Review of general surgery 1979

HAROLD ELLIS
D.M., M.Ch., F.R.C.S.

Professor of Surgery, Westminster Medical School, London, S.W.1

Introduction

THIS year's review ranges pretty widely over the broad expanse covered by the term 'General Surgery'. The endocrine system always has a particular fascination because of its precise correlation between anatomy and physiology and we consider some interesting advances in thyroid and parathyroid surgery as well as that rare but interesting condition, the insulinoma. Under malignant disease we touch on melanoma, breast cancer and tumours of the gastrointestinal tract. Bleeding from oesophageal varices is always a formidable problem and we review the very welcome recent advances in more conservative therapy of this unpleasant emergency. In vascular surgery numerous interesting reports have appeared on rather unusual types of aneurysm and their management and we also consider advances in emergency arterial surgery. Travelling to the large bowel, diverticula of the colon, amoebic colitis, gunshot wounds and the use of stapling machines are reviewed. Surgeons continue to pay increasing attention to those 2 important subjects, wound infection and wound healing; in spite of continued endeavour and improving results, perfection in the first and avoidance of the second remain unachieved goals. Finally, a miscellaneous group includes the management of axillary sweating and the diagnosis of prostatic cancer.

All but one or two of the references quoted refer to papers published in 1979.

Endocrine surgery

Insulin-secreting tumours of the pancreas are uncommon but fascinating. The diagnosis can be confirmed, once clinically suspected, by the development of hypoglycaemia provoked, in the majority of cases, by an overnight fast. However, fasting may have to be prolonged for up to 48 hr and this was so in 5 out of the 26 patients with this condition reported by Le Quesne and his colleagues (1979) from the Middlesex Hospital. It is now possible to provide direct evidence that the hypoglycaemia is

due to hyperinsulinism by demonstrating disproportion between the fasting blood sugar and serum insulin levels. In a normal person, if the blood sugar falls to a low level, serum insulin becomes almost undetectable. However, in a patient with an insulinoma, insulin secretion is no longer suppressed by this 'feed-back' mechanism. Diazoxide is effective in preventing hypoglycaemic episodes in patients with this tumour and there were no failures of treatment in the 21 patients so treated by Le Quesne and his colleagues. Seven patients were successfully maintained on this drug for periods of up to 12 years with no untoward late complications. In the early stages of administration of the drug, however, its effects must be observed carefully, both to adjust the dosage correctly and to check that it is not causing excessive fluid retention. The drug is of value in treating those few patients in which it is impossible to locate a tumour at operation, in whom surgery is for some reason contra-indicated, or in patients with a malignant tumour with metastatic spread.

The experience of dealing with insulinomas at the Mayo Clinic is immense and no less than 226 cases have been dealt with at that institution since Dr Mayo removed the first tumour in 1927. Van Heerden, Edis and Service (1979) reviewed the 72 surgically treated insulinomas at the Mayo Clinic since 1965. Angiography localized no less than 90% of these cases. Ten per cent. of the tumours proved to be malignant and symptoms could be controlled fairly successfully using diazoxide and streptozotocin (a cytotoxic drug). At the Mayo Clinic intra-operative monitoring of blood glucose is carried out; a hyperglycaemic rebound of 30 mg% confirms removal of all hyperfunctioning islet tissue and if no such response is obtained after 30 min, an additional unrecognized tumour is to be suspected. No less than 8 of their 72 cases (11%) were multiple. There was an even distribution of insulinomas through head, body and tail of the pancreas.

It is an interesting and unexplained fact that malignant endocrine tumours are often associated

with surprisingly long survivals; medullary carcinoma of the thyroid, carcinoid tumour and malignant endocrine tumours of the pancreas are examples of these. Davis and Vansant (1979) note that in the Zollinger-Ellison (Z-E) tumour registry there are 127 examples of patients with malignant gastrinomas of the pancreas with proved liver secondaries. The 10-year survival was 30% in those patients who had been submitted to total gastrectomy although there were no survivors following lesser operations. The mechanism of survival following removal of the target organ is controversial and the current use of cimetidine in the treatment of this syndrome adds a further dimension on the importance of parietal cell elimination or blockage in the treatment of malignant gastrinomas. These authors report an extraordinary case of a patient who had a total gastrectomy for a malignant Z-E tumour, at which time retroperitoneal and retropancreatic metastases were found and several removed. Three years later extensive liver secondaries were confirmed by biopsy, yet at re-exploration after 14 years no liver metastases were discovered so that spontaneous regression of advanced intra-abdominal metastases occurred and there was to date a total of 20 years' survival.

Hyperparathyroidism leading to surgical exploration of the parathyroid glands is becoming an increasingly common problem. This is partly due to the fact that the commonest presentation today of hyperparathyroidism is the patient with no definite symptoms who is found by chance on biochemical screening to have a raised serum calcium level (Wade, 1979) and because of the increasing numbers of patients with secondary and tertiary hyperparathyroidism in chronic renal failure. If hyperparathyroidism is suspected it is advisable to take at least 3 fasting specimens of blood for serum calcium estimation. Levels differ in different laboratories but, on average, a figure above 2.6 mmol/l (10.4 mg/dl) is suspicious. If hypercalcaemia is present, Wade (1979) advises that the serum parathyroid hormone (PTH) concentration should be measured. This is done by a radioimmunoassay and the test is now available in the United Kingdom through the Supraregional Assay Service. If a patient has hypercalcaemia due to any cause other than hyperparathyroidism, PTH cannot be detected in the serum. This is because of the feedback mechanism between parathyroid activity and the serum calcium level; parathyroid secretion is suppressed by a raised serum calcium level unless one or more of the parathyroid glands have become autonomous. It is therefore the presence of detectable PTH in the blood of a patient with hypercalcaemia that is diagnostic of hyperparathyroidism; the PTH level may be raised above normal or be within the normal range. The reason for a normal PTH level in peripheral venous blood in some

patients with primary hyperparathyroidism is that the PTH molecule is broken down by cleavage, probably in the liver and kidney. However, in venous blood close to the parathyroid tumour or hyperplastic parathyroid glands, the PTH level is always raised and this can be demonstrated by taking samples of blood from the innominate and internal jugular veins, as is done in selective venous catheterization to determine the site of a parathyroid tumour.

The problem of dealing with a patient found to have asymptomatic hypercalcaemia is discussed by Grimelius and his colleagues (1979) from the University of Uppsala, Sweden. Screening programmes in a normal population may give a pick-up rate of 0.6% and asymptomatic hyperparathyroidism is the indication for operation in 20 to 50% of patients operated on for verified hyperparathyroidism in different series. These authors point out that in some patients a thorough investigation does indeed reveal symptoms but in others no clinical features at all can be detected. Some patients have refused surgery and have been followed-up for several years without signs of progressive disease, others demonstrate long periods of moderate symptoms before turning up for examination and treatment. However, these authors have recently seen a fatal case of hyperparathyroid crisis in an elderly woman 3 years after refusal to have a neck exploration which was suggested for hyperparathyroidism accompanied by few symptoms. The policy of Grimelius *et al.* is to perform a neck exploration when the diagnosis of hyperparathyroidism is verified. Diffuse and slight clinical manifestations may be overlooked and the patients themselves may not be aware of their symptoms until they are relieved of them by surgical treatment. Another reason for this policy is that when neck exploration is performed by a surgeon experienced in this type of surgery the mortality and morbidity approach zero. They point out that a true picture of the risk of asymptomatic hyperparathyroidism could only be evaluated from a prospective randomized series of patients with and without surgical exploration and such a study would have to run for a long period of time. The non-explored patients would require careful follow-up to detect symptoms and complications for comparison with the surgically treated group.

Salem and Taylor (1979) review the uncommon problem of primary hyperparathyroidism in pregnancy. It is associated with a complication rate of up to 80%, mainly stillbirths, abortions and neonatal tetany. Surgical treatment during pregnancy offers the best chance for survival of the fetus. There are now 14 such cases reported, including one presented by these authors. There was only one fetal death and this was in a patient in whom the fetus

was dead before operation. There were no other neonatal complications in this group although at least 8 of the mothers developed postoperative hypocalcaemia, 2 of whom developed tetany. The authors advocate careful postoperative monitoring of serum calcium level in these patients and treatment with calcium supplements should the calcium fall below the normal range even if symptoms of hypocalcaemia are not present.

Secondary hyperparathyroidism is a relatively common problem in patients with chronic renal failure. Sivula and his colleagues (1979) found that 34 of their patients in chronic renal failure (8% of all uraemic patients on their unit in Helsinki) had the clinical features of this syndrome, with pruritus, bone pain, mental disturbance, osteoporosis, pathological fractures and metastatic calcification. Parathyroidectomy is followed by a fall in the serum parathyroid hormone and serum calcium levels with relief of symptoms. They advocate removal of three-and-a-half of the parathyroid glands, leaving one half of the smallest and most normal looking of the parathyroids. Successful renal transplantation is often followed by regression of the hyperparathyroidism. If, however, the symptoms persist this signifies that the overactivity of the parathyroid glands has now become autonomous, i.e. tertiary hyperparathyroidism.

Re-exploration for persistent hyperparathyroidism is associated with the risk of subsequent hypocalcaemia. Brennan and his colleagues (1979) present an interesting review of their experience with the cryopreservation of portions of the parathyroid removed at operation. If the patient subsequently becomes hypoparathyroid, then autotransplantation is carried out and they report 6 such cases using tissues preserved for up to 18 months. Edis (1979) points out that parathyroid autotransplantation should be considered in all patients coming to re-operation if there is any concern that the normal glands might have been removed. If facilities are available, cryopreservation can be used and transplantation performed if tetany supervenes. However, if such facilities are unavailable, the tissue can be transplanted immediately and if recurrent graft-dependent hypocalcaemia subsequently occurs, it is easily managed by resecting a portion of the implanted parathyroid tissue under local anaesthesia.

