Al-Adhahd and Cavill was totally different from ours. They made no attempt to compensate for the non-random distribution of the fragments during fixation and processing. Indeed, the reason that we devised a special method of sampling was because similar results to those of Al-Adhahd and Cavill were obtained without our method.

I agree with Al-Adhahd and Cavill that a wide range of marrow cellularity can be associated with any particular level of haemoglobin concentration in the peripheral blood. However, these authors' range of cellularity for normal marrows (40–60%) is very narrow and may reflect the fact that only 10 subjects were studied. I have studied 25 such subjects (mean Hb $\pm$ SD = 14.6 ± 1.7 g/dl; mean WBC $\pm$ SD = $8.2 \pm 2.1 \times 10^9$ /l, mean platelets $\pm$ SD = $250 \pm 50 \times 10^9$ /l) and I have found a range for normal marrows of 30–70%. This result is consistent with those of Dunnill *et al.*³ who obtained a range of 20–70% in 95 subjects and Schroder and Tongaard⁴ who found a range of 30–80% in 52 subjects.

Generally, an accurate measure of marrow cellularity has limited usefulness, however, it may have an important role in defining hypoplasia. Yet, it still should be remembered that the greatest value of any laboratory test is when it is interpreted with all the available information and not in isolation.

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Marrow cellularity and polycythaemia

We read with interest the recent paper by Lucie and Young¹ and would like to make the following comments. The value of assessment of bone marrow cellularity in the diagnosis of polycythaemia vera has been raised by several authors.^{2–7} However, unlike the above paper, there has usually been a reasonable attempt to correlate the bone marrow appearances with

other diagnostic criteria—for example, those of Modan and Lillienfeld⁸ or those of the Polycythaemia Vera Study Group.⁸ Most authors have emphasised the need for red cell volume measurements and normal arterial O₂ saturation.

Objective measurement of cellularity in bone marrow sections is also important and has been attempted by some researchers.^{2,3,5,6} The application of point counting to marrow aspirate sections presents some problems due to the different rates of sedimentation of marrow fragments during processing and most authors (with the exception of one¹⁰) have failed to take this into account. This problem does not, of course, arise with iliac crest trephine biopsies. In addition, Lucie and Young¹ rightly state that there is variation in the iliac crest marrow cellularity with respect to age; however, if age (and sex) matched controls are used this can be overcome.

We, in Dundee, have been undertaking a prospective study of bone marrow morphology and morphometry in patients referred for assessment of erythrocytosis and so far have collected comprehensive data on approximately 40 such patients. Below are some preliminary results from 15 subjects (eight with unequivocally primary polycythaemia⁷ and seven with polycythaemia secondary to respiratory disease). None of the “secondary” group satisfied any of the diagnostic criteria of Berlin *et al.*⁸

Bone marrow cellularity in patients (8 primary polycythaemia; 7 secondary polycythaemia) and age- and sex-matched controls

Bone marrow cellularity (%)			
Patient		Age and sex matched controls	
Trephine	Aspirate	Aspirate	
Primary			
1	81.6	59.9	63.1
2	83.1	93.1	45.4
3	85.6	92.5	50.2
4	ND	88.6	46.4
5	ND	81.3	48.7
6	90.3	Insuf	35.5
7	83.9	Insuf	52.4
8	97.6	Insuf	61.2
Secondary			
1	43.8	50.8	45.1
2	64.1	44.0	62.3
3	39.8	53.8	42.1
4	44.5	53.5	48.6
5	49.8	64.9	52.5
6	ND	77.5	60.2
7	63.2	Insuf	55.4

In some patients a trephine biopsy was not done (ND); in others, there was insufficient (Insuf) marrow aspirate for point-counting.

Bone marrow cellularity was assessed as previously described¹⁰ with age and sex matched controls as before.¹¹ Results are shown in the Table. There is good correlation between the aspiration and trephine biopsy results ($p < 0.05$). In four cases (three primary, one secondary), there was insufficient marrow aspirate for a proper assessment of cellularity, and in these cases the trephine result has been used in the calculations. The marrow cellularity is significantly higher in the patients with primary polycythaemia compared with the age and sex matched controls (paired t test, $p < 0.001$), and the patients with secondary polycythaemia (unpaired t test, $p < 0.001$). There were no significant statistical differences (paired t test) between the patients with secondary polycythaemia and the age and sex matched controls.

Thus, using a method of assessing marrow cellularity which takes into account different rates of sedimentation of marrow fragments¹⁰ and when patients are selected with strict diagnostic criteria,^{8,9} there is significantly higher marrow cellularity in patients with primary polycythaemia.

