tions. Furthermore, routine early resection is unlikely to decrease greatly the number of cases with advanced disease coming to operation, for a large proportion of these cases have previously had no significant symptoms (Dawson *et al.*, 1965). Many cases first present with advanced disease, while many with mild conditions never become "advanced."

Place of Colostomy in Treating Diverticulitis

It is now generally accepted that proximal colostomy, temporary or permanent, is ineffective in the treatment of diverticular disease unless followed by resection. Pemberton *et al.* (1947) reported that 30% of the cases treated by a permanent colostomy were not controlled and that 70% of those whose colostomies were closed without resection had serious recurrent disease. Lloyd-Davies (1953) recorded similar experiences. These authors did not report control series treated by laparotomy only, but in the present series simple laparotomy gave a recurrence rate of 38% compared with 50% in patients treated by permanent colostomy and 50% in patients whose colostomies were closed without resection. Moreover, the most intractable cases were particularly prominent in the group undergoing colostomy without resection. These observations suggest the possibility that colostomy is not only ineffective but, by diverting the faecal stream and allowing contraction of the affected bowel, interferes with drainage of the diverticulum and favours inflammatory complications. That the prolonged use of proximal colostomy does indeed increase the severity of the disease process cannot be deduced with certainty from this series, as the numbers are too small, and the fallacies associated with retrospective studies must be taken into consideration. However, it is hoped that other workers may be stimulated to investigate this aspect of the management of diverticulitis.

Summary and Conclusions

One hundred consecutive cases of sigmoid diverticulitis, confirmed by laparotomy, have been followed up for 5 to 15 years in an attempt to clarify the natural course of the disease and the influence of operative procedures on its progress.

The course appears to be more benign than is often suggested, with a strong tendency to natural regression. A few patients experience prolonged and severe morbidity and will merit resection. The study suggests that extension of the scope of resection to include frequent emergency or three-stage resection for patients with acute diverticulitis is not justified.

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Results from Electronic Determination of Cell Size-distribution Pattern in Cervical Washings

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In 1964 Ladinsky, Sarto, and Peckham showed that cervical washings from patients with cancer of the cervix and endometrial cancer gave a frequency distribution, when examined by means of a Coulter counter model B with automatic plotter, which differed from that of cervical washings taken from healthy women. The exfoliated cells contained in the washings from cancer patients showed a second population in the size range 500–600 μ^3 , while that of non-cancer cases was in the

size range below 300 μ^3 . The presence of a second population was found in all the 41 cases of invasive squamous-cell carcinoma of the cervix, and out of 81 normal cases only 11% were false-positive. These results seemed so promising that we decided to test the method, and this paper describes the results.

Material and Methods

The cervical washings were obtained by aspirating 7 ml. of a 0.3 M autoclaved solution of sodium salt of isethionic acid into a 10-ml. syringe, furnished with a 4-in. (10-cm.) No. 16 needle. The end of this was placed approximately 1 in. (2.5

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cm.) from the external cervical os, under direct vision; and under maximum pressure the liquid was sprayed on to the squamo-columnar junction. The liquid was then aspirated from the posterior fornix, and this procedure was repeated three times.

The washing (5–6 ml.) was filtered through coarse gauze to remove debris and mucus, and about 0.1 ml. of the filtrate was spread on a slide, air-dried, fixed in methanol, and stained with Papanicolaou stain. The remainder of the filtrate was diluted with 0.85% saline to give a cell count suitable for the counter.

The size-distribution patterns were determined by means of the Coulter counter model B with automatic plotter. The performance of this equipment was regularly checked with a double pulse generator and by repeated use of test particles from the same batch. The Coulter counter and plotter have been described in detail (Kubitschek, 1960; Brecher, Jakobek, Schneiderman, Williams, and Schmidt, 1962).

The cervical washings were obtained from patients attending gynaecological and post-natal clinics and from patients admitted to the Royal Beatson Memorial Hospital for radiation treatment. Smears and biopsy specimens were examined by the pathological departments concerned, and one of (S. I.) examined the slides from the washings.

