was found to be within the normal range in hyperthyroidism. The surprising feature of these data is that urinary excretion of adrenal steroids is not greatly increased in Graves's disease, for the administration of exogenous thyroxine is known to result in adrenal hypertrophy (Wallach and Reineke, 1949; and others), an increased excretion of 17-hydroxysteroids in the guinea-pig (Levin and Daughaday, 1955), and an increased excretion of 17-ketosteroids in man (Corvilain, 1953). Also the emotional and physical state of a patient with thyrotoxicosis would appear to afford a strong stimulus for adrenal cortical hyperactivity. It is probable, then, that there is a relative, if not an absolute, degree of adrenal cortical hypoactivity in this condition.

General Conclusions

A comparison may be drawn between (1) the findings of Harris and Woods (unpublished) that electrical stimulation of the tuber cinereum of the hypothalamus in the normal rabbit results in inhibition of, or no change in, thyroid activity (rarely thyroid acceleration), whereas the identical procedure in the same animals after adrenalectomy results in a consistent and marked increase in thyroid function; and (2) the clinical observations relating emotional stress and relative adrenal insufficiency with the state of thyrotoxicosis.

In a patient with Graves's disease it is possible that some stressful stimulus has resulted in decreased adrenocortical activity and increased thyroid activity. Such a response would seem to be the reverse of that which occurs in the normal individual. In support of this view is the clinical evidence of Hill *et al.* (1950) that corticotrophin administration may induce remission in early cases of thyrotoxicosis.

Summary

It has been found that electrical stimulation of the hypothalamus rarely elicits increased secretion of thyrotrophic hormone in rabbits with intact adrenal glands. Prior to adrenalectomy increased thyroid activity was observed in only one rabbit out of 22 during electrical stimulation of the hypothalamus. In 35 experiments on 21 such rabbits thyroid activity was either unchanged or actually decreased.

After bilateral adrenalectomy, performed on 14 of the 22 rabbits, hypothalamic stimulation consistently elicited a marked increase in thyroid activity in 20 experiments on 10 rabbits.

Thyroid activity was estimated by measuring the rate of release of ^{131}I from the thyroid and the blood concentration of P.B. ^{131}I . Electrical stimulation of the brain was carried out in unanaesthetized and unrestrained rabbits by the remote control method.

These results seem to be of interest with respect to the aetiology of Graves's disease, since: (1) there is a probable relationship between psychological trauma and the onset or exacerbation of the state of hyperthyroidism; and (2) numerous clinical reports suggest that either a relative or an absolute adrenal insufficiency is a concomitant of Graves's disease.

It is felt that investigation of the effects of corticotrophin administration in early, previously untreated cases of Graves's disease would be of interest.

