ABSTRACTS
EXPERIMENTAL STUDIES: ANIMAL TUMORS


In order to eliminate the effects of a solvent, as well as the trauma and infection inseparable from repeated injections, crystals of benzpyrene were deposited in the peritoneal cavity of rats as a thick watery suspension contained in collodion sacs. The dose lay between 500γ and 25 mg., of which it is estimated that something like 1γ escaped daily in solution.

The first change to be noted was the formation of a connective-tissue capsule, in which the cells nearest the sac were undergoing fatty "degeneration." As benzpyrene continued to escape, the zone of necrobiosis widened and chronic inflammatory changes appeared, while damage to the connective tissues outside this area was evinced by the presence of swollen and coarsely granular cells. By the time the connective-tissue capsule had attained macroscopic thickness the areas of fatty "degeneration" exhibited a strong violet fluorescence in ultraviolet light. In other words, benzpyrene had passed into solution in the fat.

The tumors appeared suddenly after the lapse of from eight to twelve months, and showed no relation, in latent period and proliferative vigor, to the amount of benzpyrene employed. All were sarcomas, and in none could the agent be demonstrated by ultraviolet light. These growths appeared to develop at the periphery of the capsule, where the concentration of benzpyrene was lowest and cell death accordingly had not taken place.

Thus the primary effect of the carcinogenic compound, as others have indicated, was severe cell injury of a type which could not be distinguished from that caused by any other deleterious influence.

The article closes with a grave warning against the use of benzpyrene for the treatment of cancer, as recommended by Bauer (Arch. klin. Chir. 189: 123, 1937. Abst. in Am. J. Cancer 32: 135, 1938). The compound thus used is no more specific than any other caustic, or than heavy radiation, and infinitely more dangerous. For if man is as susceptible as certain of the laboratory animals the patient will pay for the removal of his spontaneous neoplasm with the acquisition of a benzpyrene tumor.

Photomicrographs and a bibliography accompany the article. Wm. H. Woglom


Production of Sarcoma in the Mouse and Rat by Repeated Subcutaneous Injections of Concentrated Glucose Solution, N. Takizawa. Über die Erzeugung des Sarkoms der Maus und Ratte durch wiederholte subkutane Injektion der konzentrierten Zuckerlösungen, Gann 32: 236–237, 1938.


These three papers are all in confirmation of Nishiyama's work showing that daily subcutaneous injections for over one year of concentrated glucose solution result in the production of sarcoma at the injection site (Gann 32: 85, 1938. Abst. in Am. J. Cancer 36: 616, 1939).

In Nonaka's experiment sarcoma was found in 3 out of 4 rats that survived 400–500 days. Two of these sarcomas were transplantable.

Takizawa produced tumors in both rats and mice. He noted, as did Nishiyama, that the simultaneous feeding of o-aminoozotoluol tended to increase the rate of sarcoma production. The sarcomas were carried through many generations of mice.

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Takizawa found also that injections of galactose (0.75 c.c. of a 25 per cent solution every day or every other day for over 390 days) gave rise to spindle-cell or polymorphous-cell sarcoma in mice. Like the glucose sarcomas these galactose sarcomas were transplantable. Fructose produced sarcoma under similar experimental conditions, though not in so high a percentage as either glucose or galactose. Injections of lactose or of sucrose had yielded no sarcomas at the time of the report.

Histological changes at the site of sugar solution injections were studied by Takizawa. The local proliferation of connective tissue was found to undergo fibromatous change, with a gradual development of malignant growth.

W. NakaHara


This is a further account of the production of experimental teratoma testis in the fowl by injections of zinc (see Falin and Gromzewa: Am. J. Cancer 36: 233, 1939). The structure of the tumors is described and illustrated by photomicrographs. The author suggests that the injection of the zinc salts into the testis produces a disintegration of the cellular elements, followed by the liberation of substances acting on the pluripotential testicular cells like the "inductors" or "evocators" in the process of embryonic development. References are appended.


Feeding butter yellow (dimethylaminoazobenzol) to rats in varying doses, the author observed that a certain minimum amount is necessary for the production of liver cancer; with amounts above this minimum the rate of development of liver cancer is proportional to the concentration of the dye.

With high concentrations of butter yellow the early changes observed were those of serous hepatitis, followed by the proliferation of the bile-duct epithelium and of connective tissue, resulting in cirrhosis of the annular type. Along with these changes liver cells underwent proliferation in many lobules, forming various types of nodular hyperplasia, which were ultimately transformed into hepatomas. The presence of cirrhosis seemed to stimulate the malignant proliferation of liver cells.

With lower concentrations of butter yellow the proliferation of the bile-duct epithelium and of connective tissue did not take place, but hepatoma was produced just the same. It appears, therefore, that the presence of cirrhosis is not a necessary condition for hepatoma production.

The author also believes that the proliferation of bile-duct epithelium does not lead to true cholangioma. The cholangioma-like growths associated with butter yellow feeding he attributes to various secondary structural modifications of hepatomas.

W. NakaHara


Small fragments of hepatoma produced by dimethylaminoazobenzene feeding in the rat were cultivated in a medium consisting of a mixture of rat and chicken plasma and embryonic tissue juice. The best results were obtained when a fragment of embryonic heart tissue was placed beside the tumor fragment in the culture. After a latent period of about twelve hours hepatoma cells began to grow out around the fragment and to develop vigorously in all directions. Stromal cells were present in the early cultures but were gradually eliminated until after five or six passages a pure culture of the epithelial elements was obtained. The implantation of these pure cultures into normal rats gave rise to tumors identical with the original growth.

W. NakaHara


Record of the transplantability of a sarcoma which happened to develop in a rat repeatedly injected subcutaneously with dimethylaminoazobenzol solution.

W. NakaHara

The author tested the effect of four different diets on the production of liver cancer by butter yellow. The diets were: unpolished rice alone, unpolished rice plus 5 per cent by weight of sucrose, plus 3 per cent of cholesterol, and plus 3 per cent of lecithin. The number of animals was small and unfortunately none survived long enough to develop liver cancer. Such histologic changes as were found are discussed on the supposition that they may be significant as precancerous alterations.

W. Nakahara


A complete record is presented of a long series of experiments in which the effect of various diets was tested on the experimental production of liver cancer in rats by dimethylaminoazobenzol, or butter yellow (see Kinosita: Tr. Jap. Path. Soc. 27: 665, 1937. Abst. in Am. J. Cancer 38: 416, 1940). The diets tested were: (1) polished rice plus dried beef liver, (2) polished rice alone, (3) polished rice plus purified protein, (4) plus butter, (5) plus inorganic salt mixture, (6) plus vitamin B₁ crystals, (7) plus vitamin B₆ crystals, (8) plus nicotinic acid crystals, (9) plus “liver eluate” (a vitamin B₂ preparation), (10) plus non-absorbable liver filtrate (vitamin L and factor W), and (11) a mixture of polished rice, protein, butter, salt mixture, vitamin B₁, nicotinic acid, “liver eluate” and filtrate.

Of all the dietary supplements tested, whole dried liver was the only one to produce a striking inhibition of liver cancer development. When this substance was added to the diet of polished rice, even the development of cirrhosis, the usual forerunner of liver cancer, was prevented. In practically all the liver-fed rats the liver remained free from macroscopically recognizable lesions for 200 days, though liver cancer developed in 150 to 162 days in about 50 per cent of all the rats on other diets. In the latter the rate of liver cancer production varied somewhat, but the differences were too slight to be regarded as significant. It appears, therefore, that liver contains a substance or substances which inhibit the development of liver cancer, and which cannot be identified with any of the nutritional elements now known to be essential for rats.

References and illustrations are included.

W. Nakahara


The author studied the effect of feeding wheat and Japanese noodles on the production of liver cancer by a carcinogenic substance [probably o-aminoazotoluol, though the name of the substance is not given]. The effect of castration in both sexes was also investigated. No perceptible difference in the rate of liver cancer production in the different groups was observed, and it is concluded that neither diet nor the sex hormone has any fundamental significance in liver cancer production.

