continuous symptoms, and a clinically severe first attack. In such cases total colectomy is an important prophylactic measure against cancer. Familial polyposis coli, if untreated, is certain to go on to cancer, but this is not likely to occur under the age of 20. Treatment can therefore be postponed until the patients are in their late teens. The usual practice then is total colectomy with ileorectal anastomosis, with careful observation of the rectal stump for the rest of the patient's life. Excision of the rectum may become necessary if carcinoma develops therein.

How can diagnosis of bowel cancer be made at the earliest possible clinical stage ? The results of screening the symptomless adult population are now available from a number of cancer detection centres in the U.S.A. D. B. Shahon and O. H. Wangensteen[5] have reported their findings in an 11-year period (1948–59), during which time 9,035 patients over the age of 45 were examined at yearly intervals. The total number of examinations performed was 32,517. Full clinical examination and sigmoidoscopy were carried out at each visit, and a barium enema was given if polyps were discovered, if anaemia was present, if the occult blood test in the stool was positive, if symptoms of bowel disturbance had developed between visits, or if there was a family history of bowel cancer. Twenty-two cases of colonic and 26 of rectal cancer were disclosed ; of these 48 cases, 35 were symptomless. In addition, no fewer than 3,083 rectal and colonic polyps were discovered. In a later review from the same University of Minnesota Cancer Detection Centre, V. A. Gilbertsen,[6] reviewing now over 12,000 patients submitted to nearly 60,000 examinations, found that the estimated number of cancers of the large bowel in the recheck period should have been between 30 and 34, yet only nine did in fact occur. Possibly this fall might be attributed to the routine removal of the benign large-bowel polyps that were encountered.

Yearly routine examination has not yon the day in Britain against objections that can be raised against it, nor could it be carried out by our already strained clinical and radiological services. But there is no doubt that the slightest suspicion of bowel disturbance or episode of rectal bleeding, especially in a middle-aged or elderly patient, should be subjected immediately to investigation including sigmoidoscopy and barium enema.

The presence of advanced local disease or of distant metastases at the time of laparotomy does not necessarily place the patient completely beyond surgical help. L. M. Rousselot and his colleagues[7] have produced figures which suggest that significant improvement may be obtained in advanced cases with affected lymph nodes if surgery is combined with injection of 5-fluorouracil into the lumen of the bowel together with intravenous injection of this drug on the first and second postoperative days in a dosage of 10 mg. per kg. body weight. Solitary secondary deposits in the liver are amenable to surgical resection, and encouraging results have been reported.[8 9] In most cases, unfortunately, both lobes are involved, so that resection is impossible, but even then palliative resection of the primary lesion is well worth while. Local obstructive symptoms will thus be removed, the intractable pain of local invasion will be avoided, and occasionally surprisingly long survival may follow. H. Ellis,[10] in a review of patients in whom liver metastases were found at laparotomy for cancer of the large bowel, found that all those in whom no further procedure was carried out were dead within five months. Those submitted to colostomy or short-circuit operation only were nearly all dead within a year. Eighty-seven patients had palliative removal of the primary tumour, and 32 of these survived for more than one year.

Even when the patient returns with recurrent disease, it is sometimes possible to carry out resection of the recurrence, whether this is in the liver, the suture line, the abdominal wall, or a lung. When recurrent disease is fixed or widespread it may still be possible to give useful palliation by means of super-voltage radiotherapy, chemotherapy,[11] or a combination of the two.