REFERENCES

- Albert, A., Tenney, A., and Ford, E. (1952). *Endocrinology*, **50**, 324.
 Berson, S. A., and Yalow, R. S. (1952). *J. clin. Endocr.*, **12**, 407.
 Boyd, W. (1944). *The Pathology of Internal Disease*, 4th ed. Kimpton, London.
 Bram, I. (1927). *Endocrinology*, **11**, 106.
 Brown-Grant, K. (1955). *Ibid.*, **56**, 607.
 — (1956). *J. Physiol. (Lond.)*, **131**, 58.
 — von Euler, C., Harris, G. W., and Reichlin, S. (1954). *Ibid.*, **126**, 1.
 — Harris, G. W., and Reichlin, S. (1954). *Ibid.*, **126**, 41.
 Charcot, J. M. (1859). *Gaz. hebdom. Méd. Chir.*, **6**, 216.
 Colfer, H. F. (1949). *Trans. Amer. Goiter Ass.*, p. 376.
 Corvilain, J. (1953). *British Medical Journal*, **2**, 915.
 Crawford, R. (1897). *King's Coll. Hosp. Rep.*, **3**, 45.
 Daughaday, W. M., Jaffe, H., and Williams, R. H. (1948). *J. clin. Endocr.*, **8**, 244.
 de Groot, J., and Harris, G. W. (1950). *J. Physiol. (Lond.)*, **111**, 335.
 Deutsch, F. (1923). *Med. Klin.*, **19**, 678.
 Fraser, R. W., Forbes, A. P., Albright, F., Sulkowitch, H., and Reifenschein, E. C., jun. (1941). *J. clin. Endocr.*, **1**, 234.
 Frederickson, D. S. (1951). *Ibid.*, **11**, 760.
 Goodall, J. S., and Rogers, L. (1933). *Med. J. Rec.*, **138**, 411.
 Harris, G. W. (1955). *Neural Control of the Pituitary Gland*. Arnold, London.
 Hill, S. R., Reiss, R. S., Forsham, P. H., and Thorn, G. W. (1950). *J. clin. Endocr.*, **10**, 1375.
 Hume, D. M., and Wittenstein, G. J. (1950). *Proc. 1st Clin. ACTH Conf.*, p. 134. Blakiston, Philadelphia.
 Kuhl, W. J., and Ziff, M. (1952). *J. clin. Endocr.*, **12**, 554.
 LeCompte, P. M. (1949). *Ibid.*, **9**, 158.
 Levin, M. E., and Daughaday, W. M. (1955). *Ibid.*, **15**, 1499.
 Lewis, Nolan D. C. (1925). *Med. J. Rec.*, **122**, 121.
 Lids, T., and Whitehorn, J. C. (1950). *Res. Publ. Ass. nerv. ment. Dis.*, **29**, 445.
 Marañón, G. (1921). *Ann. Méd.*, **9**, 81.
 Marine, D. (1930). *Amer. J. med. Sci.*, **180**, 767.
 — and Baumann, E. J. (1921). *Amer. J. Physiol.*, **57**, 135.
 Migeon, C. J., Gardner, L. I., Crigler, J. F., jun., and Wilkins, L. (1952). *Endocrinology*, **51**, 117.
 Money, W. L., Krantz, L., Fager, J., Kirschner, L., and Rawson, R. W. (1951). *Ibid.*, **48**, 682.
 Moschowitz, E. (1930). *Arch. intern. Med.*, **46**, 610.
 Myant, N. B. (1953). *J. Physiol. (Lond.)*, **120**, 288.
 Oppenheimer, B. S. (1937). *J. Mt Sinai Hosp.*, **4**, 214.
 Parry, C. H. (1825). *Elements of Pathology and Therapeutics*, **2**, 111.
 Perry, W. F. (1951). *Endocrinology*, **49**, 284.
 Porter, R. W. (1953). *Amer. J. Physiol.*, **172**, 515.
 — (1954). *Rec. Progr. Hormone Res.*, **10**, 1.
 Shadaksharappa, K., Calloway, N. G., Kyle, R. H., and Keeton, R. W. (1951). *J. clin. Endocr.*, **11**, 1383.
 Talbot, N. B., Wood, M. S., Worcester, J., Christo, E., Campbell, A. M., and Zygmuntowicz, A. S. (1951). *Ibid.*, **11**, 1224.
 Trousseau, A. (1867). *Lectures on Clinical Medicine*. Translated by P. Victor Bazire and Sir John Rose Cormack, p. 542. New Sydenham Society, London.
 Verzar, F., and Vidovic, V. (1952). *J. Endocr.*, **8**, 321.
 Wallach, D. P., and Reineke, E. P. (1949). *Endocrinology*, **45**, 75.

PREFRONTAL LEUCOTOMY

VIEWS OF PATIENTS AND THEIR RELATIVES

BY

ALICK ELITHORN, M.D., M.R.C.P., D.P.M.

AND

ELIOT SLATER M.D., F.R.C.P., D.P.M.

