

Editorial.

NINETEENTH ANNUAL REPORT OF THE BRITISH EMPIRE CANCER CAMPAIGN, 1942.

“MEDICAL research to-day is an essential war activity; from that activity no disease or group of diseases can be excluded.” So runs the first paragraph of the Summary of the Report and the Editor, Mr. J. P. Lockhart-Mummery, F.R.C.S., F.A.C.S., speaks enthusiastically of the fine cancer research which has been possible even in the three years of war that have passed. “The Campaign is able to-day to make the proud boast that since the war began it has been possible to subsidize to the fullest extent every research centre associated with this Campaign. A sum of just under £100,000 has been spent and work, the importance of which is known throughout the whole world, has gone forward without serious interruption.”

A research on the action of croton resin and other irritants in relation to carcinogenesis has modified the conception of the biological mechanism of tumour production. The stages of this process, “the conversion of normal into pre-neoplastic skin (pre-cancerous action), the change from pre-neoplastic skin into papillomata (epi-carcinogenic action) and the transformation of these papillomata (meta-carcinogenic action) into malignant growths were generally thought to be consecutive stages of one single carcinogenic process. The present work has shown that there are substances which, although incapable of inducing the pre-cancerous state, are strongly epi-carcinogenic and also possess some meta-carcinogenic action. Hence carcinogenesis may be resolved into independent components and the substances concerned in the process may be divided into ‘complete’ carcinogens when they are able to induce all three actions and ‘incomplete’ carcinogens when, like croton resin, they can induce only some, but not all, of the components of the carcinogenic process.”

Drs. Berenblum and Schoental, working at the Sir William Dunn School of Pathology at Oxford, have carried out these researches. The existence of “incomplete” carcinogens may prove later on to be of importance in the clinical study of cancer-production.

These workers have also carried out investigations into a sensitive new method by which the quantitative estimation of benzpyrene from animal tissues may be carried out and the application of this process to the study of the rate of disappearance of benzpyrene from the animal body under different biological conditions examined (Berenblum, I., and Schoental, R. 1942. “The quantitative estimation of 3:4-Benzpyrene in whole animals, their tissues and excreta.” *Biochem. Journ.*, **36**, 86; and “The Rate of Disappearance of 3:4-Benzpyrene from the Mouse after Subcutaneous and

Intraperitoneal Injection." *Ibid.*, 36, 92). Benzpyrene was found to disappear from the mouse about fifteen times more rapidly when introduced intraperitoneally than when applied subcutaneously. "From any one site of injection, the rate of disappearance at any given time was found to be proportionate to the logarithm of the concentration, irrespective of the amount originally injected." Tumours were readily developed at the site of injection when benzpyrene persisted for a long time, as, for instance, in the subcutaneous tissues, but no tumours were seen to develop when the benzpyrene was rapidly got rid of as in the peritoneal cavity.

"With the disappearance of benzpyrene, a milky blue fluorescence in ultra-violet light took the place of the characteristic violet fluorescence at the site of injection and persisted till the animals died. This was found to be due to an impurity, not readily metabolized by the tissues, present in small amount in the originally injected benzpyrene."

The research favours the view that carcinogenesis is dependent on unchanged benzpyrene in the tissues.

At the Strangeways Research Laboratory at Cambridge, Dr. Glücksmann has continued to work at the skin tumours produced by benzpyrene in mice and is developing a technique for producing single tumours. It is customary to carry out quantitative histological analysis of the tumour material during the period of malignant change "and the 'treatment' of the induced tumours by radiation has now begun." This quantitative histological analysis appears to be very important and is being applied to human cancer biopsies with good effect.

"A number of separate investigations has been made including a histological analysis of a series of cases of carcinoma of the cervix, all treated in the same hospital by a standard technique. The analysis revealed that three histological types of tumour were included in the single clinical classification and that these types did not respond to irradiation equally well. It was possible to classify the tumours from an examination of the pre-radiation biopsy and thus distinguish before treatment the cases which were likely to cause difficulty."

Dr. J. G. Carr, at the Institute for Animal Genetics, University of Edinburgh, has tested the susceptibility to the Rous No. I Agent of nearly two hundred fowls "in connexion with Greenwood's genetical work on the inheritance of the atypical response shown by a particular inbred line." Some of the birds retained for breeding developed a Rous tumour induced by the test inoculation at the age of six weeks. These late tumours are devoid of the virus though it is present in normal amounts in grafts grown in young birds.

In a note on Carcinoma of the Oesophagus and Post-Cricoid Carcinoma by the Clinical Cancer Research Committee, excessive consumption of alcohol was found to be high (16 per cent) in oesophageal carcinoma in males. 20 per cent of the male patients and 22 per cent of the females admitted addiction to very hot food and liquids; 17 per cent of males and 12

per cent of females were found to be in the habit of hasty eating and insufficient mastication. The figure for the influence of excessive alcohol in oesophageal and post-cricoid carcinoma in males appears to be significant but the other percentages are of too general a character to count and no control figures are available. As to the sex incidence of oesophageal carcinoma and post-cricoid carcinoma, the males appear to predominate to a large degree in the first, the females in the second. Dr. Percy Stocks, to whom the figures were submitted, makes his comments as follows: "Of sixty-five cases of post-cricoid cancer, fifty-four were females, a percentage of 83.1 ± 4.6 , whereas, of 473 cases of oesophageal cancer, only seventy-six were females, a percentage of 16.0 ± 1.7 , the difference being significant beyond question." We are promised the clinical characteristics of these cases, along with growths of the pharynx and larynx, in a later tabulation.

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