W. Nakahara


Rats were fed on various grain diets and their susceptibility to the carcinogenic action of o-aminoazotoluol was compared. The diets used included whole wheat, wheat plus cod-liver oil, unpolished rice, and rice plus yeast. Only a few rats in each group survived long enough to be taken into consideration, but the author believed that the whole wheat diet inhibited the production of liver cancer.

W. Nakahara


In the course of experiments designed to determine the effect of feeding various grains on the production of liver cancer by o-aminoazotoluol (see preceding abstract),
the authors encountered 3 female rats developing mammary cancer and another with mammary gland hyperplasia. All these animals belonged to the wheat-fed group. The authors suggest that wheat may contain a large amount of lactation-promoting substance, probably vitamin L, the prolonged action of which may lead to mammary cancer. Since wheat feeding, according to these authors, somewhat inhibited the development of liver cancer, they offer the suggestion that some connection may exist between the lactation-promoting substance and the hepatoma-inhibiting principle.

W. NAKAHARA


o-Aminoazotoluol was given to four groups of rats: one group fed with desiccated thyroid gland; one group injected with casein; a third injected with India ink, and a fourth untreated. The rate of hepatoma production was compared among these four groups, but since only two or three animals in each group survived long enough for the development of tumors the result is inconclusive.

W. NAKAHARA


The rate of hepatoma production by o-aminoazotoluol was compared among three groups of rats: those injected with the male sex hormone, those injected with cholesterol, and untreated controls. Only very few animals survived in each group and final comparison was difficult. The author believes, however, that injections of the male hormone stimulate the development of liver cancer. This is in agreement with his former conclusion, also based on small groups of animals (Gann 32: 73, 1938. Abst. in Am. J. Cancer 36: 616, 1939).

W. NAKAHARA


The author recently observed a case of liver cancer in a thirty-year-old woman who had previously been castrated by means of x-rays. Since statistics show that liver cancer occurs only exceedingly rarely in so young a woman as this, it was felt that the castration might have had some influence. In the present experiment the effect of ovariectomy was tested on the production of liver cancer due to o-aminoazotoluol feeding.

Four groups of rats were used. The first group consisted of intact rats injected with prolan; the second of ovariectomized rats; the third of ovariectomized rats injected with prolan; the fourth group of untreated controls. All the animals were fed with o-aminoazotoluol so as to produce liver cancer. This first report deals only with the effect of ovariectomy, which, the author believes, increases the rate of liver cancer production. As many as 6 of 7 castrated rats developed liver cancer, while only 2 of 7 intact controls were found with liver cancer after 365 days.

W. NAKAHARA


After a short theoretical discussion, the authors state that the regenerative process induced by the resection of the liver did not modify the proliferation of liver cells due to o-aminoazotoluol.

W. NAKAHARA
Feeding Experiment with 4'-Amino-2 : 3'-dimethylazoxybenzol in White Rats, I. OTSUKA. Über die Fütterungsversuche mit 4'-Amino-2 : 3'-dimethylazoxybenzol bei weissen Ratten, Gann 32: 231–232, 1938.

o-Aminoazoxytoluol is the same as the hepatoma-producing o-aminoazotoluol except for the oxygen in the azo-position. Feeding experiments demonstrated that this addition of oxygen in the azo-position so reduces the action of the liver that no marked change is produced in that organ.

W. NAKAHARA


4'-Oxalylamino-2 : 3'-dimethylazobenzol was synthetically prepared and was fed to a series of albino rats. The author claims that the action of this substance is like that of o-aminoazotoluol in that it produces liver tumors and other histological changes preceding the appearance of the tumors. A small tumor was produced in only one of the animals dying after 167 days' feeding.

W. NAKAHARA

Feeding Experiment with 4'-Succinylamino-2 : 3'-dimethylazobenzol and Other Azo-Compounds in White Rats, N. NAGAO AND T. HASHIMOTO. Über die Fütterungsversuch mit 4'-Succinylamino-2 ; 3'-dimethylazobenzol und anderen Azo-verbindungen bei weissen Ratten, Gann 33: 196–198, 1939.

4'-Succinylamino-2 : 3'-dimethylazobenzol, which is produced by replacing with an acyl radical the amino radical of o-aminoazotoluol, retains to some extent the hepatoma-producing action of the latter. On the other hand, acetoxy- and carboxmethoxy- compounds show no effect on the liver. The possible action of these compounds on the lining epithelium of the urinary bladder is also discussed.

W. NAKAHARA

Feeding Experiment with 4'-N-Dimethylaminoazobenzol-4-arabic Acid in White Rats, Y. NISHIYAMA, N. NAGAO, AND H. UEDA. Über die Fütterungsversuch mit 4'-N-Dimethylaminoazobenzol-4-arsinsäure bei weissen Ratten, Gann 33: 199–202, 1939.

By feeding 4'-N-dimethylaminoazobenzol-4-arsenic acid or injecting it into albino rats, it was found that the substance has no liver-cancer-producing action, although it brought about marked dilatation of common bile ducts and the formation of gallstones. Sodium p-amino-phenylarsenic acid, when mixed with dimethylaminoazobenzol, did not modify the liver-cancer-producing action of the latter.

W. NAKAHARA


This is a preliminary announcement of the discovery that furfural feeding produces definite cirrhotic changes in the liver of the rat. Rats were maintained on polished rice with which furfural was evenly mixed at the rate of 40 c.c. per kilo of rice, the amount being gradually raised to 100 c.c. per kilo. As early as thirty-eight days after the beginning of feeding some cirrhotic changes appeared and after 139 days all the animals (7 in number) showed marked and generalized liver cirrhosis. In another experiment the furfural was reduced to 10–40 c.c. per kilo of rice, which greatly prolonged the time required for the production of cirrhosis (200–500 days). W. NAKAHARA

Effect of the Sex Hormones on the Growth of Transplanted Mammary Adenofibroma in Rats, F. E. MOHS. Am. J. Cancer 38: 212–216, 1940.

The author conducted twenty separate experiments involving 469 rats and using eight different transplantable adenofibromas. The tumors were found to grow better in normal females than in either normal males, castrate males, or castrate females. That the results were dependent upon the follicular hormone is indicated by the observation
that the percentage of takes was increased both in castrate males and castrate females by injections of the hormone. Unlike Heiman and Krehbiel (Am. J. Cancer 27: 450, 1936) the author failed to observe any increase in takes in male animals following castration, nor did testosterone injections inhibit tumor growth in castrate males. References are appended.


The hyalinization of the uterine mucosa and muscularis observed after large injections of estrogen was found to be a reversible process, the hyaline being replaced by ordinary connective tissue following discontinuance of the injections. The rarefied tissue developing in certain parts of the vagina and cervix under the influence of this hormone also disappears. Simultaneously with the return of the stroma of the sex tract to normal conditions, ovulation is resumed in the ovary and corpora lutea again form. In the mammary gland the growth and secretion processes and development of carcinoma progress, even under conditions in which, as a result of cessation of ovarian function, regressive changes take place in vagina and uterus. In experiments recorded here growth and secretion processes were accelerated and intensified in mice which had received a series of estrogen injections during the early periods of their life, as compared with non-injected mice. These results are in agreement with former experiments, in which it was shown that ovarian hormones administered during an earlier period of life induce growth changes in the mammary gland which become manifest long after these hormones have ceased to act. References are included.


The action of the Shope papilloma virus has been tested on Korean rabbits, with a 5 per cent suspension of glycerinated Shope papilloma tissue. Korean domestic rabbits reacted less satisfactorily than Korean wild rabbits to the papilloma-producing action of the virus. When the suspension was exposed to ultraviolet light for thirty minutes the virus was inactivated to some extent, although ten minutes' exposure had no effect. Vitamin C, either injected or applied on the skin, also inactivated the virus. Finally, evidence was presented to show that rabbits immunized with papilloma virus no longer produced papilloma when reinoculated percutaneously with active virus.

W. Nakahara


Appropriate use of ultra-short waves reduces the growth rate of transplantable rabbit sarcoma. This happens when the waves are applied to rabbits bearing sarcoma as well as when the tumor tissue is exposed in vitro before being transplanted. In treated rabbits there is a tendency for the leukocyte count to be reduced. Histologic examination shows that hyperemia and leukocytic infiltration take place in treated tumors, which, with a stronger dose seem to become necrotic.