Results

The results of the non-cancer cases are summarized in Table I, and those of the cancer cases in Table II. Some of the latter were examined on two occasions with an interval of one week between washings, and one case on three occasions.

The results from the cancer patients are obviously disappointing. For example, of 30 cases of cancer of the cervix 19 were Coulter-positive and 11 Coulter-negative at the first examination. Assuming an even chance for a Coulter-positive or a Coulter-negative response the probability of the occurrence of such frequency is 0.10—that is, not significantly different from the assumption. The results from the second examination of cancer of the cervix are also not significant ($P=0.073$).

Our results differ considerably from those of Ladinsky *et al.* (1964) and we have therefore tried to find a reason for this. Re-examination of the slides from the cervical washings made it apparent that all the Coulter-positive washings from cancer and non-cancer cases contained more leucocytes than epithelial cells of any type. On the other hand, the Coulter-negative washings either contained a large number of erythrocytes—far in excess of any epithelial cell type—or showed only predominance of epithelial cells. This suggests that a Coulter-positive

TABLE I.—Results in Non-cancer Cases. Coulter-positive or Coulter-negative Indicates the Presence or Absence of a Second Cell Population, as Defined by Ladinsky *et al.* (1964)

	Coulter		
	Negative	Positive	Doubtful
Negative smear	91	2†	5‡
Clinically healthy (no smear available)	28		
Positive smear	1*		

* Biopsy negative.

† On repeat 2–3 months later, Coulter-negative.

‡ Second population with modes 480–580 μ^3 . On repeat 2–3 months later they were all Coulter-negative.

TABLE II.—Results in Cancer Cases

Examination:	1st		2nd		3rd	
	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.
Carcinoma of cervix	19	11	9	3	1	0
Adenocarcinoma of uterus	2	6	1	4		
Cancer of vagina	2	6				
	23	23	10	7	1	0

pattern is not by itself an indication of malignancy but of the presence of leucocytes in sufficient number in the washing.

This is corroborated by the finding that leucocytes isolated from human blood gave size distributions with modal values in the range 620–860 μ^3 (depending upon the osmolarity of the solution), which are well within the modal values for the Coulter-positive washings. The variance of the distributions of the latter was greater than that of isolated leucocytes. A sample of human pus from an abscess gave a modal value corresponding to 740 μ^3 .

Conclusions

We conclude from these results that a Coulter-positive pattern depends more upon the number of leucocytes present in the cervical washing than on the presence of normal or malignant cells, and that, therefore, determination of cell size-distribution by this method in its present form is not a reliable screening method for cancer of the cervix or for any other form of cancer of the female genital tract.

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Preliminary Communications

Serum Alkaline Phosphatase in Pregnancy: An Immunological Study

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Evidence is accumulating that in the later stages of pregnancy placental alkaline phosphatase is present in the maternal circulation. Maternal serum alkaline phosphatase resembles placental alkaline phosphatase in its heat stability (McMaster *et al.*, 1964), substrate specificity (Sadovsky and Zuckerman, 1965), migration on starch gel (Boyer, 1961), and resistance to chemical inactivation (Kitchener *et al.*, 1965). Serum alkaline phosphatase in the foetus shows none of these characteristics.

In order to provide specific evidence for the identity between placental alkaline phosphatase and the enzyme in the maternal

circulation an anti-human placental alkaline phosphatase antibody was prepared in the rabbit. This paper describes our experiences with this preparation.

MATERIALS AND METHODS

Placental alkaline phosphatase was purified by the method of Ahmed and King (1960). The powder obtained after the first acetone precipitation had a specific activity of 40 King-Armstrong (1934) units per mg. of protein, and this was used without further purification.

The powder was dissolved in Ringer-lactate, containing 1:10,000 Merthiolate (Lilly) so as to give a concentration of 2–3 mg. of protein per ml. One part of this solution was well mixed with two parts of Freund's adjuvant (Kabat and Mayer, 1961) so as to form a water-in-oil emulsion. This was injected