Peuchmaur *et al*[1] also comment that dysplasia is rarely found in CELO; conversely, dysplasia is commonly associated with invasive adenocarcinoma arising in CELO. This subject has recently been discussed by Smith *et al.*[2] They found dysplasia in all the resection specimens from a series of 26 patients who had invasive carcinoma arising in CELO. Low grade dysplasia was found in only three of the 26 resection specimens[2] and Peuchmaur *et al*[1] suggest that type IIB intestinal metaplasia could be regarded as a form of low grade dysplasia.

We believe that our three cases provide further evidence, supporting that of other studies, for a sequence of reflux, CELO, low grade dysplasia (type IIB intestinal metaplasia), high grade dysplasia (including in situ carcinoma), invasive adenocarcinoma for the following reasons: (*a*) the association between low and high grade dysplasia in patients 1 and 2; (*b*) the association between type IIB intestinal metaplasia and high grade dysplasia in all three patients; (*c*) the absence of invasive adenocarcinoma in all three patients (although in patient 3 we base this assumption on biopsy material alone).

Our three patients were symptomatic and did not have invasive adenocarcinoma; however, Smith *et al*[2] re-emphasise that many patients with adenocarcinoma in CELO are asymptomatic and present late in the course in their disease. Furthermore, the medical "cure" of reflux symptoms does not equate with cure of reflux.[4] The problems of following up patients with CELO, especially those who are asymptomatic, have been discussed previously.[2 4] Our three cases emphasise the existence of clinically and endoscopically undetectable in situ malignancy in patients with CELO which may be diagnosed on biopsy or brush cytology and which is potentially curable by surgery. We also re-emphasise the value of mucin histochemistry in the early detection of type IIB intestinal metaplasia because the latter may act as a marker for reflux or mild dysplasia or both in patients with CELO.[1]

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Replicated Kem-O-Mat gentamicin EMIT

Although we have stated[1] that the manufacturers recommend duplicate analyses of blank control and clinical specimens for EMIT serum gentamicin assays on the Coulter Kem-O-Mat, we used single analyses in the interests of economy. We now present an assessment of the effect of replication on the results achieved by Kem-O-Mat gentamicin EMIT.

The findings are based on assaying four sera obtained from the United Kingdom National Control of Serum Aminoglycoside Assays programme. The Kem-O-Mat EMIT method[1] was used to assay each specimen four times per run, and in total 20 runs were performed on separate days. A full set of standards was included in each run to construct a calibration curve. The blank control and the high and low control sera were assayed in duplicate on each run. Runs were assessed for acceptability by the standard practice of evaluating the calibration curve and control sera results. No runs were rejected as a result of this assessment.

The contribution made by between batch and within batch random error sources to the total random error of a test result is expressed as follows:

$$S_{TOT} = (S_b^2 + [S_w^2/r])^{1/2}$$

where S_{TOT} is the total variation, r the number of times a specimen is assayed, and S_b^2 and S_w^2 are respectively the intrinsic between batch and within batch random error variance components.[2 3] The calculation of the S_w and S_b components from our quality control replication study is based on a component of variance analysis, the full details of which are described elsewhere.[2 3] Krouwer and Rabinowitz[2] discuss the untidy state of terminology in this area. We follow their recommendations, which are in line with strict statistical usage. Having established the S_b and S_w of a method it is possible to predict the total random error associated with a reported test value based on any given number of replicated assays (Table).

We found that adhering to the manufacturer's recommendations of duplicated test analyses caused negligible increases in the time to process each specimen and technician time per specimen. The financial cost of replication was calculated by including the price of the kit, standards, control specimens, and all disposables but not technician time or capital equipment outlay.

Our results show that a major component of the total random error associated with the Kem-O-Mat gentamicin EMIT method is the between batch error variance component, which is largely a function of calibration errors. Therefore, little is gained in terms of reducing the total ran-

	Specimen number				*Cost per laboratory result*
	862	*877*	*850*	*828*	
S_w	0·25	0·27	0·37	0·65	
S_b	0·13	0·14	0·21	0·61	
S_{TOT} (r = 1)	0·28	0·31	0·42	0·89	£5
S_{TOT} (r = 2)	0·22	0·24	0·33	0·76	£6·25
$\bar{x}$	1·62	3·63	4·83	10·66	
UK value	1·6	3·5	4·6	10·4	

S_b = between batch standard deviation.
S_w = within batch standard deviation.
S_{TOT} and r = see text.
$\bar{x}$ = mean specimen value after 80 analyses.
UK value = reference value given to specimen by the United Kingdom National Control of Serum Aminoglycoside Assays centre.
All values are μg/ml of gentamicin.

iance by duplicating specimens and blank control. Replication is not associated with appreciable penalties in terms of laboratory performance or finance but may draw attention to idiosyncratic errors. Such errors occurred on two occasions, with specimen 828 giving an overall rate of idiosyncratic errors of 0·5%. The runs in which these errors occurred were not included in the statistical analysis.