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Staining modification of creatine kinase isoenzyme method

Following the publication of *ACP Broad-sheet* 106¹ in which I described a fluorescence method for the detection and measurement of creatine kinase isoenzymes following cellulose acetate electrophoresis, I have been asked if the method could be adapted to isoenzyme staining by the tetrazolium reduction technique. This can be readily achieved by the addition of 2.5 mg of nitro blue tetrazolium (NBT), and of 0.025 mg of phenazine methosulphate (PMS) or Meldola's blue—for example, 25 µl of a freshly prepared aqueous solution of concentration 1 mg per ml—to each 2.5 ml of the double strength enzyme substrate (reagent 2) immediately prior to its mixture with 2.5 ml agar (reagent 3). Incubation of the cellulose acetate membrane with the modified substrate-agar mixture is then carried out in the dark in a moist chamber for one hour, following which the membrane is rinsed for one minute in a 5% vol/vol aqueous dilution of acetic acid, rinsed for a further one minute in distilled water and dried between absorbent paper under pressure.

The staining procedure is of comparable sensitivity to the fluorescence method with a detection limit approximately 3 U/l at 30°C (5 U/l at 37°C). It takes longer to complete because the incubation time is one hour, but has the advantage of yielding semi-permanent stained bands which can be densitometrically scanned in the visible rather than the UV range. Direct comparison of the two methods on isoenzyme mixtures has demonstrated that the relative proportions (recoveries) of each isoenzyme fraction are identical with both the staining and the UV procedure. Meldola's blue is a more stable electron carrier than the frequently used PMS and produces slightly less background colour.

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The assistance of Miss A Y Foo in the evaluation of this modification is gratefully acknowledged.

Reference

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Book reviews

Children with Sex Chromosome Aneuploidy: Follow-Up Studies. March of Dimes Birth Defects Foundation. Birth Defects: Original Article Series, Vol 18, no 4, 1982. Ed Donald A Stewart. (Pp 251; £41.) Alan R Liss Inc. 1982.

This book records the proceedings of a conference, held in Toronto, of those involved in a long term multicentre study, commenced in 1964, of children identified at birth as having sex chromosome aneuploidy.

An opening editorial chapter helpfully summarises the findings. Progress reports from the two largest study groups, Denver and Edinburgh, complement one another in that the former includes nine children with 45 X Turner's syndrome or its variants whilst the latter has a larger number of 47 XYY boys. Reports follow from the smaller study groups and there is a concluding discussion of ethical and legal issues.

The main conclusions are that 47 XXY and 47 XYY boys and 47 XXX girls all tend to be tall; to have a mildly depressed mean, especially verbal, IQ and impaired school achievement. Short stature is confirmed for Turner's syndrome but lowered intelligence is questionable. No consistent pattern of behavioural disturbance emerges apart from excess negativity and temper tantrums among 47 XYY boys in Edinburgh.

Regrettably the publishers do not disclose when the conference was held.

M d'A CRAWFORD

Endotoxins and their Detection with the Limulus Amebocyte Lysate Test. Progress in Clinical and Biological Research. Vol 93. Ed Stanley W Watson, Jack Levin and Thomas J Novitsky. (Pp 417; £35.) Alan R Liss Inc. 1982.

This is an account of the Proceedings of an International Conference on Endotoxin Standards and the Limulus Amebocyte Lysate Test held at Massachusetts in September 1981.

The Limulus Test is not used as a routine in Britain and there is considerable debate about its place in clinical laboratory practice. This collection of papers will be useful to anyone with an interest in possible applications of the Limulus Test and to anyone concerned with the difficult field of pyrogen tests and pyrogenic substances.

The Proceedings of a wide-ranging conference such as this tend to vary in quality of presentation and content. In addition, there is variation in the type face of different papers in this volume. The verbatim accounts of the verbal exchanges at the meeting may include some useful information, but this approach is expensive and inelegant and should be abandoned in favour of the services of someone who can write a succinct and more helpful account of such exchanges.

There is a mass of information in this book. It is less likely to be of interest to clinicians than to those who are technically involved in various areas of pathology, pharmacology and microbiology. It will certainly be of interest to those concerned with the detection and measurement of endotoxins and pyrogens. At £35 this collection of papers is rather expensive.

JG COLLEE

Tumors of the Soft Tissues. Atlas of Tumor Pathology 2nd series. Fascicle 1/Revised. Raffaele Lattes. (Pp 264; \$14.) Armed Forces Institute of Pathology. 1982.

One of the editorial "perks" is first choice of the books to review and some restraint is needed so as not to be selfish. However, restraint was cast aside for this revised version of the AFIP Fascicle on "Tumors of the Soft Tissues" and I carried it off to my laboratory with pleasure. This book should be on the shelf of every histologist with responsibility for reporting soft tissue lesions. The format is as before but expanded to take account of subjects previously dealt with inadequately or not at all. The presentation is even throughout, the photographs are excellent. I particularly enjoyed the section on malignant fibrous histiocytoma.

There are numerous electron micrographs to support the classical histology but it is a pity, though understandable, that immunofluorescent and immunoperoxidase techniques are omitted. The second edition Fascicle on CNS tumours has already been followed by a brief supplement. It would be very helpful if that precedent could be followed for soft tissue