The pre-operative preparation of a patient with hyperthyroidism is still the subject of much debate, complicated by the recent introduction of propranolol. Edis (1979) reports that at the Mayo Clinic, Lugol's iodine is still employed for 7 to 10 days pre-operatively in addition to the other anti-thyroid drugs. Klementsich, Shen and Kaplan (1979) note that their standard pre-operative regime at the University of Chicago is propylthiouracil or methimazole until the patient is euthyroid, usually at

least 4 to 6 weeks of treatment. Oral potassium iodide is then added for about 10 days to make the thyroid firmer and less vascular. If severe symptoms of tremor, nervousness or tachycardia are present, then propranolol is added and continued up to the time of operation. This drug is avoided, however, if there is poor myocardial function or asthma. Post-operatively, the other antithyroid drugs are immediately discontinued although propranolol therapy is maintained if this has been commenced pre-operatively. They do not like to use propranolol alone since they do not think this is safe and state that cases of thyroid crisis have been reported with its use. However, they do employ propranolol by itself in those few cases where there is sensitivity to iodine or to the other antithyroid drugs. Under such circumstances propranolol is continued for several weeks after operation as they consider the patient still thyrotoxic even though overt symptoms are depressed. Taylor (1979) uses propranolol for one week before and one week after operation if the patient's hyperthyroidism has not previously been treated by other antithyroid drugs. If the gland is very vascular, he also gives Lugol's iodine solution for 2 weeks pre-operatively. Anderberg and his colleagues (1979) present a carefully documented account of 38 patients whose only pre-operative treatment was propranolol; the median pre-operative treatment time was 3 weeks, but this ranged from 4 days to 2 years. The symptomatic affect of the treatment was unchanged in the 5 patients treated for more than 3 months throughout the prolonged course of treatment. The drug was continued during the first post-operative week following a standard subtotal thyroidectomy. The T3 concentration decreased to normal values within one to 2 days of the operation but the T4 concentration decreased more slowly and was normal within one to 3 weeks postoperatively. The authors conclude that pre-operative treatment with propranolol is safe and effective. The pre-operative treatment time can be short and the time for operation is flexible. No risks for operative complications or thyroid crisis have been observed.

Collapse of the trachea is an unusual complication of thyroidectomy. Green and his colleagues (1979) record a case and review 9 other reports. Tracheal collapse may occur irrespective of the nature of the thyroid disorder or the size or position of the gland. Respiratory difficulty may present unexpectedly at any time during the first 24 hr after operation. Immediate restoration of the airway is essential, either by endotracheal tube or tracheostomy, and the diagnosis can then be made by exclusion of cord paralysis, oedema and haematoma. The airway should be maintained by intubation for a minimum of 24 hr and for a more prolonged period if

respiratory distress continues. The exact mechanism of this emergency still remains something of a mystery; in the case reported by Green and his colleagues the trachea was not noticeably abnormal, either at the time of thyroidectomy or during the performance of tracheostomy.

The solitary toxic adenoma is a rare but interesting cause of thyrotoxicosis. Bransom and his colleagues (1979) present a valuable report on this condition from Sheffield. Over a 15-year period, 1128 thyroid operations were performed; 630 of these were for toxic glands and 35 of these were solitary toxic adenomas, which thus accounted for 5.6% of operations for thyrotoxicosis. Of these 35 patients, 19 presented as a mass in the neck and another 13 presented with features of toxicity. Removal of the adenoma is a quick and effective method of treatment, although 5 patients subsequently developed hypothyroidism. It is usually stated that a 'hot' nodule is rarely malignant but a positive uptake in the nodule certainly does not exclude the risk of malignant disease and it is interesting that one of the patients in this series had a toxic adenoma which contained a focus of papillary carcinoma and another patient had a possible malignant area in a 'hot' clinically toxic adenoma.

Malignant disease

Breast cancer

Two important fields of interest in this, the most emotive of the major cancers, are the search for less mutilating forms of treatment for the so-called 'early cases', and attempts to identify patients with poor prognosis in this group. The importance of the latter is the possibility of improving prognosis by adjuvant chemotherapy or hormonal therapy in these high-risk patients.

Until recently local control of breast cancer has depended on surgical removal of the breast and the axillary lymph nodes but it is now being questioned by doctors and the laity whether local control requires the loss of the entire breast with its undoubted psychological and social disturbances. Wizenberg and Brickner (1979) present an excellent survey of the important studies which have been carried out by Baclesse in Paris, Peters in Canada and Hellman in Boston, as well as in other centres, in which incisional or excisional biopsies of the tumour are followed by radiation therapy to the breast and adjacent node areas to a dose of 4500 to 5000 rad. The site of the excisional biopsy or the site of the residual tumour then receives a supplementary dose of 1000 to 1500 or more rad using either external beam radiation or interstitial implantation. The cosmetic results of such treatment are excellent and in follow-up studies to date there is no increased risk in terms either of survival or local control of the

neoplasm (Elliott, 1979; Timothy *et al.*, 1979). Speaking personally, the present author has gone over entirely to this form of treatment in his own practice in the past year having been entirely convinced by the excellent published results of this international coterie of radiotherapists.

Prognostic factors in breast cancer have been the subject of clinical and laboratory investigations for many years. The best recognized of these has been involvement of the axillary lymph nodes and it is well established that this state of affairs is associated with a reduction of the 10-year survival rate from 75% in node-negative cases to 30% in node-positive patients. Nealon and his colleagues (1979) investigated the histological appearances of the primary tumour in 203 patients with node negative cancers. They identified 4 prognostic factors: poor cytological differentiation; lymphatic permeation; blood vessel invasion; and invasion into surrounding soft tissues. Of their 203 patients, over a 3- to 8-year follow-up, 109 had none of these poor prognostic factors and only 2 became treatment failures (2%). However, among 94 patients with one or more of these factors, there were 47 failures of treatment (50%), a highly significant difference. Blamey and his colleagues (1979), using lymph node staging, tumour size and histological grading in combination, were able to identify a group of patients who have an extremely poor prognosis in the short term. Eighty-five per cent. of these patients are likely to die or suffer major recurrence within 2 years of surgery. These authors suggest that perhaps trials of adjuvant chemotherapy in the first instance should be restricted to patients having tumours with these poor prognostic features. An interesting study by Shousha and his colleagues (1979) investigated the presence or absence of carcino-embryonic antigen (CEA) in sections of breast carcinomas removed from 69 patients 6 to 13 years previously. Patients who had CEA-negative tumours had significantly higher 5- and 10-year survival rates. The difference was not related to the stage of the disease or the histological type of the tumour so that the finding of CEA in tissue sections of breast carcinoma may be helpful in differentiating between tumours that appear similar by conventional histological methods which may yet behave in different ways.

A reassuring paper by Vessey and his colleagues (1979) of 621 case-controlled pairs showed no overall relationship between the use of oral contraceptives and breast cancer. The only sub-group in which the evidence for a positive association between pill use and breast malignancy was at all convincing comprised women aged 46 to 50 years, but trends in those aged 41 to 45 were by and large in the opposite direction and results of combined analysis gave no cause for concern. Those who had never used oral

contraceptives had appreciably more advanced tumours at presentation than those who had been using the pill during the year before detection of the mass, while past users of the pill occupied an intermediate position.

Malignant melanoma

If a patient presents with a cutaneous malignant melanoma and the regional lymph nodes are enlarged, or, if after adequate excision of a malignant melanoma the regional nodes subsequently become enlarged, there is no doubt that excision of the affected nodes by block dissection becomes mandatory. There is still some degree of controversy about the management of impalpable nodes, the so-called Stage I cases. The argument against block dissection in Stage I cases is that some 75% of patients will be found to have negative nodes on histological examination and can therefore be assumed to have had an unnecessary operation. Because of this, until recently many authorities have advised a conservative policy of careful follow-up only. However, the prognostic picture has now been clarified by microstaging classification of the depth of penetration of the primary tumour itself. In Clark's classification, the tumour is graded into 5 levels: I, above the basement membrane of the epidermis; II, invasion through the basement membrane; III, tumour involving the papillary dermis; IV, lesions penetrating into the reticular dermis; and finally, V, melanoma penetrating into the subcutaneous tissue. Breslow has related the prognosis of melanoma to the actual measured thickness of the melanoma itself. It is accepted that a melanoma which has extended to a depth of 0.65 mm in Breslow's classification is comparable to Clark's level II and that a melanotic lesion that is 1.5 mm is comparable to Clark's level IV while a depth of 3 mm or more corresponds to level V. In these advanced Clark-Breslow stages IV and V (melanoma thicker than 1.5 mm), clinical Stage I cases will be found to have metastases in the regional lymph nodes at the range of 40 to 70% and many surgeons are now recommending elective lymph node dissection in such cases. For the Clark level III, metastases in the regional nodes may be expected in up to 20% of cases. This presents something of a borderline in clinical judgement in deciding whether or not a block dissection is justifiable in such cases (Goldsmith, 1978, 1979). Balch and his colleagues (1979) present a study of 394 clinical Stage I melanomas followed-up for 20 years. Of those tumours 1.5 to 3.99 mm in thickness submitted to wide excision and gland dissection, there was a 78% 8-year survival compared with no survivals whatsoever in comparable cases at 8 years if the nodes were not removed by block dissection. They also find that

prognosis varied with site, being better in melanomas on the limb than those on the head and neck which in their turn had a better prognosis than tumours on the trunk. Ulceration of the melanoma was also of more serious prognostic significance in the Stage I cases.

For many years there has been great interest in the treatment of regional nodes in Stage I cases by endolymphatic therapy. The MRC Working Party (1979) has now presented its interim results of 146 patients studied over a 10-year period. Initially ^{131}I -labelled lipidol was used but this was replaced by ^{32}P -labelled lipidol. Although total recurrence rates were not significantly affected by endolymphatic therapy, recurrence in the lymph nodes was largely prevented. More patients in the standard treatment group needed the more major procedure of block dissection. The authors point out that further, more detailed, pathological study of the material is required (for the reasons given above) and this pathological survey will be incorporated in the final analysis of the trial.

Gastrointestinal cancer

Less than 40% of all carcinomas of the gastrointestinal tract are at present controlled by current modalities of treatment. Enormous attempts have been made to improve on these results using cytotoxic drugs, alone or in combination, as adjuvant agents to surgical resection or in the treatment of advanced or disseminated disease. Terz and Beatty (1979) present an extensive review of this field with >150 references to trials carried out over the last 12 years, pointing out the failure of adjuvant chemotherapy and the only limited response in the treatment of advanced gastrointestinal malignancy. A typical example of these depressing reports is that presented by Rake and his colleagues (1979) who describe a controlled prospective randomized multicentre study of chemotherapy in advanced gastric cancer. Initiation treatment was with vincristine, 5-fluorouracil, methotrexate and cyclophosphamide, switching to a maintenance course of mitomycin C and 5-fluorouracil. Thirty-seven of the cases were inoperable and 39 had had the primary tumour resected but residual disease was still present. In the first group, the treated patients survived 9.5 weeks after surgery compared with an average of 9 weeks in the control cases. In the resected group, again, there was no difference in the ultimate overall survival and nausea was more frequently reported in the treatment group. It would seem, at present, as if the cytotoxic therapy in so many of these cases simply makes their last few weeks even more miserable.

