level of the blood, while 2 others showed little change. Urinary nitrogen excretion was not determined. No significant changes in serum calcium were noted in the 2 dogs tested.—R. A. H.


When lethal doses of a polysaccharide obtained from *Serratia marcescens* were injected into anesthetized dogs, a rapid drop in blood pressure to "shock levels" with a sharp rise in pulse rate occurred, and the animals frequently died from circulatory failure within 1 to 5 hours. Those animals that did not die within this period showed signs of recovery. Unanesthetized dogs reacted quite differently, and death did not occur until 18 to 28 hours after injection. In these dogs severe gastrointestinal disturbances were the first symptoms, followed by prostration and later by convulsions and death. An early rise in rectal temperature and a late drop in blood pressure were noted in these animals. Adrenaline was of little value in combating the signs of "shock," but the intravenous administration of saline appeared to be helpful. Postmortem examination revealed congestion and hemorrhage in the gastrointestinal tract of about one-fourth of the animals, and occasionally also in the spleen, lymph nodes, liver, kidneys, and adrenal medulla. A similar picture was noted, before and after death, in guinea pigs given lethal doses of the polysaccharide. No generalized increase in capillary permeability was observed in rats injected with trypan blue after the administration of the polysaccharide.—R. A. H.


A review is presented of investigations on cancer conducted by the U. S. Public Health Service during 1922 to 1937 (before passage of the National Cancer Institute Act), and from 1938 to the present. Research at the National Cancer Institute has been concerned with: the experimental production of neoplasms; carcinogenic agents (including chemical compounds and ultraviolet radiation), and the effect of genetics, hormones, and diet upon their action; cellular physiology; chemistry of tumors; experimental cancer therapy; and epidemiology. No effective therapeutic agent was discovered in an empiric assay of 977 substances and mixtures of substances in 18,395 mice bearing transplanted or spontaneous neoplasms. Clinical tests are being made, however, of a highly active, purified polysaccharide, isolated from cultures of *Bacillus prodigiosus*; in doses of 0.1 #gm., this polysaccharide produces hemorrhage in mouse sarcoma 37. Colchicine and anaphylaxis also evoke hemorrhages in transplanted sarcoma of mice; compounds related to colchicine are being investigated. Subcutaneous implantation of diethylstilbestrol is being tried in prostatic cancer in man. It is suggested that future research be guided by the accumulating evidence that cancer is a group of diseases rather than a single disease.—M. H. P.


The scope and some conclusions of numerous cancer research investigations in the Soviet Union are briefly reviewed with bibliography. Among the reported achievements are the demonstration of carcinogens in the liver and other tissues of patients with cancer, the production of malignant tumors in rats upon transplantation of embryonic tissue, the heterotransplantation of a melanoma of man into the rat, the use of tissue culture technic in the study of the metabolism of neoplastic tissue, the transfusion of tumors upon blocking of the reticuloendothelial system, the stimulation and inhibition of the function of the active mesenchyme by specific cytotoxic antimesenchymal serum, the increasing of carcinolytic activity of the serum of cancer patients by anti-human spleen horse serum, and the demonstration of reduced mitogenetic radiation in the blood of patients and animals with cancer.—M. H. P.

**Clinical and Pathological Reports**

**Clinical investigations are sometimes included under Reports of Research**

**DIAGNOSIS—GENERAL**


Neoplastic cells were demonstrated in the sputum in 19 of 22 histologically verified cases of primary pulmonary carcinoma, and in 7 of 8 roentgenologically positive cases of the same disease. Such cells were also found in the sputum of patients with pulmonary metastasis from osteosarcoma, hypernephroma, carcinoma of the ovary, and seminoma, but not in the sputum of a patient with benign bronchial tumor. One false positive diagnosis of neoplasm, in a person with chronic fibrotic pneumonia, is attributed to inexperience with the technic; 19 cases of nonneoplastic conditions were negative.—M. H. P.

**RADIATION—DIAGNOSIS AND THERAPY**


For obtaining maximum depth dose with limited facilities, the anode-skin distance and filtration must be carefully chosen. A chart for the selection of treatment factors is given.—R. E. S.