W. Nakahara


As a result of their experiments the authors believe that feeding with cod-liver oil, combined with injections of the anterior pituitary hormone, stimulates the growth of the Kato rabbit sarcoma.

W. Nakahara
EXPERIMENTAL STUDIES; ANIMAL TUMORS


The author was unable to produce tumors in rats either by the administration of wheat germ oil or raw wheat germ.


This paper is in the nature of a reply to Selbie's paper (Am. J. Cancer 28: 530, 1936), in which the latter reported his failure to obtain satisfactory growth of the Ehrlich-Putnoky tumor in rats. After pointing out a number of discrepancies in Selbie's technic, Putnoky describes further experiments of his own in which equal pieces of the Ehrlich mouse carcinoma and the so-called Ehrlich-Putnoky rat carcinoma were implanted by the same technic into Hungarian white rats. The rat's system showed a high degree of resistance to the Ehrlich mouse carcinoma, though the tumor was able in some cases to attain a certain size. With the Ehrlich-Putnoky rat carcinoma, on the other hand, there was hardly any evidence of resistance and the tumor grew continuously and infiltratively. These observations, together with earlier immunity experiments, the author believes indicate that the Ehrlich-Putnoky tumor is a substrain of the Ehrlich carcinoma, which, after living for a long period in the rat, has become capable of adapting itself, to a high degree, to the rat's organism. His histologic findings seem to indicate that in the production of immunity against heterologous tumors humoral factors play a large part.

Photomicrographs and references to the author's earlier papers are included.


Transplantation of chicken sarcoma was tried in several species of birds. In Bambuscola thoracica (Temminck), the bamboo partridge, a positive result was obtained in all four attempts and the new hosts died of large tumors which could not be distinguished macroscopically and microscopically from the original chicken tumor.

Three adult partridges of another variety, Arboricola crugigularis (Swinhoe), were also transplanted with chicken sarcoma successfully. There was a very active proliferation of sarcoma tissue, which killed the birds in nine to eleven days.

Of Lophura diardi (Temminck), a Siamese pheasant, only a single bird was available for experiment. The transplant took well and produced metastases. Implantation of apparently unaffected organs of this bird into normal chickens gave rise to typical sarcoma.

A single green-breasted pheasant, Phasianus versicolor (Vieillot), was transplanted, also with the production of a large tumor.

Several other species of birds were tried, including pigeons, sparrows, Java sparrows, canaries, ducks, etc., but in none of these did the transplanted sarcoma grow.

The present investigation greatly widens the range of avian species that can be successfully transplanted with chicken sarcoma, which has hitherto been transplanted only to a certain breed of Japanese domesticated ducks.

W. Nakahara


The blood of pigeons to which chicken sarcoma has been transplanted often produces sarcoma when injected into chickens, although no tumor formation is present in the pigeon. The authors attempted to investigate the possible relation of internal secretion to this form of heterotransplantation by injecting pigeon blood carrying the chicken sarcoma agent into chickens which had received various treatments, as injection with insulin, with sugar, or with thyroxin, or from which the pancreas had been extirpated. There was a higher rate of sarcoma production in the sugar-injected chickens than in any of the others.

W. Nakahara
Experimental Investigation on Degeneration and Regeneration Processes of Nerve Fibers in Intracerebral Transplantation of Heteroplastic Tumors, K. TSUKADA.


Implantation of Flexner-Jobling rat carcinoma into the brain of rabbits as well as implantation of Kato rabbit sarcoma into the rat brain produced actively growing tumors. The brains containing the heteroplastic tumor grafts were closely examined by means of serial sections and it was found that there is no nerve fiber which specifically proliferates in association with the growing tumor. There was, however, a certain amount of degenerating nerve fibers in the vicinity of the tumor tissue, especially when the latter was carcinoma. The degenerative changes may be attributed to mechanical as well as chemical influences of the growing tumor.

W. NAKAHARA

Changes in Neuroglia Cells in Intracerebral Heterotransplantation of Tumors, K. TSUKADA. Über die Veränderungen der verschiedenen Neurogliazellen bei intrazerebraler Heterotransplantation der Geschwülste, Gann 33: 262–263, 1939.

The behavior of neuroglia cells was studied in rats, rabbits, and ducks which had received intracerebral transplants of heterologous tumors, including Kato rabbit sarcoma, Flexner-Jobling rat carcinoma, and Fujinami chicken sarcoma. Examination showed that microglia and oligodendroglia cells at first, undergo proliferation, especially around the tumor graft, but later many of these cells show regressive changes. Macroglia cells, on the other hand, do not proliferate markedly during the early period but later increase diffusely throughout the brain substance and show little tendency toward degeneration. These effects of tumors grafts on glia cells are attributed not alone to the mechanical stimuli but also to some subtle chemical substances produced by the grafted tumor tissue.

W. NAKAHARA


Four groups of rats were used in this experiment: the first group fed with o-aminoazotoluol; the second with dimethylaminoazobenzol; the third with coal tar; and the fourth group untreated. After a certain period of feeding, all the rats were implanted, mostly intramuscularly, with tissues of rat embryos. The transplanted embryonal tissue proliferated for a time in all the animals and was eventually absorbed, but in the rats fed with any one of the carcinogenic substances the proliferation of the embryonal tissue was generally less than in untreated controls.

W. NAKAHARA


The author has been advocating the use of salvarsan to the saturation point for the treatment of malignant tumors, and has already reported a distinct curative effect upon chicken sarcoma, rat and mouse carcinomas, and rabbit sarcoma (see Absts. in Am. J. Cancer 22: 134, 1934; 26: 800, 1936; 29: 747, 1937). In these previous experiments the tumors treated were situated in subcutaneous tissue.

In the experiment here reported the author implanted a highly malignant rabbit sarcoma into the subserous layer of the stomach wall, producing gastric tumors. The salvarsan-saturation treatment brought about satisfactory healing of such tumors.

W. NAKAHARA


The therapeutic effect of sodium thiosulfate was tested on Kato’s rabbit sarcoma, with results entirely satisfactory to the author.

W. NAKAHARA

The therapeutic effect of injections of magnesium thiosulfate solution on rat and mouse carcinomas and rat sarcoma was tested. Thirteen of 20 rat carcinomas, 8 of 15 mouse carcinomas, and 6 of 10 rat sarcomas were cured.

W. NAKAHARA


A report is presented of three human cancer cases treated with injections of sodium dioxy-diamino-arsenobenzol-diformaldehydesulphate and sodium dioxy-diamino-arsenobenzol-formaldehydesulfoxide. The report is preceded by the statement that these substances have a curative effect on the Brown-Pearce rabbit carcinoma, liver cancer produced by o-amidoazotoluol and by butter yellow, Flexner-Jobling rat carcinoma, Bashford mouse carcinoma, tar cancer of mice, Kato rabbit sarcoma, Jensen and Fujinawa rat sarcomas, Fujinami chicken sarcoma, etc. The effect on human cases is difficult to interpret.

W. NAKAHARA


The author observed the effects of small amounts of heptyl aldehyde and methyl salicylate added to the diet on spontaneous tumor growth in 6 distinct genetic strains of mice. The results were approximately the same in all strains. The average growth of the tumors in experimental animals was slower and the experimental animals lived longer, on an average, than their corresponding controls. References are appended.


Following large daily doses of colchicine (25 gamma) the growth of transplanted mouse sarcoma 180 was retarded but the animals died a few days after treatment was instituted. Sublethal doses failed to cause tumor regression in either mice or rats or to affect the response of the tumors to radiation, though the amounts given were sufficient to produce arrest of many mitoses at metaphase. Since these smaller doses failed to bring about the fall in tissue ascorbic acid which was observed with lethal doses, it is believed that metabolic change may be in part responsible for the alteration of growth rate observed when the larger amounts were administered.

In order to determine its effect upon the regeneration of normal tissues, colchicine was also given to rats in which partial hepatectomy had been done. Cell multiplication was not inhibited in these animals even in the complete absence of normal karyokinesis. A bibliography is appended.