From the Department of Psychological Medicine and the Neurological Research Unit of the Medical Research Council, the National Hospital for Nervous Diseases, Queen Square, London

Recent correspondence in the *Lancet* and the *British Medical Journal* has shown that there are still widely diverging views on the value of leucotomy in the treatment of mental disorders. Critics object either that the deleterious effects of the operation are insufficiently appreciated and outweigh trivial symptomatic improvements if such occur, or that if beneficial results are obtained then they are in some ill-specified way not ethically justifiable. Thus it has been stated that all the surveys which show favourable results have been published by those who are emotionally prejudiced in favour of this treatment (Allen, 1955); and that the majority of surgeons do not know how badly their operations turn out (Standley, 1955; Atkinson, 1956). Winnicott (1956) has said that even if he were convinced that a leucotomy could be good he would still believe it was bad; and he has observed that many of his patients have a deep fear of leucotomy. Hardenberg (1956) confirms this finding, adding that the fear may be so deep that it can be unearthed only with difficulty. Tow (1956) attributes much of this fear to scare articles in the lay press.

Published reports of results, for reasons of space, commonly confine themselves to overall assessments made by the authors and such objective observations as rates of discharge from hospital and proportions of patients at work. However, these are not always found convincing, and it can be and is argued that leucotomy represents some form of degradation. Better for the

patient, it is claimed, that he should continue indefinitely an incapacitating battle with pathological ideas and emotions than that he should resign himself to becoming a diminished personality, the struggle abandoned, in a socially tolerated role. Overall assessments have a subjective aspect. Subjectivity in the judgment of results obtained is not to be excluded altogether, and there is some advantage in seeing what emerges if we change the judge. In the material which follows we have excluded all consideration of our own views of what has happened to our patients, and report solely what the patients themselves and their relatives think.

Material and Method

The subjects of the present analysis are all the patients from the public wards of the National Hospital who were leucotomized there before June, 1954, together with those patients from the private wards with whom one of us (E.S.) was clinically concerned. Two patients transferred to the Radcliffe Infirmary for cingulotomy by the late Sir Hugh Cairns have also been included. The great majority of these patients have attended, with their relatives, at regular intervals at a follow-up clinic, where consistent efforts at the greatest attainable degree of rehabilitation have been made. In addition, home visits have been made by the psychiatric social worker in nearly all cases, and contacts have been established with the disablement rehabilitation officers and employers. The assessments which are the basis of this paper have been obtained at the follow-up clinic or in the patients' homes. The diagnoses have been intractable pain (22 cases), excessive emotional reactions to physical symptoms such as tinnitus or involuntary movements (19 cases), chronic anxiety or tension states (36 cases), endogenous depression (21 cases), and schizophrenia (5 cases). There was a total of 46 standard and 57 modified operations. The average lapse of time between the operation and the taking of the assessments was 31 months, the shortest time being six months and the longest 104 months.

In making these formal assessments a modified "opened" interview technique was used. Each patient was asked the same six questions: (1) Whether the operation had helped him and, if so, how? (2) Which symptoms had improved (or) had any symptoms improved? (3) Which symptoms had not improved? (4) Had he noticed any bad effects? (5) Had he noticed any change in personality? (6) Was he glad that he had had the operation, did he regret it, or was he undecided? (This last question was arranged as a five-point scale: see Table I.) Free spontaneous elaboration of answers under all these heads was invited.

The relative was asked whether the operation had relieved the patient, which symptoms were relieved, and which had not, whether any bad effects could be reported; and he was asked to assess the value of the operation to the patient on a five-point scale from much improved to much worse (see Table I). He was further asked whether, with his present knowledge, he would in similar circumstances again give consent. And, finally, he was asked about the social consequences of the operation, how it had affected his own life and his relationship with the patient. After these questions both patient and relative were taken through the complete range of pre-operative symptoms and disabilities to ascertain their present standing.

