FIG. 3(a).—The treatment of Carcinoma of the Lip. (Smithers).
Epithelioma of the Lip before treatment.

FIG. 3(b).—The treatment of Carcinoma of the Lip. (Smithers).
Six weeks after treatment.

FIG. 4(a).—The treatment of Carcinoma of the Lip. (Smithers).
Epithelioma of the Lip before treatment.

FIG. 4(b).—The treatment of Carcinoma of the Lip. (Smithers).
Four months after treatment.

FIG. 5(a).—The treatment of Carcinoma of the Lip. (Smithers).
Epithelioma of the Lip before treatment.

FIG. 5(b).—The treatment of Carcinoma of the Lip. (Smithers).
Three months after treatment.

THE TREATMENT OF CARCINOMA OF THE LIP.

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Introduction.

Many cases of cancer are curable if treatment is started soon enough, but this is dependent upon an early diagnosis being made and the patient being sent for treatment without delay. An early diagnosis should be the rule in cases of carcinoma of the lip. These tumours are continually reminding the patient of their presence, they are visible to his relatives and friends and the diagnosis should be a simple matter. There are few other similar lesions and a piece may be taken for biopsy with safety immediately before treatment in all ulcerated tumours of the lip. Nevertheless delay in starting treatment is still far too common.

Pack and Gallo (1938) attempted to assess the responsibility for delay in starting treatment by analysing one thousand random cases of cancer from the records of the Memorial Hospital, New York, and the Paterson General Hospital, New Jersey. They defined delay on the part of the patient as reasonable when the time elapsing between the onset or discovery of symptoms and the first visit to a physician was under three months, and allowed one month as a reasonable time for a physician to make a diagnosis or refer a patient to a clinic. In twenty-one cases of carcinoma of the lip sixteen patients delayed more than three months in seeking advice, and in nine cases the physician was considered to be subject to criticism. In the twenty-one cases of carcinoma of the lip treated at The Royal Cancer Hospital (Free) by the method to be described later, twelve were delayed more than four months from the onset of symptoms before starting treatment. The culpability for delay was not assessed as between patient and doctor in these cases, but there is no doubt that the blame must be divided.

These tumours do not tend to spread rapidly to the regional lymph nodes. Duffy (1938) found that in 271 cases, only 14 per cent. were admitted with lymph node involvement as compared with 37 per cent. of 122 cases of carcinoma of the floor of the mouth, 27.5 per cent. of 268 cases of carcinoma of the tongue, and 24.5 per cent. of 98 cases of carcinoma of the buccal mucosa. In Lund and Holton's (1933) series of 181 cases of primary carcinoma of the lip, 19.3 per cent. were admitted with enlarged lymph nodes. Kaplan (1937) found that 13.7 per cent. of 160 treated cases had palpable nodes on admission. Of the 21 patients treated at The Royal Cancer Hospital, four were admitted with clinical lymph node involvement and in one case lymph nodes were first palpated at an early stage in the treatment of an extensive primary growth, that is 23.8 per cent. had lymph node involvement if the last case is included.

As a result of early diagnosis in a reasonable proportion of cases, the comparatively slow course of the disease and the accessibility of the lesions, the results of treatment by a variety of methods have proved very satisfactory. They could be improved still further by education of the public and by the fuller realisation by a section of the medical profession of the urgency of making a diagnosis in a patient with an ulcer of the lip that will not heal. As soon as involvement of the regional lymph nodes has occurred the patient's chance of survival is materially reduced.

The Treatment of the Primary Tumour.

There is still some difference of opinion as to the best method of treating the primary tumour, due largely to the fact that the surgeon tends to see the failures from radiation, and the radiotherapist the failures from surgery. Failure to control the primary growth should be a rare occurrence and is usually due to underdosage of portions of the growth by the radiotherapist, or too conservative an excision by the surgeon. Good surgical treatment is better than inadequate radiation, and good irradiation better than incomplete excision, but it is possible to effect the complete removal of all the malignant tissue present with equal certainty by either method. The selection of the best method of treatment depends upon the assessment of the advantages to the patient inherent in the various forms employed.