Perhaps a more hopeful line of investigation is the use of serial carcinoembryonic antigen (CEA)

determinations for the early detection of recurrent disease in large bowel cancers enabling either 'second look surgery' or perhaps more effective cytotoxic therapy to be employed. Martin and his colleagues (1979), for example, report 17 patients following colorectal cancer resections and one patient after resection of a hepatoma who were all followed-up with frequent serial CEA determinations and in whom there was a rise in titre. Re-exploration of these 18 patients revealed 13 to have localized recurrent disease, and 4 to have disseminated cancer. There was only one negative exploration.

'Telling the patient'

A fascinating report from the U.S.A. by Novack and his colleagues (1979) notes that, in answer to a questionnaire issued in 1961, 90% of clinicians indicated a preference for *not* telling a cancer patient his diagnosis. The same questionnaire, now administered to 264 university-hospital medical staff showed a 97% preference for telling the cancer patient his diagnosis—a complete reversal of attitude. Partly, at least, this reflects the dramatic improvement in the palliative control of metastatic cancer (Freireich, 1979; Shimm *et al.*, 1979).

Portal hypertension

The surgeon may be asked by his physician colleagues to help in the management of a patient with portal hypertension either because bleeding from oesophageal varices has failed to respond to conservative treatment or because of medically-resistant ascites.

The modalities of surgical treatment for bleeding oesophageal varices include some form of porto-systemic shunt, surgical disconnection of the portal and azygos anastomoses, percutaneous transhepatic injection of the varices and sclerotherapy. An excellent review of this subject has recently been published by Terblanche (1979).

For more than 20 years, some form of porto-systemic shunt, usually a portacaval shunt, has been the accepted method of preventing recurrent variceal bleeds or treating the acute episodes. Today, the value of these shunts is being seriously questioned as the result of numerous prospective randomized studies (Marion *et al.*, 1979). These have demonstrated that prophylactic portacaval shunts actually decrease the survival rate in elective cases and in emergency operations. If, in addition, the morbidity of shunting, particularly post-shunt encephalopathy, is considered, the role of portacaval shunting in managing these patients is very questionable indeed. It may be that the Warren splenorenal shunt, which preserves flow to the liver while decompressing the varices in the lower part of the oesophagus, may

be of more value but this is a technically difficult operation to perform (Terblanche *et al.*, 1979a).

The difficulties of conventional shunt operations, particularly when performed under emergency conditions, has led to the increasing popularity of the mesocaval shunt procedure, in which a wide Dacron graft is inserted between the first part of the superior mesenteric vein and the inferior vena cava. However, Cameron and his colleagues (1979) report that 13 out of 34 of their cases developed encephalopathy even though this only persisted in 3 cases. Another problem is the high risk of late thrombosis of the mesocaval shunt with reports of late patency rates ranging from 0 to 20% (Rosenthal *et al.*, 1979).

Percutaneous transhepatic occlusion of oesophageal varices was introduced by Lunderquist and Vang in 1974. A catheter is introduced into a large intrahepatic branch of the portal vein; a flexible guide wire is then manipulated into the left gastric vein along which the catheter is guided and occlusion of this vessel is achieved by embolization with an absorbable gelatin sponge soaked in sclerosant or isobutyl cyanoacrylate. Published figures claim a hospital mortality rate of 18% and an incidence of recurrent bleeding in those in whom occlusion had been obtained as 20%. Henderson, Buist and Macpherson (1979) report rather less favourable results from the Royal Infirmary, Edinburgh. The procedure was attempted in 9 patients with portal hypertension (11 procedures). On 2 occasions, the left gastric vein could not be entered. Two patients after radiologically satisfactory occlusion bled again within 2 days and a further 3 patients bled between one and 10 months later. Other complications included portal vein thrombosis, gross ascites and right pleural effusion and there were 2 hospital deaths.

Injection sclerotherapy of oesophageal varices via the oesophagoscope was first used in 1939 by Crafoord and Frenckner and introduced into this country by Macbeth of Oxford and Rodgers in Belfast (Leading Article, 1979). In recent years, the comparative simplicity of this technique, combined with good control of bleeding varices, has resulted in its more widespread use (Sinnett *et al.*, 1979). Terblanche and his colleagues (1979b) in Cape Town report that, between 1968 and 1971, conservative treatment of bleeding oesophageal varices using the Sengstaken tube was associated with a re-bleed rate of 60% and a hospital mortality rate also of 60%. They now report on 22 patients (14 with alcoholic cirrhosis) in whom injection treatment was used after removal of the Sengstaken bag. There were 9 deaths (41%) but no patient died of bleeding and these authors now regard injection treatment as the emergency therapy of choice in patients who have

further bleeding on conservative treatment. These same authors (Terblanche *et al.*, 1979a) are now commencing a prospective control trial of sclerotherapy in the long-term management of patients after bleeding from oesophageal varices compared with patients treated on conservative medical lines. In a preliminary report on the first 31 patients in the trial, results are encouraging. One of the problems with this method of treatment is the danger of using the rigid oesophagoscope. Williams and Dawson (1979) describe a new technique using the flexible gastroscope. Once the gastroscope has been inserted, a flexible tube with a window cut into its distal end is pushed down over the gastroscope until a varix protrudes through the window. The varix can then be injected with a needle passed down the biopsy channel of the gastroscope. Once the varices have all been injected in this way, the tube is advanced to compress the injection sites and so help control the bleeding. At this stage any residual blood in the stomach may be aspirated and it may occasionally be necessary to insert a Sengstaken tube at the completion of the procedure. In their series of 150 patients, there have been no oesophageal perforations using the flexible gastroscope. The minor complications associated with injection treatment are substernal pain, tachycardia and an occasional small pleural effusion.

Turning now to the problem of ascites, many of these cases can, of course, be managed on medical lines with diuretics and a low salt diet. However, there are a group of cases resistant to this therapy and there has been much interest in the use of the LeVeen peritoneo-venous shunt between the peritoneal cavity and (*via* the jugular vein) the superior vena cava. A low pressure valve prevents reflux of blood into the peritoneal cavity. Wapnick, Grosberg and Evans (1979) now report a prospective randomized matched pair study of patients treated with the LeVeen shunt and those treated on medical lines. The surgical patients outlived their matched partners in 12 of 14 pairs, spent less time in hospital and had a greater weight loss and reduction in girth. In the experience of these authors, the shunt is valuable in truly refractory ascites and has also been shown to be effective in chylous ascites, the Budd-Chiari syndrome and nephrogenic ascites. However, patients with alcoholic hepatitis, hyperbilirubinaemia, peritoneal sepsis, severe coagulopathy and those who have recently bled from oesophageal varices are poor risks for this surgical procedure.

Vascular surgery

Aneurysms have fascinated surgeons since they were first mentioned by Celsus and described by Ambroise Paré. Today, remarkable successes are being recorded in the management of aneurysms

even of the most complicated and inaccessible kind. Crawford and his colleagues (1979) provide an extensive review on the current status of surgical treatment of aortic aneurysms from their enormous experience at the Baylor College of Medicine in Houston. For acute dissections, they advise a combination of preliminary stabilization of the hypertension by medical treatment (except in patients with rupture who are immediately submitted to operation). This is then followed by elective surgery with a 60% 3-year survival rate, in contrast to a 30% survival in medically treated patients. Most surgeons advise surgical treatment of abdominal aortic aneurysms >5 cm in diameter, and diagnosis can now be made with great accuracy and safety by ultrasonography. However, these authors point out that even small aneurysms of 4 to 5 cm in diameter may occasionally rupture and they therefore advise operation for even small aneurysms in patients who would tolerate operation well, as well as carrying out surgery in the poorer risk patient where there is an enlarging, large, symptomatic or ruptured aneurysm. The Houston group have dealt with no less than 99 thoraco-abdominal and abdominal aortic aneurysms involving the coeliac, superior mesenteric and renal arteries with 90 survivors. They advocate the graft inclusion technique in these cases; the graft is simply inserted inside the aneurysm and the visceral arteries are re-attached to openings made in the graft. The technique in this position is particularly advantageous, since time-consuming dissection leading to bleeding and damage to adjacent structures is avoided, and the need for side arm grafts with their multiple anastomoses and their tendency to kink and to obstruct is eliminated. Replacement of extensive aneurysms involving long segments of both thoracic and abdominal aortas may be associated with spinal cord ischaemia from extensive interruption of intercostal and lumbar vessels. These vessels must therefore also be re-attached in such extensive cases.

Inaccessible aneurysms or their feeding vessels can now be embolized through ingeniously placed catheters passed under X-ray control. Beesinger and his colleagues (1979) described a vertebral aneurysm which developed following a stab wound of the neck. The vertebral artery was tied off above and below the aneurysm but the aneurysm persisted. Further arteriographic studies revealed that the aneurysm was being fed by an anomalous vessel arising from the proximal subclavian artery. This feeding vessel was satisfactorily embolized using Gelfoam. Rankin, Youngson and McKenzie (1979) describe an interesting problem in a girl of 19 years who developed a superior gluteal aneurysm after a laparoscopic ovarian biopsy. A pulsatile mass could be felt on vaginal examination. Gelfoam embolization was

attempted but failed because of the large neck of the aneurysm. A Fogarty catheter was inserted into the aneurysm under X-ray control, filled with contrast material and kept in place at the neck of the aneurysm for a 48-hr period. Arteriography then showed no filling of the aneurysm and 3 months later a further arteriogram confirmed that the aneurysm was soundly thrombosed. Surely a tribute to ingenious radiology!

With the explosion in the numbers of arterial reconstructive operations now being performed, surgeons themselves are responsible for producing many aneurysms. Indeed, false aneurysms constitute the single most common group of late postoperative complications following arterial reconstruction (Szilagyi, 1979). They occur in slightly more than 1% of all vascular anastomoses postoperatively and more than 95% are found in the area of the common femoral artery following aorto-femoral bypass procedures with Dacron. Starr and his colleagues (1979) review their extensive experience of 1330 peripheral arterial grafts carried out in Houston. Twenty-six patients developed 39 aneurysms (2% of all cases) and, of these, no less than 30 occurred at the distal anastomosis of an aorto-femoral reconstruction. Twenty-four were directly attributable to failure of the silk or monofilament plastic suture material and these authors therefore advise the use of braided non-absorbable stitches (e.g. braided Dacron) wherever possible in vascular reconstructive surgery.

