Abstracts

Experimental Research, Animal Tumors


Twenty-eight tumors developed in the 47 C3H mice implanted with pellets of 3,4-benzpyrene in the right cerebral hemisphere. Fourteen of these were gliomas, 9 were intracranial fibrosarcomas, 2 were extracranial fibrosarcomas, 2 were extracranial rhabdomyosarcomas, 1 was a mixed glioma and sarcoma. The types of glioma were: astrocytoma, ependymoblastoma, glioblastoma multiforme, medulloblastoma, and oligodendroglioma. The gliomas were infiltrative and poorly demarcated from the brain tissue, while the intracranial sarcomas were sharply circumscribed. Subcutaneous transplantation of the intracranial tumors proved valuable as an aid in their study. Three plates of figures illustrate the growths.—J. G. K.


Spectroscopic analyses were made of the organs and excreta of 9 rats, each of which received an intraperitoneal injection of 10 mgm. of dibenzanthracene dissolved in tri-caprylin. After 14 days the absorption of the hydrocarbon from the peritoneal cavity was almost complete. The feces, collected at 48 hour intervals, contained less than 5.4 mgm. of dibenzanthracene and about 1.5 mgm. of 4'-dihydroxydibenzanthracene. Only traces of hydrocarbon or phenolic metabolite were excreted in the urine, and 25% of the hydrocarbon remained in the carcasses in an unchanged condition after 14 days. The phenolic metabolite was detected only in the excreta. The greater part of the hydrocarbon was not accounted for and was presumably metabolized to some other product that was not detected by the analytical methods employed.—Authors' abstract.


The elimination of dibenzanthracene from the rabbit was investigated under conditions closely similar to those employed in studies of the elimination from the rat, reported previously.

The observation of other workers that the hydrocarbon is excreted in part as a phenolic metabolite, not identical with 4'-dihydroxydibenzanthracene, was confirmed.

The metabolism was studied over periods of 4 and 28 days after intraperitoneal injection, and it was shown that the hydrocarbon passed rapidly into the intestinal tract. About 40% was recovered from the intestinal tract and feces, either as the unchanged hydrocarbon or as the phenolic metabolite. After 16 days the rate of excretion fell to very low levels and only traces of the hydrocarbon could then be detected in the carcass or excreta. The elimination is thus much more rapid in the rabbit than in the rat, and the unchanged hydrocarbon and the phenolic metabolite are probably the main forms in which it is eliminated.

The phenolic metabolite was not detected in the liver or gall bladder, and consideration is given to the hypothesis that the phenolic substances are produced by the action of bacteria in the intestinal tract. However, attempts to obtain such phenolic products by the incubation of dibenzanthracene with cultures from the intestinal tracts of rats or rabbits have been unsuccessful.

The possibility is discussed that some relation may exist between the rapid elimination of dibenzanthracene from the rabbit and the resistance which this animal shows to the carcinogenic activity of the hydrocarbon.—Authors' abstract.


The mean concentration of ascorbic acid in the liver was found to be greater in mice of 3 high cancer pure lines (db, C3H, RH), and in the males of the low cancer pure line CBA, than in females of the CBA line and in both sexes of the low cancer pure line C57 and of 2 other low cancer breeds (buff MRC and stock).

Other statistically significant differences were found: (a) between the sexes in C3H and CBA strains (higher in males) and in the dba (higher in females); and (b) between older and younger CBA female mice, the ascorbic acid of the liver decreasing with advancing age.—Authors' summary.

Effect of a Low Lysine Diet on the Growth of Spontaneous Mammary Tumors in Mice and on the

Diets deficient in lysine but adequate in other respects were fed to 2 normal human subjects. N, balance was maintained. A similar low lysine diet was fed to normal young female mice and found to arrest or retard growth. This diet was then given to mice of the Marsh strain with spontaneous mammary carcinomas. It was found that tumor growth was retarded or arrested in its early stage for short periods, but rapid growth was resumed when the lysine-deficient diet was continued for periods of over 30 to 40 days or started after the tumors had already attained considerable size. The animals all died prematurely of their tumors when the latter ulcerated or reached large size regardless of the diet. It therefore does not appear promising to use low lysine diets in human cancer patients as a therapeutic measure.—Author’s abstract.