1 *The Registrar General's Statistical Review of England and Wales for the Year 1966*, 1968, Pt. 1, Tables, Medical. London, H.M.S.O.
2 Morson, B. C., *Brit. J. Surg.*, 1968, **55**, 725.
3 Simpkins, K. C., and Young, A. C., *Brit. J. Surg.*, 1968, **55**, 731.
4 Lockhart-Mummery, H. E., *Brit. J. Surg.*, 1968, **55**, 735.
5 Shahon, D. B., and Wangensteen, O. H., *Postgrad. med. J.*, 1960, **27**, 306.
6 Gilbertson, V. A., in *Progress in Clinical Cancer*, 1966, Vol. II, ed. I. M. Ariel, p. 56. London.
7 Rousselot, L. M., *et al.*, *Amer. J. Surg.*, 1968, **115**, 140.
8 Friesen, S. R., Hardin, C. A., and Kittle, C. F., *Surgery*, 1967, **61**, 203.
9 Flanagan, L., and Foster, J. H., *Amer. J. Surg.*, 1967, **113**, 551.
10 Ellis, H., *Brit. med. J.*, 1968, **3**, 37.
11 Rochlin, D. B., Smart, C. R., and Silva, A., *Amer. J. Surg.*, 1965, **109**, 43.

Another Green Paper

Speculations about the future of the Green Paper[1] were ended last week, when Mr. Richard Crossman in a speech at Norwich stated that the Government was scrapping it. There was, he said, almost unanimous criticism of the proposed single tier, area board peripheral administrative structure as being too remote and denying those who use and those who work in the Health Service an effective voice in its management. He claimed, however, that there was virtually unanimous support for a unified service. The Department of Health and Social Security is to produce another Green Paper which will propose unification through a two-tier system of local administration consisting of some 200 district committees, based on one or more district hospitals, and above them a second tier of about 20 regional authorities (instead of the 50 or so area boards proposed in the Green Paper). It is aimed to publish the Green Paper, Mark II, in July and a White Paper setting out the Government's policy in the autumn.

Mr. Crossman was on surer ground in pointing to the virtual unanimity of the criticism of the Green Paper than in claiming a similar degree of support for a unified service. The B.M.A. hedged round its support with a number of provisos,[2] and the general practitioners' conference[3] voted—though by a narrow margin—against unification. Doctors will certainly welcome the proposal for a two-tier structure, and it could go some way to meet some of the B.M.A.'s terms for unification. But much will depend on what emerges in the discussions between now and July. What, for example, will be the respective functions of the tiers, and where will the responsibility lie—and for what ?. How will the district committees be appointed, and how representative will they be ? Will the second tier, the apex of the pyramid of the peripheral administrative structure, be built up from its base

1 *The Administrative Structure of the Medical and Related Services in England and Wales*, 1968. London, H.M.S.O.
2 *Brit. med. J. Suppl.*, 1969, **1**, 55.
3 *Brit. med. J. Suppl.*, 1969, **1**, 31.
4 *Report of the Committee on the Local Authority and Allied Personal Social Services*, 1968. London, H.M.S.O.

or will it be imposed from the top ? And, since action is also to be taken on the Seebohm Report,[4] it will have to be decided which social services properly belong to the Health Service and which should be administered by local authorities.

Above these and other questions hangs the larger one of what the Maud commission on local government reform is going to recommend. Its report cannot now be far away. Whatever it proposes will be relevant to the administration of the N.H.S. It is equally certain that the debate on the recommendations will be so prolonged that probably no legislation on them will be enacted before about five years. Yet Mr. Crossman's programme seems to envisage legislation on reforms in the health and social services by next year. This could mean that he does not expect the new second-tier regional health authorities to be the same as any of the new regional government bodies that the Maud commission might propose, or it could mean that the regional health authorities will form the advance guard of the new local government structure and will be trimmed for absorption into the main body when the time is ripe. The B.M.A. has recorded[2] its opposition to the transfer of the administration or financing of the health services to local authorities either in their existing or in any modified form which would subject the Health Service " to the fluctuating and conflicting pressures of local government." Probably anything the Maud commission proposes would come within that formula.

