aged 24-50) were then visited without prior warning and their height and weight measured. Their reported heights and weights were on average 6.9 in (17 cm) above and 6 lb (3.1 kg) below their actual measurements. As in Ashwell and Ethell's paper, overweight was assessed using the Metropolitan Life Insurance Company tables. For 90% of the women the reported measurements indicated a lower degree of overweight than the actual measurements, the difference being roughly proportional to the degree of overweight.

As well as broadly classifying body size as "normal," "suitable," or "underweight" Ashwell and Ethell define categories of under- and overweight. Individuals 30%, 20%, and 10% above ideal weight were classed as severely, moderately, and mildly overweight respectively, with corresponding groupings for underweight.

Using these categories 15 of the 40 women in our study were classified in a lower category on reported than on actual measurements. Four of these changes were from the broad classification "overweight" to that of "suitable weight."

Our data indicate that reported height and weight were treated with much caution, as there appears to be systematic underestimation of body size. It may well be that this underestimation of body size as assessed from reported data reflects awareness of overweight status. We would suggest that any further studies on perception of overweight should obtain information on reported as well as actual height and weight and also perceived weight status. —We are, etc.,

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Tafraher

Sir,—I was most interested in the view of the Ghanian word tafraher (8 February, p. 329). Though English has no direct equivalent the sentiment has not, at least in the past, been foreign to us, as is witnessed by the expression of an Irish woman describing the death of her daughter's child to my father some years ago: "... and then, saving your presence, his little bowels gave way."—I am, etc.

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Comparison between Free Thyroxine Index and Effective Thyroxine Ratio

Sir,—We read with great interest the paper by Dr. E. G. M. D'Haeene and others (21 September, p. 708) on the comparison of the Marillaud-Croze effective thyroid ratio (E.T.R.) with the serum free thyroxine index (F.T.I.). Using Spearman's rank correlation analysis, the authors found a highly significant relationship between the E.T.R. and the F.T.I., with a correlation coefficient of 0.68. The correlation coefficient was considerably less than that found by us—namely, 0.95—when we used the Pearson product-moment correlation coefficient in a study of the relationship of F.T.I. to the patients classified as hypothyroid, euthyroid, and hyperthyroid.1 A similar correlation coefficient (0.93) was found between the E.T.R. and the free thyroxine concentration (F.T.C.).

We found it necessary to select patients and subjects in order to yield diagnostic groups of approximately equal numbers. This leads to a much more sensitive regression analysis because of the wider span of the curves.

Dr. D'Haeene and his colleagues, however, considered that if a given variable has a normal distribution in the population it is necessary, in assessing the variable, to select a group (or subjects for specimens) by random sampling and hence are critical of our statistical handling of our data. However, we submit that their approach, which studies a randomly selected group of subjects, has no application in the regression model used by us. The essential point in the design is the random distribution of assay errors and not of the population from which the specimens were collected.

It seems that these authors have confirmed regression with correlation analysis. As pointed out by Hays,2 each is appropriate to a particular kind of research enterprise. Correlation analysis applies especially to problems of prediction. If we accept that correlation on the other hand determines the relationship between a set of variables—for example, does the E.T.R. increase as the F.T.I. increases and, if so, what is the mathematical rule which describes the relationship? Dr. D'Haeene and his colleagues have found a poorer correlation between E.T.R. and F.T.I. because 70-75% of their specimens showed normal values and hence the E.T.R. has a very low coefficient of variation (C.V.) (37% in our hands) in euthyroid subjects. Furthermore, they would have encountered a substantial number of multiple tied values, which would detract from the degree of correlation found, and there is no indication in their paper that they have corrected for ties.