Virgin female A strain mice, 9 to 14 months old, did not develop mammary cancer and displayed no hyperplastic nodules in the mammary glands. C3H (subline Z) virgin females of the same age did have hyperplastic mammary gland nodules and developed mammary cancer in 43% of the cases studied. When the 2 strains were crossed the C3H tendency toward a high mammary cancer incidence among virgin females appeared to be inherited as a dominant character. Virgin females among the F1 hybrids from both C3H female × A male, and A female × C3H male crosses had mammary cancer incidences comparable with that of C3H virgin females and like them displayed hyperplastic mammary gland nodules.

Both the milk agent and hormonal stimulation appeared to be involved in the production of the hyperplastic nodules. Neither the virgin A females, possessing the milk agent but suboptimal hormonal stimulation, nor fostered breeding A and C3H females, having greater hormonal stimulation but no milk agent, developed the nodules.—R. B.


An influence transmitted in the milk of certain lactating female mice was found to be effective in promoting the growth of 2 transplantable lymphoid leukemias and a transplantable myeloid leukemia in normally refractory mice. It is probable that a similar influence, or influences, affects the growth potentialities in refractory mice of 2 other lymphoid leukemias.

The growth in mice of refractory strains, or sub-strains, of 2 fibrosarcomas, a melanoma, a mammary adenocarcinoma, a monocytic leukemia, and 2 other lines of myeloid leukemia were found not to be affected by an influence, or influences, transmitted in the milk.

Saline extracts prepared from homogenized liver, spleen, or mammary gland tissue were found to contain the susceptibility influence of myeloid leukemia, line C1498.

The following characteristics of the susceptibility influence affecting the growth of myeloid leukemia, line C1498, as determined by using mammary gland tissue extracts were found: (a) It will apparently dialyze through parchment paper. (b) It remains stable in 50% glycerin for 30 days at 4°C. (c) A certain heat stability is indicated. (d) The Seitz filter did not remove all of the influence from extracts. (e) Desiccation in vacuum for 4 hours at room temperature apparently inactivated the influence. Desiccation under similar conditions failed to inactivate the influence present in leukemia cells. (f) Digestion, or partial digestion, apparently failed to inactivate the influence.—Author’s abstract.


Filtrates of cultures of Serratia marcescens in a simple synthetic medium, and their concentrates prepared by Shear and his co-workers are capable of eliciting the phenomenon of local skin reactivity. The phenomenon-producing principles are closely related to or identical with the factors capable of inducing hemorrhage and regression of mouse tumors.

The chemical treatment, including tryptic digestion, employed by Shear and his co-workers for preparation of the product brings about the concentration and purification of the active principles of the phenomenon without inducing any measurable alteration in the antigenic specificity as shown by the immunizing value, the precipitation and the neutralization reactions of the materials.—Author’s summary.


Liver regenerating after partial hepatectomy in adult white rats exhibits the same chromosomal conditions as does control adult liver, not only with regard to average chromosome volume in metaphase and the frequency distribution of average chromosome volumes, but also with respect to the relative proportions of diploid, tetraploid, and octoploid metaphase figures. Therefore the appearance of polytene chromosomes in cancers cannot be a result solely of rapid growth in adult tissues.

Adult liver, both control and regenerating, has modes of average chromosome volume frequency at 0.8 and 1.2 cubic microns, while liver of the newborn rat shows only the smaller sort of chromosomes. The larger chromosomes of adult liver are held not to be polytene, however, because they are only 50% greater in volume than the smaller chromosomes, and because the enlarged diploid hepatic nucleus in the adult does not have an increased number of plasmosomes.—Author’s abstract.