The Green Paper (Mark I) served its intended purpose of promoting debate. Because of it discussions on the next Green Paper will be easier and need not be so prolonged. Nevertheless, a schedule for publishing the Green Paper, Mark II, in July and a White Paper in, say, October seems too ambitious. Since it is improbable that there is anything ready-made to fit, four months is too short a time in which to dress a bare two-tier structure in working clothes. The doctors will have to work out some constructive suggestions, and between July and the autumn come the medico-political dog-days in August and September. Though there are many other important bodies whose interests Mr. Crossman will be taking into account, he would hardly wish to proceed without the co-operation of the medical profession. It is easily said that the N.H.S. is a personal service, but too easily forgotten that the individual consultation between patient and doctor, and all that that relationship implies, are at the heart of it. This may be a hindering factor in planning for a collective service, but it is one which it would be most unwise to ignore.

Carcinogens in the Environment

A century ago food and drink were deliberately adulterated, milk was teeming with tubercle bacilli, young women died of puerperal fever, children and adolescents of diphtheria and scarlet fever, and conditions in industry were shocking—to mention but a few of the causes of early death. The hazards of life have changed in this century, and they are more apt to afflict the population as a whole or its older members than the young. Accidents on the roads, degenerative arterial disease, and cancer are among the major causes of death today. It is to the last that F. J. C. Roe[1] has drawn attention in a recent review.

The author is himself engaged in experimental cancer research, and his pen ranges over almost all the fields which are under investigation throughout the world at the present time, thus providing a summary of current thought on the problems of cancer in man and a good bibliography. But his chief emphasis is on the carcinogens which contaminate man's environment, both in fact and in theory. He pays special attention to possible carcinogenic substances in food which might lead to the development of cancer of the colon, and to the steps which might be taken to eliminate them.

Only a few carcinogens have been definitely implicated in human cancer. Foremost among them are certain dyestuff intermediates, radiations, asbestos, and chromium salts. Legislation already exists to control or eliminate some of these hazards, but there is no doubt that loopholes exist and that regulations will have to be tightened and extended before safety to industrial workers in certain fields is assured. Equally important is clinical vigilance so that any unusual local rise in tumour rate may be investigated.

Though the number of carcinogens proved to be harmful to man is small, it has been suggested that 80–90% of human cancers are environmental in origin. The known human carcinogens have been discovered by surveys of populations and industrial groups or by experiments in animals. It follows, therefore, that one method of preventing increased human exposure to carcinogens is to test in animals substances such as food additives and pesticides proposed for use in the human environment and to eliminate any which give cause for suspicion. This method is accepted and is in wide use in this and other countries. It is clearly impossible to test all substances proposed for use, and so discrimination is exercised by appropriate Government committees. Full testing is asked for only when a compound has a structure related to that of other known carcinogens or when preliminary tests show changes which seem to resemble those occurring during the latent period of other carcinogens. Roe believes members of advisory committees sometimes exercise capricious judgements about which compounds should or should not be tested in animals, and he suggests a classification of five groups in descending order of precedence into which the substances under consideration could be placed. But such a practice is hardly different from that already in use.

Roe advocates a new approach to the control of carcinogens in food. As man's food is usually cooked, there is ample opportunity for the production in it of aromatic polycyclic hydrocarbon compounds by the pyrolysis of organic matter. Of these, benzo[a]pyrene has been found in a variety of foods, especially home-smoked foods, but it is also present in cereal crops, in drinking-water, and in the atmosphere. As this compound has a highly characteristic ultraviolet absorption spectrum, which enables it to be detected in very low concentrations, Roe considers that an upper limit should be set for the contamination of food with benzpyrene and means taken to enforce this. Upper limits of related substances could follow. Though the idea sounds attractive, it must be realized that the test would not be simple, as other fluorescent substances occur in food, and that expensive apparatus and staff would be needed before legislation could be effective. It would seem to be more reasonable to make trials on a limited scale by setting limits on smoked foods.

Several hundreds of chemical compounds are known to cause cancer in animals, and in addition substances exist which are incomplete or cocarcinogens, having the property of acting

[1] Roe, F. J. C., *Fd Cosmet. Toxicol.*, 1968, **6**, 485.