate) may well prolong the action of the muscle relaxant suxamethonium, but it is difficult to predict the severity of such interaction. However, depression of cholinesterase activity resulting from severe liver disease does not produce the

alarming prolongation of neuromuscular block and apnoea seen after similar treatment of patients with genetically low levels of cholinesterase (compare for example 8.6 min in patients with cirrhosis having an enzyme hydrolysis rate of 27% of normal, 3 min in normal patients, and 3 h for a genetic variant^{10,11}). Prolonged neuromuscular blockade (up to 2½ h has been reported¹²) can, however, result from continuous infusion of suxamethonium in patients with depressed cholinesterase activity.¹³⁻¹⁵ In those receiving metrifonate it is more likely that the action of suxamethonium will be prolonged by only a few minutes and then only during the 24-48 h period immediately after treatment when cholinesterase is maximally depressed.

In view of these reports the following guidelines seem reasonable for patients receiving metrifonate therapy: (1) during the first 24-48 h after administration of the drug very low levels of cholinesterase activity may be anticipated and suxamethonium is perhaps best avoided during this period; (2) thereafter cholinesterase activity recovers rapidly and few problems need be expected.

There are, of course, no absolute contraindications to the use of suxamethonium provided that adequate respiratory support facilities are available. Nor is it likely, even immediately after a dose of metrifonate, that apnoea will exceed 30 min after a single small dose of suxamethonium. However, it would seem unwise to use a dose of suxamethonium in excess of 0.75 mg/kg or to use intermittent or continuous suxamethonium techniques at any stage during treatment with metrifonate.

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¹ Forsyth, D, and Rashid, C, *Lancet*, 1967, **1**, 130.

² Forsyth, D, and Rashid, C, *Lancet*, 1967, **2**, 909.

³ Davis, A, and Bailey, D R, *Bulletin of the World Health Organisation*, 1969, **41**, 209.

⁴ Farahmandian, I, *et al*, *Iranian Journal of Public Health*, 1974, **3**, 23.

⁵ Reddy, S, Oomen, J M V, and Bell, D R, *Annals of Tropical Medicine and Parasitology*, 1975, **69**, 73.

⁶ World Health Organisation, *Technical Report Series*, No 515, Geneva, WHO, 1973.

⁷ Pleština, R, Davis, A, and Bailey, D R, *Bulletin of the World Health Organisation*, 1972, **46**, 747.

⁸ Jewsbury, J M, Cooke, M, and Weber, M C, *Annals of Tropical Medicine and Parasitology*, 1977, **71**, 67.

⁹ Holmstedt, B, *Pharmacological Reviews*, 1959, **11**, 567.

¹⁰ Foldes, F F, *et al*, *Anesthesiology*, 1956, **17**, 559.

¹¹ Thornton, J A, and Levy, C J, *Techniques of Anaesthesia*, London, Chapman and Hall, 1974.

¹² Schneider, S M, *Anesthesiology*, 1965, **26**, 335.

¹³ MacDonald, A G, and Graham, I H, *British Journal of Anaesthesia*, 1968, **40**, 711.

¹⁴ Wildsmith, J A W, *Anaesthesia*, 1972, **27**, 90.

¹⁵ Gesztes, T, *British Journal of Anaesthesia*, 1966, **38**, 408.

Paracetamol overdosage

SIR,—I read with interest the letter from Dr W R Jondorf (14 January, p 109). He concludes with the suggestion that the hepatotoxic effects of paracetamol after overdose could be minimised if pharmaceutical preparations of the drug incorporated N-acetyl cysteine. The idea of making paracetamol safer after overdose by the addition of aminoacids such as methionine or cysteine to act as liver glutathione precursors has previously been proposed by McLean^{1 2} in 1974.

The firms that market paracetamol have made no use of this seemingly simple method for making safer a widely used drug. It would be interesting to know if the Committee on Safety of Medicines has considered the proposal and, if it has, what are the reasons for

not recommending this change in the interest of public safety.

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¹ McLean, A E M, *Lancet*, 1974, **1**, 729.

² McLean, A E M, and Day, P A, *Biochemical Pharmacology*, 1974, **24**, 37.

Confidentiality and life insurance

SIR,—I am sure that Mr V H Kendall (14 January, p 109) has stated the position of the life insurance companies very adequately in his letter, although I do not think that he has completely understood the problems that I tried to portray in my previous letter (10 December, p 1544).

Of course I accept the fact that life insurance is a necessity for many people and I am not arguing against its existence; and, of course, I accept the fact that insurance companies do not want to lose money by insuring people at normal rates if they have reduced expectations of life. The problem is related to the way such people are identified by the insurance companies.