This study was undertaken to determine the immediate effect of methylcholanthrene on cell division in the epi-
dermis of the mouse. The inner surfaces of the ears of 24 Swiss mice were painted once with a 0.6% solution of methylcholanthrene in benzene. Ears were removed from each of 3 mice at 6 hour intervals for 48 hours immediately following the application of the carcinogen. Mitotic counts were made on total mount preparations of the epidermis of these ears. Fifteen thousand nuclei were counted in each ear, and the number of mitoses observed was recorded. At 6 and 12 hours after painting the mitotic count was slightly lower than that for normal epidermis, but at 18 hours the mitotic count rose above the normal average and remained above it for the next 30 hours.

It is concluded that methylcholanthrene applied to the skin of the mouse ear produces a stimulating effect on cell division in the epidermis within the first 48 hours after a single application.—Authors' abstract.


(1) Measurements of individuals of and micronuclei of normal Colpidium sp. and of abnormalities produced by blastomatogenic agents showed that the majority were of varying multiple constitution, and a few were singles.

(2) This confirmed previous findings in which, by selection from abnormal races, clones of apparently normal individuals were produced.

(3) The cells of primary tumors are considered from the point of view that the abnormal races of ciliates are equivalent to tumors in multicellular animals; support for this contention is found.—Author's summary.


Irradiation with 5,000 r of roentgen rays caused the regression of virus-induced papillomas of domestic as well as of cottontail rabbits. The regression of the irradiated papillomas was due to pathological changes in the cells rather than to a destruction of the virus, for the amount of virus recovered from the regressing papillomas was equal to, or greater than, the amount extracted from non-irradiated papillomas. However, the fibroma virus of rabbits was much more sensitive to x-ray irradiation both in crude extracts and in vivo. While 100,000 r is required to inactivate 50% of the papilloma virus, 10,000 r destroyed at least 90% of the infectivity of the fibroma virus in extracts containing about the same amount of protein.

Irradiation of the papilloma virus or the fibroma virus did not seem to produce any variant.—D. S.


Single doses of roentgen rays varying from 750 to 7,500 r were given to the heart of 17 adult male and female rats of the Sherman strain. No change in the myocardium was observed in animals surviving 68 to 491 days after treatment. There were no late changes in the heart of control animals that received radiation to the lungs or thigh muscle. Pulmonary infection, when present, did not cause any demonstrable change in the heart of these animals. The fluid flow theory of Failla was applied to explain the relative resistance of the myocardium to roentgen irradiation.—J. F.


An attempt was made to determine whether different tissues fluoresce in specific colors and whether such specificity of colors can be employed in differentiating malignant from benign lesions. It appeared that the primary fluorescence excited in these tissues by the filtered ultraviolet light used in this study might be employed by the surgeon in the operating room in an examination of the fresh specimen, for the tissues are seen in a variety of colors, without fixation or staining. The ultraviolet radiation were obtained from a lamp consisting of an 85 watt mercury capillary arc enclosed in a protective glass bulb. A filter holder to accommodate the spectral filter was directly in front of the lamp. The filter used permitted the passage of ultraviolet light, absorbing all significant visible rays. Under these conditions the architecture of the tissues under examination becomes sharply outlined. Small nodules, otherwise hardly visible, become clearly defined. Lymph nodes invaded by malignant cells apparently duplicate the fluorescent features of the primary tumor. All varieties of diseases and neoplasms of the breast were examined for their fluorescent properties. Over 200 specimens of pathological breast tissue were examined immediately after removal in the operating room. One error of diagnosis was made with this method as against one made with the method of frozen sections.—Author's abstract.


Report of a case in a 2 year old Pointer.—E. E. S.


The dog, a 13 year old Pekingese, died during resection of a poorly encapsulated nodular thyroid tumor. There is no mention of examination of the remainder of the body.—E. E. S.


Autopsy disclosed enlarged lymph nodes in a 7 year old cow, and sections were interpreted as indicated. The spleen was not involved.—E. E. S.