Results

Of the original 118 patients who fall into this series, five died as a direct consequence of the operation; one other patient failed to survive six months, dying of an intercurrent cerebral accident; four others died of natural causes before the assessment was made, and one committed suicide. Of the remaining 107 cases, the assessment has been mislaid in two cases, was made to a questionnaire since abandoned in one, and was blocked by a relative in a fourth, the husband maintaining that post-operative improvement had been brought about by spiritual means. The data provided by the residual 103 patients (96% of the survivors) are presented in

TABLE I.—Value of Operation to Patient

Relatives' Opinion	Patients' Opinion					Totals
	Very Glad	Definitely Glad	Indeterminate	Regrets	Great Mistake	
Great improvement	23	14	4	—	—	41
Some " "	6	10	10	5	—	31
Little change ..	1	3	4	2	—	10
Slightly worse ..	—	1	2	1	1	5
Much " "	—	1	2	1	2	6
None available ..	3	4	1	2	—	10
Total ..	33	33	23	11	3	103

Table I. The views of a close relative or friend, obtained at a formal assessment interview, are available for 93, or 90%. In the 10 remaining cases no relative with adequate knowledge was available in four, the assessment has either not yet been made or has been mislaid in four, and in two cases the patient has requested us not to contact relatives.

Table I shows a marked but not complete agreement between patient and relative on the value of the operation. Rather surprisingly, considering that leucotomy is supposed to produce personality changes of an antisocial type, the relatives were more favourably impressed than the patients. Of the patients, 65% were glad they had had the operation, 32% very glad; of the relatives, 78% thought there had been improvement, 45% that there had been great improvement. Disagreement between patient and relative is clearly, in part at least, due to the fact that they were required to answer rather different questions. However, in the 72 cases where the relatives thought there was improvement the patient regretted the operation in only five, and in the 66 cases where the patient was glad to have had it relatives thought they were worse in only two.

At the time when these interviews were being conducted our predilections were more for modified operations than for standard ones. If the interview had any suggestive effect in eliciting favourable reports (which we do not believe), then this effect should be greater in the reports of patients who had had modified operations than in those who had had standard ones. Actually, the latter group of patients gave the more favourable answers (39 "glad," 3 "indeterminate," 4 "regret," as against 27, 20, 10). The reports of relatives also tended to favour standard rather than modified operations.

Personality Changes, Bad Effects, and Social Adjustment

Of our 103 patients, 46 denied both that there had been any bad effect and that there had been any personality change of any kind; 14 denied any bad effects but claimed that there had been personality changes which were regarded as beneficial; 11 others, also denying bad effects, said that there had been personality changes which they felt were unfortunate. The remaining 32 patients all reported bad effects—15 with unwelcome changes of personality, 16 with no such change, 1 with a favourable change. In all, 43 patients reported either bad effects or an unwelcome change of personality, or both.

Bad effects, apart from personality change, are not of a very impressive kind: eight patients reported an increase in one or more of their symptoms, six complained of pains or unpleasant sensations in eyes or head which they attributed to the operation, one patient complained of fits, one of frequency of micturition, one of depersonalization and difficulty in making decisions, one that the certification which had followed operation meant that he would not be able to emigrate.

Among personality changes the most common complaints, with numbers reporting them, were: increased irritability (12), emotional flatness (11), lack of energy or laziness (7), intellectual impairment (6), tactlessness (5), loss of self-assertiveness (3), decreased ability to mix socially (3), lack of personal tidiness (2), lack of self-confidence (1). One woman claimed she was now able to assert her ideas more than before. Unfortunately these were Christian principles

relating to the status of coloured people, and she asserted them at bridge parties in South Africa. Since this embarrassed her husband, and she herself regretted it, the tendency has been recorded as a personality deficit under the heading of tactlessness. Another woman, after the operation less preoccupied with her own symptoms, now complained of greater sensitivity to those of others, her husband's uncouth eating habits particularly distressing her. A handful of other patients had complaints which they had difficulty in characterizing, or which do not fall under any of the main headings.