Multiple transplants of the anterior lobes of the pituitary of closely inbred strains of mice were found alive after periods of from seven to ten months following transplantation. The persisting transplants were surrounded by a fibrous capsule from which strands of connective tissue grew into the graft. The surviving anterior lobe tissue was made up chiefly of chromophobes, but in a majority of the transplants a few eosinophiles were also seen. Basophiles were not observed. In some grafts persisting intermediate lobe tissue was identified.

Cell counts made in the anterior pituitaries of the host mice showed that basophiles were more abundant in the glands of ovariectomized mice than in glands of non-ovariectomized animals. They were generally degranulated. Castration cells were not observed. There was no similarity between the cellular pattern in the transplants and in the pituitaries of the host.
Results of a "Functional Test" in a Strain of Mice (C57 Black) with a Low Breast Tumor Incidence, C. C. Little and J. Pearson.


Ninety-eight female mice of the low-tumor strain C57 submitted to the functional test of forced breeding failed to produce a single mammary tumor. This result is at variance with that of Bagg (Am. J. Cancer 27: 542, 1936), who obtained 9 mammary tumors in a series of 60 animals of the same strain under the same conditions. Taking the two series together the incidence of breast tumors was slightly but not significantly increased over the normal. Thus while the ability of forced breeding to change the threshold of genetic breast tumor incidence in the C57 strain as a whole is negligible it may help to detect hidden mutations in certain families or substrains in the direction of a higher tumor incidence.

The authors include observations on the aging of the reproductive system of female mice made possible by the elimination of nursing and the consequent simplification of the reproductive history.

References are appended.

Observations on Three Functional Tests in a High-Tumor and a Low-Tumor Strain of Mice, Elizabeth Fekete.


Mice of the dilute brown high-tumor strain and of the low-tumor strain C57 were submitted to three functional tests. (1) By increasing the number of pregnancies and limiting lactation, the mammary glands were exposed to many periods of increased ovarian and decreased pituitary hormonal influences. (2) By permitting the animals to become pregnant while still nursing, the periods of ovarian and of pituitary hormonal influence were equally increased. (3) By prolonging the lactation period by the successive substitution of younger litters and limiting the number of pregnancies, the period of ovarian hormonal influence was decreased and that of pituitary hormonal influence increased.

The number of animals used for each test was small and the author is unwilling to draw definite conclusions. The results indicate, however, that infrequent pregnancy followed by prolonged lactation reduced the tumor incidence.

References are appended.

Malignant Hepatoma in the White-Tailed Deer (Odocoileus Osceola), J. H. Winer and C. R. Schroeder.


Report of a case with illustrations and references to the literature.

Carcinoma of the Esophagus in an Antelope, L. Moschkowitz and H. Sprinz.


A case of a stenosing and ulcerated, hornifying squamous-cell carcinoma of the esophagus in a Nyla antelope is presented. This is of special interest because of the rare occurrence of esophageal neoplasms in animals. A photograph and a photomicrograph are included and references are added.

A Cytological Study of the Effect of Colchicine on Plant Tumors, H. Dermen and N. A. Brown.


Tumors produced in two varieties of marigold by Bacterium tumefaciens were killed by applications of colchicine. Immediately following the applications there was an apparent stimulation of growth but following this the tumors became shrunken and discolored and eventually died. Observations showed that the apparent growth and subsequent death of the tumors were associated with excessive polyplody in the meristematic cells, resulting in large nuclei and enlarged cells which failed to divide and increase numerically. The reaction of plant tumors to colchicine thus differs from that of animal tumors. While in the former the effect is to inhibit cell division without inhibiting chromosome multiplication, perhaps affecting the cytoplasm alone, in the latter both cytoplasm and chromosomes appear to be affected.

Photomicrographs are included and there is a review of the literature on colchicine, with a bibliography.
CHEMICAL STUDIES


In contrast to the inhibition of growth of helianthus seedlings the lesions produced in this plant by B. tumefaciens were stimulated by the aroma of a fresh apple. The author alludes to an experiment demonstrating the lack of effect of apple odor on a transplantable mouse cancer. Photographs and photomicrographs illustrate the plant changes. MILTON J. EISEN

CHEMICAL STUDIES


In this supplement to their earlier paper (Ztschr. f. physiol. Chem. 258: 57, 1939. Abst. in Am. J. Cancer 38: 116, 1940) the authors first answer Chibnall’s criticism (Nature 144: 71, 1939. Abst. in Am. J. Cancer 38: 117, 1940), showing that the method which the latter author and his collaborators employed is an unsatisfactory procedure for the separation of the d-form of glutamic acid. The authors also mention a personal communication from Dr. S. Graff stating that he was able to obtain l (+)-glutamic acid from only six tumors, but they believe that this is due to the fact that he used barium salt as a preliminary precipitant just as Chibnall used a calcium salt.

The authors grant that the mere depression of the optical rotation of an amino-acid is not an absolutely satisfactory technic because of the possibility that this depression may be due to unrecognized impurities of the opposite rotatory power. For this reason they have attempted to obtain pure l- and d-glutamic acid. They have prepared pure d-glutamic acid according to F. Ehrlich’s method (Biochem. Ztschr. 63: 379, 1914), using as a source material the glutamic acid extracted from the Brown-Pearce tumor. An attempt to separate the acids by picking out the crystals was not satisfactory.

Details concerning the various methods for the separation of the acids are given, but nothing important is added to the previous investigations.


This paper contains nothing especially new except detailed analyses of some uterine myomata, from one of which no glutamic acid could be isolated. In another the amount of the d-form was only 1.7 per cent, which is about the limit of sensitivity of the method.

Much of the paper is taken up with general discussions and laboratory records of recently conducted analyses, which record certain improvements in the technic of separation of the amino-acids.


The author digested the proteins extracted from a fibrosarcoma with pepsin and trypsin, and found that the tumor cells were easily digested by these ferments. Hence the suggestion of Kögl and Erxleben that tumor cells because of the d-configuration of the tumor proteins are resistant to digestion is not supported. It is well known, however, that d-peptides are not split by such ferments.


Cholesterin esters of fatty acids other than butyric acid did not protect cancer cells against the lytic action of normal serum. (For the author’s account of the protective
action of cholesterin butyrate see Absts. in Am. J. Cancer 33: 135, 1938; 34: 293, 1938; 35: 584, 1939.)

Milton J. Eisen


Cholesterin butyrate is believed to be synthesized in the blood and organs of cancer patients by the action of a specific esterase on cholesterin and butyric acid. This reaction does not occur in the normal organism, since butyric acid is previously acted upon by a dehydrase. In the cancer patient this dehydrogenation process is inhibited by some specific factor formed perhaps in the malignant cells.

Milton J. Eisen


Sixty-three human tumors were studied, including malignant and non-malignant neoplasms, and those of epithelial and of connective-tissue origin. Four different microchemical methods were employed for the demonstration of fats. These were Kawamura-Yasaki’s new Sudan technic, staining with Nile blue sulfate, polarization microscopy, and Cicaccio-Kawamura-Yasaki’s new Sudan method. With the exception of a mammary adenoma, a part of the fat substance in living tumor cells was found always to occur in the form of granules or droplets.

W. Nakahara

Etiology


The study of the relation of the ovarian hormone to tumor growth has been approached by two routes: (1) hormone studies in tumor patients and in animals with spontaneous neoplasms; (2) the results of injection of excessive quantities of the hormone in normal animals and in those bearing transplantable or spontaneous tumors. The work that has been done along these lines is reviewed and the author reaches the following conclusions: “First, there exists ample evidence to show that immense quantities of the estrogenic substance when given to laboratory animals produce a series of changes including proliferation and metaplasia of specific tissues, some incidental inflammatory processes, and various reactions in certain endocrine glands. Second, there can be found a series of lesions in human pathology which are perhaps, even probably, analogous to the experimentally produced estrogenic lesions in animals. The final proof that the latter are also due to estrogenic stimulation depends on the demonstration of some excessive activity of the estrogenic hormone in man. This has not been satisfactorily accomplished, however, for any human lesion with the possible exception of endometrial hyperplasia. For the other conditions the evidence, outside of that offered by their morphologic similarity to the estrogen-produced lesions in animals, is simply suggestive.”