A Barred Plymouth Rock hen became emaciated and developed scattered white feathers. Autopsy disclosed ascites and tumor throughout the abdominal cavity and in the liver. A diagnosis of lymphosarcoma was made but
not confirmed histologically. The author believes the changed color pattern resulted from endocrine dysfunction, which in turn was caused by the presence of a neoplasm. Although the ovary was tumorous, it was thought unlikely that the tumor, on the assumption that it was lymphosarcoma, was responsible for the color change since avian ovarian lymphocytomas are very common.—E. E. S.

Clinical and Pathological Reports

**Diagnosis—General**


The use of escharotics, in the form of zinc chloride, in the treatment of cancer has been revived recently by Mohs. The present paper is based on a study of 39 cases previously treated by escharotics. It is concluded that the treatment of cancer by these agents, as generally practiced today, is an unsatisfactory, ineffective, and dangerous method. Except in a few instances, it accomplishes nothing that cannot be equally well or better done by radiation or surgery. In certain cases, it offers a means of local attack when cancer must be eradicated with a minimum sacrifice of normal tissue, and when ordinary methods of treatment are not applicable. In any case, zinc chloride should not be used without the safeguards developed by Mohs. The paper includes case histories and photographs illustrating the damage that can be caused by the injudicious use of escharotics.—A. C.

**Radiation—Diagnosis and Therapy**


A case of cystic tumor of a bone of the little finger, successfully treated, is discussed. It is of interest because of the location of the lesion, the length of time it had been present (30 years), its response to irradiation, and the control of pain by nerve section.—A. C.


The author reviews some of the previously held opinions on surgical and roentgenologic treatment of laryngeal carcinoma and discusses the validity of the basis for choice between the two procedures. He believes that the decision as to the radiocurability of a particular tumor should not be based on histologic structure but on the degree of invasion that can be established by the mobility of the tumor and the surrounding structures. The majority of early carcinomas are thought to be operable. The author gives details of 3 patients with well advanced laryngeal cancer without recurrence, 2 years, almost 2 years, and 4 months, respectively, after irradiation therapy.—E. E. S.


The limitations of both local and spray irradiation of patients with leukemia are presented. In chronic leukemia there is a marked elevation of blood phosphorus, which is increased by irradiation. Leukemic tissues pick up radioactive phosphorus in greater concentration than do normal tissues. Since 75% of administered P³² has decayed by the end of 3 weeks, there is no danger of unduly prolonged effects. P³² may be given orally, intravenously, or by other parenteral routes; the oral route is preferred. Dosage is discussed in detail. Eleven patients with chronic myelogenous leukemia were treated by this method, with improvement in 7 of the 9 who had been observed for some time. It is concluded from observation of 11 patients with chronic lymphatic leukemia that this type responds less favorably. There were no real beneficial effects in 2 cases of acute lymphatic leukemia in adults and in 11 in children. The lymph nodes and spleen had diminished in size in a girl with eosinophilic leukemia.—E. E. S.


Treatment offers more hope in carcinoma of the body of the uterus, than in any other internal malignant neoplasm. Here, as in any form of cancer, the earliest possible diagnosis is essential. In early localized lesions, with patients in good general health, major surgical operation followed by irradiation is the treatment of choice. In advanced lesions decided value, palliation and occasional cure result from well-planned irradiation therapy.—J. L. M.


Results of the treatment of 142 cases of carcinoma of the cervix seen over a 10 year period are reported. Only those treated by combined x-ray and radium and those with a positive biopsy are included in the report. The Schmitz grouping of cases was used in preference to the League of Nations method as being more logical in its definitions. Intracavitary radium was first administered in doses of from 2,400 to 3,600 mgm.-hr. and followed, after the reaction had subsided, by about the same dose applied directly to the cervix. Following radium application, deep roentgen therapy was given with 200 kv. to a total of 1,800-2,400 r (measured in air) to each of 4 ports. Recurrences were treated with further roentgen therapy except in cases where the initial dose was large. The results show a 3 year survival rate of 37% and a 5 year survival of 24% when all grades of tumor are classed together. Among patients classified in groups I and IV the 5 year survival rate was 100% and 10% respectively.—J. F.