than that obtained with the carcinogens. The exceptions to this rule were noted with carotene and dihydroxy-diphenyl where 81% and 82% depression of the oxygen uptake was observed. Since the carcinogens are soluble in fats and are water-insoluble, these data appear to substantiate the theory that the mechanism of carcinogenesis could be explained as an interference with lipid metabolism. A disturbance in the system described might be one step in a series responsible for cancer formation.—Authors' abstract.


The results of daily injections of graded doses of heptyl aldehyde-sodium bisulfite in aqueous solution into tumorbearing mice of the Strong A strain have led to the following conclusions: 1. Spontaneous carcinoma of the mammary gland in mice may be influenced by the injection of an aqueous solution of heptyl aldehyde-sodium bisulfite at sites remote from the tumor. 2. This effect may be altered by the amount of the drug administered per diem. 3. There is a graded sequence of inhibition of spontaneous tumors as measured by the criteria employed in this investigation between 2 mgm. per diem and 6 mgm. per diem. 4. There is a reverse sequence of inhibition on tumors between 6 mgm. per diem and 11 mgm. per diem. 5. A daily dose of 12 mgm. per diem actually stimulates spontaneous tumors, especially in polycentric growth. 6. Thus the maximal degree of inhibition of tumors is obtained with 6 mgm. per diem.

7. The number and severity of pulmonary metastases is indirectly proportional to the amount of the drug administered per diem; the minimal number (40% of total treated mice) was obtained with 2, 3, and 4 mgm. per diem; the maximal number (33.4% of total treated mice) was obtained with 11, 12, and 13 mgm. per diem. 8. The maximal degree of liquefaction, 58.6%, was obtained with 5, 6, and 7 mgm. per diem. 9. With doses of 10 mgm. and greater per diem liquefaction occurred infrequently.—Author's abstract.

COMPARATIVE ONCOLOGY


An embryoma arising in the ovary of a C3H mouse has been carried through 13 serial transplants without losing its pleomorphic character. All tumors contain undifferentiated "embryonal" tissue with high mitotic activity and mature tissues of various types which appear to arise from the embryonal tissue and do not grow to any extent. It appears that the growing embryonal tissue throws off some cells which mature into specialized tissues and others which retain the ability to grow; an analogy is seen between this divided responsibility of daughter cells and polar body formation in ova. The embryoma has the metabolic activity of a malignant tumor.—Authors' abstract.

Clinical and Pathological Reports

ETIOLOGY


Trauma reveals many malignant tumors, but whether it can actually cause a malignant tumor is an unsettled point. In the discussion following the paper the statement was made that in over 175,000 cases of accident claims made to a railroad there had never been a claim for an injury producing or aggravating a malignancy.—H. G. W.


A man who took Fowler's solution from 1904 to 1914 developed palmar and plantar keratoses in 1918. In 1935 he developed a papilloma of the ureter and papillomatous lesions of the bladder, which were removed, and disclosed crystals of arsenic. The probability of arsenic crystals remaining in the tissues for 21 years is not discussed.—H. G. W.


Although the proportion of cases of mammary carcinoma in which the evolution of malignancy can be followed is comparatively small, a considerable number of such cases was studied and the following conclusions reached.

The origin of malignancy is frequently multicentric and there may be independent foci in ducts or in acini or in both. Also, the process is often a gradual one and may be seen at different stages in the same breast. "It represents a gradually accelerating hyperplastic growth attended by de-differentiation—the growth, histioid at first, becomes purely cellular." Furthermore, the malignant process often affects a given area in a diffuse manner, the change being regional rather than focal. The diffuse origin of cancer raised the question as to whether there occurs a transference, in an autacatalytic fashion, of growth-stimulating substance from malignant to nonmalignant cells. No clear evidence was found that such a transference occurs, although the question is left entirely open. The facts are interpreted as showing that the carcinoma represents the end result of a disturbance produced by one causal agent. No evidence was found of a dual causation; e.g., of a diffusely acting hormonal agent leading to hyperplasia followed by another agent, such as a virus, causing focal malignancy.—A. H.


