HEMATOPOIESIS and COMPARATIVE HEMATOLOGY


Most of the experimental work on radiation has been carried out on mammals, consequently it was thought that a study of cold blooded animals might aid in clarifying the influence of low body temperature and metabolism on the effects of irradiation. The 109 box turtles used in these experiments were exposed to whole body x-irradiation with doses ranging from 500 to 10,000 r on survival. Within 7 days after x-irradiation, irrespective of dosages, leucocyte counts dropped below 16,000/cu.mm. and in approximately 2 weeks the counts were between 5,000 and 10,000/cu.mm. The normal range for this species is 28,000 to 48,000/cu.mm. Thrombocytes and lymphocytes were the most resistant cells. No significant differences between erythrocyte counts, hematocrit and hemoglobin content was noted during the first 2 weeks post-irradiation. After x-irradiation with 3,000 or 6,000 r the bone marrow showed a marked cellular depletion, particularly of the granulocytes, and after 10,000 r there was a disappearance of nearly all marrow cells. In the spleen there was a complete absence of granulocytes and a disappearance of the periarterial collar of lymphoid cells. Apparently the erythrocytes of the turtle are quite resistant to x-irradiation.—O. P. J.


Male mice weighing 20 to 25 Gm. were adrenalectomized and implanted subcutaneously with a 15 mg. pellet of desoxy Corticosterone acetate, then pretreated with 20 μg. of epinephrine, and then (4 hours later) massaged with cortisone ointment or with sesame oil. The ointment contained 25 mg. of cortisol acetate per Gm. and 4 mg. of the ointment was massaged in a single dose. A marked eosinopenic response occurred one hour after treatment, reached a maximum from 4 to 6 hours, and returned to normal in 20 hours. The controls showed no response.—R.C.C.


The authors checked the plasma staining sometimes observed in the ordinary giemsa blood smear. It consisted of a light blue “film” connecting the red cells, and may be found in malignant diseases, liver cirrhosis, anemias and infectious diseases. It is proved that the phenomenon indicates a plasma dysproteinemia, especially in the globulin fraction.—C.M.
ABSTRACTS

IRON and HEMOGLOBIN METABOLISM


Experiments are described in which dogs were subjected to: (1) hypotension and intravenous infusion of either oxyhemoglobin or methemoglobin (2) unilateral renal anoxia both with and without hemoglobinemia. The renal damage produced by anoxia alone was minimal or absent, whereas severe but recoverable renal damage was produced by the combination of hemoglobinemia and hypotension or anoxia.

These findings are in accord with clinical and experimental observations in the human. The authors employed serial biopsies in order to determine the sequence of pathologic lesions. They suggest that the lesions closely resemble those seen in humans after similar events.—T.R.T., Jr.


Serum iron determinations were performed in 60 cases of acute viral hepatitis: 50 normal males, 10 cases of obstructive jaundice, 15 cases of portal cirrhosis, 12 cases of “chronic” hepatitis and 4 cases of fatty liver. The mean for the normals was 130 γ per 100 ml., with a range of 70 to 180 γ per 100 ml. Fifty-five of the 60 cases of acute hepatitis had serum iron levels above 200 γ per 100 ml., and only one fell within the normal range. The majority of the other cases were below 200 γ per 100 ml., and all were below approximately 210 γ per 100 ml. The majority of cases of acute hepatitis were well above this range, the mean appearing to be near 300 γ per 100 ml.

The mechanisms by which this may be brought about are discussed.—T.R.T., Jr.


The authors studied 7 cases of hemochromatosis proved by liver biopsy, employing the intravenous iron tolerance test. They reaffirm that the 5 minute specimen of the 10 mg. intravenous iron tolerance test represents the total iron binding capacity (TIBC). Their procedure included the following sequence of events: serum iron on fasting specimen; injection of 10 mg. of iron intravenously; a 5 minute sample and a 120 minute sample for determination of changes in the serum iron after injection.

It is pointed out that the ratio of the decrease in the serum iron level between the TIBC and 120 minute samples (DEC) to the increase, viz., TIBC fasting level before injection of iron (INC), averaged 0.26 for normals and 2.09 for patients with hemochromatosis. This is merely a convenient manner of expressing the facts: (1) that in hemochromatosis the serum iron need not be very high, but is at a level close to TIBC; and (2) that although the tissues are also saturated, the DEC remains at or near normal levels. On this basis the authors suggest that in hemochromatosis there is an increased tissue affinity for serum iron as well as an increased absorption of iron from the gastro-intestinal tract.—T.R.T., Jr.

THE RELATION OF OXYGEN UPTAKE TO HEMOGLOBIN SYNTHESIS. J. E. Richmond, K. I. Altman and K. Salomon. From the Departments of Radiation Biology and Biochemistry, University of Rochester School of Medicine and Dentistry, Rochester, N. Y. Science 113: 404-405, 1951.