Fifteen patients, when asked about personality changes, said that there had been such changes, but of a beneficial kind; only one of these patients thought that there had also been some bad effect. These favourable changes are mostly classifiable as increased stability of affect and a reduced liability to unpleasant emotional reactions. Increased self-confidence, increased confidence in others, increase of energy, initiative, and of interests are also mentioned. A patient who had had several years of orthodox psycho-analysis claimed that the operation had made him more adult and less narcissistic.

As might be expected, bad effects following the operation were more readily and more often recognized by the relatives than by the patients; nevertheless there was fairly good agreement. There was also close agreement in the kinds of bad effect reported, and the list quoted above provided by the patients is duplicated by the relatives, with somewhat increased numbers (see Table II). Irritability,

TABLE II.—Incidence of Certain Defects in 93 Cases

Nature of Defect	Report by Either Relative or Patient	Report by Relative	Report by Patient
Irritability	30	25	12
Lack of energy, laziness ..	15	12	6
Emotional flatness	23	15*	11
Intellectual or memory defect	12	7	8†
Tactlessness	13	11	5

* Includes two cases where the reduction in emotional responsiveness was regarded by the patient as an asset.

† Includes one case in which the patient did not regard this impairment of his powers of memory as a deficit, since they were reduced from phenomenal to normal.

lack of energy or laziness, and tactlessness were reported by the relatives twice as often as they were mentioned by the patients; though sometimes they were reported by the patients and not by the relatives. Although emotional flatness was reported more frequently by the relatives, the patients were in general aware of this defect, and they were actually more sensitive to defects of memory and intellect than the relatives.

In addition to the above, relatives also reported, in individual cases, fits, frequency of micturition, difficulty in finding words, selfishness, restlessness, excitability, and an increased interest in sex. The relatives reported some bad effects in 59% of the cases in which a standard leucotomy had been performed, and in 53% of those in which the operation was a modified one.

When asked about the effects of the operation on the personal relationship between informant and patient, 45 relatives replied that this had improved, 28 that there was no significant change, and 20 that there had been a deterioration. In these 20 cases irritability was reported in 15, lack of energy in 7, tactlessness in 4, emotional flatness in 4, and memory or intellectual impairment in 3. Irritability was by far the most ominous change and the one most likely to be associated with social deterioration.

Discussion

The aim of this paper is to present the solicited but unselected testimony of patients and their relatives about leucotomy. Of the 103 patients available at the time of the inquiry only three regarded their operation as a great mistake. Eleven others regretted having had it, but in

five of these cases the relative reported definite improvement, and in two more they said that the patient was no worse.

It is not appropriate here to raise the question of how far these results may justify the operation on certified patients without their consent. In the present series the operation was carried out only on the request of the patients themselves. It is clear from their replies to the questionnaire that they would, in the majority of cases, now regard any psychiatrist who had previously advised them against the operation as having been mistaken. On the other hand, they would regard with scepticism Pippard's (1955) statement that "positively undesirable changes" occurred in only 2 of a series of 114 cases treated by modified leucotomy.

There is an unfortunate tendency in the literature either to disregard favourable personality changes or to confuse personality changes of any kind with bad effects. Changes of personality that are regarded as favourable by patients and relatives are not uncommon, and may be independent of symptomatic changes. They may well be brought about by more than one mechanism. Thus Pippard (1955), in his series, reports a favourable change in energy output in seven patients, and attributes it to the removal of hampering symptoms. It might as easily be the case that an increase in energy, perhaps analogous to the increase in appetite often noticed after operation, has, through the activation of basic emotional drives and the arousal of normal interests, provided a primary contribution to the alleviation of symptoms. We argue all too easily that damage to tissues which appear normal under the microscope can produce nothing but defects, and that then, if symptomatic improvements occur, some defect must be called on to account for them. Surely the fact that leucotomy is a crude therapeutic weapon, and that unnecessary and unwanted changes are often produced by it, should not blind us to the observation that occasionally it may produce effects which are wholly beneficial.