Risberg and Kewenter (1979) report an unusual arterio-appendiceal fistula 5 years after an aorto-iliac Dacron reconstitution. The patient, a man of 60 years, presented with intestinal bleeding and was found to have a fistula between a false aneurysm at the right iliac anastomosis and his appendix. The aneurysm was resected together with the appendix, a new Dacron graft inserted and recovery followed.

Among the other rare aneurysms recently reported we can note what is apparently the first case report of an arteriosclerotic aneurysm of the vertebral artery (Thompson, Eilber and Baker, 1979) and an inferior mesenteric artery aneurysm (Duke, Lamberth and Wright, 1979), both of which were treated successfully by resection and arterial reconstruction. Even in to-day's antibiotic era, mycotic aneurysms are still encountered and tend to be due to rather unusual organisms. Mendelowitz and his colleagues (1979) present a case of *Salmonella* mycotic aortic aneurysm in a 55-year-old male diabetic. The aneurysm was resected but the graft became infected. A bypass using an axillo-femoral graft was employed with later successful replacement of the aortic graft. The patient was well 3 years later. These authors review 24 previous case reports; most probably represent the lodging of *Salmonella* in an atheromatous vessel during a transient bacteraemia.

Less frequently, there may be infection of the aorta from adjacent structures, as in spinal osteomyelitis or lymphangitis. Fox (1979) reports the first case of a mycotic aneurysm of the abdominal aorta due to *Streptococcus milleri*. This *Streptococcus* has only recently been recognized widely, especially as a cause of deep-seated sepsis. The source of infection is usually the mouth as the organism has been isolated from the dental root canal, from the surface of teeth and from sutures removed after dental operations. Fortunately it is penicillin-sensitive. This patient was treated successfully by resection of the aneurysm with Dacron graft replacement and remains well 18 months later on meticulous mouth toilet and penicillin.

Extra-cranial aneurysms of the internal carotid artery are uncommon and fascinating. Even that repository of excellence in arterial surgery, the Baylor College of Medicine in Houston, under its Chief of Surgery, Michael De Bakey, has dealt with only 34 patients with 37 aneurysms over a 21-year period (McCollum *et al.*, 1979). Of these, 16 were due to atheroma and 21 were false aneurysms—2 resulting from trauma and 19 from previous carotid surgery. Of their 16 atheromatous aneurysms, 7 received no treatment, 3 were dealt with by proximal ligation, 3 by arterial reconstruction and 3 by graft replacement. Nesbit, Neistadt and May (1979) record 2 cases of bilateral internal carotid aneurysms. The first was resected and grafted 9 years after an aneurysm on the opposite side had been treated by ligation. Their second patient underwent sequential resection and reconstruction of both aneurysms. These authors can trace only 3 previous reports of bilateral aneurysms. Although, ideally, graft replacement of the aneurysm should be carried out, lesions may extend almost to the base of the skull so that distal control of the internal carotid artery is impossible. Such a case has been noted (Haywood and Ellis, 1979) in a woman of 54 years whose aneurysm actually presented as a mass bulging into the tonsillar fossa and pushing the uvula to one side. Treatment comprised ligation of the internal carotid artery in continuity just beyond the bifurcation under local anaesthesia, the tolerance of the patient's cerebral circulation to this procedure being first assessed by measuring the back pressure across the circle of Willis after temporary carotid artery occlusion. She was nursed in a horizontal position for one week and then allowed to sit up slowly. On the first day of altered posture she developed a mild right hemiparesis. She was immediately returned to the horizontal position and within 24 hr her neurological status had returned to normal. A more gradual return to the vertical was initiated only after 4 more weeks in bed and she was completely well at review 6 months later.

Gautier and his colleagues (1979) review false aneurysms following carotid endarterectomy, with a collected series of 25 cases, and Fievet and his colleagues (1979) describe an interesting mycotic aneurysm of the common carotid which was successfully excised and vein-grafted.

Aneurysms of the innominate artery present particularly difficult surgical problems of involvement of major structures and difficulties of access. It is not surprising, therefore, that they are associated with a high mortality and serious complications following attempts at surgical cure. Schumacher and Wright (1979) report a successful cure in a female aged 53 years with an arteriosclerotic innominate aneurysm in whom vein grafts were taken from the ascending aorta to the common carotid and subclavian arteries leaving the aneurysmal sac *in situ* but excluded. They point out that computerized axial tomography is helpful in the pre-operative assessment of such cases.

Vascular emergencies

The Fogarty catheter, which came into popular use about 12 years ago, has revolutionized the ease with which embolectomy can be performed. Szczepanski (1979) reviews the experience at the Municipal Hospital, Aarhus, Denmark, over a 10-year period dealing with 260 patients in whom a total of 299 emboli developed. Embolectomy was carried out unless the limb was frankly gangrenous and even after a 72-hr delay no less than 50% of limbs were saved. Embolectomy was repeated if necessary, even up to a total of 4 times and, indeed, 50% of the limbs that were saved required at least one re-intervention. Although excellent results were obtained in 63% of cases, the overall mortality was 28.5%. This high figure was due to the large number of elderly patients (a mortality of 40% was observed in the group of patients of 80 years or more of age), the presence of heart disease, multiple emboli involving other organs and the frequency of pulmonary embolism.

An important paper from the Royal Victoria Hospital, Belfast (O'Reilly *et al.*, 1979), reviews an extensive experience of penetrating vascular injuries. In a series of over 2000 cases of bullet or shrapnel wound, 207 resulted in major vascular trauma. The majority involved the femoral and popliteal vessels, often as a result of knee-capping or subsequent to machine-gunning from a passing car. Knee-capping is an injury unique to Northern Ireland; it is caused by placing a weapon, usually a pistol, close to the knee joint and discharging it. The effect is extreme. Wounds of the vessels of the trunk and root of the neck were associated with a particularly high mortality and, indeed, all 5 patients with wounds of the subclavian artery due to high velocity missiles died. The majority of peripheral arteries were

repaired by means of autogenous vein tissue, either as a patch or a graft. Even where vessel loss was limited, it was felt that end-to-end anastomosis produced too great a likelihood of suture line tension with risk of disruption of the repair, particularly on mobilization of the patient. Wide division of the deep fascia (fasciotomy) was utilized frequently and appeared to be of particular benefit in dealing with vascular injuries in high-velocity wounds of the limb.

The large intestine

It has been said that only surgery benefits from war. The experiences of the Royal Victoria Hospital, Belfast, in gunshot wounds of blood vessels is summarized above in the section on vascular surgery. Parks (1979) has reviewed the 88 cases of gunshot wounds of the large intestine at the same hospital during a 7-year period of civilian violence. Seventy-five of these patients sustained full thickness injury of the large bowel with faecal contamination, and of these 75 cases, only 14 were without injury to other viscera. The small intestine was damaged in no less than 38 cases and frequently the liver, stomach and kidney were implicated. There were 16 deaths in this series. Surgeons have argued about the correct management of these patients in civilian practice but the Belfast experience can now lay down fairly well defined criteria:

For perforations of the right side of the large bowel, suture or primary resection is indicated. Transverse colon injuries should be exteriorized with a colostomy. The descending colon should be repaired or resected and protected by a colostomy. The injured sigmoid colon can be exteriorized or resected and the anastomosis protected by a colostomy. The damaged rectum should be repaired if possible and again a colostomy should be carried out above the injured segment.

As modern air travel shrinks the world's frontiers, it behoves us in these temperate islands to remember that we may occasionally encounter acute diseases of hotter climates and for us to keep abreast of progress in their management. Stein, Bank and Louw (1979), in an interesting paper from Cape Town, review the management of fulminating amoebic colitis. Emergency surgery is indicated for perforation, localized abscess, fulminating disease not controlled by medical therapy, and liver abscess not responding to repeated aspiration together with treatment using metronidazole, emetine and chloroquin. From Thailand, Vajrabukka and his colleagues (1979) point out that diagnosis of fulminating amoebic colitis may be difficult, especially because of the curious periodic absence of amoebae in the stools. Indeed, these were only recovered in 3 of their 11 cases. By the time amoebiasis is confirmed,

it is often too late to commence effective anti-amoebic therapy. These authors advise that in an area where amoebiasis is endemic, a trial of anti-amoebic therapy is worth-while in patients with severe, undiagnosed colitis where the diagnosis must depend first upon therapeutic response and later on the result of specific serological tests. The cardiac toxicity of emetine makes it unsuitable for many patients who are already hypotensive from toxæmia; metronidazole is much safer and equally effective. The Thai surgeons agree with their South African colleagues in the indications for surgery and also agree that primary total resection of the diseased colon with exteriorization is the treatment of choice.

The management of diverticular disease of the colon has altered radically over the last 15 years with the widespread use of high roughage diet and bran. Reinforcing this concept, Gear and his colleagues (1979) have demonstrated a 12% incidence of diverticula in life-time vegetarians over the age of 45 years compared with 33% in controls. Certainly it is much less common now for surgeons to be called upon to deal with uncomplicated diverticular disease operatively. An interesting study by Hyland and Taylor (1979), from Liverpool, has investigated whether this dietary regime has improved the prognosis in patients admitted with acute complications of diverticulitis. One hundred consecutive patients admitted with complications of diverticular disease between 1971 and 1973 were studied. All 99 of the patients who survived this acute episode were discharged from hospital on a high roughage diet with bran and were reviewed 5 to 7 years later. Seventy per cent. of the patients adhered strictly to the diet. During the period of follow-up, 27 patients died of unrelated disease but 91% of the remainder were asymptomatic and only one patient had died from complications of diverticular disease. These results appear to be an improvement on the long-term prognosis reported in previous series before the widespread use of high roughage diet, with relapses of 56% and 38% in 2 large series. These authors conclude, therefore, that after acute complications of diverticular disease, a high roughage diet appears to protect patients from further problems.

It is interesting that with the 'Westernization' of diet which appears to be occurring in urban communities in Africa, recent reports have appeared of an increase in incidence of diverticular disease in the black African population (Trowell and Burkitt, 1979). Calder (1979), in a series of 226 barium enemas carried out in Nairobi, reports 15 examples of diverticular disease (5 of them under the age of 40 years) against a background of 7 cases of carcinoma of the large bowel and 4 examples of ulcerative colitis. This paper follows shortly after the

report by Archampong, Christian and Badoe (1978) of 14 cases of diverticular disease observed in 360 barium enema examinations over a 2-year period in Ghana; 60% of these patients derived from the upper social classes.