This paper is a supplement to the Paterson-Parker charts in radium therapy. The problems and errors that may occur with the present system of distributing radium and calculating irradiation are discussed.—R. E. S.
The Histopathology of Radiation Lesions.

This review sums up the more recent information on the biologic effects of radiation, with emphasis on: (a) effects on cytoplasm and nucleus of cells; (b) the relative sensitivity of different mammalian cells and tissues, both somatic and germinal; (c) the sequence of clinical and histologic changes in various normal tissues following radiation; and (d) the sequence of these changes in irradiated tumors of 3 general types—radiosensitive, radioresponsive, and radioresistant.—R. B.


A correlation of the pathology of various types of tumors occurring in the brain with their roentgenographic appearance is presented. Brain tumors are divided into the supratentorial and subtentorial. Of the supratentorial group gliomas comprise 40 to 50%. These tumors arise from the brain substance and pneumographic studies show more or less pronounced ventricular shift. Meningiomas comprise approximately 13% of supratentorial tumors and show a fairly characteristic appearance in their various forms. Other less frequent supratentorial types are the pituitary tumors, craniopharyngiomas, cysts of the third ventricle, pineal tumors, angiomas, and cholesteatomas. The subtentorial tumors, of which the medulloblastoma is most common, may produce signs of increased intracranial pressure and changes in the fourth ventricle with dilatation of the lateral ventricles and third ventricle. Clinical data together with complete roentgen studies can provide a basis for accurate localization.

—R. E. S.


A study was made of the various diagnostic methods used for 565 patients with brain tumor seen at the University of Michigan Hospital over a 10 year period. Routine skull examination, encephalography, and ventriculography all played a role in diagnosis. Adequate equipment, facility in its use, and experience are prime requisites if the radiologist is to contribute to the diagnosis of brain tumors.—R. E. S.


Encephalography and petrographic studies are described, and case reports given to demonstrate their value. The EEG is an adjunct to, but not a substitute for, other studies in the localization of brain tumors. The petrographic microscope, which operates on a beam of polarized light, is of value in the study of fresh or formalin-fixed tissues without the alterations caused by staining or other chemical methods.—R. E. S.


A small group of 10 cases of carcinoma of the breast in which a preoperative cycle of radiation therapy was given is reported. In none was there absolute sterilization of the tumor. At the present time it is concluded that radiation may be given in an attempt to make operable an inoperable carcinoma, when operation is refused, or when other physical conditions contraindicate operation. A central commission to study the best way to treat carcinoma of the breast is proposed.—R. E. S.


The author stresses three main conclusions in a survey of about 176 cases. In the most promising group of cases, Stage I, the 5 year clinical cure rate was 75%, as contrasted with 65% in many larger surgical clinics; this suggests some benefit from prophylactic radiation. The statistics cited in this paper show that postoperative x-ray therapy has raised the survival rate by 15 to 20% among Stage II cases. It is suggested that the prognosis in mammary cancer Stage II might be more noticeably improved by the institution of preoperative radiation in preference to, or in some instances combined with, postoperative treatment. Among the hopeless cases of carcinoma of the breast, Stage III, both primary and recurrent, radiation offers the only hope of relief of distressing symptoms.—M. E. H.


Mr. A. BREWS reported on the incidence of malignant disease of the ovary, and its pathological and clinical types. He made a strong plea for exploratory laparotomy in the majority of cases.

Miss M. C. TOD reported on radiotherapy of malignant disease of the ovary under five headings: 1. Types of tumor which the radiotherapist is asked to treat. 2. Results of treatment.—Although no final conclusion can be drawn from the 73 cases reported upon, 50% of the fully treated patients are alive more than a year after treatment. 3. Principles of treatment.—Since all of the peritoneal cavity is potentially involved, it is a first principle of treatment that the entire region from the floor of the pelvis to the underside of the liver must be treated. It is necessary to hold the balance between volume of tissue treated and dosage. 4. Technique of treatment.—Three fields are used. The anterior fields are rectangles 30 x 20 cm. tilted 30° from the vertical, the applicator being brought down on a simple mechanical "trunk bridge." The posterior field is a circle of 30 cm. diameter directed along the midline. The paper gives details of the resulting radiation distribution. The dose, described as "tumor dose" although it is delivered to the whole central zone, is 3,000 r in 3 to 4 weeks. It is necessary to begin with a low dose and increase each day. 5. Toler-
ance of the patient.—Investigation has been made of the blood changes following irradiation, a relationship being sought between integral dose and total white count as well as absolute number of lymphocytes and monocytes. It is shown that the integral dose to reduce white cells to one-half increases with the time over which the integral dose is spread.