Few will doubt that the incidence of personality defects is larger with more extensive operations than it is with modified ones (Meyer and Beck, 1954; Pippard, 1955). In the present series patients and relatives detected bad effects with approximately the same frequency in the standard and the modified series. Since those who had a full leucotomy made better symptomatic improvements than those who had only a partial operation, it would seem that, if the result obtained is generally good, side-effects may not only appear less important or less bad but also may actually be less readily detected. Any particular change of personality cannot be regarded as good or bad in itself, though there are some changes, such as irritability, whose effects are nearly always bad. With most changes of personality there are both good and bad sides to its effects; all that is observationally possible is to say whether the patient as a whole has benefited or has suffered. Even this is a question which can only be answered in a defined context. There are patients who consider themselves better and are considered worse by their relatives, and a more numerous group to which the opposite applies. By what standards are we to say that one opinion is right and the other wrong?

Summary

A series of 103 patients have been asked for their views about the value to them of a leucotomy-type operation: 66 were glad to have had the operation, 11 regretted it, and 3 thought it had been a great mistake; 23 were neither glad nor sorry that they had had the operation.

The views of 93 relatives were also obtained: 72 thought the patient was better off, 11 thought the patient was worse, 10 thought it had made little difference.

Unwelcome changes were reported by the patients in 43 cases and by the relatives in 51 cases.

In the present series a good result was reported much more often with a standard operation than with a

modified one. On the other hand, the incidence of bad effects was only slightly higher with the standard operation.

It is emphasized that the assessment of the value of a leucotomy operation to the patient is a subjective one whoever makes it; and it is pointed out that in the past the patients' opinion has tended to take second place to that of the medical investigator.

We would like to thank our colleagues at the National Hospital for letting us see and investigate all their patients who came to leucotomy over the time covered by this study, and for their permission to publish the results of this investigation. One of us (A.E.) has been supported by the Medical Research Council and would like in particular to thank Dr. E. A. Carmichael, Director of the Neurological Research Unit, for his advice and encouragement. To Mr. Eric Glitheroe and his colleagues in the Social Welfare Department we are indebted for the main labour of the conduct of the follow-up clinic and for invaluable help in collecting the material.

REFERENCES

- Allen, C. E. (1955). *British Medical Journal*, 2, 1502.
 Atkinson, W. J. (1956). *Ibid.*, 1, 172.
 Hardenberg, H. E. W. (1956). *Ibid.*, 1, 350.
 Meyer, A., and Beck, E. (1954). *Prefrontal Leucotomy and Related Operations: Anatomical Aspects of Success and Failure*. Oliver and Boyd, Edinburgh.
 Partridge, M. (1956). *British Medical Journal*, 1, 574.
 Pippard, J. (1955). *J. ment. Sci.*, 101, 774.
 Standley, D. W. (1955). *British Medical Journal*, 2, 1390.
 Tow, P. M. (1956). *Ibid.*, 1, 230.
 Winnicott, D. W. (1956). *Ibid.*, 1, 229.

RESULTS OF TREATMENT IN CARCINOMA OF COLON AND RECTUM*

BY

E. G. MUIR, M.S., F.R.C.S.

Surgeon, King's College Hospital, Bolingbroke Hospital, and
Queen Victoria Hospital, East Grinstead

Reviews of this subject are often derived from special hospitals or private clinics. They show the good results of specialized service or of work amongst a section of the population perhaps better able to recognize the early symptoms of disease and more interested in it. They do not usually include in their numbers the same proportion of advanced or inoperable cases, or those admitted in acute obstruction, as are found in general hospital beds. Becker (1953) pointed out that while 25% of all cases of colon carcinoma admitted to the Charity Hospital, New Orleans, were in complete obstruction, the corresponding figures at the Lahey Clinic and the Mayo Clinic were only 2% and 5.6% respectively, indicating a somewhat different type of surgical practice. These factors should weigh with both operability and the results of treatment.