A bibliography of several pages is furnished.

General Clinical and Laboratory Observations


The author analyzes 64 consecutive examples of malignancy in children under thirteen years of age seen by him. The types follow fairly well the distribution observed in larger series, with the exception that in this series the frequency in the kidney is highest, whereas in larger collections neuro-epitheliomas of the eye are the most frequent tumors. Such differences are unimportant and depend merely upon the sampling of the patients entering the hospital.

All of the ordinary types of congenital tumor were observed. In addition there were 10 primary tumors of bone, including a reticulum-cell myeloma (Ewing tumor)
and osteogenic sarcomas of the left femur and of the clavicle. There were 5 retroperitoneal lymphosarcomas, 2 primary carcinomas of the liver, 2 so-called embryonal carcinomas of the ovary, and a primary carcinoma of the thyroid. One of the most interesting tumors observed was a cyst of the third ventricle in a girl with well marked pubertas praecox. It would be natural to assume that the tumor was of pineal derivation, but the author thinks that this can be disproved and that the sex syndrome was due entirely to the involvement of the third ventricle. He quotes three reports on the subject, though in all these the patients were males. There are nine roentgenograms illustrating the various tumors, and a photograph. An excellent bibliography is appended.


A statistical study of various structural anomalies in the internal organs in the presence of carcinoma and sarcoma. The anomalies considered are an abnormally long appendix, extralobulation of the lung and of the spleen, accessory spleen, abnormal folds and lobulations of the liver, variations in the size of the aorta and the weight of the endocrine glands. Generally speaking structural anomalies were more frequent among sarcoma patients than among those with carcinoma, indicating, according to the author, that a constitutional or tissue inferiority may be associated with sarcoma.

W. NAKAHARA


The author suggests that the prognostic significance of the microscopic structure of a tumor may be expressed numerically by a correlation with its tendency to produce metastases. As an illustration the autopsy records of 120 cases of breast cancer are utilized. Tumor extension occurred by continuity, by the lymph stream or by the blood stream (designated as \(c\), \(l\) and \(h\)). A so-called malignancy index (\(M\)) was constructed by multiplying the percentage of each tumor type giving rise to the three methods of extension by the factors \(1\), \(2\), and \(10\) chosen arbitrarily as indicative of the relative importance of direct infiltration, lymphatic and hematogenous metastases respectively. The sum of the resulting three numbers is then divided by 100. Thus,

\[
M = \frac{c + 2l + 10h}{100}
\]

If, for example, in a single group all cases should show the three forms of tumor extension, the result numerically would be represented as \(M = \frac{100 + 200 + 1000}{100} = 13\).

There were 70 instances of carcinoma simplex, 26 of a glandular type, and 14 of scirrhous cancer. The malignancy (\(M\)) of the three types was 9.2, 9.6 and 9.4. A comparison is made with more commonly employed grading methods based on histologic criteria.

Photomicrographs illustrate the tumor types described. A bibliography is appended.

MILTON J. EISEN


The intrinsic structural individuality and the degree of differentiation of cancer metastases are to a large degree determined by the morphology of the primary growth. A comparison of a representative number of histologic sections of the primary tumor and metastases in 10 cases each of breast and gastro-intestinal cancer disclosed a correspondence of structure to the original tumor in 83 per cent of 303 metastatic foci. In 2 cases of breast cancer differences not indicating an essential structural change were observed.
Growths consisting of scirrhus and solid areas of tumor produced 15 metastases in which only the latter arrangement occurred. Three tumors gave rise to secondary foci of somewhat greater differentiation. In the case of gastro-intestinal cancer, tumors of combined solid, glandular and scirrhous elements reproduced only one type of neoplastic tissue in 74 metastases. Greater or lesser degrees of differentiation, as compared to the primary tumor, were observed in 35 metastatic foci. There are no illustrations.

Milton J. Eisen


Necropsy in a man of fifty-three years with chylous ascites secondary to an inoperable cancer of the stomach disclosed generalized lymphogenic metastases in the cervical, thoracic, and abdominal organs secondary to carcinomatous obstruction of the thoracic duct caudal to its juncture with the left subclavian vein. No evidence of hematogenous metastasis was observed. Photomicrographs are reproduced. Milton J. Eisen


Supplementing their studies on pooled urines (Am. J. Cancer 35: 50, 1939) the authors studied individual specimens from 92 cancer patients and 91 non-cancer controls. Nineteen of each group showed a high urinary cholesterol. This cannot therefore be regarded as a general symptom of cancer, though it will be frequently found in the presence of a tumor for two reasons besides the occasional presence of secondary or concomitant kidney disease: (a) the occurrence of cachexia, in which mobilization of peripheral fat depots is temporarily accompanied by hypercholesterolemia; (b) the breakdown of tumor-affected tissues and organs and of the tumor itself, releasing stores of cholesterol from cellular structures into the blood and lymph system.

References are appended.


The authors report two examples of glomus tumor. One was a small, purplish nodule on the foreskin of a boy aged six, present since birth. The sections showed a Sucquet-Hoyer canal lined by a single layer of epithelium (see N. W. Popoff, Arch. Path. 18: 295–330, 1934). Silver stain showed reticulum in what were apparently myelinated nerve fibers. The second patient was a man twenty-five years of age who had an angiomatous lesion of the penis. He alleged that he had been injured when about fourteen years of age. The appearance of the growth was that of a solitary varix. Pressure on the lesion did not cause blanching. The mass was made up of a cluster of vascular channels lined by a single layer of epithelium. Outside of the endothelial lining were polyhedral cells which stained heavily with eosin. Silver stain showed the presence of neuroreticular material. A bibliography of recent contributions and five photomicrographs illustrate the paper.

DIAGNOSIS AND TREATMENT


For some years Břidlička has been using the polarographic method for investigating the serum of patients with carcinoma and his results have appeared in Nature 139: 330, 1020, 1937 (Abst. in Am. J. Cancer 31: 122, 123, 1937. See also Absts. in Am. J. Cancer 38: 293, 1940 and in extenso in the Acta of the International Union Against Cancer 3: 13, 1938. While the apparatus is somewhat expensive, the technic is relatively simple and rapid and can be used for clinical purposes providing the method proves to be of
real diagnostic value. The reports hitherto available have shown positive diagnoses in from 85 to 100 per cent, depending somewhat upon the localization and type of tumor.

Waldschmidt-Leitz and Mayer have been working on the subject and they believe they have improved the reaction by using instead of serum the fluid which remains after removing the proteins. This can be done with sulphosalicylic acid or with alcohol. Břdička considered that the reaction was due to changes in the sulphydryl activities of the carcinomatous serum, but if an even more characteristic reaction is obtained from serum which has been freed from protein, it is evident that this explanation is incorrect.

A long series of tables is appended to the article, but these show that while the carcinomas have given positive reactions, there are still a considerable number of other pathological lesions, especially those with fever, that also give positive tests. It is interesting to note that many, if not all, cases of pregnancy which were tested gave a positive reaction for cancer. [In other words, the reaction is connected with the growth of tissues in the body and is presumably not a specific reaction to cancer as such, a fact which has been known for many years.—Ed.]


The authors found that by mixing an extract of cancer tissue (antigen) with serum and by measuring the turbidity at the isoelectric point, cancer sera can be distinguished from non-cancer sera. The test has now been carried out on 106 cancer cases, and a positive reaction was obtained in 94 per cent.

W. Nakahara


The authors irradiated the testes of the rabbit in an attempt to elucidate differences in reactions to identical total doses of fractionated and protracted fractional roentgen radiation. At the present time the opinion is widely maintained clinically that fractionated radiation is of advantage because of its greater selectivity of action on tumor tissue. This effect is further enhanced by protraction; that is, by the administration of low intensity radiation, since under such conditions greater numbers of malignant cells are encountered in mitosis, when they are supposedly more radiosensitive. More favorable results of treatment would compensate for the greater maintenance costs of the x-ray apparatus and the increased expenditure of the patient’s and operator’s time necessarily entailed by the utilization of protracted radiation.