The effect of X-rays or radium depends on the vulnerability of malignant cells being greater than that of normal cells to the destructive influence of the radiation. Any resulting deformity is due to the previous destruction of normal tissues by the tumour, the irradiation itself producing little or no deformity. In many early cases it is not possible to tell from examination after treatment where the original lesion was situated. The effect of surgery depends upon a sufficiently wide margin of normal tissue outside the tumour being removed to avoid the possibility of leaving any malignant cells behind. An optimal cosmetic result is obtained by radiation methods and must be a secondary consideration in surgical procedures. Irradiation can usually be carried out without admitting the patient to hospital and with little loss of time from his occupation. The reaction produced causes the patient some temporary discomfort, probably more than he would experience after simple excision of a small tumour, but less than would be caused by a more extensive operation involving tissue replacement. Considerations of the patient's convenience, hospitalisation and even of deformity must, however, be secondary to securing healing and subsequent freedom from recurrence. Success or failure is nearly always dependent upon the patient receiving adequate treatment from the first. The majority have only one chance of a cure for second attempts at treatment are seldom so successful. The patient's best interest is, therefore, served if he receives treatment by the method that is most skilfully carried out in the centre to which he applies. Where treatment is equally good by either method the balance is in favour of irradiation, which has now displaced surgery in the treatment of the primary tumour in most of the larger treatment centres.

The method employed in the treatment of the primary tumour at the Royal Cancer Hospital in the 21 cases referred to below was introduced by Chaoul and Adam (1933) and is known as contact, Chaoul or short-distance low-voltage X-ray therapy. It was designed to produce a distribution of X-radiation in the tissues similar to that due to radium, on the grounds that this, and not the quality of the radiation, was the factor of chief importance. This end was achieved by the construction of special X-ray apparatus that enabled the source of the X-rays to be brought to within a few centimetres of the tumour. The result is to confine the destructive effect to a small volume of tissue and allow a large tumour dose to be given with minimal damage to the surrounding healthy tissue. The advantages over the use of radium are that it takes only a few minutes to treat each patient each day, that a large number of patients can be treated in a short time and that the initial outlay is small compared with that necessary for the purchase of an amount of radium capable of doing the same volume of work. Furthermore, it is a comparatively simple matter to find the complete distribution

of the radiation in the tissues, for the three-dimensional or volume distribution can be readily obtained and the maximum and minimum tumour doses determined. Flood and Smithers (1939) have given a full account of the use of this form of treatment over a period of four years, including an account of the technique employed in the treatment of carcinoma of the lip. Tumours of the lip are treated wherever possible by two directly opposing fields, the distributions due to which have been described by the present writer in a symposium on three

FIG. 1.

FIG. 2.

dimensional radiation distributions by Honeyburne, Lamerton, Smithers and Mayneord (1939): The dose distribution diagrams referable to the treatment of lip tumours are shown here (Figs. 1 and 2). With these charts available it is only necessary to take a caliper measurement across the lip, to find the distance between the fields, to be able to read off the maximum and minimum tumour doses directly. These charts were prepared from isodose contours published by Mayneord (1936) and others, determined by L. F. Lamerton in the physics department of the Royal Cancer Hospital under the direction of Dr. W. V. Mayneord.* The technique of treatment must be adapted specially to large infiltrating tumours and the dose distribution determined for each case. The dose prescribed for the primary tumour is a minimum tumour dose of 6,000 r in 10 to 21 days; a maximum tumour dose of 8,000 r is not exceeded in any but exceptional cases.

Chaoul (1937) reported the results in 37 cases of carcinoma of the lip treated by his method with 87 per cent. symptom free over a period of one to five years. Twenty-one patients who had received no previous treatment have been treated by this method at the Royal Cancer Hospital since 1935, but sufficient time has not yet elapsed for the results to be assessed. Disappearance of the tumour and healing occurred in all cases where the growth was limited to the lip. Of the five patients with lymph node involvement, three died without primary healing, in two of which the condition was so advanced that a full course of treatment was not given. The third patient died from metastases in three months. Three other patients have died with no sign of primary recurrence, two from intercurrent disease, and one with metastases. The latter patient had large palpable lymph nodes on admission. One patient developed a hard palpable lymph node two years after treatment and this has been treated recently with a teleradium unit. The remaining patients are all alive and well with the exception of one who has cabled from California to say that he has a recurrence; as yet we have no information as to the site and nature of this. When last seen a year ago, fifteen months after his treatment, there was no sign of growth. Figs. 3, 4, and 5 [Art Plate] show the cosmetic results that can be obtained with this form of treatment.

The Treatment of the Lymphatic Drainage.

In the treatment of the regional lymphatic system we are on much less certain ground. The problem must be considered separately for three groups of patients (1) those with no palpable lymph nodes, (2) those with small movable lymph nodes, and (3) those with fixed lymph node masses.

