LETTERS TO THE EDITORS

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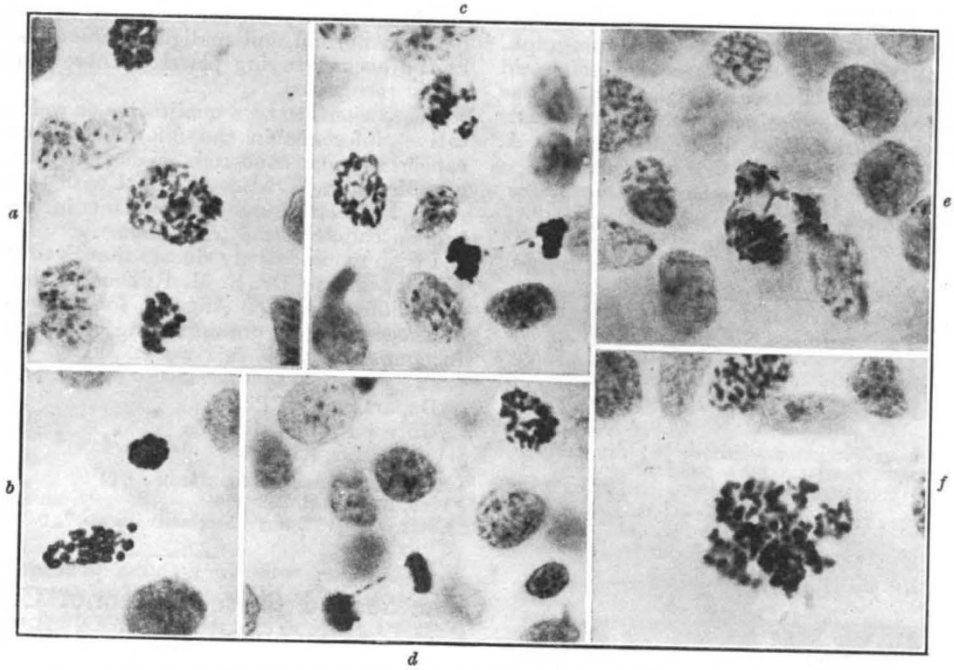
A New Technique for Mitosis in Tumours

IN cancer therapy it is of great interest to distinguish between tumours according to their degree of mitotic activity. This requires a determination of the proportion of dividing to resting cells. It may even be useful to follow the character of mitosis after X-ray treatment. Human cells are difficult to handle for this purpose. The usual techniques are tedious and unsatisfactory. Indeed, misleading conclusions have often been reached owing to the inadequacy of the preparations used. In contrast with the older methods, I find that La Cour's acetic-lacmoid (resorcin-blue) treatment[1] is rapid and, as may be seen from the photographs, capable of showing both the character as well as the stage of division.

The method is as follows. Fix small pieces of tumour in acetic-alcohol (1 : 3) for 10 min.–24 hr. Before staining, cut small shreds of tissue from the surface with scalpel and transfer them into 10 per cent acetic acid for five minutes and 45 per cent for ten minutes. Then stain with warm (40° C.) acetic-lacmoid for 15–30 minutes. Put one drop of acetic-lacmoid on slide with one piece of stained tissue. Crush the tissue by tapping with the blunt end of a bone needle-holder. Remove all unmacerated fragments. Cover and press with blotting paper to spread the cells and remove surplus stain. Heat slide gently without boiling. It is at once ready for study. If required for further use, keep slide 1–5 days in moist atmosphere at freezing point and make it permanent by the usual method[1]. In order to make well-stained permanent preparations, leave tissue in acetic-lacmoid for twenty-four hours. Using the above method, good smear preparations of rat carcinoma and mouse sarcoma have also been obtained.

Fixed tumour tissues can be stored in 70 per cent alcohol, but the best preparations are obtained from freshly fixed material. If the tissue is left in fixative more than forty-eight hours the chromosomes swell and their staining is not satisfactory.



MICROPHOTOGRAPHS SHOWING VARIOUS TYPES OF DIVIDING CELLS IN TUMOUR OF THE CERVIX. MAGNIFICATION 2,300. (MATERIAL WAS KINDLY SUPPLIED BY THE RADIUM INSTITUTE, MANCHESTER.)

(*a*) Two diploid and one tetraploid mitotic metaphase.
(*b*) Abnormal mitotic metaphase in a haploid cell; only 24 chromosomes are present.
(*c*) Delayed separation of two daughter chromosomes at anaphase.
(*d*) Chromatid bridge at mitotic telophase.
(*e*) Tripolar spindle in a tetraploid cell.
(*f*) Highly polyploid, probably octoploid cell in division.

The work is a part of the programme aided by the British Empire Cancer Campaign.

P. C. KOLLER.

Institute of Animal Genetics,
University of Edinburgh.
Jan. 16.

[1] Darlington, C. D., and La Cour, L. F., "The Handling of Chromosomes" (Allen and Unwin, London, 1942).

Fluorescent Lipoidal Spectra of Human Tissue

HIEGER[1] pointed out that most of the carcinogenic hydrocarbons studied were highly fluorescent and they produced characteristic bands in the regions 4,000, 4,180 and 4,400 A. The investigation of the presence or absence of similar spectrographic characteristics in non-malignant and malignant tissues was instituted with the end in view that it might shed some light on the presence of possible carcinogens in the latter.

In 1935 I suggested the possibility that "cholesterol or some of its decomposition products" may, under