Of 764 cases of cancer occurring between the ages of 20 and 64 in the armed forces of the United States, 284 were tumors of the lips or skin and 480 of the internal
occurred in II8 northern and 166 southern individuals, site north and south of 40 degrees latitude, skin cancers or organs. If the patients are divided on the basis of birth or ovarian cysts, and (c) presence of necrosis or infection in the fibroma itself. Radiation is relatively contra-indicated in the following cases: (a) presence of nodules in the submucoa, (b) presence of pedunculated nodules in the subserosa, (c) large size of the tumors (extending beyond the umbilicus), (d) presence of symptoms of compression which do not call for a surgical operation, and (e) in cases of doubtful diagnosis. Even though radiation can be applied to patients of all ages the author believes that in young women conservative surgery is preferable to radiation. If the latter is adopted it must be applied at doses inducing only temporary castration. Massive radiation is only indicated in the exceptional cases where very severe hemorrhage is present. The author adheres to the view that radiation acts both directly on the tumor and on the ovaries. About 250 references are appended.—M. D-R.


In the Physics Department of the Imperial College of Science and Technology an investigation has been carried out on the production of secondary neutrons as a result of fission of the nuclei of uranium when bombarded by neutrons. It was found that uranium produces secondary neutrons in excess of the number of primary neutrons from the source captured by it. Experiments on the possibility of the production of neutrons in a “chain reaction” are in progress.

At St. Bartholomew’s Hospital investigations have been commenced in the use of radio sulfur ($^{35}$S) as a biological indicator. Using the cyclotron at the Cavendish Laboratory some progress has been made in the isotopic separation of the active sulfur and the detection of its soft radiations.

At the Royal Cancer Hospital’s work has been continued on the distribution of radiation throughout a volume of tissues when irradiated under therapeutic conditions, and by the use of special instruments it has been found possible to study these distributions in detail. Means have also been devised of finding the mass of tissues raised to given dosage levels so that the “integral dose” throughout the body may be estimated. It has also been possible to compare the energy absorption in the body with that sent into it as gamma or x-ray beams.

At the Radium Beam Therapy Research Centre attempts have been made using a 200 kv. x-ray source to obtain a radiation distribution in tissues which is like that obtained when a telecurium unit is employed. In the course of these investigations new bakelite-graphite materials have been used in the production of ionization chambers which are wave length independent. A mathematical process has been worked out for the computing of volume dosage distributions and the same problem is being attacked experimentally.

The report from the Strangeways Research Laboratory may be conveniently divided into three sections—

a) The biological effects of radiation. The effects of x-rays on tissue cultures of chick fibroblasts have been
studied at three dose levels, 100 r, 1,000 r and 10,000 r. With doses of the order of 100 r, radiation is followed by temporary diminution of cell division. When an attempt at recovery subsequently occurs, a few degenerate cells appear. With doses of the order of 1,000 r great numbers of abnormal mitotic figures are seen immediately after exposure, indicating an action on cells in the process of division. These abnormalities may be traced after subcultivation. After doses of 10,000 r mitosis is absent and degenerate cells are found soon after the exposure. It has been found that the action of gamma rays on the tadpole eye is essentially similar to that in tissue culture, the same sequence of changes: radiation—diminution in mitosis—subsequent attempt at cell division accompanied by cell degeneration. The work has been continued by a quantitative study of the effect of divided doses in terms of the number of mitotic and degenerate cells seen after exposure. The second irradiation is most effective if delivered at a time when the effects of the first exposure are wearing off.

Similar observations on human malignant cells have been made, the same sequence of events being noted. Quantitative work is being continued with biopsy material.

b) Mechanism of the action of radiation. Using chick fibroblast cultures the effectiveness per röntgen of gamma rays and x-rays of three wave lengths (0.107, 0.150, and 0.363 A.) has been compared. It was found that the three x-ray wave lengths were equally effective but that the gamma rays were less effective by a factor of the order of two. The results, together with those of neutron experiments, are interpreted in terms of varying density of ions liberated by the different radiations.