Bone marrows of normal rabbits and of rabbits exposed to 800 r of x-rays were removed at varying times after exposure. Oxygen consumption determinations were made on these homogenates. It was found that hemin synthesis and oxygen consumption decreased in a parallel manner in homogenates from bone marrows removed immediately after radiation,
and reached a minimum about one week after exposure. Globin synthesis also increased after radiation but reached a maximum 48 hours after radiation, a time when oxygen consumption reaches a minimum.—R.C.C.

VITAMIN $B_{12}$ AND FOLIC ACID

Since the isolation of vitamin $B_{12}$ in 1948, numerous forms of the vitamin have been reported. Although $B_{12}$ and $B_{12a}$ are identical, $B_{12}$, is a more highly oxygenated form. All of these seem to have the same biologic activity when measured by animal growth responses. This is a report on characteristics of a material isolated from the feces of rats fed a corn-soybean meal diet supplemented with cobalt-sulfate. Although it has growth-promoting properties for *L. leichmannii* and chicks, it is inactive in this respect for the rat. The chromatographic pattern and absorption spectrum of the material are not identical with those of vitamin $B_{12}$.—P.F.W.


In the hope that some of the gastric juice intrinsic factor may leave the body in the urine of normal persons, the authors tried the simultaneous oral administration of vitamin $B_{12}$ in 30 $\mu$g. daily doses and urogastrone in doses of 0.15 Gm. daily on a typical case of pernicious anemia showing signs and symptoms of combined system disease. The dialyzed polysaccharide urogastrone failed as a potentiating factor for orally administered vitamin $B_{12}$.

Subsequently, the case responded well both hematologically and neurologically to the oral use of folic acid in 5 mg. doses three times a day plus the parenteral administration of vitamin $B_{12}$ in 30 $\mu$g. daily doses. The case proves that folic acid can be administered safely to pernicious anemia patients showing nervous system involvement if vitamin $B_{12}$ is given parenterally at the same time and that urogastrone does not contain Castle's intrinsic factor.—R.M.S.


High dosage of folic acid (but not of citrovorum factor, thymine and thymidine) inhibited the growth promoting effect of vitamin $B_{12}$ on *L. leichmannii*. It is suggested that they may be a mechanism in the stomach of patients with pernicious anemia by which citrovorum factor is oxidized to a substance similar to folic acid, by which vitamin $B_{12}$ and vitamin C are destroyed. The results might explain the development of neurologic symptoms and the effect of aureomyein treatment of pernicious anemia.—C.M.

INFLUENCE OF VITAMIN $B_6$ (PYRIDOXINE) AND FOLIC ACID ON THE TOXIC BENZENE NEUTROPENIA. H. Dubois-Ferriere. From the Medical Faculty of the University of Geneva, Switzerland. Schweiz. med. Wehnschr. 1235, 1951.

Treatment of 6 cases with moderate benzene neutropenia by pyridoxine (0.30 Gm. weekly) showed a marked increase in the leukocyte count within 2 weeks, whereas 5 control cases treated with folic acid did not show any response.—C.M.

LEUKEMIA and LYMPHOMA

ABSTRACTS

An unusual case of visceral cryptococcosis without central nervous system involvement in a 25 year old male is reported. The true nature of this illness was not suspected until autopsy because of the diagnosis of myelogenous leukemia made six months prior to death. Autopsy material, however, failed to show leukemic infiltrations.

While the clinical and hematologic findings in this patient were characteristic of leukemia, the clinical course and response to treatment were atypical in certain respects for even a case of chronic myelogenous leukemia in an acute exacerbation. These points are well discussed.

The obvious possibility of a leukemoid reaction to the cryptococcal infection is raised but in this instance it appears more likely that the patient actually had leukemia. In view of the not too infrequent association of leukemia and cryptococcosis and bearing in mind the susceptibility of the leukemic process to various chemical and infectious agents, it is interesting to speculate how far the leukemic state was influenced in this patient by the cryptococcal infection.—H.W.B.


This is the report of a 64 year old white woman developing agranulocytosis in regular three week cycles. The low counts were frequently associated with fever, prostration and stomatitis. Removal of a 670 Gm. spleen seemed to decrease the severity of the cyclic episodes. Following a massive gastric hemorrhage an autopsy revealed generalized lymphosarcomatosis.—P.F.W.


The clinical courses of 2 series of patients with Hodgkin's disease were compared. One series received radiotherapy alone and the other series received both radiotherapy and nitrogen mustard. It was concluded that the addition of nitrogen mustard to the therapy regimen did not modify the duration or the life expectancy of the disease. However, the amount of time necessary for effective radiation therapy was reduced when nitrogen mustard was also given. Improvement followed 78 percent of the courses of nitrogen mustard.—P.F.W.