Though the conclusion of Dr. D'Haeene and his colleagues that the E.T.R. is not a satisfactory substitute for the F.T.I. is probably incorrect in the light of our studies, we do agree that there are some limitations in the E.T.R., as continuing studies in our laboratory have demonstrated. It is not a good parameter to use in patients undergoing treatment with T-3 suppression, nor is it a good assay in either thyroid-stimulating hormone (T.S.H.) or thyroxine-releasing hormone stimulation tests. Furthermore, the very low C.V. of the E.T.R. may indicate relative insensitivity rather than a high degree of precision. This leads to a marked overlap in values between clinically hypothyroid patients and normal subjects, particularly where treatment has been given for thyroid disorders. In such instances, such as that following radioiodine treatment, it is mandatory to use serum assays such as T.S.H. and T-3 concentration to supplement the E.T.R. test.—We are, etc.,

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Venoous Gangrene in Multiple Myeloma

Sir,—The incidence of thromboembolism in myelomatisis based on a preliminary estimate of 376 patients admitted to the Medical Research Council's myelomatosis trial up to March 1970 was reported to be about 35%, but the shape and frequency of the feet as a presenting feature is uncommon. Gavovsky et al.1 reported 14 cases of myelomatisis associated with major
thromboembolic complications: six patients died of pulmonary embolism, seven had deep vein thrombosis as a presenting symptom, and three had evidence of amyloidosis. We report here a case of multiple myeloma presenting as venous gangrene of feet.

A 71-year-old woman presented with bilateral deep venous thrombosis, gangrene of her left foot, and a paraplegic state of her left foot. She was operated upon for hypernephroma, and peripher- al arterial pulsations were normal, but she had swelling of both calves, which were warm and tender to palpation, and blisters on the toes of both feet were black and gangrenous.

The urine contained 2.6 g/l (280 mg/100 ml) protein and 100 pus cells per field. It was positive for Bence Jones protein. Her blood urea nitrogen was 11 mmol/1 (280 mg/100 ml), haemoglobin 14.8 g/dl, and leucocyte count 54 × 10⁹/l (54 900/mm³), with 91%, neutrophils, 6%, lymphocytes, 2%, monocytes, and 0.9 g/l (280 µg/ml) platelets. Serum paraprotein was 86 g/l (7.5 mg/100 ml), albumin 32 g/l (3.2 g/dl), serum albumin 3.5 g/l (3.5 g/dl), and serum transferrin 250 µmol/l (15 mg/100 ml). Serum protein electrophoresis showed grossly increased γ-globulins with a sharply defined band of abnormal protein in the α₂ position on starch gel electrophoresis. Serum immunoelectrophoresis showed the bands to be an IgG and transferrin was reduced. On immunodiffusion IgG was shown to be increased to 68 g/l (6 800 mg/100 ml) (normal 8–16 g/l), IgA 0.1 g/l (110 mg/100 ml) (normal 0–9.5 g/l), and IgM 0.34 g/l (34 mg/100 ml) (normal 0.6–2.9 g/l). The Sia test for macroglobulins was negative and no cryoglobulins were detected. Bone marrow examination showed increased cellularity in her plasma cells with depressed erythropoiesis, and the haemoglobin level later dropped to 9 g/l (90 g/10⁹). Serum paraprotein was normal ar 2.45 mmol/l (9.8 mg/100 ml) but serum phosphate was increased to 2.5 mmol/l (7.8 mg/100 ml) owing to renal failure. Serum urate was 79.7 mmol/l (134 mg/100 ml). Skeletal survey, which included x-rays of chest, pelvis, upper femoral shaft, mandible, humeri, and dorsolumbar spine, showed no evidence of myeloma.

On intravenous fluids her blood urea fell to 4.4 g/l (120 mg/100 ml) and her creatinine fell to 0.8 g/l (7.1 mg/100 ml). This was followed by a clinical improvement in her gangrene.

The incidence of venous gangrene in multiple myeloma is rare and it is interesting to note the remarkable improvement in the gangrene in this elderly woman with the treatment of multiple myeloma alone and without any surgical intervention. In view of the good arterial supply to the feet the superficial gangrene was attributable to occlusion of venules associated with the high level of IgG and hypothyroidism. —We are, etc.,

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Illness in the Clouds

Sir,—Your leading article (8 February, p. 295) has caused me some disquiet. I travel not infrequently by air and am therefore one who may be expected to have statistical grounds to be available in an emergency. As a microbiologist engaged for the past 10 years in administration, this prospect fills me with no enthusiasm. Can anyone advise me on how to prepare for it? Do I need to carry an emergency kit, go on a course, and carry extra international insurance? On reflection, I shall avoid air travel where possible—and also reading the BMJ.1—I am, etc.,

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New Causes of Malignant Hyperpyrexia

Sir,—Dr. J. A. Lack (4 January, p. 36) raised the possibility of inadvertent administration of halothane to a patient who developed malignant hyperpyrexia with nitrous oxide.1 He pointed out that halothane would be present in the gas delivered from most anaesthetic machines due to halothane liberated from rubber breathing tubes, etc. Other sources of contamination have been found such as elastomeric seals and certain rigid plastics within anaesthetic apparatus.