The significance of wave length factor in causing a delayed lethal action on chick embryos has also been investigated.

c) The genetical effects of radiation. A study of the production of mutations in Drosophila by neutrons and x-rays in the light of the target theory of the action of radiations enables an estimate to be made of the number of genes in the X chromosome.

At the Mount Vernon Hospital investigations have been carried out upon the relative response of the skin of mice to x- and gamma radiation. The ratio of effectiveness for erythema and desquamation was 1.3 and for epilation and exudation 1.6, the x-radiation having greater effectiveness.

Experiments on the relative effects of the same dose of gamma rays from radium and radon sources on the ovary of rabbits revealed no difference in the effect although the exposure for radon was 11.1 days as opposed to 4.8 days for radium with the same screening.—W. V. M.

GASTROINTESTINAL TRACT


A case report of a submucous lipoma of the splenic flexure, clinically and radiologically indistinguishable from carcinoma. The involved area of the bowel was successfully extirpated in a two stage operation.—M. J. E.


In a series of 40 cases of esophageal carcinoma, the author had 2 cases which followed benign lesions. He lists 31 other cases from the literature. Lyce stricture appears to play a definite role in the later development of carcinoma. It was responsible for 16 of the 20 cases in which the exact etiology is mentioned.

The author's 2 cases are presented in detail. One appeared at 58 in a male with a congenital stricture. The second occurred at 35, 34 years after a lye stricture.

Three x-ray photographs and a bibliography of 19 authors are included.—A. M.


A study of 354 cases of carcinoma of the large bowel, including 2 of the appendix and 10 of the anus, with a satisfactory follow-up of about 97%. Emphasis is laid on the slow growth and late metastasis of these tumors. Fifty % of the regional node biopsies are inflammatory. In this series of cases pathological grading is of no significance.—H. G. W.


The simultaneous occurrence of grade II adenocarcinoma in the colon of presumably homologous twins is reported.—G. De B.

Large inoperable rectal cancers may be coagulated en masse with the electrical current and the coagulated tumor removed with a curette or an electric loop. This procedure readily disposes of necrotic ulcerated masses and produces temporary local alleviation. Satisfactory wound healing is the rule. A case is reported of an inoperable fungating growth treated twice in 7 months. The patient was in good condition and tumor-free 2 years later. The favorable results are demonstrated with photographs.—M. J. E.


This is a monograph which the specialist has to read in the original. It is divided in 3 parts: I. Etiological factors; clinical and anatom-pathological types; anatomical evolution; symptoms, diagnosis, and complications; II. surgical and radiological treatment; III. practical application of methods and the factors determining the operability of the neoplasm. The study is amplified by 28 clinical histories from the author's files, and is illustrated by 90 pictures, mostly microphotographs. About 300 references are appended.—M. D.R.


Study of 33 cases of histologically verified small bowel tumors.—H. G. W.


The patient died of an acute peritonitis secondary to a rupture of a fibrosarcoma of the lower ileum.—M. J. E.


Fifty-five cases of squamous carcinoma of the anus and anal canal were grouped according to their low, medium, or high grade of malignancy on histological grounds. Low grade carcinoma, generally originating at the anal margin, is twice as frequent in males as in females; medium grade carcinoma may arise at the anus or in the anal canal, and is equally distributed between the sexes; high grade carcinoma is much more common in the female sex and is almost limited to the anal canal. Diagnosis and treatment are discussed, and an additional note by R. W. Raven (pp. 157-160) describes the methods and results of treatment in 19 similar cases from the records of the Royal Cancer Hospital (Frem).—A. H.


Report of a case.—E. A. L.


Two successful cases of resection of the stomach are reviewed. Neither patient had metastases in lymph nodes. In the discussion Dr. Pack reviewed hospital statistics of gastric cancer. According to these about 2 patients among 14 resectable cases in 100 admissions for gastric cancer survive 5 years.—A. M.