Five cases are studied. Beside the well known features of the disease (occurrence in young adults and boys, radiological osseous holes, rarity of eosinophilia in the peripheral blood, lack of humoral disturbances, benign evolution with possible recurrence), the authors point out the great interest of bone aspiration with a bone marrow needle. The May-Grünwald-Giemsa staining shows not only the eosinophils but demonstrates very easily large histiocytes with a foamy appearance. The histologic diagnosis of the disease is more easily made on stained smears than on histologic sections. The nosology of the disease is discussed as is its relationship with Schuller-Christian disease, with osseous xanthomas and with Letterer-Siwe disease. They do not find any specificity in the histologic aspect and believe that all the intermediary forms of reticulopathies may be met, with eosinophilic granuloma at one end, and Letterer-Siwe disease at the other end.—J.P.S.


The authors tried As 76 (radioactive arsenic) orally in 2 cases of Hodgkin's disease with special skin manifestations. One patient had complete remission even 15 months after application. Two patients with mycosis fungoides showed marked improvement of the skin.
HEMORRHAGIC DISEASE and BLOOD COAGULATION

INFLUENCE OF THE PHYSIOLOGICAL BLOOD CLOTTING PROCESS ON THE COAGULATION OF BLOOD BY STAPHYLOCOAGULASE. M. Tager and A. L. Lodge. From the Department of Microbiology, Western Reserve University School of Medicine, Cleveland, Ohio. J. Exp. Med. 84: 79-85, 1951.

While there is good evidence to show that staphylocoagulase action and normal blood coagulation are two distinct clotting processes, recent observations have suggested that the plasma factor with which staphylocoagulase reacts, so-called “C.R.F.,” may be actively influenced by normal blood coagulation. Marked alterations in the C.R.F. content of sera have been noted frequently during the course of various experiments, whereas plasma C.R.F. titers have remained constant.

The series of experiments described in this report show that conversion of plasma to serum results in a variable loss of the C.R.F. of plasma; that this loss is not due to adsorption on the fibrin clot; and that it is definitely related to prothrombin conversion. Maximal C.R.F. loss occurred during conditions favoring the most effective prothrombin conversion and conversely, this loss was reduced by the presence of factors interfering with prothrombin conversion. Of possibly practical application is the observation that in the presence of an adequate concentration of calcium, thromboplastin and prothrombin, C.R.F. loss reflects the amount of prothrombin conversion-accelerating substances present.

These data suggest that while the functions of C.R.F., other than its reaction with staphylocoagulase, remain obscure, it may have greater physiologic or pathologic significance than heretofore realized.—H.W.B.


The third recorded case of parahemophilia has been presented. The following characteristics were noted: a prolonged silicone tube coagulation time, a prolonged one-stage prothrombin time on undiluted plasma corrected by the addition of normal prothrombin-free plasma, normal prothrombin content, deficient prothrombin conversion and deficiency of factor V. Screening of the patient’s immediate family failed to reveal any coagulation disorders. The factor V deficiency in this patient produced a mild hemorrhagic tendency which was readily controlled by transfusions of fresh blood.—T. R. T., Jr.


The results of splenectomy in 68 patients with idiopathic thrombocytopenic purpura are reviewed. Seventy-two per cent of the patients were followed for 4 years or longer and the longest consecutive follow-up was 24 years.

Forty-nine patients (72 per cent) were benefited materially by splenectomy. The majority of successful outcomes occurred, however, in patients who were operated on before the age of 31.

The importance of careful search for accessory spleens is discussed. Accessory spleens were found at the time of splenectomy in 17 cases in this series. While a recurrence could not be attributed to an accessory spleen in all instances, the advisability of reoperating on such patients is none the less not lessened.

Of interest was the 72 per cent failure rate with three deaths due to cerebral hemorrhage in a control series of 25 patients treated conservatively.

Splenectomy for “symptomatic” purpura is considered briefly with mention of 10 cases.
ABSTRACTS

Any review of long term results of a therapeutic procedure is of obvious value, and the
above findings, particularly in the light of the frequently greater risk of conservative man-
agement, justify splenectomy in most cases of idiopathic thrombocytopenic purpura.—
H. W. B.

Behavior of Factor VII and Prothrombin in Late Pregnancy and in the Newborn.
A. Loeliger and F. Koller. From the Dept. of Medicine, University of Zurich, Switzerland.

The experiments of the authors demonstrate that the hypercoagulability of the blood
during late pregnancy is caused primarily by an increase of factor VII, whereas prothrom-
bin values in most cases are within normal limits.
The hypocoagulability of the newborn's blood is due to a marked decrease of both pro-
thrombin and factor VII.—C.M.

The Effect of Vitamin K₁ on the Dicoumarol Hypoprothrombinemia and the Ac-
celerator Factors in Rabbits with Liver Damage and on Hepatectomised Cats.
R. Jürgens. From the Research laboratories of Roche, Ltd., Basle, Switzerland. Acta
haemat. 7: 143-156, 1952.