As we were aware of this danger we took the following precautions: (1) the vaporizer was removed from the machine (a conventional B.O.C. Mk II Boyle’s machine); (2) all rubber tubing, needles, and syringes were brand new; and (3) the machine was purged with a nitrous oxide/oxygen gas mixture at a flow rate of 8 l/min for about 3 minutes before induction of anaesthesia. It could be argued that even with these precautions enough halothane could still be present to induce malignant hyperpyrexia. However, during the third anaesthetic given to the patient, when thiopentone without nitrous oxide, oxygen was administered from the same machine and no pyrexia occurred. A second patient, the above patient’s homoyzgous twin, received thiopentone and halothane anaesthetically similarly with no rise in temperature.

There is a potential danger to patients highly susceptible to halothane in leaving the vaporizer on the machine even though it is in the “off” position. On a hot morning in June 1973 we anaesthetized a third patient susceptible to malignant hyperpyrexia using an anaesthetic machine with the halothane vaporizer on the machine in the “off” position. The patient developed a low-grade pyrexia towards the end of the procedure, which had lasted 1 hour, and on investigation a faint smell of halothane vapour was detected. A Hook and Tucker ultraviolet halothane meter indicated that a low but measurable concentration of halothane was present (less than 0.25% v/v). Professor J. S. Robinson and his colleagues in the University of Birmingham investigated our suspect vaporizer in their laboratory under similar conditions and found that there was a constant leak of halothane vapour of between 4 and 9 p.p.m. v/v. However, when the gas flow was first turned on comparatively high levels of halothane vapour were delivered; initial concentrations were well in excess of 0.25% v/v and fell rapidly to 10 p.p.m. v/v after 15 minutes. The effect of a rising ambient temperature (as we had experienced during the anaesthetic) was to almost double the constant leak. Professor Robinson and his colleagues have described their analytical technique.3

In the light of more recent experience it is impossible to know whether the low grade pyrexia in the third patient was due to nitrous oxide, low concentrations of halothane, both these drugs acting together, or other cause. When anaesthetizing a patient thought to be highly susceptible to halothane for any reason it would be sensible to take the precautions outlined above. We now use Cyprane equipment comprising a Quantiflex gas mixer, single vaporizer, a conventional Magill attachment. No vaporizer has ever been fitted to this equipment and we feel that the inadvertent administration of halothane or other anaesthetic vapours is virtually impossible.—We are, etc.,

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Changing from a High- to Low-dose Oral Contraceptive

Sir,—The trend towards reducing the steroid content of combined-type oral contraceptives continues, and products containing 20–40 µg/day ethinylestradiol are now available or on trial in many countries. In the hope of reducing adverse side effects of oral contraceptives many practitioners will transfer patients to these new products. An important problem for such women is to determine whether the sudden reduction in dose is associated with “escape” ovulations during the first cycle of treatment with the low-dose preparation.

We have investigated this problem in 13 healthy young women who were switched from high-dose products (Gynovar (3 mg norethisterone acetate + 50 µg ethinylestradiol) or Nordette (150 µg ethinylestradiol)) to a new low-dose preparation, Norodette (150 µg norgestrel + 30 µg ethinylestradiol). Venous blood specimens were collected daily during the first 3 days of treatment to follow the change in medication. Plasma progesterone and luteinizing hormone (LH) were measured by a specific radioimmunoassay. Progesterone concentration did not exceed 0.9 µg/l in any specimen, while LH concentration remained less than 21 IU/l.

We conclude that transferring patients from a high-dose oral contraceptive to one containing only 30 µg ethinylestradiol poses little likely threat during the first cycle with the new product. It would therefore seem unnecessary to advise the use of additional contraceptive precautions to patients who make this change in oral contraceptive preparations.

—We are, etc.,

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1 Wustiers, T. B., Current Medical Research and Opinion, 1974, 2, 92.

2 Schneider, W., Spiera, J., and Matt, K., Contraception, 1974, 9, 81.