A case report. The unusually severe involvement of the intestinal and urogenital tracts and the variable structure of the neoplastic process are stressed. The originally excised growth in the neck, consisting exclusively of undifferentiated cells, is contrasted with the reticular nature of periportal deposits in which production of argyrophilic fibrils was pronounced.—M. J. E.


Cancer of the colon in its earliest recognizable stage produces only vague persistent intestinal symptoms. These are frequently disregarded by the patient and physician and valuable time is lost. Rectal examination, proctosigmoidoscopy and thorough roentgen studies are capable of revealing small tumors. In consequence of competent early diagnosis operative intervention may be performed with a distinct possibility of effecting a permanent cure.—M. J. E.


Two cases are recorded in which successful resection of cancer of the lower colon was performed according to the technic of Devine (preliminary colostomy with de-functionalizing of the distal colon followed by resection of the tumor and end to end anastomosis).—M. J. E.


The authors present 3 cases of adenocarcinoma of the jejunum. Two are alive and well 12 and 7½ years after resection and end to end anastomosis. The third died 2 years and 4 months after operation with extensive metastases to the femur.—A. M.


Diagnostic methods, preparatory preparation of patients, and the various types of resection of the colon performed either in one stage or in two stages are outlined.—M. J. E.


The article emphasizes that gastroscopy ought not to supersede but complement roentgen ray examination of the stomach. The authors discuss the chief difficulties they have had with 800 gastroscopies in a 3½ year period. Small gastric lesions, particularly about the lesser curvature of the cardia and upper third of the stomach, are readily missed. The differentiation between ulcerating cancer and benign ulcer is subject to error and requires repeated examination. Gastric mucosal changes may be secondary to disease elsewhere and a careful clinical
history is necessary for proper diagnosis. The discovery of marginal ulcers or the evaluation of functioning stomas is difficult. A bibliography of 18 papers is given.—A. M.


Of 55 patients on whom a significant estimation of the course of disease was obtainable following operative removal of anorectal cancer, 16 (28.9%) survived 5 years after treatment. If in this group are considered only the 24 patients with operable tumors treated radically, 14 (41%) survived after 5 years.—M. J. E.


A case of a benign lipoma of the hepatic flexure of the colon is reported.—A. M.


A case of adenocarcinoma of the transverse colon is presented. Urinary symptoms caused by invasion of the bladder preceded bowel symptoms by 9 months.—A. M.


A case of widespread reticulum cell sarcoma of uncertain origin involving the stomach, gastrocolic omentum, retroperitoneal tissues, mediastinum, pleura, right lung, etc., is presented.—A. M.


The clinical aspects of primary cancer of the small bowel are reviewed on the basis of 108 cases observed between 1907 and 1939. Surgery is the accepted treatment, but radical resection was possible only in 42.4% of the cases; palliative measures were resorted to in 41.3%, and in 16.3% intervention was limited to exploration. Of 64 patients in whom a radical resection of the tumor was performed 5 or more years previously, 8 survived this period, but in this group 5 died of unstated causes between 5 and 18 years. Of interest histologically is the fact that all 4 tumors observed in a persistent Meckel's diverticulum were leiomyosarcoma, while this form constituted only 10% of the total tumors in the small intestine.—M. J. E.


A statistical study of 885 cases of malignant lesions of the cecum, ascending colon, and hepatic flexure, which constitute 30% of the lesions of the abdominal colon, and 13% of the malignant lesions of the entire colon and anal canal. Resection with a view to cure was performed in 67% of the cases in this series which is higher than in malignancies elsewhere in the large intestine. The net hospital mortality rate was 23.5% and the 5-year survival rate was 57%. Grading of the neoplasms by the method of Broders is of prognostic value.—H. G. W.


In adults, 40% of intussusception cases are due to tumors, most of which are benign. Of 237 carcinoid tumors in the literature only 3 resulted in intussusception. All 3 were in the ileum. In the case reported, intussusception resulted from a mushroom-shaped carcinoid in the lumen of the jejunum. The tumor was successfully resected.—A. M.