It has long been preached that massive haemorrhage from the colon, especially in elderly patients, is likely to be due to diverticular disease. Yet, when surgery has been necessary for unrelenting haemorrhage, the findings have often proved equivocal and unsatisfactory. Indeed, a total colectomy has been advised in such instances. The introduction of emergency angiography in unexplained gastrointestinal haemorrhage (Giacchino *et al.*, 1979) has shown that quite a number of such cases are, in fact, due to vascular ectasia of the ascending colon. Boley and his colleagues (1979a) review 99 major lower intestinal haemorrhages in patients over the age of 65 years. Of these, 43 were presumed to be due to diverticular disease but in many cases the diagnosis was based on insufficient evidence. However, in no less than 20 of the cases, vascular ectasia of the right side of the colon was identified on angiography. Of these, 18 required operation (16 undergoing right hemicolectomy and 2 subtotal colectomy). There is little doubt that emergency angiography enables more accurate diagnosis and specific treatment to be carried out in this serious emergency.

Boley and his colleagues (1979b) present further important study of 32 patients with lower intestinal tract bleeding in whom one or more vascular ectasias of the right colon were identified by selective superior mesenteric angiography. All but one were older than 55 years of age and 22 were more than 70 years of age. Twelve of the patients had diverticula of the colon as well, and 3 patients had had previous resections of the left colon for supposed diverticular bleeding. These authors point out that special pathological techniques must be employed in order to identify the majority of these vascular abnormalities. The resected colons from 7 patients were studied by routine gross and histological study and in only one case was a solitary mucosal ectasia identified. However, in 22 colons studied by the injection of a silicone rubber compound intra-arterially, combined with clearing of the specimen to produce a transparent bowel wall in 20 of the cases, the mucosal ectasias could be seen by transillumination. These varied in size from one mm to one cm and were multiple in 16 of the 22 injected specimens. Histological sections of the vascular lesions showed them to consist of dilated, thin-walled vessels, mostly lined only by endothelium. Structurally they appeared to be ectatic veins, venules and capillaries. The earliest abnormality was the presence of dilated, often very large, sub-mucosal veins. In the most severe lesions, the

mucosa was replaced by a maze of distorted, dilated vascular channels.

Anastomosis with a stapler

Stapling instruments for intestinal anastomosis have had widespread use in Russia for over 20 years but until very recently there was little interest in their use in Western countries. Ravitch, at the University of Pittsburgh, was responsible very largely for introducing the stapling instrument into the U.S.A. and for the development of an American model produced by the U.S. Surgical Corporation (Ravitch and Steichen, 1979). The principle of the stapling instrument is to create an inverted circular anastomosis held by a double staggered row of staples. The 2 pieces of bowel are compressed together by means of a 'gun' which, when 'fired' by the surgeon, simultaneously introduces the staples around the anastomosis and cuts a circular 'doughnut' out of the centre of each of the two structures to be anastomosed. Techniques are now available for carrying out virtually all the gastro-intestinal anastomoses by end-to-end, side-to-side and end-to-side techniques (Nance, 1979). One great advantage of the American machine over the Russian gun is that the American instrument contains a disposable cartridge of self-loaded staples, whereas the Russian machine requires a tedious preliminary loading of the gun with the staples by hand.

In this country, the stapling instrument has evoked particular interest because it enables a low anastomosis to be performed in the depths of the pelvis in patients with carcinoma of the rectum where such an anastomosis would be otherwise impossible or very difficult using conventional suturing methods, and where the surgeon would otherwise have had to carry out an abdomino-perineal resection of the rectum with permanent colostomy (Heald, 1979).

Goligher and his colleagues (1979) have reported 62 patients on whom an anterior resection or colectomy with ileorectal anastomosis have been carried out using the Russian suture gun. In 38 cases, the anastomosis was high in the rectum and in 24 the anastomosis was performed low; at least 6 of these were considered too low to have an anastomosis performed by conventional surgery (a stump of 4 to 5 cm). A gastrograffin enema carried out at 14 days showed that all the high anastomoses were intact. Of the low anastomoses, there were 6 small leakages, 2 of which were evident on clinical examination. Postoperative complications comprised 3 moderate bleeds within the first 2 or 3 days, all of which settled spontaneously, and 2 strictures, one of which dilated spontaneously and the other was dilated with bougies. In 12 of the low anastomoses, control was at first imperfect but after several

months 5 had returned to normal, 3 were nearly so and 4 were still imperfect although 2 of these were fairly recent cases. There is no doubt that the stapling gun has increased the possibility of conservation of the anal sphincters in low resections of rectal cancers (Goligher, 1979; Kirkegaard *et al.*, 1979).

The long-term results of the stapling operations will naturally be of considerable interest. There is the anxiety that more and more conservative surgery might be achieved only at the risk of later recurrence. There is some encouragement from an important report from St Mark's Hospital, London, by Nicholls and his colleagues (1979) comparing restorative resection and abdomino-perineal excision of the rectum for carcinoma of the mid-rectum for the period 1963 to 1972. Of course, at this stage the restorative resections were being carried out by conventional suture techniques. The total of 199 patients were followed-up for 5 years, of whom 112 had been treated by total excision of the rectum and 87 by restorative operation. The authors conclude that for the most commonly occurring tumours in the mid-rectum, i.e. Dukes stage B or C tumours of average grade, the 5-year survival is similar after either total excision or restorative resection. It was not possible to comment from this study on survival after removal of high grade tumours since there were only 5 patients with such tumours in the resection group. This reflects the attitude of surgeons who regard a pre-operative biopsy showing an undifferentiated tumour as an indication for a more radical procedure of total excision. Certainly, surgeons must resist the temptation of carrying out too limited a resection of the tumour in their enthusiasm for the new stapling instruments. Rosenberg (1979), in a careful study of the aetiology of suture-line recurrence in large bowel cancer, found that, of 16 such cases, no less than 14 were due to incomplete excision of the original tumour and one was a second primary tumour. This leaves only one patient whose suture-line recurrence was not so easily explained.

Colonoscopy

It is well recognized that early diagnosis of bowel cancer is followed in many cases by long-term survival and, indeed, detection and removal of large polyps is an effective preventative measure against the development of malignant change. The introduction of the fiberoptic colonoscope has enabled the whole of the colon to be screened by direct vision and has enabled colonoscopic polypectomy to be possible without the need to resort to abdominal surgery in the majority of patients except those with familial polyposis coli (Leading Article, 1979). Gillespie and his colleagues (1979) have recently

reported their extensive experience at St Mark's Hospital, London, in 620 patients with 1049 colonic adenomas. No less than 97% were amenable to endoscopic removal or ablation. It is interesting that of the larger adenomas, 2 cm or more in diameter, 66% were situated in the sigmoid colon and of those containing invasive carcinoma (nearly 5% of the total) an even higher percentage, 94%, were in the sigmoid and low descending colon. There are, of course, complications of colonoscopy, as described by Schwesinger, Levine and Ramos (1979) but these can be kept to a minimum in skilled hands. It is perhaps a pity, therefore, that a review in 1978 by the British Society of Endoscopy showed that only 80 hospitals in the U.K. had a colonoscopy service (Williams, 1979).

The distribution of both benign and malignant tumours particularly to the rectum and sigmoid colon emphasizes the particular value of the recently developed sigmoido-fibrescope. This has the advantage over conventional colonoscopy of being a rapidly performed examination which can be carried out without elaborate preparations; only a disposable enema is required. The value of this instrument as a screening procedure is detailed by Lipshutz and his colleagues (1979) who screened 200 asymptomatic subjects over the age of 40 years using the 60-cm flexible sigmoidoscope. Fifty-three polyps were found in 39 patients and 22 of the polyps were 0.5 cm or more in diameter. All the polyps of this size were found in patients of 50 years of age or more in whom the incidence of polyps of this size was 11.9%. More than 50% of the polyps of this size were above the reach of a standard sigmoidoscope. There seems little doubt that the introduction of the sigmoido-fibrescope into our out-patient clinics will provide a useful contribution not only to early detection of bowel cancers but also to our pick-up rate and removal of colonic polyps.

Wound infection and wound healing

Operations in which the gastrointestinal tract or its adnexae are opened are associated with a high degree of wound sepsis (Pollock, 1979). Thus, Keighley and Burdon (1979) report data from the General Hospital, Birmingham, showing that patients who received no antibiotics developed wound sepsis in 12% of cases after truncal vagotomy and pyloroplasty, 53% following resection for gastric carcinoma, 10% after elective cholecystectomy, 41% after emergency biliary operations, 35% after resections of the left colon and no less than 61% following anterior resection of the rectum. Numerous trials have now indicated that the use of topical antiseptics, topical antibiotics and systemic antibiotics can reduce the incidence of postoperative

wound infection. It still remains to find out the 'best buy' and to weigh up the advantages against the disadvantages of the various regimes.

Finch, Taylor and Morris (1979) report a randomized trial of topical cephradine (one g), and 2-dose systemic cephradine (an i.v. injection of 500 mg at the time of anaesthetic induction followed by a second injection 4 hr later) against untreated controls in a series of patients undergoing gastrointestinal surgery. The wound infection rate was 14.5% in the 83 control patients, 7.2% in the 83 patients receiving topical antibiotic and 3.6% in those receiving systemic cephradine. Only the systemic group showed statistical improvement over the controls. Rodgers and his colleagues (1979) studied the value of intra-rectal metronidazole in the prevention of anaerobic infection after emergency appendectomy. One hundred and two patients were randomized between 48-hr intra-rectal metronidazole and a placebo. Twelve of these were withdrawn from the trial, including 6 who received other antibiotics. Seven out of 48 of the control patients sustained severe anaerobic infection compared with none in the 42 receiving metronidazole, a statistically significant improvement in the latter group. Salem, Johnson and Devitt (1979) compared topical povidone iodine spray with systemic metronidazole in the prevention of wound infection after appendectomy. There were 4 infections in 65 patients receiving metronidazole compared with 16 in the 60 patients receiving topical povidone iodine, a significant advantage for the metronidazole group. However, where the appendix was gangrenous and perforated there was still a high rate of sepsis (3 out of 10 patients receiving metronidazole and 7 out of 14 receiving povidone iodine). The authors suggest that delayed primary suture or additional antibiotics might be needed to reduce the infection rate in this high-risk group. Metronidazole appears also to be of value as an efficient bowel preparation before colonic surgery. Taylor, Cawdery and Smith (1979) randomized 120 patients with carcinoma of the colon into those receiving Thalazole and those receiving Thalazole as well as metronidazole pre-operatively for 4 days combined, in both groups, with mechanical cleansing. The Thalazole group showed a disturbing 39% infection rate and 17 of 29 wound infections proved to be due to *Bacteroides*. In the group with additional metronidazole there was a 13% infection rate and none of these 8 cases was due to anaerobes. The present author's own routine practice is to use neomycin and metronidazole as a 48-hr pre-operative preparation for large bowel surgery combined with a fluid diet and bowel cleansing. Sindelar and Mason (1979a) have studied the value of irrigation of the wound with a 10% solution of povidone iodine before closure and

compared this with saline irrigation. Systemic antibiotics were employed in patients with potentially contaminated, contaminated or frankly septic wounds. There was a significant reduction in the overall incidence from 15% in the saline group to 2.9% in the povidone iodine group in a study of 500 cases. This reduction applied to all categories of clean, potentially contaminated, contaminated and frankly septic wounds. No complications were reported from the use of povidone iodine.

