

wholly—probably not even chiefly—by an immediate destructive action upon the cancer cell, but by local and general stimulation of the protective mechanisms of the body. Laboratory investigations as to the effects of varying doses of x rays upon cancer masses *detached from their natural surroundings* cannot therefore be in any way relied on to forecast the results of similar doses applied to the living patient.

Experiments designed to raise or lower the immunity of an animal are, of course, in a different category. It has been shown at the Rockefeller Institute in America, and confirmed by Professor Sidney Russ and others in this country, that a single large dose diminishes resistance to cancerous invasion; whereas a series of carefully graduated small doses raises resistance to such an extent that it is almost impossible to get a cancer graft to "take." Whether the rays from a tube "backing up" a 16-inch gap are more effective as resistance-raising agents than those from a tube "backing up" only 10 inches remains to be proved.

The Erlangen procedure, whatever it does to the primary growth, must lower the general resistance, at any rate for a time, thus actually helping any existing metastasis to spread, and likewise any projection of the tumour which may have escaped irradiation. It also produces some skin reaction. The method must stand or fall by itself; it cannot safely be combined with operation. After such dosage he would be a bold man who would submit the skin and subjacent parts to surgical trauma; while as a post-operative procedure it is difficult to see how it can have any *raison d'être*.

Now the tendency at present, in this country, is to seek to combine x -ray treatment with surgery. That this can be successfully done, both before and after operation, can be testified by many, including myself. But the large single dose must be eschewed. Dr. Morton tells us that small doses stimulate a malignant growth. Perhaps a single small dose does; I have no experience. But it is certain that seven or eight comparatively small doses, from a Coolidge tube having a 10-inch spark gap, if spread over a period of about three weeks, will cause a palpable diminution in a carcinoma of the breast, and not in any way interfere with the surgeon's work. A 3-millimetre filter is used, the anti-cathode skin distance is one foot, and the patient is not shielded except as to the face. The current in the secondary is 1.5 milliampères and the time fifteen minutes.

The action I do not believe to be primarily a local one. In my opinion the treatment acts much as a course of vaccines—it raises the resistance of the patient to cancerous invasion, and places him in a favourable condition for the operation. As to post-operative treatment, the same idea is carried out. Courses of a dozen to eighteen sittings are given at intervals varying from three months to a year, the object being not to kill off any remaining cancer cells by the direct effect of the rays, but to put the body in a condition to combat their growth. That a series of small doses has this effect in animals was proved in the same set of experiments which showed the harmful effect upon the body resistance of large single doses. It will be noted that this system permits of actually shielding the growth itself from the x rays should this be considered desirable.

The results quoted by Dr. Reginald Morton as having been attained at the Erlangen clinic are not wholly convincing—as yet. The number of cases is small, and the observations extend for an average of about three years only. Taken at their face value, they are decidedly better than those obtainable by surgery alone, more especially as regards uterine cancer. Figures for cases treated by a combination of x rays and surgery, with pre- and post-operative raying, are not yet available to any great extent in this country, but there is no doubt but that they show an improvement on surgery alone.

It may be that, at no very distant date, uterine and breast cancer will be treated by x rays alone; but, even then, it does not follow that the Erlangen technique is the only one by which cures can be accomplished, or that there is no apparatus in Great Britain suitable for the purpose. It must be remembered that, so far, British radiologists have had practically no opportunities of finding out what can be accomplished entirely apart from operation, for the latter has been the rule.

British x -ray workers will, I am sure, hesitate long before adopting the heavy dosage advocated in Germany. They remember the skin disasters which were beginning to

come to light just before the war as a result of big doses, although the skin had not at the time appeared to be injured; and if in the near future they are called upon to treat cancer apart from surgery, they are likely in the first place to try out less drastic procedures. To condemn the Erlangen technique would be foolish; it is a serious attempt to substitute x -ray irradiation for surgical operation in the treatment of cancer of the breast and uterus, and it may be successful; but, in the nature of things, the proof or disproof will occupy many years.

Meanwhile, any attempt to secure the wholesale adoption of the method in this country is to be deprecated. I have already had medical men writing to me to ask if I am sure my doses are big enough—if I am certain that I am not stimulating instead of depressing. Such is the effect of a single letter from a man of Dr. Morton's eminence.

Let us clearly understand that the Erlangen technique has not been designed for use in conjunction with surgery, whereas the attempt to "immunize" the patient by comparatively small doses is based on the results of animal experiments, makes surgical operation more easy, and is without risk of sudden catastrophe. So far it is justified by clinical results, and it is at least worth some years' systematic trial.

The use of x rays as immunizing agents in cancer was fully discussed by me in a paper in the *BRITISH MEDICAL JOURNAL* for June 12th, 1920. The immunity is not specific; it is effective in tubercle, Graves's disease, and other conditions. The conception of x rays as resistance-raising agents, rather than substitutes for local surgery, is likely to help much towards that close combination between surgeons and radiologists which is so greatly to be desired.—I am, etc.,

London, W., Feb. 14th.

F. HERNAMAN-JOHNSON.

CONFERENCE OF STAFFS OF VOLUNTARY HOSPITALS.

SIR,—I observe that the Leicester motion, which I vainly attempted to oppose at the London Conference, and against which I protested strongly in a letter to the *JOURNAL* immediately afterwards (January 1st, 1921, p. 31), has been rejected by the Conference in Scotland in favour of one considerably more modest even than that which I put forward myself as an alternative. I trust that the Leicester motion may now be dropped altogether. Rarely indeed has a resolution so detrimental to the voluntary system been propounded, even by its worst enemies. Had the Representatives in London first discussed it with their own lay committees, and had the Chairman refrained from giving that very strong lead which he did, I am persuaded that the ill-considered motion of Leicester would have received in London the same reception that it has now deservedly encountered in Scotland.—I am, etc.,

Chichester, Feb. 27th.

G. C. GARRATT.

THE POSITION OF ARMS IN BREECH WITH EXTENDED LEGS.

SIR,—The gain to obstetrics from Dr. Victor Bonney's letter of February 16th, in your issue of February 28th, will be specially recognized: it signifies careful clinical obstetrics; it marks the value of museum evidence which, to some of us, brings its daily lesson.

The paper by Dr. W. S. A. Griffith and the late Dr. Arnold W. W. Lea on breech presentation with extended legs, in the *Obstetrical Society's Transactions*, 1897, brought the best of clinical information.

Since that time I have collected relative museum material. Some of the material, the undisturbed foetus with extended legs at four and a half months within the intact amnion and chorion, and at seven months within the uterus, both confirm Dr. Victor Bonney's description of the extended arms, only partial however, and confined to the lower hemisphere of the head, amounting to this—that if the vertex presented the foot and the hand would be palpable at the periphery of the head.

Eight years ago, after discussing this fact with Sir Francis Champneys, I was supplied by him with the notes of one of his forceps deliveries in August, 1882, embodying these anatomical facts, which so often escape published description and, probably nearly as often, clinical observation. At that time it was my wish to