Miss Tod concluded that in all cases of malignant neoplasm of the ovary in which removal is incomplete or impossible, the patient should have the chance of a course of x-ray therapy.

Dr. F. Ellis contributed a statistical analysis of 105 cases of primary carcinoma of the ovary treated at the Sheffield Radium Centre from 1932 to 1939. The results shown strongly suggest, but do not prove, that radiation therapy is of value. Details of the results must be sought in the original paper.

Mr. A. Green expressed surprise that such a large volume of tissue as the whole abdomen and pelvis was irradiated en bloc to a dosage of at least 3,000 r. In his experience, such a large body dosage makes the patient ill, and it often has been found beneficial to treat the patient in stages, pelvis first and abdomen later, or in strips. It might be an advantage to treat the patient from below because of the mobility of the pelvic structures.

Miss Tod (in reply) stated that they had treated a large number of cases in the manner described and had never had any serious trouble due to the large volume of tissue irradiated.—W. V. M.


Hysterectomy, radium, and x-ray are essential in the treatment of operable carcinoma of the uterus. Hysterectomy alone promises a 5 year survival rate of approximately 60%, and radium alone 55%; x-rays alone are incompletely effective (results in the literature are widely discrepant). When all these methods are employed in combination, a survival rate of 80% may be expected.—M. E. H.


An analysis of patients treated for carcinoma of the bladder by supervoltage x-ray indicates that the palliation accomplished justifies the continuation of this method of treatment. One hundred and thirty-nine cases were studied in which, for various reasons, surgery was not indicated. Symptoms were relieved in over one-half the treated cases, and pronounced regression occurred in about one-third. The low-grade tumors responded less well than the highly malignant, rapidly growing types. In some cases the tumor had shrunk sufficiently to permit the use of other types of treatment in conjunction with the external radiation. It was felt that the patients were made more comfortable and lives probably lengthened by the treatment.—R. E. S.


Two cases of carcinoma of the trachea are reported. Both tumors were demonstrated by roentgenography in the oblique or lateral position with a barium-filled esophagus.—R. E. S.


The increasing success of radical surgery in the treatment of carcinoma of the ampulla of Vater and head of the pancreas makes roentgen diagnosis of these lesions of increasing importance. Large polypoid tumors in the lumen are readily observed if the duodenum can be distended. Irregularity and stiffness of the duodenal walls may be produced by ampullar carcinoma. Extensive disease with infiltration of the duodenal wall may produce marked changes in the mucosa. Frostberg's reversed '3' sign when present may be a valuable aid to diagnosis. Lesions of the head of the pancreas may or may not produce definite roentgenographic changes. Clinical study is of aid in the differential diagnosis.—R. E. S.


The various roentgen methods for the study of pancreatic tumors are discussed. Usually the diagnosis must be made by a combination of various procedures available, e.g. fluoroscopy of the chest, roentgenography of the spine and abdomen, cholecystography, visualization of the pancreatic duct, and roentgenography of the gastrointestinal tract after administration of barium preparations or inflation with gas.—R. E. S.


A review of 29 cases of giant-cell tumor seen at the University of Pennsylvania Hospital indicates that irradiation produces good late results. Moderately large doses were given, and the patients appeared to do better when weight-bearing was avoided during healing. The phenomenon of apparent increase in the tumor with osteolysis, swelling, and pain was sometimes observed after radiation given before healing took place.—R. E. S.


A case of myeloma of the pubic bone with subsequent generalization is presented with a differential diagnosis. Comparatively small doses of x-ray treatment led to local and general improvement but caused severe chills and fever.—R. E. S.


The authors present tables and charts covering the various phases of protection in x-ray and radium therapy.—R. E. S.
Clinical and Pathological Reports

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