Vitamin K₁ administered to subjects with dicoumarol hypoprothrombinemia caused a
normalization of the prothrombin content and the accelerator factors V and VII in the
blood. In the rabbit with liver damage caused by carbon tetra chloride or trypan blue pro-
thrombin and accelerator factors are brought to normal by vitamin K₁. In dicoumarol hypo-
prothrombinemia with deficiency of factors V and VII followed by extirpation of the liver,
prothrombin and accelerator factors V and VII are reformed in the reticulo-endothelium
after intravenous injection of vitamin K₁.—C.M.

IMMUNOHEMATOLOGY

S. R. Michael and I. L. Vural. From the First Medical Service and the Laboratories of

Interesting cytologic and chemical studies are reported which contribute to our knowl-
edge of the nature and origin of the L.E. cell.
On the basis of their experience with 17 cases of acute disseminated lupus erythemato-
sus, a control group with various disorders and the few cases referred to in the addendum,
the authors consider the specificity of the L.E. cell to be about 96 per cent.
Experimental studies are described which demonstrate that the factor responsible for
the L.E. cell phenomenon resides in the gamma globulin fraction of plasma, as previously
reported by Haserick, and that the element necessary for activation of this factor is time
outside the body rather than the presence of an anticoagulant. The L.E. cells, first found
after 2 minutes of incubation, reached their greatest concentration after 20 to 30 minutes.
Cytologic changes, observed throughout this entire period and also when abnormal white
cells were utilized as substrate material, showed rather clearly that the included body of
the L.E. cell is altered nuclear material derived from polymorphonuclear leukocytes and
lymphocytes. Further cytochemical study of the nuclear material by means of Feulgen
and methyl green stains indicated that it contains partially depolymerized deoxyribose nucleic
acid and that it appeared optically and chemically identical with the hematoxylin-staining
body described by Klemperer in his study of the mesenchymal cells from autopsied cases
of disseminated lupus erythematosus.—H. W. B.

Serum Lipid and Protein Fractions. III. Diseases of the Mesenchyme. I. Leinwand.
From the Department of Medicine, New York University Postgraduate Medical School

Electrophoretic patterns of the serum proteins were determined for the serum of patients
with disseminated lupus erythematosus, dermatomyositis, rheumatic fever, scleroderma
ABSTRACTS

and rheumatoid arthritis. The gamma globulin and albumin tended to vary inversely, and as the gamma globulin increased, it was associated with a larger amount of ether extractable material. It is suggested that “this may be due to an increase in lipoproteins in amounts too large to be linked with the beta globulin.”

The most marked variations occurred in disseminated lupus erythematosus and dermatomyositis, with rheumatic fever, scleroderma and rheumatoid arthritis following in descending order.

The patients with rheumatoid arthritis usually had hyperlipemia and hypercholesterolemia, which the other diseases did not exhibit.—T.R.T., Jr.


Tissue extracts contain lysin-inhibitor complexes, from which active alcohol-soluble lytic components can be extracted. These may be ether soluble or ether insoluble, and they may be related to similar lysins obtained from plasma and blood. Three aspects of this problem are considered: (1) the comparison of the lysins obtainable from blood with those obtainable from tissue such as mouse liver, (2) the application of paper chromatography and related technics to the separation of these lysins and their complexes and (3) various observations on the nature of the lysins and on some of the properties of the inhibitors which form part of the lysin-inhibitor complexes.—O.F.J.

BOOK REVIEWS


This is a remarkable little book of 121 pages and 57 Kodachrome illustrations of the urinary sediment. As the author states in his Foreword, “The principal original contribution is a collection of photographs in color, which preserve subtle differences in shade and refraction that make the reproductions recognizably similar to actual microscopic observations.” There can be no doubt as to the end result, which is as close to perfection as one can hope for. The casts and other urinary materials are absolutely life-like and therefore of great value for teaching purposes. The text itself is well written and compact. A section on technics and another on bibliography close the book. The only deterring feature about the work is its rather high cost ($7.50) but this is presumably brought about by the large number of illustrations.—William Dameshek


These two little books are both excellent guides for those who are about to embark on a writing career—and which scientific worker is not? Scientific data are relatively easy to accumulate; to set them down in a clear and interesting manner is something else again. Any book that will guide the aspiring scientist into recording his thoughts in simple fashion for their eventual presentation to a more or less harassed editorial board deserves considerable credit from all concerned. Both books do this well and are to be recommended not only for the tyro but for the experienced worker who is never too old to learn. Even an editor can pick up a point or two. Chapters IX and X, in the volume by Jordan and Shepard, dealing with illustrations and statistics, deserve special commendation.—William Dameshek
ABSTRACTS

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