

At the present time, in the treatment of cancer in man, surgery, in my opinion, still holds first place though it is obvious that it is only applicable before dissemination of the malignant cells throughout the body; and also, of course, provided that the situation of the growth can be reached without such extensive damage to, or interference with, vital organs as directly to endanger life. Details of surgical technique have been modified as more has been discovered about the characters of the malignant cells and their mode and direction of spread. It is now known that if a living cancer cell be implanted in or on the cut surface of a normal tissue it will settle and proliferate in its new surroundings, and produce a second tumour there. Every surgeon, therefore, does his utmost to make his incision outside the growing edge of the tumour, going through only normal tissue, and avoiding all risk of transferring on the knife-edge any cells from the growth to healthy parts. It was at one time common to do a local excision, just the tumour was removed with but little of the surrounding tissue. Then it was found wise to submit the mass to microscopic examination, and if it was found malignant to perform a second and more extensive operation. Finally the modern view was adopted. It is considered essential to decide before operation what is the exact nature of the tumour and if it is thought to be malignant to perform at once a complete and radical removal. There is less risk in removing a little more than subsequently proves to have been necessary rather than fail to remove sufficient.

As a further safeguard and protection against the transference of malignant cells from the tumour to normal tissues in the course of an operation the diathermy knife is sometimes used. This consists of a fairly fine metal wire which is heated by an electric current. While the current passes such a wire will cut soft tissues like a knife and will cut bone more rapidly than a saw. The heat of the knife can be regulated as required. If it be not very hot it cuts slowly but burns the surface that is cut and thereby closes and seals the cut ends of all blood and lymphatic vessels so that bleeding is reduced to a minimum and no living cells can remain on the knife. If the knife be heated to a higher temperature cutting is more rapid but vessels are less effectively sealed.

Every part of the body is nourished by blood which is carried to it by the blood vessels. From the finest of these, the capillaries, some of the fluid of the blood passes out to bathe the individual cells of the tissue which extract from it their nourishment. Thereafter the fluid is collected into other vessels, the lymphatics, and carried back into the veins. But before they enter the veins the lymphatics pass certain solid nodes, the lymphatic glands, which act as filters and remove any solid particles from the lymph. As the cells of a cancer multiply they invade the lymphatics and grow along them, sometimes as solid cords, sometimes as separate cells. In either case they eventually reach the nearest lymphatic glands where they are held up and immediately commence to proliferate and form a secondary tumour. Statistics show that in the case of the breast, for instance, 80 per cent. of patients are alive and well five years after operation if, at the time of operation, the glands in the axilla or armpit are not involved; whereas the earliest involvement of these glands reduces the number to about 20 per cent. This, again, is another factor in the surgical treatment. Not only is the primary mass completely removed but also, as far as possible, all lymphatic vessels and glands connected with it, so that the amount of subcutaneous tissue removed is much greater than the amount of skin.

The two great principles of surgical treatment are, then, 1—Never to cut into the growth, and 2—To remove all tissue within a wide radius so that no living cancer cells are left behind. Unfortunately the latter is by no means

always possible, *e.g.*, a cancer in the inner half of the breast tends to spread deep through the chest wall to glands behind the sternum where they cannot be reached by the surgeon.

Consequently some surgeons, after removing the breast, place needles of radium in the intercostal spaces with a view to destroying any malignant cells which may already have penetrated into the chest. The idea is good, but it seems impossible that the object can ever be attained, while there are certain dangers which render the method undesirable.

Investigation of the lymphatic drainage of the part has led to technical improvements in the operative procedure for the removal of growths affecting two organs in particular, *viz.*, the breast and rectum. In the former situation it was found that not only does extension of the growth take place to the glands in the axilla, but also through the underlying muscles and downwards along the deeper layers of tissue, the dense fibrous covering of the intercostal muscles and those of the anterior abdominal wall. On this account the modern radical amputation removes both the pectoral muscles and sweeps widely downwards much lower than formerly. In the case of the rectum, extension occurs to the glands alongside the rectum and colon, so that it is necessary to remove a much greater length of bowel than was usually done if the whole disease is to be eradicated. Miles's abdomino-perineal excision is designed to effect this and is the most successful method yet devised.

A second method of treatment is electrical and is called diathermy or fulguration. If an electric current of sufficient strength be passed through water containing salt in solution, it will gradually raise the temperature of the water which may in time be made to boil in this way. Now all the tissues of the body consist for the most part of water containing various salts in solution, so that they, too, can be heated to any desired temperature by passing an electric current through them. This method is chiefly used in the treatment of cancer of the cervix of the uterus. A small metal rod is passed into the cervical canal and a damp pad is placed on the patient's back or abdomen. The current is then passed through from the rod to the pad and thus traverses the growth. The temperature of the cancer gradually rises until it is so great that the cancer cells are destroyed. Unfortunately it has never proved possible to kill all the cancer cells, indeed, if this were really effected, so much damage would inevitably be done to surrounding normal cells that more harm than good would result. Wherever we turn we find that every cancer cure is like the Pied Piper of Hamelin. He could destroy all the rats except one, all the vampires of Tartary but one, and finally he led into Transylvania all the children except one. So with our cures, one or a few living cancer cells defy us, and so long as one remains alive the disease may at any moment recur.

(To be continued.)

BOYS' O.T.C. CAMPS.

In reply to a question by Miss Picton-Turbervill (The Wrekin, Lab.) in the House of Commons, Mr. T. Shaw, Secretary of State for War (Preston), announced that the O.T.C. summer camps of the Junior Division of the Officers' Training Corps would be cancelled, as owing to the continued incidence of cerebro-spinal meningitis throughout the country, it is considered inadvisable to collect boys of a susceptible age in camps in large numbers. Boys who would have attended camp but for the cancellation will, for purposes of "efficiency," be deemed to have attended. The total number of boys affected was 14,000. Although this must be a great disappointment to the boys, we are of opinion that the decision is a very wise one.

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