This article reviews the results obtained in a series of 714 cases of carcinoma of the colon and rectum admitted to a group of some 650 general hospital beds, located in three separate hospitals, over the ten-year period 1945-55. All cases are included whether admitted for radical surgery, for palliative surgery in the inoperable case, or for investigation of ascites, enlarged liver, or other distant metastases. There were in this series 109 patients with carcinoma of the right colon, 74 with carcinoma of the left colon, 114 with carcinoma of the sigmoid, and 417 with carcinoma of the rectum and recto-sigmoid.

Acute Obstruction

Of the 714 cases, 75 were admitted in acute obstruction. The site and the frequency of acute obstruction with growths in that site are shown in Table I.

* Part of the third Lettsomian Lecture delivered to the Medical Society of London on March 5, 1956

TABLE I

Site of Growth	Total in Series	No. Admitted in Obstruction
Right colon	109	11 (10%)
Left	74	16 (21.6%)
Sigmoid colon	114	33 (28.9%)
Rectum and recto-sigmoid ..	417	15 (3.5%)
Total	714	75 (10.5%)

Of the 297 cases of colonic carcinoma, 60 (20.2%) were admitted in acute obstruction. This figure is lower than that reported by Newell (1951), when out of 490 cases 59% were undiagnosed until obstruction had occurred, and is similar to that of Becker (1953) already quoted. It is still surprisingly high, and, as in most series, the highest frequency was found in the sigmoid colon.

Treatment in Acute Obstruction

A straight x-ray film of the abdomen, gastric suction, and intravenous fluids appear to have been routine preliminaries in almost all cases. Of the 75 patients, one was admitted moribund and 1 refused all operative treatment; the treatment of the remaining 73 is shown in Table II.

Caecostomy.—This was done in 18 cases, with 2 deaths, a mortality of 11.1%. Both deaths occurred in gravely ill patients a few hours after operation, and do not appear to have been due to peritonitis or leakage; one other patient, however, developed a right subphrenic abscess and empyema after caecostomy but survived. Seven caecostomies were "blind"; in the remainder a laparotomy was performed. In recent years caecostomy has received considerable criticism. Becker (1953) cites an operative mortality of 42% and quotes Wangenstein as stating that the mortality at the University of

TABLE II.—Acute Obstruction: Operative Treatment

Operation	Right Colon	Left Colon	Sigmoid	Rectum and Recto-sigmoid	Mortality
Caecostomy ..	2	6	10	15	2 (11.1%)
Colostomy ..	7	3	16	4	4 (12.5%)
Enterostomy ..	2	2	1	4	4 (36.3%)
Resection ..	2	2	3	1	1 (14.2%)
Laparotomy only			2	2	2
Died under G.A.		1		1	1
Total ..	11	15	32	15	14 (19.2%)
Cases subs. resected	6	8	15	12	

Minnesota Hospital is almost 50%. It is difficult to understand these figures unless one assumes that in these centres the operation is used only in almost moribund patients. Its disadvantages are: a distended caecum is difficult to handle; tube drainage may permit leakage and peritonitis; though the operation relieves tension it does not divert the faecal stream; and drainage is occasionally difficult. A distended caecum can be decompressed before it is handled, for much of the distension is due to gas, and, while it is true that it does not divert the faeces and that at the second operation the bowel above the growth may still be loaded, most of this can be prevented by careful lavage through the caecostomy and per rectum. "Blind" caecostomy can sometimes be performed on a very ill patient when a laparotomy cannot. The presence of a caecostomy does not really interfere with the subsequent resection of the right colon, for it is simply removed with the bowel; if it has been used for a growth of the left colon its presence is a safety vent for subsequent resection. The choice of a caecostomy is governed by the taste of the surgeon, but it seems to have been a useful operation in this series.

Colostomy.—This is the decompressive operation favoured by most surgeons at the present time. It was used on 34 cases with 4 deaths (12.5%). One death was due to pneumonia, one to cerebral thrombosis, one to pulmonary