The experiments of Kirchhoff and Kelbling, however, offer no evidence in support of a superiority of protracted radiation. Nevertheless, the authors refrain from applying unhesitatingly the results of irradiation of a radiosensitive normal tissue, the testicular epithelium, to the biologic conditions in malignant tumors. The testes of 12 young rabbits were examined histologically after exposures to 200 to 1800 r of varying intensity. The dose on the right side was fractionated. By increasing the distance from the opposite testicle a greater length of time was required for the administration of an identical dose. The daily fraction was 200 r, measured in air, except for 3 animals that received 30 to 50 r per day. Two additional rabbits irradiated with 1800 r received identical exposures bilaterally, the dose in one being fractionated and in the other protracted as well. The physical factors were as follows: 170 to 180 kv., filter 1.2 mm. Cu + 1 mm. Al or 0.7 mm. Cu + 1 mm. Al, distance from 20 to 125 cm. depending on the intensity desired. The r per minute ratio of the fractionated to the protracted type of irradiation varied from 1 : 5.5 to 1 : 39. The extreme differences in intensity of radiation produced no differences visible histologically as gradations in changes in the seminiferous epithelium. The degree of degeneration was directly proportional, and the faculty for regeneration inversely proportional, to the total amount of radiation absorbed.
Following a dose of 1200 or 1800 r in 5 animals pronounced irreversible degenerative phenomena occurred in the seminiferous tubules. The lining cells, with the exception of residual Sertoli cells, were completely obliterated in rabbits killed four, five and thirty-three days after the final treatment. No regenerative activity was observed. A comparable effect resulted in 2 animals sacrificed eight and forty-three days following an exposure to 800 r.

Smaller doses did not exert an irreparable sterilizing action. The most sensitive cells were the spermatogonia, the earliest effect of irradiation being an inhibition of their differentiation to spermatocytes. With higher doses previously formed spermatids and spermatozoa also disappear. Two animals received 600 r. In one killed after eleven days the seminiferous epithelium showed varying degrees of depopulation of its constituent elements. No evidence of regenerative activity was demonstrable, however, in a second rabbit examined after thirty-one days. Following 200 r an early effect, namely reduction in the number of spermatogonia, was evident after five days, while in a second animal receiving this amount practically normal restitution of the lining cells of the tubules had occurred thirty-one days after treatment.

Three animals were exposed to 30, 40 and 50 r daily for a total dose of 300, 400 and 500 r respectively. The right testicle received 20 r per minute, the left 2.2 r per minute. After forty-three days the testes showed a combination of evidence of residual regressive changes and signs of regenerative activity of the spermatogonia.

[Regaud (Compt. rend. Soc. de biol. 86: 787, 1922) stated that a small amount of radium acting over a long period of time on the ram's testis was more efficacious in its sterilizing effect than larger amounts inserted for shorter periods. Regaud and Ferroux (Arch. Inst. du Radium 1: 343, 1929) reported observations on the action of roentgen rays on the rabbit's testis. They found that a single massive dose of approximately 4000–5000 R units (Solomon) had a sterilizing effect, but produced intense damage to the skin and rectum, and severe general effects. A dose of 5000–6000 R divided into 4 or 5 fractions also produced complete sterilization without giving rise to serious injury of other tissues.]

Photomicrographs are reproduced.

THE SKIN


Excellent early results of low-voltage contact roentgen therapy in 15 cases of skin cancer are tabulated. A total dose of 6500 r was administered in a period of twenty-nine days. Nine of 10 patients with basal-cell cancer and 2 of 4 with squamous-cell tumors were cured, while improvement resulted in 1 case each of basal-cell and lupus cancer and 2 of the squamous-cell type. The maximum time of observation was one and one half years. Similar treatment was employed in 5 additional cases, but no follow-up data were available.

THE ORAL CAVITY


A case of squamous-cell epidermoid carcinoma of the tongue in a girl aged fifteen years is reported. The primary lesion disappeared under radium and roentgen therapy, but a cervical metastasis proved to be radioresistant. Death occurred one year after onset of symptoms. Eight cases of cancer of the tongue in subjects of twenty years or less and 2 in newborn infants have been collected from the literature.

Photomicrographs of the author's case are included and references are appended.

THE BREAST


The author believes that the proper treatment for mammary carcinoma is radical removal with excision of the axillary nodes when these are not palpable. Seventy per
cent of five-year cures may be expected. If the nodes are involved, the five-year cure rate falls to 30 per cent. There seems to be sufficient evidence now that some improvement is possible in the more extensive types by the application of roentgen radiation both before and after radical mastectomy. The writer believes that a sterilizing dose of x-ray should be given to the ovaries in all young women who have carcinoma of the breast. [Those who have seen the transient effects of complete oophorectomy (Beatson: Lancet 2: 104, 162, 1896) will perhaps not be so anxious to place the burden of an acute menopause upon these young patients—Ed.]


After citing some of the literature on clinical and experimental material which seemed to be pertinent, the authors report the case of a white woman aged fifty who complained of a tumor in the right mammary gland. She had first noticed it three weeks before admission to the hospital. About a year and a half earlier she had consulted a physician for symptoms of weakness and fatigue following exertion. She was given 2,000 units of theelin twice a week for twenty-six weeks. Another physician continued the treatment, giving a single injection of 10,000 units of theelin followed by 2,000 units three times a week for six months.

In the upper quadrant of her right breast was a mass measuring 5 × 7 cm. It was removed and showed a carcinoma both in the tumor itself and in the axillary nodes. Microscopic sections showed a rather firm fibrous tissue with small ducts filled with carcinoma cells.

The authors are unwilling to commit themselves upon the relation of the treatment to the appearance of the carcinoma, but consider that the total dose of theelin, some 258,000 units for the year, may possibly have had something to do with the situation. Animal experimentation has shown that tumors appear in the breast of mice after prolonged administration of theelin, and it is certain that the administration of the hormone in human beings causes hypertrophy of the breast with hyperplasia of the glandular system. The same sort of therapy will also produce in the uterus hyperplasia of the glands of the endometrium which can scarcely be distinguished from carcinoma.

INTRATHORACIC TUMORS


Roentgen examination of the thorax of an emaciated, dyspneic patient revealed a dense shadow in the medial portion of the left upper lobe of the lung, interpreted as pulmonary neoplasm or aortic aneurysm. Slight pulsations were perceptible. Autopsy verified the diagnosis of bronchial cancer involving a considerable area of the adjacent lung tissue. The growth produced mediastinal metastases which infiltrated the pericardium and circumscribed the upper aorta. Roentgenograms are reproduced.

THE DIGESTIVE TRACT


The saliva of 14 patients with cancer of the stomach, 11 patients with pernicious anemia, and 14 patients with functional histamin-refractory achylia gastrica was examined prior to the introduction into the stomach of 300 c.c. of water as a gastric stimulant, during gastric activity, and in the post-secretory phase. The average values indicated a reduction in the minute volume of saliva and excretion of potassium thiocyante in all groups, while diminished chloride and diastase output was pronounced only in cases of cancer and primary anemia.
Simultaneous Occurrence of Two Types of Metastasizing Carcinoma in the Stomach,

This is a report, based on autopsy findings, of two distinct tumors present simultaneously in the stomach of a man of forty-six: an adenocarcinoma at the lesser curvature of the stomach and a medullary carcinoma at the pylorus. Each tumor was of a distinct type and each metastasized separately. Nine other examples of the simultaneous occurrence of two distinct types of carcinoma in the stomach were found in the literature.

Photomicrographs are included and references are furnished.

Gynecologic Features of Carcinoma of the Large Bowel, J. Schwartz and H. Bergman.

Of 125 carcinomas of the colon and rectum observed by the authors 9, or 7.2 per cent, simulated disease of the uterus or adnexa. In two-thirds of these cases the neoplasm was located between the sigmoid and rectum. Such tumors may gravitate into either fornix and be palpable on vaginal examination. The uterus or adnexa may become adherent to this mass, suggesting primary disease of the genital tract, or a localized abscess may develop and lead to a diagnosis of tubo-ovarian or pelvic abscess. Peritonitis due to perforation of the bowel may be attributed to a tubal infection. Summaries of the nine case histories are included.