Patients with gross peritonitis represent a group in particular danger, with a high incidence of wound infection, septicaemia and intra-abdominal abscess. Stephen and Loewenthal (1979) describe their use of continuous peritoneal lavage using gentamicin, cephalothin and lincomycin combined with the same 3 antibiotics given parenterally. In 27 patients with poor prognosis there were 21 survivals of whom only 2 developed intra-abdominal abscesses. Sindelar and Mason (1979b) used intraperitoneal irrigation with povidone iodine in bacterially contaminated abdominal operations. All the patients received antibiotic therapy systemically in addition, which was commenced pre-operatively. In this study one litre of irrigation fluid was used containing povidone iodine 1% diluted 1 : 9 to give 0.1% of available iodine and this was compared with similar lavage using saline. There was no significant difference in contaminated abdominal wounds between the use of povidone iodine and saline but there was a significant reduction of infection when frankly dirty wounds (perforated viscera with pus in the peritoneal cavity or penetrating trauma more than 12 hr old at the time of operation) were compared. Because of the high risk of infection, Steinberg (1979) advocates secondary suture of the abdominal wall in patients with acute generalized suppurative peritonitis. A pack is placed in the abdominal wall with wire sutures *in situ*. Two to 3 days later the wound is irrigated with 2% xylocaine, the pack is removed and the wires are tied. The skin is allowed to heal by secondary intention or is subsequently sutured. Probably few surgeons would be tempted to follow such advice except in extreme cases.

In frankly contaminated cases, with a high risk of septic complications, the role of antibiotics is well established and it is now realised that, to be effective, these must be employed at the very earliest moment. However, their prophylactic use must be approached with the greatest caution. The risks of antibiotics are well demonstrated by Mogg and his colleagues (1979) who review 66 cases of antibiotic-associated colitis encountered in Birmingham since March 1975 which have been associated with a 27% mortality. It now seems established that this entity results from a toxin produced by *Clostridium difficile*. The antibiotics used in these patients were, particularly,

gentamicin, lincomycin, clindamycin and ampicillin and 27 of the patients had received antibiotics as a part of their bowel preparation. These authors note that vancomycin has been an effective treatment of this dangerous complication. It is interesting that Price, Larson and Crow (1979) have been able to produce an experimental model of antibiotic-associated enterocolitis in the hamster by injecting clindamycin and combining this with oral administration of *C. difficile*. The lesion in the hamster is particularly the caecal region.

Wound healing

The burst abdomen is still a serious complication following the closure of a laparotomy wound. Penninckx and his colleagues (1979), for example, had a 2.5% incidence of abdominal wound dehiscence in >4500 patients. There were no bursts in the 230 oblique incisions for appendectomy and only 3 in 460 oblique cholecystectomy incisions where the 0.6% incidence was significantly lower than with other incisions. Greenburg, Saik and Peskin (1979), in a study of 32 cases, could define the patient at risk of wound dehiscence as a male, aged 60 years or more who is malnourished, has a bad chest, is undergoing surgery of the gastrointestinal tract and who gets postoperative pulmonary complications. The introduction of the mass closure technique, in which the laparotomy incision is closed in a single layer (excluding skin) and in which the sutures are placed one cm or more from the edge of the incision, < one cm apart and under the minimum of tension, has greatly reduced the risk of burst abdomen. Using this method of closure, Pollock, Greenall and Evans (1979) had no burst abdomens in 305 consecutive patients randomized between monofilament nylon, stainless steel wire or polyglycolic acid sutures. However, even though this technique has greatly reduced the risk of dehiscence, it has not eliminated the problem of incisional hernia and in this series there were 26 examples detected within 6 months of operation. These were significantly associated with male sex, old age, long incisions, long operations, postoperative cough and distension, blood transfusion and wound sepsis. These authors conclude that further reduction in the rate of wound herniation must depend on better methods of prevention of sepsis. The present author's own experience confirms the value of mass abdominal closure (Ellis and Heddle, 1979). In 250 vertical abdominal incisions closed with mass nylon only one burst abdomen was encountered (0.4%). However, in this preliminary report already 8 incisional hernias have been encountered and only 50% of the patients at the time of the report have been followed-up for 6 months.

As well as purely local factors, standard surgical

textbooks list the numerous general factors that are thought to affect wound healing, probably by decreasing collagen synthesis. These include protein depletion, steroids, systemic infection, associated injuries, diabetes (Goodson and Hunt, 1979), vitamin C deficiency and cytotoxic drugs (Hunt, 1979). Interestingly enough, there is a dearth of careful clinical and laboratory studies in this field. Colin, Elliot and Ellis (1979) report the adverse effects of uraemia on wound healing in the rat. Acute uraemia was induced by performing a 70% nephrectomy. Uraemia was shown to delay the healing of intestinal anastomoses and abdominal wounds as judged by bursting strength tests. Cellular proliferation was depressed at the wound edges and fibroblast growth in tissue culture was affected by the addition both of uraemic plasma and of urea solution to the culture medium. The most likely explanation for these phenomena is that the uraemic state causes alteration in some of the processes of cellular metabolism.

Miscellaneous

Serum acid phosphatase and rectal examination

It is often stated that rectal examination of the prostate increases serum acid phosphatase activity and so temporarily invalidates the diagnostic significance of this investigation in differentiating between benign and malignant enlargement of the prostate. This assumption is based largely on evidence that prostatic massage may raise the serum acid phosphatase level. It is a fascinating phenomenon that the same research project so often occurs to different people at the same time. Within a few weeks of each other, no less than 3 groups set out to investigate this topic. Bannerjee, Barker and Waterworth (1979) studied the serum acid phosphatase in 200 patients with symptoms of prostatism 5 min and 48 hr after rectal examination. This had no effect on the enzyme level in these patients which was only elevated by prostatic massage. Steele (1979) measured the enzyme after rectal examination in 10 patients with no clinical indications of prostatic disease and 10 with benign hyperplasia. Again the acid phosphatase activity was not significantly altered after this examination. Johnson, Costa and Castro (1979) studied 20 patients with carcinoma of the prostate, 31 with benign hypertrophy and 18 without prostatic disease. There was no difference in the serum tartrate-labile acid phosphatase level estimated before, or 5 min after, a rectal examination. A transurethral resection produced a rapid, large rise in the enzyme level, which had returned to normal by the following day.

Axillary hyperhidrosis

Excessive sweating from the axilla is a relatively

common complaint. Patients are socially embarrassed by their soaking clothes and find that replacement of stained and rotted shirts, blouses and even jackets is a costly exercise (Ellis, 1979). The extent of the disability is shown by the fact that these sufferers are only too happy to submit themselves to surgical treatment which is designed to remove the eccrine sweat glands in the axillae, corresponding roughly to the hair-bearing axillary skin, either by excision of an ellipse of the affected skin (Bergkvist and Engevik, 1979) or by subcutaneous excision. Breach (1979) has described an elegant method of performing the latter procedure through 3 transverse incisions with excellent cosmetic results.

Naturally one would like to avoid surgery, if possible, in what is purely a cosmetic disability and there has been much interest in the use of aluminium chloride hexahydrate as a topical application in a saturated solution in absolute alcohol. A trial of this technique was carried out using patients already on the waiting list with axillary sweating severe enough to warrant surgery (Ellis and Scurr, 1979). Thirty-four patients were followed-up for 6 months with seven failures; 3 patients found they were not able to manage the treatment and 4 more experienced irritation or soreness which made it impossible for them to continue. These 4 patients have now been submitted to surgical treatment. The remaining 27 patients described the treatment as highly successful. Twenty were able to use the treatment once a week or less while the remainder continued using the solution twice or more each week. Irritation or soreness was often relieved by means of 1% hydrocortisone cream. The preparation needs to be treated with respect; the caustic nature of the solution was well demonstrated in the trial when in the initial preparation a stainless steel bucket being used for this purpose in the pharmacy dissolved! Macfarlane and his colleagues (1979) give an interesting account of 4 patients with severe hyperhidrosis in acromegaly. The forehead, hands, feet and axillae were involved and the treatment was effective in every case. The patients were then given bromocriptine; in one patient severe hyperhidrosis remained unchanged on this therapy, the other 3 improved but 2 of these continued the aluminium chloride treatment.

References

Endocrine surgery

- ANDERBERG, B., KAGEDAL, B., NILSSON, O.R., SMEDS, S., TEGLER, L. & GILLQUIST, J. (1979) Propranolol and thyroid resection for hyperthyroidism. *Acta chirurgica scandinavica*, **145**, 297.
- BRANSOM, C.J., TALBOT, C.H., HENRY, L. & ELEMENOGLOU, J. (1979) Solitary toxic adenoma of the thyroid gland. *British Journal of Surgery*, **66**, 590.
- BRENNAN, M.F., BROWN, E.M., SPIEGEL, A.M. & MARX, S.J.