The initial process of identification clearly depends on the honesty of the proposer when he fills in the proposal form; it is after this stage, when the proposer's general practitioner comes to be involved, that the problems begin to arise.

Provided that the proposer has given his consent and understands the significance of what he is doing, then I have no objection in principle to life insurance companies seeking to verify statements made on proposal forms, with two notable exceptions: firstly, that information disclosed by general practitioners should be relevant to the life expectancy of the proposer, and, secondly, that there should be no disclosure of information or conditions that could have prevented the proposer from seeking medical advice for fear of being classified as an insurance risk.

In this context I refer particularly to alcohol and tobacco intake, but the same problems occur in many other conditions. To illustrate the alcohol problem perhaps I could relate the case of a middle-aged man who came to see me only last week: a man with increasing anxiety and depression brought on by business pressures and worries about his health, as several of his colleagues had recently died from myocardial infarcts. As a result of his depression he had started to drink heavily and his condition was steadily deteriorating. Because of his (unfounded) worries about his heart he had decided to take out more life insurance. Now if that patient had realised that what he was telling me about his alcohol consumption might increase his future insurance premiums (which, of course, it will do when I send off his "short report") he might well have been strongly tempted to consult his insurance broker and get his life insurance before consulting me about his real problems. It would be naive to assume that he would have told the insurance company about his alcohol intake; we all know how difficult it is to obtain this sort of information from a person who drinks too much. Had this particular man seen his insurance broker first and delayed in seeing me or any other doctor, then his condition would undoubtedly have deteriorated. He would have obtained his life insurance, but

his health would have suffered and he might well have lost his job.

It must be understood that the best form of life insurance that this man could have taken was to obtain medical advice and help rather than spend more money on insurance premiums. I would therefore like to suggest that, in order to protect our patients, doctors should not be expected to disclose any information about alcohol consumption. This information must be obtained directly from the proposers themselves by the insurance companies.

I would like to see the BMA produce a set of guidelines giving doctors an idea of what they should disclose and what they should not. I have already mentioned alcohol and tobacco consumption, but the same problems apply to many other conditions ranging from drug abuse to chest pains. In many of these conditions information could be withheld from a doctor for fear of the patient being unable to obtain life insurance. If such guidelines could be produced, then it would go a long way towards reducing any conflict between the patients, the insurance companies, and the doctors.

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Breast lumps in adolescent girls

SIR,—I have read with interest the opening statement of your leading article on this subject (4 February, p 260), which comments on the "steady trickle of frightened young girls" seeking advice about breast problems. I have found a similar trend in our well woman breast screening clinic.

The women attending the clinic submit themselves for the first visit, the only limits at this stage having been the availability of appointments and age of the women—that is, at least 35 years. The waiting list is opened at specified intervals and the first 150 applicants are accepted. Forty to fifty applications per week are refused between these specified dates. From this self-selected group high-risk women are abstracted for annual review on the grounds of personal and family history and the results of the initial screening by clinical examination, thermography, and mammography.^{1 2} The aim of the clinic is to screen a cohort of high-risk women at annual intervals, so few appointments have been available for new entrants in recent years.

Significant trends have appeared in the self-selection over the years. In 1968 31% were in the high-risk group; by 1976 this figure was 62%. It is assumed that this increase in the self-selection of high-risk groups is due to public education.

Until mid-1977 there was a satisfactory spread of ages in the self-selected group, as shown in the accompanying table, which also indicates the percentage of total cancers according to age group. In the second half of 1977, however, there has been a marked change in the age groups of women seen for the first time at the breast screening clinic (see table). Questioning these women indicates that various articles in the media have caused undue concern in the younger women, who are swamping the clinic at the expense of the older women. No cancers were found in the under-40 age group.

In spite of the fact that 7.2% of all the registered breast cancers in this region occur

Age distribution of women being screened for first time and of confirmed cases of cancer among them

Age group (years)	1968–July 1977		August–December 1977	
	Percentage of total screened	Percentage of total confirmed cancers (216)	Percentage of total screened (436)	Percentage of total confirmed cancers (11)
35–39	5.9	8.3	34	—
40–50	44.9	53.9	50	51
51+	49.2	37.8	16	49

in women of 39 years or younger I have decided that, while resources are limited, the lower age limit for screening must be raised to 40 years, so giving more opportunity for screening to older women. It would appear that the effects of public education in medical matters are not so completely beneficial as some people believe.

This work is financed by the Women's Cancer Detection Society, a registered charity, based in the north-east of England.