A report with autopsy record of a case of adenocarcinoma of the stomach in a patient who suffered from pernicious anemia 4 years previously. A complete clinical remission had been obtained with liver therapy.—M. J. E.


Review of literature, with 295 references, and report of 4 operated cases, with one patient living over 1½ years after the operation. Of the total number of 195 cases in which resection was performed there was an operative mortality of 71.5%. This paper is followed by a pertinent paper on experimental esophagastrotomy, and a discussion.—H. G. W.


The tumor in this patient was associated with profound anemia and weakness and, although palpable, gave rise to no symptoms directly referable to the stomach. It was successfully extirpated.—M. J. E.


A report of 2 cases in patients aged 74 and 76. The tumors were extirpated radically and 1 patient survived in good condition. The second died after 2 months, of a complicating cellulitis of the neck.—M. J. E.


This is a study of bone metastases based upon the findings in 1,005 cases of carcinoma of the gastrointestinal tract. The most common site for the primary carcinoma was the stomach, followed in order by the rectum, colon, and esophagus. The incidence of bone metastases was 2.6% for stomach, 5.93% for rectum, 0.93% for colon, and 2.94% for esophagus. The presence of carcinoma and incidence of metastases were less for other portions of the tract. These findings are compared with other reports

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occurring in the literature. The incidence of metastasis is higher than generally thought. The majority of the metastatic lesions are of the osteoclastic type.—E. A. L.


A report of a case in which successful excision of the tumor was performed.—M. J. E.


The authors emphasize the importance of the neurogenic theory of origin of peptic ulcer and quote from the literature to demonstrate the frequent concomitance of intracranial lesions and peptic ulceration. The case reported had a subtemporal decompression for an intracerebral tumor. Ulcer symptoms were present at that time and responded to diet but later necessitated three operations: excision of the ulcer, gastroenterostomy, and feeding jejunostomy. The patient succumbed almost 16 years after the onset of her decompression. Autopsy showed a fibrillary astrocytoma of the right frontal lobe compressing the corpus callosum and third ventricle. The gastric ulcer showed "beginning malignant change." A diagram schematically presents the possible action of the brain tumor on the gastric lesion. Three photographs are shown. There is a bibliography of 20 papers.—A. M.

Conference on Gastric Cancer, National Advisory Cancer Council, October 11 and 12, 1940


Dogs were prepared with gastric pouches and were desensitized to the injections of extracts of human tissues. They were then fed, and after the flow of gastric juice in the pouch was measured as a control value, they were injected intravenously with either an extract of cancerous or control human stomachs or the secretions from such stomachs. It was found that the extracts and juices from achlorhydric (cancerous) stomachs in the great majority of instances had a pronounced depressant effect upon the secretion in the pouch while only a few samples of control extract produced a similar effect. Extracts, furthermore, prepared from the achlorhydric stomachs of patients with peptic anemia were equally as effective in depressing gastric secretion as were the cancerous stomachs. The depressant factor is nondializable and heat labile. It is believed not to be enterogastrone.

The paper is discussed by Dr. A. C. Ivy.—L. W.


A summary of statistical data reveals that the recorded mortality from all cancer in the United States has increased steadily since 1900. The increase has affected males more than females. However, since 1920 in females and since 1922 in males, there has been a slight decrease in the death rate from cancer of the stomach and liver. The decrease has been more marked in women. The highest recorded death rates from cancer of the stomach and duodenum in the years 1930-32 occurred in the northern states from the Atlantic to the Pacific. The southern states had uniformly low mortality rates in this respect. On the other hand, mortality rates for skin cancer are much higher in the South than in the North.

From census figures of current cancer cases in the white populations of 12 large cities in the North, there were 2.3 cases for every annual death as compared with 4.0 per death in the South and 2.8 in the West. There were 24 cases of skin cancer under treatment for each annual death in all areas surveyed, but only 1.4 digestive tract cases.

Among white males, cancer of the digestive system made up 34% of the cancer cases and 54% of the deaths; in white females cancer in this site accounted for 20% of the cases and 40% of the deaths.