- (1979) Autotransplantation of cryopreserved parathyroid tissue in man. *Annals of Surgery*, **189**, 139.
- DAVIS, C.E. & VANSANT, J.H. (1979) Zollinger–Ellison syndrome. Spontaneous regression of advanced intra-abdominal metastases with 20-year survival. *Annals of Surgery*, **189**, 620.
- EDIS, A.J. (1979) Prevention and management of complications associated with thyroid and parathyroid surgery. *Surgical Clinics of North America*, **59**, 83.
- GREEN, W.E.R., SHEPPERD, H.W.H., STEVENSON, H.M. & WILSON, W. (1979) Tracheal collapse after thyroidectomy. *British Journal of Surgery*, **66**, 554.
- GRIMELIUS, L., JOHANSSON, H., LJUNGHALL, S., THOREN, L. & AKERSTROM, G. (1979) Controversies in the treatment of hyperparathyroidism. *Acta chirurgica scandinavica*, **145**, 355.
- KLEMENTSCHITSCH, P., SHEN, K. & KAPLAN, E.L. (1979) Reemergence of thyroidectomy as treatment for Graves' disease. *Surgical Clinics of North America*, **59**, 35.
- LE QUESNE, L.P., NABARRO, J.D.N., JURTZ, A. & ZWEIG, S. (1979) The management of insulin tumours of the pancreas. *British Journal of Surgery*, **66**, 373.
- SALEM, R. & TAYLOR, S. (1979) Hyperparathyroidism in pregnancy. *British Journal of Surgery*, **66**, 648.
- SIVULA, A., KUHLEBACK, B., KOCK, B., KAHR, A., WALLENSUS, M. & EDGREN, J. (1979) Parathyroidectomy in chronic renal failure. *Acta chirurgica scandinavica*, **145**, 19.
- TAYLOR, S. (1979) The surgical treatment of thyroid disease in modern perspective. *Annals of the Royal College of Surgeons of England*, **61**, 132.
- VAN HEERDEN, J.A., EDIS, A.J. & SERVICE, F.J. (1979) The surgical aspects of insulinomas. *Annals of Surgery*, **189**, 677.
- WADE, J.S.H. (1979) The diagnosis of primary hyperparathyroidism. *Annals of the Royal College of Surgeons of England*, **61**, 362.

Malignant disease

- BALCH, C.M., SOUNG, S.J., MURAD, T.M., INGALLS, A.L. & MADDOX, W.A. (1979) A multifactorial analysis of melanoma. II. Prognostic factors in patients with Stage I (localized) melanoma. *Surgery*, **86**, 343.
- BLAMEY, R.W., DAVIES, C.J., ELSTON, C.W., JOHNSON, J., HAYBITTLE, J.L. & MAYNARD, P.V. (1979) Prognostic factors in breast cancer—the formation of a prognostic index. *Clinical Oncology*, **5**, 227.
- ELLIOTT, J. (1979) New era in treatment of localized breast cancer. *Journal of the American Medical Association*, **242**, 14.
- FREIREICH, E.J. (1979) Should the patient know? *Journal of the American Medical Association*, **241**, 928.
- GOLDSMITH, H.S. (1978) Melanoma. In: *Practice of Surgery*, Chapter 19. Harper Row Inc., Hagerstown, Maryland.
- GOLDSMITH, H.S. (1979) The debate over immediate lymph node dissection in melanoma. *Surgery, Gynecology and Obstetrics*, **148**, 403.
- MARTIN, E.W., COOPERMAN, M., KING, G., RINKER, L., CAREY, L.C. & MINTON, J.P. (1979) A retrospective and prospective study of serial CEA determinations in the early detection of recurrent colon cancer. *American Journal of Surgery*, **137**, 167.
- MRC WORKING PARTY (1979) A clinical trial of endolymphatic therapy in malignant melanoma: interim report of the progress of the Medical Research Council trial. *British Journal of Surgery*, **66**, 9.
- NEALON, T.F., NKONGHO, A., GROSSI, C. & GILLOOLEY, J. (1979) Pathologic identification of poor prognosis Stage I cancer of the breast. *Annals of Surgery*, **190**, 129.
- NOVACK, D.H., PLUMER, R., SMITH, R.L., OCHITILL, H., MORROW, G.R. & BENNETT, J.M. (1979) Changes in

- physicians' attitudes toward telling the cancer patient. *Journal of the American Medical Association*, **241**, 897.
- RAKE, M.O., MALLINSON, C.N., COCKING, J.B., CWCYNARSKI, M.T., FOX, C.A., WASS, V.J., DIFFEY, B.L. & JACKSON, G.A. (1979) Chemotherapy in advanced gastric cancer: a controlled prospective randomised multi-centre study. *Gut*, **20**, 797.
- SHIMM, D.S., LOGUE, G.L., MALTBIE, A.A. & DUGAN, S. (1979) Medical management of chronic cancer pain. *Journal of the American Medical Association*, **241**, 2408.
- SHOUSA, S., LYSSITIS, T., GODFREY, V.M. & SHEVER, P.J. (1979) Carcinoembryonic antigen in breast cancer tissue: a useful prognostic indicator. *British Medical Journal*, **1**, 777.
- TERZ, J.J. & BEATTY, J.D. (1979) Chemotherapy and cancer of the gastrointestinal tract. In: *Surgery Annual 1979*, p. 149. Appleton-Century-Crofts, New York.
- TIMOTHY, A.R., OVERGAARD, J., OVERGAARD, M. & WANG, C.C. (1979) Treatment of early carcinoma of the breast. *Lancet*, **ii**, 25.
- VESSEY, M.P., DOLL, R., JONES, K. & YEATES, D. (1979) An epidemiological study of oral contraceptives and breast cancer. *British Medical Journal*, **1**, 1755.
- WIZENBURG, M.J. & BRICKNER, T.J. (1979) Carcinoma of the breast. *Surgery, Gynecology and Obstetrics*, **149**, 321.

Portal hypertension

- CAMERON, J.L., ZUIDEMA, G.D., SMITH, G.W., HARRINGTON, D.P. & MADDEY, W.C. (1979) Mesocaval shunts for the control of bleeding esophageal varices. *Surgery*, **85**, 257.
- HENDERSON, J.M., BUIST, T.A.S. & MACPHERSON, A.I.S. (1979) Percutaneous transhepatic occlusion for bleeding oesophageal varices. *British Journal of Surgery*, **66**, 561.
- LEADING ARTICLE (1979) Injection sclerotherapy for oesophageal varices. *Lancet*, **ii**, 233.
- LUNDERQUIST, A. & VANG, J. (1974) Transhepatic catheterization and obliteration of the coronary vein in patients with portal hypertension and esophageal varices. *New England Journal of Medicine*, **291**, 646.
- MARION, P., GEORGE, M., VACCA, C. & VADOT, L. (1979) L'anastomose porto-cave latéro-latérale. *Lyon Chirurgica*, **75**, 235.
- ROSENTHAL, D., DETERLING, R.A., O'DONNELL, T.F. & CALLOW, A.D. (1979) Interposition grafting with expanded polytetrafluoroethylene for portal hypertension. *Surgery, Gynecology and Obstetrics*, **148**, 387.
- SINNETT, H.D., MURRAY-LYON, I.M., REYNOLDS, K.W. & JOHNSON, A.G.J. (1979) Long-term injection sclerotherapy of esophageal varices. *Gastroenterology*, **76**, 1250.
- TERBLANCHE, J. (1979) Treatment of oesophageal varices. *Journal of the Royal Society of Medicine*, **72**, 163.
- TERBLANCHE, J., NORTHOVER, J.M.A., BORNMAN, P., KAHN, D., SILBER, W., BARBEZAT, G.O., SELLARS, S., CAMPBELL, J.A.H. & SAUNDERS, S.J. (1979a) A prospective controlled trial of sclerotherapy in the long term management of patients after esophageal variceal bleeding. *Surgery, Gynecology and Obstetrics*, **148**, 323.
- TERBLANCHE, J., NORTHOVER, J.M.A., BORNMAN, P., KAHN, D., BARBEZAT, G.O., SELLARS, S.L. & SAUNDERS, S.J. (1979b) A prospective evaluation of injection sclerotherapy in the treatment of acute bleeding from esophageal varices. *Surgery*, **85**, 239.
- WAPNICK, S., GROSBURG, S.J. & EVANS, M.I. (1979) Randomized prospective matched pair study comparing peritonovenous shunt and conventional therapy in massive ascites. *British Journal of Surgery*, **66**, 667.
- WILLIAMS, K.G.D. & DAWSON, J.L. (1979) Fibreoptic injection of oesophageal varices. *British Medical Journal*, **2**, 766.

Vascular surgery

- BESINGER, D.E., THAL, E.R., MAY, R.O. & FRY, W.J.