When operation for disease of the reproductive organs unexpectedly reveals instead a lesion of the large bowel, a cecostomy may be done before transferring the patient to the abdominal surgeon, as this is a valuable preliminary step in the surgical management of these cases.


The operations mentioned in the title are described and illustrated by drawings. They offer a choice of procedures which can be applied to almost any growth of the bowel below the level at which a Mikulicz operation can be performed.

In a series of 40 women in which a one-stage procedure was done there were 6 operative deaths. Four of these the author believes might have been prevented. In the other 2 the condition was inoperable and surgery should not have been attempted. The end-results are given as follows:

"Without separating the palliative operations, among all the patients operated, 7 out of 11 (63.6 per cent) lived five years or longer; 11 out of 17 (64.8 per cent) lived four years or longer, and 12 out of 20 (60.0 per cent) lived three years or longer."

THE PANCREAS


Among 1,861 post-mortem examinations pancreatic tumors were found in 43. In 32 the tumor had originated in the head, in 5 in the body; and in 6 in the tail. No jaundice was present in half of the cases. Distant metastases were found in 33 of the 43 cases. Eleven of the tumors were derived from the duct epithelium and 20 from the parenchyma. A bibliography is appended and the report is illustrated by a gross picture and a photomicrograph.

THE SPLEEN

Case of Splenoma, H. Tokugawa. Über einen Fall von Splenom, Gann 33: 429-434, 1939.

What appears to be a case of splenoma, rather than of a nodular hyperplasia in the spleen, has been described in a nineteen-year-old girl. Histologically the growth was
referable to the medullary or the Pick type, and was different from the follicular or the Schrindle type. Details of clinical and pathological findings are given.

W. Nakahara

THE FEMALE GENITAL TRACT

Causes of Vaginal Bleeding and the Histology of the Endometrium after the Menopause,

Postmenopausal bleeding may be due to malignant or benign tumors or to inflammatory disease or it may be functional in character. In a series of 406 patients with a history of vaginal bleeding after the menopause, 259, or 63 per cent, had some form of malignant growth, while in 67, or 17 per cent, benign tumors were present. The malignant growths included carcinoma of the cervix, corpus, vagina, vulva, and ovaries, granulosa-cell tumors, and uterine myosarcoma. The benign tumors were fibromyomas, ovarian tumors, cervical and endometrial polyps, and urethral caruncles.

Photomicrographs showing the endometrial histology are reproduced and a bibliography is included.


Of 738 examples of uterine bleeding unrelated to pregnancy, 340 were due to fibromyoma, 175 to endometrial hyperplasia, 68 to fibrosis uteri, and 28 to malignant neoplasms. The patients with fibromyomata were most frequently treated by supravaginal hysterectomy, but the author believes that in older patients radium insertion is the procedure of choice except for the larger growths and those undergoing degenerative changes or associated with inflammatory disease of the pelvis. Myomectomy should be done in younger women. Curettage alone or with radium insertion gave excellent results in the group with endometrial hyperplasia and curettage and radium in those with fibrosis uteri. No mention is made of treatment in the group with malignant growths.


Trained personnel, radium, and an adequate roentgen apparatus are generally lacking for the treatment of cancer in a small hospital. Surgical measures are usually resorted to. The author reports satisfactory results of therapy of 105 patients with uterine tumors. Included in the series are 2 cases of early carcinoma of the cervix cured by curettement and 1 case of vaginal cancer. Radical extirpation was performed in 11 of 12 patients with cancer of the body of the uterus. One patient died postoperatively, 4 at a later date, probably of tumor, and 5 were cured. Vaginal or abdominal resection was employed in the treatment of 55 of 90 patients with cervical cancer, and 15 were cured after five years. A considerable number of the 35 patients with cervical tumors treated by non-surgical, apparently palliative, measures or admittedly incomplete roentgen therapy died within one year and none was alive five years later.

Milton J. Eisen


Lipoma of the uterus is rare. Lund (New England J. Med. 208: 536, 1933. Abst. in Am. J. Cancer 20: 243, 1934) reported a case and furnished references to the German literature. The authors' patient gave a history of a radical mastectomy for mammary carcinoma with axillary node involvement fifteen years earlier. Hysterectomy was done for extreme procidentia and the uterus was found to contain a lipomatous tumor containing adenomatous and acanthomatous areas. The three types of neoplastic tissue showed no tendency to merge into one another and the authors suggest a multicentric origin from various heterotopia. Photomicrographs are reproduced and references are appended.

A woman of thirty-three years in the fifth month of pregnancy had a hard tumor in each breast and two indistinct pelvic masses suggesting the possibility of twin fetuses. Because of incontrollable vomiting, pregnancy was terminated and the patient died six hours later. The necropsy findings were diffuse carcinoma in the stomach wall, a large Krukenberg tumor replacing the left ovary, with characteristic signet-ring cells; small groups of similar cells in the right ovary; metastatic lesions in both breasts, the fallopian tubes, and pancreas. Three photomicrographs are included.


A search of the literature reveals only 27 reported cases of tumors of the theca interna of the ovary. The authors report three additional cases.

The tumor occurs most frequently after the menopause, between fifty and sixty years of age. In the sexually active woman the usual symptom is menorrhagia, although there may be alternating periods of amenorrhea. The usual irregularity of the menstrual cycle at the menopause makes the diagnosis of this tumor a difficult matter at this time. After the menopause, vaginal bleeding may occur and in some cases may closely simulate the normal cyclic menstruation. In most patients the only symptoms are slight lower abdominal discomfort and pelvic pressure.

The tumors vary in size from that of a cherry to an orange. Usually they are regular, round and firm, with occasional small cystic areas of degeneration near the surface. They bear a striking resemblance to the ovarian fibromas and are invariably free from adhesions to neighboring structures.

Paraffine sections show multiple streaks coursing through the growth. Some of these are rich in fusiform fibroblastic cells with little surrounding collagen, while others are rich in collagen and poor in cells. The more cellular portions may be mistaken for sarcoma. In frozen sections stained with Sudan there is a fine stippling due to intracellular lipoids. The stroma contains little or no lipoid. In most instances the lipoid droplets are doubly refractive, although the authors have not been able to demonstrate this in all their cases. It is generally agreed, however, that the lipoid substance is composed of cholesterol esters.

During the maturation of the normal follicle, the granulosa cells are separated from the theca interna by a basal layer called the membrane of Slavianski. The cells of the theca interna in contrast to the granulosa cells are vascularized and rich in cholesterol esters. These morphologic observations support the theory that the theca interna gives rise to these tumors.

Aschheim and Zondek have shown that implantation of only granulosa cells does not produce estrus in castrated mice, whereas a positive result is obtained when the theca cells are included. Other similar observations seem to indicate that the theca interna furnishes the follicle hormone. Clinically, a neoplasm of the theca interna produces a syndrome of hyperfolliculinism.

The authors aim to separate the granulosa-cell tumors from those of the theca interna. Although they are functionally similar, their histologic structure is definitely different.

Simple oophorectomy is the treatment of choice and is followed by cure in nearly all cases. The tumor is benign and the presence of a small amount of ascites is not incompatible with this concept.

WM. MENDELSOHN


A single case report of a corpus luteum cyst whose only interest is its size. The growth measured about 11 cm. in diameter. The menstrual periods had been greatly diminished since the appearance of the mass, presumably because of excessive lutein hormone.
THE GENITO-URINARY TRACT


An embryonal rhabdomyochondro-adenosarcoma of the kidney is described in a child of three years. The involved organ, containing a large tumor measuring 21 x 15 x 13 cm. and several smaller masses, was removed, but the patient died of a recurrence five months later. Photomicrographs and a review of the literature are included.

Milton J. Eisen


A general clinical dissertation on the diagnosis and treatment of prostatic cancer.

Milton J. Eisen


Some 247 tumors of the spermatic cord have been recorded, about 70 per cent being benign and 30 per cent malignant. Lipomas are the most frequent and in decreasing frequency are sarcomas, fibromas, dermoids, angiomas, and myomas. The authors report a neurofibroma of the epididymis and cord in the testis. The tumor had been noticed by the patient six years before operation. Neurofibrils could not be demonstrated. No further record of the case is given.