Resident cases of all forms of cancer in the surveyed areas amounted in the North to 282 per 100,000 white population, 386 in the South, and 425 in the West. The South showed a lower cancer death rate but a higher rate of cases under treatment than the North. Cancer of the stomach, intestine, and rectum was more prevalent in the white population in the cities of the North than in those of the South.

There is discussion by Dr. C. C. Little, Dr. M. T. Macklin, Dr. Walter Alvarez, Dr. Albert Tannenbaum, Dr. E. V. Cowdry, and Dr. Joseph O'Brien.—L. W.


This paper is reprinted with additions, from Arch. Path., 29:814-844. 1940. It is a comprehensive review of the subject of experimental gastric cancer with a bibliography of some 60 titles. The criteria of induced malignancy are summarized as follows:

Proof of malignancy is not given by the histologic appearance of a tumor. It is given by (1) the ability of the tumor to proliferate independently as metastases; (2) the ability to invade progressively and destructively neighboring tissues; (3) the irreversibility of these activities which must be shown to continue in the absence of the extrinsic factor initially held responsible for the cellular changes; and (4) it must be shown that a given malignant change occurs with sufficient regularity to establish a causal relationship of the experimental procedure to the cancer.—L. W.


The author describes the organization and work of the gastric research laboratory associated with the gastric clinic at the University of Cincinnati. He concludes that the coordinated efforts of the clinician, gastroscopist, roentgenologist, pathologist, and other specialists have resulted in concrete advances in the knowledge of gastric disease and how to treat it. He stresses the importance
of carefully assaying the nutritional state of gastric cases before operation. Finally, he cautions against complete dependence upon laboratory tests. They should serve to aid sound clinical judgment and not overrule it.

The paper is discussed by Drs. C. P. Rhoads, J. J. Morton, A. R. Dochez, and W. Alvarez. Dr. Alvarez’ discussion brings out many noteworthy clinical facts based on the statistical data from the very large series of gastric cases (10,890) studied at the Mayo clinic by Dr. Walters and Dr. Lewis.—L. L. W.


The evidence supporting the assumption that certain gastric cancers develop in a gastric mucosa, the seat of a concomitant or precedent chronic gastritis, is marshalled from the literature. The chief points emphasized are the chronicity of gastric symptoms in some patients developing gastric neoplasms, the frequency with which gastritis is found in cancerous stomachs removed at operation or autopsy, the frequent association of gastric polyposis or carcinoma as a sequel of pernicious anemia, and an hereditary tendency in some families to develop one or the other of these disorders.

If chronic gastritis is really a precancerous condition in some cases, as it would seem from the above, then therapeutic measures aimed at clearing up these lesions would constitute a logical prophylaxis. For the gastritis of tropical sprue, and that of pernicious anemia, dietary supplements constitute a logical prophylaxis. For the gastritis of tropical sprue and that of pernicious anemia, dietary supplements are effective.

The paper is discussed by Drs. L. Schiff and R. Schindler.—L. L. W.


The author reviews the technics involved in the early diagnosis of gastric cancer. From his own experience, he concludes that almost every gastric carcinoma no matter how small can be diagnosed by combining improved x-ray visualization with gastroscopy. Not only is he able to diagnose cancerous growths in the stomach but he has been able to grade them macroscopically—a distinct aid in surgical prognosis. Further, in a majority of cases he has been successful in distinguishing benign from malignant ulcers of the stomach and in recognizing alleged precancerous conditions including gastric polypi and chronic atrophic gastritis.

Gastrophotography may be used to record the gastrointestinal findings. Gastroscope is apparently a safe procedure and is technically easy in trained hands. Only one fatality has been reported in 23,351 gastroscopies, and this was not conclusively attributable to the procedure.

In light of the above evidence, Dr. Schindler feels that failure to advise prompt x-ray examination and gastroscopy in patients with minor digestive symptoms is inexcusable.

The paper is well illustrated. There is discussion by Dr. James Ewing, Dr. Max Zinninger, and Dr. Gordon McNeer.—L. L. W.