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¹ Stark, A M, in *Breast Cancer, Trends in Research and Treatment*, ed J C Heuson, p 279. New York, Raven Press, 1977.

² Stark, A M, *Acta Thermographica*, 1976, 1, 33.

SIR,—In recent years there has been a great increase in interest in cancer of the breast and its early diagnosis and in other conditions of the breast which could be confused with cancer or which could predispose to it or precede it.

I thought it would be interesting to consider which breast complaints or breast abnormalities arose in a young population. I looked at the records of every person attending the University Health Service between 1 January 1976 and 1 January 1978 who either came with a specific breast complaint or who, on routine examination for another purpose, was found to have a breast abnormality sufficient to warrant inclusion in the diagnosis or diagnoses following the consultation. The numbers are accurate in that a diagnostic card index was kept and when the day's consultations were reviewed for record purposes I marked each case to be included on the diagnostic card. The investigation was not prospective (but for the same reason perhaps more informative) in that my colleagues did not know what information I was collecting and did not take this into account when making their notes. There are approximately 6500 patients, of whom just over a third are women, registered with the University Health Service for NHS purposes, and these are almost all students—staff are not eligible except for a very few resident in an official capacity in a hall of residence.

The number of patients included on the diagnostic card with the criteria laid down was 128. Of these 107 (group 1) were born in 1952 or later (and were 25 years of age or younger at the mid-point of the two years) and 13 (group 2) between 1952 and 1947 (and were between 25 and 30 years at the mid-point of the two years). Eight patients were older and were excluded from those in the figures now given.

Of the 120 patients (group 1, 107; group 2, 13), 13 (group 1, 12; group 2, 1) were males. Forty-five (group 1, 39; group 2, 6) were referred for a second opinion, although one

failed to attend, and 74 (group 1, 67; group 2, 7) were not. Of those referred only four (group 1, 3; group 2, 1) were subjected to biopsy and none of the specimens showed any malignancy. A fifth patient included among the 45 had had a fibroadenoma removed in 1975. Forty-two (group 1, 36; group 2, 6) of these patients presented with a swelling (including inflammatory) or "lump" of the breast. In four cases (group 1, 3; group 2, 1) a lump could not be confirmed when the patient was seen and in many the "lump" was part of a more generalised nodularity. In a case not included in the 42 a lump had been removed previously elsewhere, although there was no lump at the time we saw her. Twenty-five (group 1, 20; group 2, 5) were complaining of breast pain or tenderness. Other presenting symptoms included galactorrhoea, inflammatory lesions, skin conditions, pendulous breasts, unequal breasts, injuries to the breast, symptomless fear of breast cancer, unilateral breast enlargement and secretion premenstrually, embarrassment about small breasts, nipple retraction, and gynaecomastia (including adolescent male mastitis). A large number of the girls were, of course, on the pill, and this probably made them more conscious of breast symptoms and the possible implications of these, as well as in some cases contributing to them.

Thus in two years over 100 girls below the age of 25 were seen with breast complaints and abnormalities. These covered a wide spectrum of conditions, but none of them was malignant.

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Carcinoma in a gastroenterostomy stoma

SIR,—In their report of a case of adenocarcinoma occurring in a gastroenterostomy stoma (21 January, p 151) Drs Rose Buchanan and M J Sworn claim that "even when a gastroenterostomy has been performed only a minority [of gastric carcinomas] have been restricted to the stoma itself." Reported series of gastric carcinoma occurring many years after surgery for benign conditions all document the area of the anastomosis as being the commonest site for carcinoma to occur. This seems to be the case whether the previous surgery has been partial gastrectomy^{1–3} or just gastroenterostomy alone.^{4–6}

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¹ Schrupf, E, *et al*, *Lancet*, 1977, 2, 467.

² Pack, F T, and Banner, R L, *Surgery*, 1958, 44, 1024.

³ Bushkin, F L, *Major Problems in Clinical Surgery*, 1976, 20, 106.

⁴ Morgenstern, L, Yamakawa, T, and Seltzer, D, *American Journal of Surgery*, 1973, 125, 29.

⁵ Hammar, E, *Acta Pathologica et Microbiologica Scandinavica*, section A, 1976, 84, 495.

⁶ Kobayashi, S, Prolla, J C, and Kirsner, B J, *American Journal of Digestive Diseases*, 1970, 15, 905.

Yawning in pharyngeal obstruction

SIR,—After observing two infants in the early stages of choking, I wish to draw attention to yawning as a symptom of pharyngeal impaction.

In the first infant, aged 11 months, an acute episode of obstruction occurred immediately