Milton J. Eisen


Orchidectomy was performed in a thirty-year-old man for a polymorphous-cell sarcoma arising in the tunica vaginalis seven months following a bilateral vasectomy. A recurrence and abdominal metastases developed three months later. A photograph of the tumor and 3 photomicrographs are reproduced.

Milton J. Eisen

THE NERVOUS SYSTEM


The characteristic clinical syndrome of pituitary basophilism with a fatal outcome is described in 2 patients, a man aged twenty-seven and a woman aged thirty-five. Terminal pneumonia, complicating cardiac insufficiency, and cerebral hemorrhage were the immediate causes of death. No consistent improvement had followed earlier roentgen irradiation of the hypophysis. Necropsy disclosed in the first case a hypophysial basophilic adenoma extending from the anterior into the posterior lobe and in the second irregular adenomatous nests of degranulated cells, believed by some authors to represent fetal elements, in the two lobes. Hypertrophy of the adrenal cortex was present in both cases. Photographs of the first patient, photomicrographs, and a bibliography are included.

Milton J. Eisen

THE BONES


The author has studied the results in 258 cases of osteogenic sarcoma selected from the Bone Registry of the American College of Surgeons. Only 8 per cent of the patients survived early amputation and 29 per cent survived later amputation. In this series early amputation was fatal even when the degree of malignancy of the tumor was not great. This, of course, is in absolute contradiction to all current notions of the necessity for prompt treatment of a malignant tumor and Ferguson throws up his hands, so to speak, with the statement that there is no rational explanation of these findings, except that early amputation is fatal.
He then plunges into highly theoretical assumptions that tumor cells are discharged into the blood stream more or less constantly in osteogenic sarcoma and that these free tumor cells are aided to develop by the trauma produced by amputation, but not by the trauma produced by biopsy, incision, curettage, or excision. More theory follows in the statement that the cells of an osteogenic sarcoma tend to differentiate more during quiet periods of the tumor, but the less-differentiated cells do most of their multiplying in the more active periods. The less-differentiated, actively multiplying cells require less aid to leave the blood stream and go into the lungs where they can grow to form metastases. 

The early months of osteogenic sarcoma are always an active period. Later, there is at least some chance that the time selected for amputation is a quiet period during which the free tumor cells in the blood stream require greater aid than is offered by the amputation to enable them to leave the blood stream and to locate in the lung tissue. Hence late amputation offers a better chance of survival than does early.

Ferguson says further: "Radiation is useful in creating a proper time for amputation, in that it tends to reduce the more virile cells to a less virile state in which they are less apt to be able to form metastases in the lungs at the time of amputation." [It is interesting in this connection to note that if a carcinoma of the breast in a mouse is given radiation just short of the killing dose for all the cells of the tumor and the tumor is then massaged, metastases will form in the lungs, so that a reduction of virility is not sustained by experiment.—Ed.]

The author also recommends the insertion of bone chips or grafts after an osteogenic sarcoma has been excised, "as these chips occupy space which would otherwise be partly occupied by blood clot, and fibrin nourishes or stimulates fibroblastic cells." [This is not shown in tissue cultures.]

[It would be well to give more study to this problem on material which is not so highly selected as that of the College of Surgeons Registry and also to study osteogenic sarcoma experimentally in animals—since it is now possible to produce these tumors—to see whether such investigations under optimum control will confirm the clinical records.—Ed.]


A vertebral chordoma of characteristic histologic structure was an incidental necropsy finding in a man of sixty-five years who died of urinary sepsis following the extirpation of a hypertrophied prostate. The tumor was situated in the posterior region of the bodies of the twelfth dorsal and first lumbar vertebrae, extended into the spinal canal, and infiltrated the psoas muscles laterally. A photograph of the vertebral column, 3 photomicrographs, and a review of 21 comparable cases recorded in the literature are included.

RETICULO-ENDOTHELIAL TUMORS; LEUKEMIA; CHLOROMA


The author presents a system of classification of tumors of the reticulo-endothelial system, based on his own experience as well as the published work of others. The principle of classification rests upon the view that hematopoietic tissue consists only of the myeloid and lymphatic systems, and that the reticulo-endothelial element cannot be regarded as a third independent system. This latter is only a supporting tissue of the true hematopoietic systems and must be given a subordinate position. The author designates reticulo-endothelium in the myeloid and lymphatic systems as blood reticulo-endothelium and lymphreticuloendothelium, respectively.

Tumors of the reticulo-endothelium, i.e., the supporting tissue of the myeloid and lymphatic systems, may be classified as follows: myeloid reticuloma, myeloid reticulomatosis, myeloid reticulosarcoma and myeloid reticulosarcomatosis on one hand (tumors of blood reticuloendothelium), and lymphatic reticuloma, lymphatic reticulomatosis, lymphatic reticulosarcoma, and lymphatic reticulosarcomatosis on the other (tumors of lymph reticuloendothelium).

W. Nakahara
RETICULO-ENDOTHELIAL TUMORS; LEUKEMIA; CHLOROMA


A clinical and pathological report of a case of reticulosarcomatosis of a twenty-five-year-old man. The primary growth was situated in the right side of the neck, with extensive metastases in the lymph nodes in various parts of the body, in the subcutaneous tissue and muscles of the neck and chest, and also in the lung and kidney. The growth of the tumor tissue in lung and kidney was infiltrative.

W. Nakahara


The successive occurrence of fatal acute myeloblastic leukemia is recorded in two sisters at the age of sixty years.

Milton J. Eisen


Six cases of lymphatic leukemia first manifested by signs of localized tumor are described. The first patient had a tonsillar mass excised as a primary undifferentiated carcinoma, the second a mammary tumor which proved to be of leukemic origin following histologic examination of the extirpated breast [cf. case of McWilliams and Hanes: Am. J. M. Sc. 143: 518, 1912], the third and fourth circumscribed masses in the neck and axilla respectively, the fifth leukemic infiltration about the spinal cord giving rise to transverse myelitis, and the sixth a large mediastinal tumor.

There are no illustrations. References are appended.

Milton J. Eisen


Details are recorded on the platelet changes in 10 cases of chronic myeloid aleukemic leukemia. The platelets are practically always reduced in number although normal counts may be observed in early stages of the disease. In late stages, as the invariably fatal outcome approaches, a relative increase in the round type of thrombocyte occurs, in contrast to a previous excess of elongated forms. Hemorrhagic manifestations are common.

Milton J. Eisen


Chloroma is accepted by the author as a true neoplasm, an unusual form of myelogenous leukemia, bearing the same relation to that disease as lymphosarcoma to leukemia of the lymphatic type. Localized growths of myeloid elements and myelogenous leukemia, progressing rapidly to a fatal termination are the outstanding features of the disease. The underlying pathologic character consists in primary hyperplasia of bone marrow which may produce masses of immature white blood cells beneath or in the periosteum of the flat bones with metastases through the blood-stream to distant tissues. The hyperplastic areas in the bone marrow increase in size and the bony trabeculae become rarefied. If they break through, they produce flattened, greenish tumors over the inner surface of the skull, the vertebrae, and the rib. The cause of the green color of the tumors has not definitely been determined. The disease occurs more frequently in children than in adults.

The patient was a boy of four years with left exophthalmos as the first symptom. A tumor was discovered in the left orbit and later a similar mass appeared in the right orbit. The white blood count was 32,000 with 82 per cent myelocytes. Both tumors were removed and roentgen therapy was given over the parietal regions. In spite of this there were recurrences in both eyes less than three months after the original operation. One of these was removed and proved to be identical pathologically with the original tumors. Death occurred a month later. Autopsy showed a heavy infiltration
ABSTRACTS

of a greenish-yellow tumor over the vertebral periosteum of the thoracic and midthoracic lumbar region. On cut section the tumor was firm, and of a dirty yellow-green color with hemorrhagic and necrotic foci. In appearance this tumor was identical with those primarily removed from the orbits. There was some lymph node enlargement.

A detailed hematologic study is included, showing the response to irradiation and transfusions. Pictures of the child and of the tumors, roentgenograms, and a blood chart are included. References are furnished.

PUBLIC HEALTH


A lecture in general terms on the organization of cancer control in Belgium.

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