- (1979) Vertebral arteriovenous fistula associated with an anomalous arterial vessel. *Surgery*, **85**, 230.
- CRAWFORD, E.S., PALAMARA, A.E., SALEH, S.A. & ROEHM, J.O.F. (1979) Aortic aneurysm: current status of surgical treatment. *Surgical Clinics of North America*, **59**, 597.
- DUKE, L.J., LAMBERTH, W.C. & WRIGHT, C.B. (1979) Inferior mesenteric aneurysm: case report and discussion. *Surgery*, **85**, 385.
- FEVET, P., VEYSSIER, P., GRUNEWALD, P. & PHILLIPS, J.M. (1979) Anévrysme mycotique primitif de la carotide primitive. *Journal de Chirurgie*, **116**, 527.
- FOX, N.D. (1979) Mycotic aneurysm of the abdominal aorta due to *Streptococcus milleri*. *Journal of the Royal College of Surgeons of Edinburgh*, **24**, 225.
- GAUTIER, R., GUIDICELL, H., VINARD, J.L. & QUESADA, C. (1979) Faux anévrysmes après endartériectomie carotidienne. *Lyon Chirurgial*, **75**, 172.
- HAYWOOD, I.R. & ELLIS, H. (1979) Extra-cranial aneurysm of the internal carotid artery treated by proximal ligation. *Postgraduate Medical Journal*, **55**, 30.
- MCCOLLUM, C.H., WHEELER, W.G., NOON, G.P. & DE BAKEY, M.E. (1979) Aneurysms of the extracranial carotid artery. *American Journal of Surgery*, **137**, 196.
- MENDOLOWITZ, D.S., RAMSTEDT, R., YAO, J.S.T. & BERGAN, J.J. (1979) Abdominal aortic salmonellosis. *Surgery*, **85**, 514.
- NESBIT, R.R., NEISTADT, A. & MAY, A.G. (1979) Bilateral internal carotid aneurysms. *Archives of Surgery*, **114**, 293.
- O'REILLY, M.J.G., HOOD, J.M., LIVINGSTON, R.H. & IRWIN, J.W.S. (1979) Penetrating vascular injuries. *Journal of the Royal College of Surgeons of Edinburgh*, **24**, 213.
- RANKIN, R.N., YOUNGSON, G.G. & MCKENZIE, G.N. (1979) Management of superior gluteal artery aneurysm by percutaneous balloon catheter occlusion. *Surgery*, **85**, 235.
- RISBERG, B. & KEWENTER, J. (1979) Arterio-appendiceal fistula after arterial reconstruction with synthetic graft. *Acta chirurgica scandinavica*, **144**, 121.
- SCHUMACHER, P.D. & WRIGHT, C.B. (1979) Management of arteriosclerotic aneurysm of the innominate artery. *Surgery*, **85**, 489.
- STARR, D.S., WEATHERFORD, S.C., LAWRIE, G.M. & MORRIS, G.C. (1979) Suture material as a factor in the occurrence of anastomotic false aneurysms. *Archives of Surgery*, **114**, 412.
- SZCZEPANSKI, K.P. (1979) Results of surgical treatment of arterial embolism. *Scandinavian Journal of Thoracic and Cardiovascular Surgery*, **13**, 71.
- SZILAGYI, D.E. (1979) Management of complications after arterial reconstruction. *Surgical Clinics of North America*, **59**, 659.
- THOMPSON, J.E., EILBER, F. & BAKER, J.D. (1979) Vertebral artery aneurysm: case report and review of the literature. *Surgery*, **89**, 583.
- diverticular disease and intake of dietary fibre. *Lancet*, **i**, 511.
- GIACCHINO, J.L., GEIS, W.P., PICKLEMAN, J.R. & DADO, D.V. (1979) Changing perspectives in massive lower intestinal hemorrhage. *Surgery*, **86**, 368.
- GILLESPIE, P.E., CHAMBERS, T.J., CHAN, K.W., DORONZO, F., MORSON, B.C. & WILLIAMS, C.B. (1979) Colonic adenomas—a colonoscopy survey. *Gut*, **20**, 240.
- GOLIGHER, J.C. (1979) Use of circular stapling gun with per anal insertion of anorectal purse-string suture for construction of very low colorectal or colo-anal anastomoses. *British Journal of Surgery*, **66**, 501.
- GOLIGHER, J.C., LEE, P.W.R., MACTIE, J., SIMPKINS, K.C. & LINTOTT, D.J. (1979) Experience with the Russian model 249 suture gun for anastomosis of the rectum. *Surgery, Gynecology and Obstetrics*, **148**, 517.
- HEALD, R.J. (1979) A new approach to rectal cancer. *British Journal of Hospital Medicine*, **22**, 277.
- HYLAND, J.M.P. & TAYLOR, I. (1979) Diverticular disease—has its natural history altered? *Gut*, **20**, 441.
- KIRKEGAARD, P., CHRISTIANSEN, J., LAURITZEN, B. & HENRICHSEN, S. (1979) Primary results after resection and anastomosis for mid-rectal cancer with a new stapling instrument. *Acta chirurgica scandinavica*, **145**, 321.
- LEADING ARTICLE (1979) Large-bowel polyps and colonoscopy. *British Medical Journal*, **1**, 1587.
- LIPSHUTZ, G.R., KATON, R.M., MCCOOL, M.F. & MAYER, B. (1979) Flexible sigmoidoscopy as a screening procedure for neoplasia of the colon. *Surgery Gynecology and Obstetrics*, **149**, 19.
- NANCE, F.C. (1979) New techniques of gastrointestinal anastomoses with the EEA stapler. *Annals of Surgery*, **189**, 587.
- NICHOLLS, R.J., RITCHIE, J.K., WADSWORTH, J. & PARKS, A.G. (1979) Total excision or restorative resection for carcinoma of the middle third of the rectum. *British Journal of Surgery*, **66**, 625.
- PARKS, T.G. (1979) Surgical management of gunshot injuries of the large intestine. *Journal of the Royal Society of Medicine*, **72**, 412.
- RAVITCH, M.M. & STEICHEN, F.M. (1979) A stapling instrument for end-to-end inverting anastomoses in the gastrointestinal tract. *Annals of Surgery*, **189**, 791.
- ROSENBERG, I.L. (1979) The aetiology of suture-line recurrence. *Annals of the Royal College of Surgeons of England*, **61**, 251.
- SCHWESINGER, W.H., LEVINE, B.A. & RAMOS, R. (1979) Complications of colonoscopy. *Surgery, Gynecology and Obstetrics*, **148**, 270.
- STEIN, D., BANK, S. & LOUW, J.H. (1979) Fulminating amoebic colitis. *Surgery*, **85**, 349.
- TROWELL, H.C. & BURKITT, D.P. (1979) Diverticular disease in urban Kenyans. *British Medical Journal*, **1**, 1795.
- VAJRABUKKA, T., DHITAVAT, A., KICHANANTA, B. & SUKONTHAMAND, Y. (1979) Fulminating amoebic colitis: a clinical evaluation. *British Journal of Surgery*, **66**, 630.
- WILLIAMS, C. (1979) Colonoscopy. *Journal of the Royal Society of Medicine*, **72**, 483.

The large intestine

- ARCHAMPONG, E.Q., CHRISTIAN, F. & BADOE, E.A. (1978) Diverticular disease in an indigenous African community. *Annals of the Royal College of Surgeons of England*, **60**, 464.
- BOLEY, S.J., DiBIASE, A., BRANDT, L.J. & SAMMARTANO, R.J. (1979a) Lower intestinal bleeding in the elderly. *American Journal of Surgery*, **137**, 57.
- BOLEY, S.J., SAMMARTANO, R., BRANDT, L.J. & SPRAYREGAN, S. (1979b) Vascular ectasias of the colon. *Surgery, Gynecology and Obstetrics*, **149**, 353.
- CALDER, J.F. (1979) Diverticular disease of the colon in Africans. *British Medical Journal*, **1**, 1465.
- GEAR, J.S., FURSDON, P., NOLAN, D.J., WARE, A., MANN, J.I., BRODRIBB, A.J.M. & VESSEY, M.P. (1979) Symptomless

Wound infection and wound healing

- COLIN, J.F., ELLIOT, P. & ELLIS, H. (1979) The effect of uraemia upon wound healing: an experimental study. *British Journal of Surgery*, **66**, 793.
- ELLIS, H. & HEDDLE, R. (1979) Closure of the abdominal wound. *Journal of the Royal Society of Medicine*, **72**, 17.
- FINCH, D.R.A., TAYLOR, L. & MORRIS, P.J. (1979) Wound sepsis following gastrointestinal surgery: a comparison of topical and two-dose systemic cephradine. *British Journal of Surgery*, **66**, 580.
- GOODSON, W.H. & HUNT, T.K. (1979) Wound healing and

- the diabetic patient. *Surgery, Gynecology and Obstetrics*, **149**, 600.
- GREENBURG, A.G., SAIK, R.P. & PESKIN, G.W. (1974) Wound dehiscence. *Archives of Surgery*, **114**, 143.
- HUNT, T.K. (1979) Disorders of repair and their management. In: *Fundamentals of Wound Management* (Ed. by Hunt, T.K. and Dunphy, J.C.), Chapter 2, p. 68. Appleton-Century-Crofts, New York.
- KEIGHLEY, M.R.B. & BURDON, D.W. (1979) *Antimicrobial Prophylaxis in Surgery*. Pitman Medical Publishing Co., Tunbridge Wells.
- MOGG, G.A.G., KEIGHLEY, M.R.B., BURDON, D.W. & WILLIAMS, J.A. (1979) Antibiotic-associated colitis—a review of 66 cases. *British Journal of Surgery*, **66**, 738.
- PENNINCKX, F.M., POELMANS, S.V., KERREMANS, R.P. & BECKERS, J.P. (1979) Abdominal wound dehiscence in gastroenterological surgery. *Annals of Surgery*, **189**, 345.
- POLLOCK, A.V. (1979) Surgical wound sepsis. *Lancet*, **i**, 1283.
- POLLOCK, A.V., GREENALL, M.J. & EVANS, M. (1979) Single-layer mass closure of major laparotomies by continuous suturing. *Journal of the Royal Society of Medicine*, **72**, 889.
- PRICE, A.B., LARSON, H.E. & CROW, J. (1979) Morphology of experimental antibiotic-associated enterocolitis in the hamster. *Gut*, **20**, 467.
- RODGERS, J., ROSS, D., McNAUGHT, W. & GILLESPIE, G. (1979) Intrarectal metronidazole in the prevention of anaerobic infection after emergency appendicectomy. *British Journal of Surgery*, **66**, 415.
- SALEM, R.J., JOHNSON, J. & DEVITT, P. (1979) Short term metronidazole therapy contrasted with povidone-iodine spray in the prevention of wound infection after appendicectomy. *British Journal of Surgery*, **66**, 430.
- SINDELAR, W.F. & MASON, G.R. (1979a) Irrigation of subcutaneous tissue with povidone-iodine solution for prevention of wound infections. *Surgery, Gynecology and Obstetrics*, **148**, 227.
- SINDELAR, W.F. & MASON, G.R. (1979b) Intraperitoneal irrigation with povidone-iodine solution for the prevention of intra-abdominal abscesses in the bacterially contaminated abdomen. *Surgery, Gynecology and Obstetrics*, **148**, 409.
- STEINBERG, D. (1979) On leaving the peritoneal cavity open in acute generalized suppurative peritonitis. *American Journal of Surgery*, **137**, 216.
- STEPHEN, M. & LOEWENTHAL, J. (1979) Continuing peritoneal lavage in high-risk peritonitis. *Surgery*, **85**, 603.
- TAYLOR, S.A., CAWDERY, H.M. & SMITH, J. (1979) The use of metronidazole in the preparation of the bowel for surgery. *British Journal of Surgery*, **66**, 191.

Miscellaneous

- BANNERJEE, S.K., BARKER, I.F. & WATERWORTH, T.A. (1979) Does rectal examination affect serum acid phosphatase levels? *British Journal of Surgery*, **66**, 512.
- BERGKVIST, L. & ENGEVIK, L. (1979) The surgical treatment of axillary hyperhidrosis. *British Journal of Surgery*, **66**, 482.
- BREACH, N.M. (1979) Axillary hyperhidrosis: surgical cure with aesthetic scars. *Annals of the Royal College of Surgeons*, **61**, 295.
- ELLIS, H. (1979) Transaxillary sympathectomy in the treatment of hyperhidrosis of the upper limb. *American Surgeon*, **45**, 546.
- ELLIS, H. & SCURR, J.H. (1979) Axillary hyperhidrosis—topical treatment with aluminium chloride hexahydrate. *Postgraduate Medical Journal*, **55**, 868.
- JOHNSON, C.D., COSTA, D. & CASTRO, J.E. (1979) Acid phosphatase after examination of the prostate. *British Journal of Surgery*, **66**, 361.
- MACFARLANE, I.A., KNASS, D., BEARDWELL, C.G. & SHALET, S.M. (1979) Hyperhidrosis in acromegaly: effectiveness of topical aluminium chloride hexahydrate solution. *British Medical Journal*, **2**, 901.
- STEELE, R.J.C. (1979) The effect of rectal examination on serum acid phosphatase. *Journal of the Royal College of Surgeons of Edinburgh*, **24**, 227.