encourage it. For the same reasons industrial colonies staffed by disabled miners cannot be regarded as a sound economic proposition.

My main purpose in bringing up the question of miners' nystagmus again is not to discuss its etiology and symptomatology, but to appeal to ophthalmologists to take interest in the matter of its curative treatment. On the preventive side it must be admitted that a vast amount of work has been done and much money spent, though the tangible results so far have not been very great. Improvement in the hygiene and illumination of the mines seems to have had some salutary effect. Probably still better illumination, which would definitely substitute photopic for scotopic vision, would result in a very definite reduction in the incidence of miners' nystagmus. But what are we doing to relieve the patient who is already afflicted with this truly distressing complaint? There are hundreds of cases not receiving any form of treatment, apart from encouragement to get some work to do to avoid the evils of idleness and introspection. I consider this a reflection on the enterprise and public spirit of the ophthalmologists in mining areas. It may be true "that there would appear to be a disease, miners' nystagmus, the nature of which, as far as the eyes are concerned, we, as ophthalmic surgeons, can appreciate, accurately measure, and record; there is another disease, miners' psychoneurosis, of which we, as ophthalmic surgeons, have no special knowledge,"¹ but that is no reason why we should not make good that knowledge, with or without the help of psychological and other experts. The psychologists could deal with the factors of innate nervous instability and the psychic disability, but we could certainly deal with the toxic factor, which is probably present in all cases. The mining engineer will attend to the question of toxicity due to exogenous agents such as gases, but it should be our duty to find out the part played by endogenous toxins in establishing and sustaining the disease, and to adopt methods to counteract their action.

Mr. Frank Thomas of Swansea has obtained some favourable results by dealing with obvious oral and nasal sepsis in these cases, but if we are to attack the problem properly we shall need to go into the whole question of sepsis, and especially of intestinal toxæmia, and its correction. Investigations into these matters involve the institutional treatment of the patients, and obviously the institution must have the staff and equipment necessary to carry out these investigations.

REFERENCE.

¹ Reports of the Miners' Nystagmus Committee of the Medical Research Council, *Brit. Journ. of Ophthalmol.*, vol. viii, 1924, p. 63.

A NEW METHOD OF APPROACH IN GASTRIC SURGERY.

BY

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THE two cases of carcinoma of the stomach which I am about to describe in detail belong to a small group which at first sight might appear to be inoperable. From the point of view of a radical excision of carcinoma of the stomach cases fall into three categories. There are (1) cases in which the growth is confined to the stomach, where the stomach is not fixed, and which are suitable for an immediate partial gastrectomy; (2) cases where there are secondary deposits in the liver or elsewhere, which are obviously inoperable; and (3) cases where there are no secondary deposits, but where on account of the local conditions, the size and fixation of the growth, it is doubtful whether an excision can be done. It is to this last group that these two cases belong. They were both operated on by Sir Berkeley Moynihan, under whose care they were at the General Infirmary, Leeds.

Briefly, the method is to open the abdomen and give a big dose of deep x rays directly on to the tumour. A second operation is done six weeks later, when the growth is found to be considerably shrunken in size, and to be much more freely movable.

CASE I.

A woman, aged 45 years, was admitted with a three years' history of attacks of abdominal pain and nausea. Five months previously she had begun to vomit, and since that time she had been unable to retain any solid food whatever. For the last two months she had been in bed. There was a fixed tumour palpable in the epigastrium. An x-ray examination showed a filling defect in the stomach, involving both curvatures and extending from the pylorus about two-thirds of the way to the oesophageal opening. A fractional test meal showed a complete absence of free hydrochloric acid. She was given two transfusions of blood, and on August 31st, 1923, the abdomen was opened, using hedonal as an anaesthetic. A large mass of growth was found in the stomach; its extent was as shown by the x-ray examination, and the condition was described as a leather-bottle stomach. Glands were present along both curvatures, but there was no sign of any malignant deposit elsewhere. The abdominal wall was retracted, everything except the growth protected by mackintosh clothes and lead plates, and the growth itself was exposed to the direct action of the deep x rays for forty minutes. The abdomen was then closed and the patient sent to a convalescent home.

A second operation was done on October 12th, when the growth was found to have shrunk to roughly half its original size. In addition, it could be moved about quite freely and a partial gastrectomy was done without much difficulty. The patient had an uninterrupted convalescence and left hospital finally on November 3rd. She was still in good health four and a half years after the operation, except for a secondary anaemia. A recent blood count was as follows: Erythrocytes 4,180,000 per c.mm., haemoglobin 36 per cent., colour index 0.42, leucocytes 6,100 per c.mm.—a reading which is very definitely not of the pernicious type.

CASE II.

A man, aged 60, was admitted in July, 1924, with a history of indigestion since the preceding December. He complained of pain coming on three to four hours after a meal, and said that food relieved his pain. His appetite was fair, he had not lost much weight, but looked pale. An x-ray examination showed a filling defect in the middle third of the stomach, and a test meal revealed an absence of free hydrochloric acid. He was given three transfusions of blood, and on August 8th his abdomen was opened under local anaesthesia. There was a growth in the middle third of the stomach, mostly on the anterior surface. It extended into the great omentum and appeared to be dangerously close to the transverse colon. It was adherent posteriorly, so that it was quite impossible to lift the stomach up into the wound. There were no secondary deposits elsewhere. As in the previous case, an application of deep x rays was given directly to the growth for thirty minutes.

The second operation was done on October 1st, when it was found that the growth had shrunk considerably in size, that the posterior fixation had disappeared, and that it was quite possible to get between it and the transverse colon. The stomach was removed, and a note made at the time says that the upper division of the stomach was very close to the edge of the growth. The patient left hospital on November 11th and is still in good health more than three years after the operation.

A pathological examination of the specimen showed it to have been a spheroidal-celled adeno-carcinoma. The interesting point about this case is that in spite of the stomach having been divided closer to the growth than would ordinarily have been considered advisable there has been no recurrence. This is what we might expect, for as well as an action on the main mass of the growth, an effect must be produced on the clinically imperceptible permeation round it.

These two cases illustrate very well the changing of an apparently inoperable into a definitely operable state. At first sight there is no doubt that it would have been absolutely impossible to attempt to excise the stomach, while at the second operation the conditions for its removal could hardly have been more favourable.

An alternative method is, of course, to give a preliminary exposure of deep x rays to every case of carcinoma of the stomach which is to be operated on. To give a dose of the strength which can be applied directly to the growth would be to run the risk of an x-ray burn, and experience shows that one big dose is considerably more efficacious than a number of smaller applications applied to the growth at intervals by the cross-fire method.

Cases of this type belong to a very small group, for the conditions must be as I have described them for this line of treatment to be possible. It is a very high recommendation for the method that these two patients, the only ones to undergo treatment by this method, are alive without any signs of recurrence, in the one case four and a half years, and in the other five and a half years after operation.