

Cancer Research.

IN the twenty-sixth annual report of the Imperial Cancer Research Fund, the Director, Dr. J. A. Murray, reviews certain aspects of the cancer problem with special reference to the contributions made by members of the scientific staff of the Fund. He points out that although cancer is at its inception a local disease, a factor of general susceptibility or resistance also plays a part in the development of, or failure to develop, a tumour. The response to a local irritation, if it occurs, is the appearance of a growth at the site stimulated; early removal will result in complete cure, even though the growth may be of a typically malignant character. Such cure is observed not only in mice painted with tar, but also in human beings, provided the operation is carried out at the earliest stages of the development of the tumour. But tarpainting only produces a neoplasm after different intervals in different mice: some fail to develop one even after a year's painting. If the growths are removed from a number of mice in which they have appeared soon after the commencement of the course of tarpainting, it is found that these animals are distinctly more resistant to a second course of tarring. A similar resistance to a subsequent course of tarring is also observed in mice which have suffered from a spontaneous mammary cancer, after the successful removal of the latter. This last experiment proves that the increased resistance is not due to a change in the cells of the skin alone, but to a general constitutional factor.

The existence of this factor of susceptibility or resistance in man is disclosed by two different sets of observations: first, multiple malignant new growths in a single individual are extremely rare; secondly, the incidence of tumours in males and females in different countries strongly suggests that a certain number of the population are susceptible to the disease, but that the actual site at which it will appear depends on factors of race and environment. In England, Holland, Japan, and Switzerland the incidence of cancer is about the same in men and women, and varies from 1.0 to 1.2 per 1000 living. In the male, however, the majority of the tumours observed are found in some part of the digestive tract: in the female the incidence here is lower, but is very much heavier in the specific sex organs, especially the uterus and breast; 20-40 per cent of all cases of cancer in women occur in these organs. Thus, so to speak, the heavier incidence in the specific female organs is compensated by a lower incidence in the digestive tract. At the same time the incidence in breast and uterus varies in different countries: cancer of the breast is commonest in Englishwomen, rare in

Japanese, and only half as common in Dutch women; cancer of the uterus is very prevalent in Japanese, but only half as common in Dutch as in English women. The lower incidence of cancer of the specific organs in Dutch women is, however, accompanied by an increased incidence in the digestive tract, so that the total mortality is about the same as in English women. These observations strongly suggest that the incidence of cancer is determined by general factors of susceptibility, but the actual organ in which it appears by local factors varying according to the environment in its widest sense.

Dr. Murray states that his colleagues have been unable to demonstrate any connexion between malignant growths and dietetic deficiencies. Old rats, or rats kept on diets deficient in vitamins A or B, frequently develop papillomata and warts of the epithelial lining of the fore-stomach, but no malignant tumour has ever been observed. He considers, in fact, that there is no trustworthy evidence, experimental, statistical, or clinical, of a causal correlation between cancer and the absence, or presence, or excess of any particular dietetic constituent, in spite of statements to the contrary frequently made.

During the year Prof. Heidenhain stated that he had been able to transmit cancer from man to animals, by injecting a large number of mice with human cancerous material. After a considerable interval a certain number of these mice developed tumours; however, the incidence of these growths was similar to that of spontaneous neoplasms in the stock of mice maintained by the Imperial Fund, so that Heidenhain's growths must be considered to be spontaneous new developments, and not as originating directly from the human material injected.

The glycolysis produced by cancer cells in the presence of oxygen does not appear to be a specific phenomenon: virus infections resulting in cellular overgrowth also show glycolysis, whilst those in which this overgrowth is absent fail to show this characteristic. It appears, therefore, that an aerobic glycolysis is not restricted to cancer, but occurs also in other types of pathological cellular overgrowth. The majority of normal tissues only show this phenomenon in the absence of oxygen.

Exposure to low oxygen pressures results in delayed growth and extensive necrosis of tumour cells, but even prolonged exposure fails to arrest the growth completely, and regression has never been observed. As a possible treatment of cancer this method is therefore without therapeutic value by itself (although it might be useful as a supplement to other methods of treatment).

Report of the Forestry Commission.

IN their eighth annual report, the Forestry Commissioners give a record of the work accomplished in Britain during the year ending Sept. 30, 1927. The planting programme, which has formed the chief of their activities, was continued. On the subject of finance, the report shows that out of the total of £3½ millions sanctioned in 1919 for a ten years' programme to be paid before Mar. 31, 1929, £3,014,400 had been allotted up to Sept. 30, 1927, leaving £485,600 still to be provided. The Treasury had since intimated that this balance would be made available for the financial year 1928-29, which, with a balance of £136,000 estimated to be in hand on April 1, 1928, gives a sum of £621,600 for the possible expenditure during 1928-29.

The land acquisitions amounted to 36,039 acres

during the year, of which 30,755 acres were classified as plantable. The total land acquired between 1920 and 1927 amounted to 391,511 acres, of which 244,838 acres were classified at the time of acquisition as plantable; 155,208 acres of this latter land are leased and 109,630 acres have been purchased. Of the plantable area, 140,756 acres (57 per cent) are situated in England and Wales and 104,082 acres (43 per cent) in Scotland. In spite of the smaller amount of planting land in the latter, the total acreage, leased and purchased, acquired in Scotland amounts to 233,667 acres as against 157,844 acres in England and Wales. It is at least open to doubt whether the Commissioners are acting wisely in thus saddling themselves with so large an area of unplantable land in the early years of their existence.