On balance, although we leave it to individual laboratories to draw their own conclusions from our data, we believe that specimen replication is not indicated in this method, although we cannot extrapolate our data to other EMIT analyser systems. If an effective reduction in total imprecision is required, this would be best achieved through improvements in calibration rather than test specimen replication. Work is required to evaluate whether these improvements can be achieved by modifying the assay of standards in terms of their number and replication or whether this problem reflects a limitation imposed by the equipment used.

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Book reviews

Interpretation of Breast Biopsies. Biopsy Interpretation Series. Darryl Carter. (Pp 201; $44·50.) Raven Press. 1984.

This volume is one of a series edited by Ancel Blaustein which seems mainly to be directed at those in training in histopathology. Its principal strengths are good black and white illustrations and clear reviews of the relevant papers available in different areas, with concise, up to date accounts of Paget's disease and stromal and lobular lesions. The section on the variables that have been considered as prognostic indicators in what are grouped together as "high grade invasive carcinomas" is good and includes comments on the probability of finding small metastases in nodes of different sizes which should, but often do not, figure in discussions of staging data.

The earlier chapters are the weakest, and the second entitled "Biopsy" consists largely of truisms and follows a defensive (? American = style). Under the heading "Frozen Section" appears "If the frozen section shows carcinoma and if the gross appearance and consistency is that of a carcinoma, this can be safely reported. If the gross and microscopic appearances do not correlate, it is best to defer the diagnosis until permanent sections are prepared". What? I thought that was why we cut frozen sections!

Other faults, from the English speaking point of view, include the statement that "it is necessary to properly interpret" a biopsy in order "to accurately place" it in the spectrum of breast disorders. This book will be helpful in parts to the trainee.

CL BERRY

Surgical Pathology of the Mediastinum. AM Marchevsky and M Kaneko. (Pp 304; $63·00.) Raven Press. 1984.

With the development of advanced imaging and endoscopic techniques previously inaccessible lesions of the mediastinum have come under increasing investigative scrutiny, and the pathologist must become aware of the diagnostic problems involved. This book undoubtedly fulfils this function in an admirably comprehensive manner despite at times a somewhat oblique style of writing. Most pathologists will find the detailed account of the thymus and its diseases especially useful, and the multifarious other neoplastic and cystic disturbances of the mediastinum receive excellent coverage. Only with the lymphomas which are classified according to the US National Cancer Institute Working Formulation (despite the comment that it is not a classification) is there any faltering in confidence, and in this respect it is curious that there is no clear recommendation with regard to the handling of pathological material from the mediastinum. Even so this is a helpful, wide ranging and well illustrated book which brings together a great deal of the information pathologists will require to understand this hitherto poorly explored area.

FD LEE

A Manual of Cytotechnology. 6th ed. Ed Catherine M Keebler and James W Reagan. (Pp 325; $75·00.) Raven Press. 1984.

This is the sixth edition of a loose leaf book produced by the American Society of Clinical Pathologists for students of cytotechnology. Most of the twenty seven chapters describe the cytopathology of the body systems encountered in clinical cytology but the history of the subject, the microscope, bench techniques, laboratory safety, cell structure, and function are also represented. It is well illustrated with colour and half tone plates and line drawings.

The chapters on gynaecological and respiratory tract cytology are presented well but a new edition should include mention of alveolar lavage and the modern techniques for direct endometrial sampling. The reluctance of American cytologists to adopt haematological staining methods limits the usefulness of this publication for European cytologists. The references include one to the Eng. J. Clin. Pathol. among several more inaccuracies.

There is much useful information for cytotechnologists in this well illustrated book but the price is beyond most laboratory budgets.

ELIZABETH HUDSON

Ischaemic Colitis. JWAJ Reeders, GNJ Tytgat, G Rosenbusch, and S Gratama. (Pp 186; Dfl145; £37.) Martinus Nijhoff Publishers BV. 1984.

This monograph constitutes an "in depth" retrospective study of 199 cases of ischaemic colitis collected from various hospitals in the Netherlands and analysed by a gastroenterologist, two radiologists and a pathologist. Histological material was available from 165 patients comprising 82 colonic resections and 32 biopsies with follow up autopsies in 108 cases. There is an excellent review of the literature and a critical assessment of the clinical and laboratory aspects, as well as the endoscopy, the radiology and the pathology. The