In the group with no palpable lymph nodes the alternatives are either no treatment to the lymphatic drainage, block dissection or irradiation. In deciding on the advisability of giving any treatment to the neck in these cases, the chances of the patients developing palpable lymph nodes must be assessed. Richards (1936) analysing 275 cases of carcinoma of the lip, admitted without palpable lymph nodes and receiving no treatment to the lymphatic drainage, found that only 1.3 per cent. of cases, where the lesion was 1.5 cm. in diameter or less, and entirely confined to one half of the lip, developed palpable lymph nodes subsequently. Lesions measuring 1.5 to 3 cms. but still confined to one side of the lip subsequently developed palpable lymph nodes in 13 per cent. Lesions larger than 3 cms. but still limited to one side and smaller lesions crossing the mid-line developed palpable lymph nodes in 28.5 per cent. All cases with larger tumours involving the whole lip had enlarged lymph nodes present on admission. If the whole group of 275 cases is considered lymph node involvement occurred in only

* The figures on these charts represent the percentage of the dose given to any one of the fields provided that both fields receive the same dose.

4 per cent. Duffy (1938) in 233 cases with no nodes palpable, found that 90.1 per cent. did not subsequently develop them. Before deciding on routine surgical treatment it is also necessary to consider the operative mortality. In 193 patients Kennedy (1934) found the mortality in routine block dissections of the neck to be 11.4 per cent., though some other writers give a much lower figure than this. It appears that there is no advantage to the patient in having a prophylactic neck dissection, a major operation with a definite mortality, when he stands an excellent chance of remaining well without it and some chance of cure even if palpable nodes develop later. In early cases the mortality from the operation would be greater than the mortality from the disease itself, and many useless operations would be performed. The position with regard to radiation in this group is much the same, except that the operative mortality is removed. From our knowledge of the dose necessary to cause disappearance of developed lymph nodes it does not appear that anything less than heavy dosage will be of any avail. Such treatment subjects the patient to considerable discomfort in a large number of cases quite unnecessarily. Costolow (1937) stated that if routine neck irradiation had been carried out in his series of 630 cases, at least 90 per cent. would have been treated unnecessarily. This treatment, if adopted, is given with the object of destroying any malignant cells present in the lymphatic system and although unnecessary in most cases has a reasonable theoretical basis. Prophylactic irradiation to prevent cancer developing in a site where no malignant cells are present at the time of treatment is supported by some on the grounds of certain experimental work done on animals. There is as yet insufficient evidence to show that prophylactic irradiation of this nature is of any value, and at the present state of our knowledge this type of treatment appears to be quite illogical.

In view of the work quoted above we may reasonably conclude that in the group of patients with no lymph nodes palpable and a small primary tumour, no treatment should be given to the lymphatic drainage. If the primary tumour is large and infiltrating and responds well to treatment, then a block dissection or irradiation of the lymphatic system may be carried out in the hope of improving the results in this group to some extent. Widmann (1934) disagrees with this view and states that lymph nodes developed in 17 per cent. of 52 cases that had radiation to the neck and in 57 per cent. of 72 cases that had no irradiation. The percentage of patients developing lymph node metastases without irradiation is so much higher than that usually found that these figures require further confirmation before they can be accepted.

The real divergence of opinion as to the best method of treatment occurs when small movable lymph nodes are present. Radiation methods are improving rapidly, but there is a wide variation in technique and dosage employed and no microscopical confirmation is obtained in most cases. Fischell (1935) found that in 42 cases operated on with palpable nodes, 28 were diagnosed hyperplastic and 14 carcinomatous on microscopical examination, and in 13 cases with no palpable nodes carcinoma was found in 2. Duffy found that in 41 cases with supposed lymph node involvement 9 were inflammatory. No true comparison of the results obtained by surgery and radiation is, therefore, possible at the present time and there is still insufficient evidence to show that radiation should supplant surgery in the treatment of these patients. Surgery is still indicated where the primary tumour is controlled, the lymph nodes are small and movable and the patient's general condition is good. It is possible that a combination of surgery and irradiation will improve the results slightly. Figi (1934) taking all cases whether primary or recurrent lesions, found that 78.74 per cent. were symptom free for five years

or more when treated with surgery without radiation, that 80.54 per cent. were well over the same period with post-operative radiation, and that the figure was 83.95 per cent. with pre-operative and post-operative radiation treatment.

Where the lymph nodes are fixed, radiation is the only possible form of treatment. Some palliation may be expected, but there is as yet little hope of cure.

Conclusions.

Primary carcinoma of the lip responds very well to several forms of treatment, the balance being in favour of radiation methods, with short-distance low-voltage X-ray therapy presenting several advantages. Early cases with no clinical involvement of the lymph nodes should not receive any treatment to the neck. Small movable lymph nodes are best treated surgically though there is probably some slight advantage in combining this with radiation. Large fixed lymph nodes should be given palliative treatment by radiation alone.

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